VIRGINIA DEPARTMENT OF TRANSPORTATION

LOCATION AND DESIGN DIVISION

INSTRUCTIONAL AND INFORMATIONAL MEMORANDUM

GENERAL SUBJECT: Interstate, NHS Non-Interstate and Non-NHS (IJR / IMR Guidance)	NUMBER: IIM-LD-200.9
SPECIFIC SUBJECT: Development of Justification for Additional or Revised Access Points; Creation of Interchange Justification / Modification Reports	DATE: January 3, 2017
	SUPERSEDES: IIM-LD-200.8
APPROVAL:	B. A. Thrasher, P.E. State Location and Design Engineer Approved December 12, 2016

Changes are shaded.

CURRENT REVISION

- This memorandum was revised to replace Regional Traffic Engineer with “responsible District Traffic Engineer”, effective January 25, 2017.

EFFECTIVE DATE

- These instructions are effective for all IJR’s and IMR’s upon receipt.

PURPOSE OF POLICY

- This IIM sets forth the federal and state requirements and processes to be utilized by all applicants in the development of an interchange proposal [Interchange Justification Report (IJR) or Interchange Modification Report (IMR)] requesting a new or modified interchange for any new or modified access on both interstate and non-interstate roadways.

- This policy adheres to the current VDOT/FHWA Stewardship and Oversight Agreement, which defines oversight responsibilities with regard to Interstate, NHS Non-Interstate, and Non-NHS Access Approvals.

- It is essential to require full compliance with these requirements and processes listed herein to allow for Departmental consideration of any interchange proposal. However, such compliance alone does not ensure approval by VDOT or the Federal Highway Administration "FHWA". Each proposed request will be reviewed independently and a decision given based upon current VDOT and FHWA policies.

- For consistency and streamlining the review process, all grade separated interchange requests, including conversion of existing intersections, follow similar reporting format regardless of the funding source or facility type.

BACKGROUND

- All agreements between the Federal Highway Administration (FHWA) and VDOT for the construction of projects on the Interstate System contain a clause providing that the State will not add any points of access to, or exit from, the project in addition to those approved by FHWA in the plans for the project, without the prior approval of the FHWA Administrator.

- Due to the numerous requests by States for additional access to the Interstate System, the FHWA has clarified its policy and emphasized the need for justification in areas such as safety, traffic operations and coordination with land use. On November 9, 1989, FHWA issued a proposed policy statement for public comment in "the "Federal Register". Based on comments received and further analysis, on October 22, 1990, FHWA issued its final policy statement. An additional policy statement was issued in the Federal Register on February 11, 1998.

- The Federal Register was updated on August 27, 2009 to reflect the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and to clarify the operational and safety impacts of interstate access. This information is available at: http://www.fhwa.dot.gov/safetealu/

- The August 31, 2010 FHWA Memorandum, "Interstate System Access Information Guide" was issued to provide guidance on preparing access modifications for FHWA approval. This information is available at: http://www.fhwa.dot.gov/design/interstate/pubs/access/access.pdf

ABBREVIATIONS

U.S.C. - U.S. Code
C.F.R. - Code of Federal Regulations
H.C.M. - Highway Capacity Manual

SOURCES OF INFORMATION

- Federal Highway Administration (FHWA, "Interstate System Access Information Guide, 8/31/10 http://www.fhwa.dot.gov/design/memos/100831.cfm

- Authority: 23 U.S.C. 111; 49 CFR 1.48(b) (10)

- Federal Highway Administration
  Additional Interchanges to the Interstate System
  Federal Highway Administration (FHWA), DOT.
  Notice of policy statement

- Federal Register / Volume 74, No. 165 / August 27, 2009 / Notices (Interstates Only) http://www.fhwa.dot.gov/programadmin/fraccess.cfm

- FHWA Policy Memorandum – Operational Analysis of the Access Point to the Interstate System, August 21, 2001.

- Federal Register / Volume 63, No. 28 / February 11, 1998 / Notices

- Federal Register / Volume 55, No. 204 / October 22, 1990 / Notices

POLICY POINTS FOR INTERSTATE ACCESS

Quoted from Federal Register, August 27, 2009, pages 43743-43746:

- "It is in the national interest to preserve and enhance the Interstate System to meet the needs of the 21st Century by assuring that it provides the highest level of service in terms of safety and mobility. Full control of access along the Interstate mainline and ramps, along with control of access on the crossroad at interchanges, is critical to providing such service. Therefore, FHWA's decision to approve new or revised access points to the Interstate System must be supported by substantiated information justifying and documenting that decision."

  The FHWA's decision to approve a request is dependent on the proposal satisfying and documenting the following 8 Policy Point requirements as shown in FHWA's Interstate System Access Informational Guide and listed below:

  Policy Point 1: Need for the Access Point Revision

  Policy Point 2: Reasonable Alternatives

  Policy Point 3: Operational and Collision Analyses

Policy Point 4: Access Connections and Design

Policy Point 5: Land Use and Transportation Plans

Policy Point 6: Future Interchanges

Policy Point 7: Coordination

Policy Point 8: Environmental Processes

POLICY STATEMENT IMPACT

- The policy statement summarizes and clarifies FHWA/VDOT policy and guidance for the justification and documentation needed for requests to add or revise access to the Interstate System, NHS Non-Interstate System, and Non-NHS. Specifically, the policy statement emphasizes the need for clear and convincing justification based on adequate information in areas such as safety, traffic operations, planning and environmental processing. The scale and complexity of documentation required for requests to add or revise access to an existing situation (Interstate, NHS Non-Interstate, or Non-NHS) varies with the scope of the proposed revision.

TYPES OF PROPOSALS

- Providing "New" Interchange Access

    - Interchange Justification Report - An operational analysis prepared in accordance with both VDOT and FHWA guidelines for any proposed new interchange. The IJR process applies to **all** access additions and FHWA's approval is required on all interstate projects greater than or equal to $1.0 million in construction cost.

    - FHWA approval is **not** required on:
        - Any NHS Non-Interstate projects
        - Any Non-NHS projects

    - IJRs on the Interstate require that all eight policy points (shown in the "Policy" section above) must be addressed. The level of effort necessary to adequately address each point varies based upon the complexity of the proposal. The level of effort will be set and agreed upon in the scoping meeting and scoping document.

    - For non-Interstate IJRs, the scope approval outlines which of the policy points will be addressed and the level of analysis required.

- Examples of IJRs, which may require review and action include, but are not limited to, the following: (Contact the appropriate Assistant State L&D Engineer for concurrence)

    - New Interstate-to-Interstate interchange
    - Major modification of Interstate-to-Interstate interchange configuration, e.g., adding new ramps, abandoning/removing ramps, completing basic movements
    - New partial interchange or new ramps to/from a continuous frontage road, resulting in a partial interchange
    - New Interstate-to-crossroad interchange
    - Modification of existing Interstate-to-crossroad interchange configuration
    - Completion of basic movements at an existing partial interchange
    - Abandonment of ramps or interchanges

- Modification to an Existing Interchange

    - Interchange Modification Report (IMR) - An operational analysis, prepared in accordance with both VDOT and FHWA guidelines for access modifications that are needed to improve operations and safety of an existing interchange. The IMR process applies to access modifications on the Interstate System, NHS Non-Interstate and Non-NHS.

    - IMRs on the Interstate require that all eight policy points (shown in the "Policy" section above) be addressed. The level of effort necessary to adequately address each point varies based upon the complexity of the proposal. The level of effort will be set and agreed upon in the scoping meeting and scoping document.

    - For NHS Non-Interstate and Non-NHS IMRs, the scope approval outlines which of the policy points will be addressed and the level of analysis required.

    - Examples of IMRs, which may require review and action include, but are not limited to the following: (Contact the appropriate Assistant State L&D Engineer for concurrence)

        - Changing a single lane exit to a dual lane exit. However, should VDOT or FHWA have a concern about merge, diverge or weaving operations with an adjacent interchange, additional information may be necessary.
        - Ramp metering, ramp HOV bypass lanes and potentially other travel demand management strategies intended for use on an existing interchange.

- Minor adjustment of an existing ramp terminal at the Interstate connection for safety or operational purposes. As stated above, potential interaction with an adjacent interchange could require additional information.

- Increasing the capacity of ramp segments, provided the merge to the existing ramp cross section occurs a sufficient distance from the existing entry point with the Interstate such that the operating conditions of the Interstate are not impacted.

- Modifications of the ramp termini at the crossroad. This includes accommodating crossroad widening, change ramp lane configurations, installation/modification of traffic control devices, addition of a turn lane from the crossroad to the ramp or other modification to the ramp/crossroad intersection configuration.

- Extending an existing entrance ramp to become an auxiliary lane ending at the next adjacent downstream interchange. This condition has the potential to require additional information.

- Extension of a deficient acceleration lane, deceleration lane or recovery lane at the Interstate connection point.

- Bridge modifications/replacement that change the geometrics of the Interstate or crossroad.

- Replacement or modification of an interchange “in-kind” to accommodate an Interstate widening project.

INTERSTATE APPLICATION

- Required information is found in Appendix A of the August 31, 2010 FHWA Publication, “Interstate System Access Information Guide”

IMPLEMENTATION PROCESS

- **Applicant Responsibilities**

  - Prior to proceeding with a detailed analysis for a potential new or revised access point, the applicant must validate two items:

    (1) Is the access supported by the local/municipal government?

(2) Is the access supported by VDOT?

- With positive endorsement from these two entities, the applicant study can move forward to assess the need for the access point and determine economic justification.

- An applicant may be an office within VDOT (District), a local government, an authority (toll authority, etc.) or a private developer. The applicant is responsible for all preliminary work. This work includes, but is not restricted to, the following: collecting all data, providing the Department with sufficient and appropriate documentation for the need of such a proposal, all engineering and operational analyses required for approval authority (VDOT/FHWA) to provide an informative decision on the proposal.

The Applicant must specifically:

- Reach agreement with VDOT/FHWA on the scope of work through a mandatory scoping meeting prior to initiating work, as well as an approved scope document. The scope will include (at a minimum) the following:
  - Assumptions used in the IJR/IMR
  - Existing and proposed geometrics
  - Proposed traffic analysis tools and approach
  - Study area
  - Peak periods for analysis
  - Traffic and crash data
  - Design year
  - Opening year
  - Travel demand forecasts
  - Baseline conditions
  - Design year conditions
  - Policy points to be utilized and level of detail for each one

- Develop the preliminary interchange proposal containing all analyses and documentation agreed upon by VDOT/FHWA.

- Respond (in a timely fashion as specified by VDOT and/or FHWA) to all comments for corrections, requests for additional information and analysis and document revisions.

- Develop a final interchange proposal that includes all VDOT/FHWA approved comments and revisions.

- **VDOT Responsibilities**

<u>FHWA / VDOT APPROVAL</u>

FHWA approval is required on all Interstate projects greater than or equal to $1.0 million in construction cost.

VDOT will coordinate with the applicant, participate in scoping meetings, provide review and comments on all interchange proposal submittals, provide technical and policy guidance and provide all coordination with FHWA. Upon finding all information within the proposal satisfactory, VDOT will consider approving the document and forwarding to FHWA for their review and possible approval. The VDOT approval process will adhere to the most up to date version of the VDOT/FHWA Stewardship and Oversight Agreement. The approval process will generally abide by the following steps:

- Applicant will submit information to the appropriate District Location and Design Engineer for review by the appropriate disciplines.

- All traffic operations and crash analysis will be reviewed and recommended for approval by the responsible District Traffic Engineer.

- District Location and Design Engineer will either recommend approval or deny the submittal. A recommendation for approval will be forwarded to the State Location and Design Engineer in the Central Office for final review. All requests that are denied will be provided back to the requestor for further review and work or denied outright.

- Upon receiving recommendation for approval from the District L & D Engineer, the State Location and Design Engineer will then either recommend approval to the VDOT Deputy Chief Engineer or deny approval and return to applicant for possible resubmission.

- Upon approval by the Deputy Chief Engineer, VDOT will forward to FHWA for their review and request engineering and operational acceptability.

- Please review FHWA's "Interstate System Access Information Guide" for approximate processing times by FHWA.

VDOT ONLY APPROVAL

For those projects that only require VDOT approval, the approval process will generally abide by the following steps:

- The District Location and Design Engineer is responsible for coordination of the final product and review by all functional disciplines.

- District Location and Design Engineer will review the package with input from other VDOT disciplines and provide a final recommendation to the State Location and Design Engineer.

- All traffic operations and crash analysis will be reviewed and recommended for approval by the responsible District Traffic Engineer.

- The State Location and Design Engineer will review the package and either provide a recommendation of approval to the Deputy Chief Engineer, send back to the District Location and Design Engineer for further work or deny the request.

- Final VDOT approval of the request rests with the VDOT Deputy Chief Engineer.

REQUEST PROCEDURES

- State DOTs are required to submit requests for proposed changes in access to their FHWA Division Office for review and action under 23 U.S.C. 106 and 111, and 23 CFR 625.2(a). The FHWA Division Office will ensure that all requests for changes in access contain sufficient information, as required in this policy, to allow FHWA to independently evaluate and act on the request.

- Report Organization

  The Contents of Request shall follow the format shown below. Please reference FHWA's "Interstate System Access Information Guide" for specific information.

  Executive Summary

  - Describe the access point revision being submitted and why it is needed.
  - Brief summary of the report

  I. Introduction

  A. Background
  B. Purpose
  C. Project Location

  II. Methodology

  A. Summarize the methodology and all assumptions used to develop the request.

  III. Existing Conditions

  A. Demographics
  B. Existing Land Use
  C. Existing Roadway Network
  D. Alternative Travel Modes
  E. Interchanges
  F. Existing Data
  G. Operational Performance
  H. Existing Safety Conditions
  I. Existing Environmental Constraints

IV. Alternatives Considered

All alternatives that are considered should be included in the report documentation with evaluation results. At a minimum, the report shall include:

A. No-Build Option - Analysis which demonstrates that the existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to reasonably provide a satisfactory level of service (LOS) to accommodate the peak period Design Year traffic demands while at the same time providing the access intended by the proposal. The past three year crash trends indentifying high crash locations which warrant further assessment. Expected design year crashes and severity, using Highway Safety Manual (HSM) methodology where available, shall be documented. Related methods, such as FHWA's Interchange Safety Analysis Tool, may be used until applicable methods are included in the HSM.

B. Build Options – Analysis which demonstrates that the Build Options provide the necessary access and no significant adverse impacts to the peak period LOS to satisfactorily accommodate the Design Year traffic demands. Design year build options expected crashes and severity will be compared to the No-Build Option using the Highway Safety Manual methods where applicable. Related methods, such as FHWA's Interchange Safety Analysis Tool, may be used until applicable methods are included in the HSM.

C. Transportation System Management Options (i.e. HOV, ITS, Ramp Metering, Transit) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.

D. Description and Configuration of the existing and proposed interchange access show basic geometry of the proposed interchange. This can be accomplished by an arrow diagram showing the number of lanes for all movements, including ramps and interstate through lanes. (The proposed access must connect to a public road only and must provide for all traffic movements. Less than "full interchanges" for special purpose access for transit vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis.).

V. Roadway Geometry

A. The proposed access should be designed to meet or exceed current standards in accordance with the AASHTO Green Book, AASHTO Design Standards Interstate System and VDOT Road Design Manual. The applicant will strive to design to the highest design standards possible. Deviations from the information contained in the references above shall be indicated in the body of the report and serve as the basis for possible design exceptions or design waivers. All design exceptions shall require a formal submittal process to VDOT and FHWA (if required). Please refer to IIM-LD-227 for specific details to the exception process.

B. Number of main line and crossroad lanes; including any auxiliary lanes or C-D roads.

VI. Traffic Volumes

Forecast traffic volumes should be developed using the latest available planning assumptions (information from approved statewide, MPO, and local long range plans). Traffic forecasts should be coordinated with any adjacent or regionally significant projects in the study area. Guidance on the incorporation of the "latest" planning data/assumptions shall be a joint decision between VDOT and FHWA based on a project specific analysis.

A. Ramps Interstate through lanes and crossroad Traffic Volumes (ADT) including Turning Movements, Directional Distribution for Current Year, Opening Year, any interim years identified at scoping and Design Year (Ad date plus 22 years). Traffic data utilized shall be collected no more than 2 years prior to first submittal.

   Crash locations and collision diagrams for the most recent three year period that identify at a minimum, collision type, time of day, severity and number of vehicles involved.

B. Plan view map showing Existing Peak Period Volumes, Design-Year No-Build and Design Year Build Peak Period Volumes for ramps, crossroads and interstate through lanes labeled as such. Plan view map showing crashes and severity for the past three years, design year No-Build and Build for each roadway intersection and segment in the study area.

C. Plan view map showing Existing Peak Period LOS, Design-Year No-Build Peak Period LOS and Design Year Build Peak Period LOS for ramps, interstate through lanes and crossroads with calculated values for Peak Period LOS labeled as such.

D. The peak periods for analysis will be determined with the project scoping and may include the AM, PM, and/or weekend peak period.

VII. Traffic and Crash Data

The proposal must demonstrate that the new or revised access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. Traffic and operational analysis must be performed for existing and proposed conditions, including crossroads and other roads and streets to the extent necessary to ensure the ability of them to effectively collect and distribute traffic from the new access. This selection of methodology/software analysis is extremely important and needs to be discussed and decided upon in the scoping document and explained in this section of the report. Therefore, the following items shall be addressed in the initial proposal:

A. Freeway Analysis

Provide Minimum Design Speed, Terrain type [Either qualitative (level, rolling, mountainous) or quantitative (percent grade and length)], Percent of Trucks for each movement, Lane Widths and offset distance to side obstruction if less than 6' (1.8 meters) and Peak Hour Factor (PHF) for:

(1) Existing Conditions
(2) Design Year "No-Build" Conditions
(3) Any Interim Year "No-Build" Conditions
(4) Any Interim Year "Build" Conditions
(5) Design Year "Build" Conditions

B. Weave Analysis

Identification of the weave type and lengths measured from gore area to gore area for:

(1) Existing Conditions
(2) Design Year "No-Build" Conditions
(3) Any Interim Year "No-Build" Conditions
(4) Any Interim Year "Build" Conditions
(5) Design Year "Build" Conditions

C. Ramp Junction Analysis

Provide Queue Lengths for Ramps, Length of Ramp Requirements to accompany queue, stopping sight distance and taper length for:

(1) Existing Conditions
(2) Design Year "No-Build" Conditions
(3) Any Interim Year "No-Build" Conditions
(4) Any Interim Year "Build" Conditions
(5) Design Year "Build" Conditions

D. Upstream and Down Stream Impacts

(1) Additional "access points shall not be looked at as isolated actions". Sufficient study/analysis needs to be preformed to evaluate its effect on the whole Interstate facility. As a minimum, in urbanized areas, the analysis must extend through at least the first adjacent existing or proposed interchange on either side. If rest areas or welcome centers are located between adjacent interchanges, they shall be incorporated into the analysis.

(2) Sufficient study/analysis is also necessary for the upstream and downstream intersections along the crossroad. As a minimum, in urbanized areas, the analysis must extend through at least the first adjacent existing or proposed major intersection on either side of the interchange.

E. Safety Analysis

Demonstrate that the proposal does not have a significant adverse impact on the safety of the freeway and the adjacent affected local surface system. If impacts are anticipated, mitigation strategies should be included. Highway Safety Manual methodologies will be utilized to assess the geometric and traffic control options for the roadway intersection/segments in the study area. The analysis will contain the following at a minimum:

(1) Documentation on collision histories, rates and types for the freeway section and adjacent affected local surface system, severity and number of vehicles involved for the freeway section, ramps compared to similar elements in an area defined during scoping (For Example, compare intersection(s) crash frequency to jurisdiction, district or statewide averages and ranking).

(2) Discussion on proposed geometrics and the expected impact on crash history and development of alternative treatment strategies to mitigate the number and/or consequences of the predicted crashes per year for the No-Build and Build Options.

F. Summary

(1) A summary of the operations software raw input and output data used for the operational analysis should be provided (both in hard copy and electronic form), showing the Level of Service (LOS) of each element (basic freeway, all ramp gores, weaving sections) for AM/PM Peak Hours and No-Build/Build conditions for both the year of opening and the design year.

(2) The following information shall be provided with the operations analysis:

a. A disk media or FTP copy of the electronic files.
b. A description of the method used to calibrate the model.
c. An explanation of model input values and assumptions, including roadway characteristics and driver/vehicle behavior assumptions, should be provided.
d. An explanation of the number of runs and random seeds used to develop the final model.
e. A summary of the model results in graphic or tabular format.
f. A summary chart showing the Level of Service (LOS) results from the operation analysis and other measures of effectiveness as agreed upon in the IMR/IJR scope.

(3) The following information shall be provided with the safety analysis including the use of the Highway Safety manual (HSM):

a. A disk media or FTP copy of the electronic files

b. A description of the method used to calibrate the HSM models and worksheets used.
c. An explanation of which HSM model values were used based on assumptions and if any were changed and why.
d. An explanation of the crash adjustment and modification factors used for each design option and mitigating treatment alternatives assessed.
e. A summary of the HSM model results in graphic and tabular format.

(4) All electronic analysis files shall be submitted for review and concurrence.

VIII. Land Use

A. A request for a new or revised access generated by new or expanded development should demonstrate appropriate coordination between the developments and related or otherwise required transportation system improvements.

IX. Environmental Compliance

A. FHWA approval of a new or revised access point constitutes a Federal action, and as such, requires that National Environmental Policy Act (NEPA) procedures are followed. Compliance with the NEPA procedures need not precede the request for approval of a new or revised access point. However, the request should indicate how the NEPA requirements are anticipated to be satisfied. FHWA approval of requests is conditioned upon the State complying with all applicable Federal rules and regulations. NEPA requirements must be satisfied prior to the final approval of the new or revised point of access.

X. Appendix

A. Letter of Commitment from Locality
B. Certified Traffic Data
C. Traffic Software Analysis Results
D. Environmental Document (Summary/Overview)
E. Conceptual Signing Plan
F. Any required design exception(s) and/or waiver(s)

XI. Additional Information:

A. Any other information that might help explain and/or support the proposal, e.g., cost effectiveness analysis, source of funding, schedule,

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BASIS FOR APPROVAL

- Under normal circumstances, justification of the need for the proposed access break is based upon traffic demand in the design year. However, other important information may be used in combination with, or in lieu of, these criteria and with the concurrence of the Department and/or FHWA.

- Existing VDOT policy, standards, guidelines and procedures, together with the current FHWA and AASHTO policy requirements, shall form the basic criteria for the analysis and documentation that is required for the preparation, review and decision of any interchange request.

- A proposal shall not cause a safety problem that may affect the mainline, connecting arterial road system, proposed interchange or any adjacent interchanges. It is imperative that the design of such a proposal consider the reduction and elimination of conflict areas associated with entrances, exits and weave sections and the overall simplification of driver perception and decision making. This would include (but not be limited to) clear and concise signing, clarification of decision points and uniformity in the overall design and operations.

- Typical Approval Time for IJR and IMRs (varies based upon final / approved scope)

    - Interchange modification reports (IMRs) for minor modifications to rural interchanges typically take from 3 to 6 months.

    - IMRs for major modifications to urban interchanges can take from 12 to 18 months.

    - IMRs involving more than one interchange in densely populated urbanized areas can take 24 months or more.

    - A typical interchange justification report (IJR) can be completed in 14-30 months based upon the complexity of the project.

        - New interchanges to Interstate facilities and system-to-system interchange modifications may require additional review time by FHWA based on the importance and complexity of these proposals.