

## GENERAL INFORMATION REQUIRED IN AN IMR/IJR

### A. General information required in an IMR/IJR

FHWA policy states that all requests for new or revised access must include sufficient supporting information to allow FHWA to independently evaluate the request and ensure that all pertinent factors and alternatives have been appropriately considered. SCDOT should submit three copies of the IMR/IJR to FHWA. The following is a description of what information should typically be included in an IJR or IMR:

- A clear description of the location and type of proposed new or modified access. Maps, schematic diagrams, and functional preliminary design plans shall be included as needed to clearly describe the proposal. Drawings and plans should include (as applicable): project limits, adjacent interchanges, proposed interchange configuration, adjacent intersections to ramp terminals, travel lanes and shoulder widths, ramps to be added, ramps to be removed, ramp radii, ramp grades, acceleration lane lengths, deceleration lane lengths, taper lengths, auxiliary lane lengths, "taper" or "parallel" type exit ramps, truck climbing lanes, and collector/distributor roads. A large-scale layout of the project on an aerial photograph is helpful to FHWA in reviewing the request.
- Purpose and need for the new or revised access points (i.e., why it is needed, what are the intended benefits).
- Any background or supporting information that further explains the basis for the proposal (i.e., new highway proposed, planned private developments, known political support, etc.) Maps should show exact locations of all developments. If the purpose of the IMR/IJR is to support one or more proposed developments, the IMR/IJR should say so. Economic development can be a valid justification for new access.
- If the interchange is within a Transportation Management Area
- If there are any known issues of concern or controversy (i.e., environmental, public opposition, etc.).
- A description of the design alternatives considered (i.e., diamond interchange, single-point, directional ramps, alternate locations, etc.) and why the proposed alternative was selected.
- Estimated costs of the project, proposed funding sources (i.e., private development, local funds, State or Federal-aid funds), and implementation schedule.
- Relationship and distance of the interchange to adjacent interchanges and the ability to provide adequate signing.
- Any necessary design exceptions from currently adopted AASHTO Interstate design standards.
- Existing and Proposed Limits of Access

- Schematic drawings showing current and design year ADT and DHV for mainline traffic volumes, ramp volumes, cross road volumes, and intersection turning movements.
- Additional proposed traffic signalization and signing (if applicable).
- Safety issues regarding the existing conditions and proposed alternatives

**B. Policy information required in an IMR/IJR**

The IMR/IJR needs to address each of the following policy requirements listed in the Federal Register:

1. Operational Analysis: FHWA policy states: *"An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access. The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network. Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network. Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative."*

The operational and safety analysis performed needs to include all elements of the Interstate System, including collector-distributor roads, and provide a comparison of the no-build and build conditions that are anticipated to occur through the design year of the project. For consistency, it is anticipated that the current Transportation Research Board (TRB) "Highway Capacity Manual" (HCM) analysis procedures will be used. Other analysis tools may be used to supplement the HCM when appropriate. The operational impact on the mainline Interstate between the proposed new/revised access and the adjacent existing interchanges on either side is a critical item that must be analyzed. The analysis may be extended beyond the minimum requirements outlined above to establish the potential extent and scope of the impacts. Extending the limits of the analysis in urbanized areas where there are closely spaced interchanges may be required. The spacing between interchanges must safely accommodate weaving, diverging, merging maneuvers, and good directional signing. The analysis should demonstrate the engineering and operational acceptability of the proposed change in access. When considering the

impacts of various alternatives, priority needs to be given to the performance of the Interstate System within the context of the local planning, environmental, design, safety, and operational conditions.

2. Access Connections and Design: FHWA policy states: "*The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System.*" *In rare instances where all basic movements are not provided by the proposed design, the report should include a full-interchange option with a comparison of the operational and safety analyses to the partial-interchange option. The report should also include the mitigation proposed to compensate for the missing movements, including wayfinding signage, impacts on local intersections, mitigation of driver expectation leading to wrong-way movements on ramps, etc. The report should describe whether future provision of a full interchange is precluded by the proposed design.*"

All interchanges need to provide for each of the eight basic movements (or four basic movements in the case of a three-legged interchange), except in the most extreme circumstances. Partial interchanges usually have undesirable operational characteristics. If circumstances exist where a partial interchange is considered appropriate as an interim improvement, then commitments need to be included in the request to accommodate the ultimate design. These commitments may include purchasing the right-of-way required during the interim improvements. Access to special use lanes, transit stations, or park and ride lots that are part of the Interstate System are special cases, and the movements requiring access should be determined on a case-by-case basis.

### C. Operational analysis required in an IMR/IJR

The IMR/IJR must contain an operational analysis. The operational analysis of the proposed access must clearly demonstrate to the satisfaction of FHWA that there will be little or no impact to the safety and operation of the Interstate facility. The methodology from the current TRB Highway Capacity Manual (HCM), or current version of the Highway Capacity Software (HCS) shall be used to perform the needed engineering analyses. Other analysis tools, such as Synchro and SimTraffic may be used to supplement the HCS analysis for signalized intersections and in some complex projects, more powerful simulation software packages such as TransModeler or VISSIM may be required. The IJR/IMR submittal shall include all electronic data used in all the analyses. The operational analysis should use traffic data based on a design year 20 years from the date when the project is scheduled to be complete and open to the traveling public. Alternate analysis tools for determining operational acceptability will need prior approval by FHWA.

The operational impact on the mainline Interstate between the proposed new/ revised access and the adjacent existing interchanges on either side must be analyzed. The analysis should be extended as far along the mainline and include as many existing interchanges as is necessary to establish the scope of the impacts. In some cases in urban areas, the effects of a new interchange may be felt several miles downstream where a bottleneck occurs. If this is the case, then it must be addressed in the analysis. If there are multiple planned projects on a corridor, the corridor should be analyzed. The spacing between interchanges must safely accommodate weaving, diverging, and merging maneuvers, and also allow for understandable signing.

The engineering analysis shall include all of the following, as applicable, unless agreed otherwise by FHWA:

- Existing Peak Hour Volumes: Plan view map with ramps and Interstate through lanes labeled with existing "AM Peak Hour" and "PM Peak Hour" volumes.
- Design Year No-Build Peak Hour Volumes: Plan view map with ramps and Interstate through lanes labeled with the Design Year No-Build "AM Peak Hour" and "PM Peak Hour" volumes.
- Design Year Build Peak Hour Volumes: Plan view map with ramps and Interstate through lanes labeled with the Design Year Build Peak "AM Peak Hour" and "PM Peak Hour" volumes.
- Summary Of Operational Analysis: Preferably, a table listing the "Freeway LOS", "Ramp LOS", and "Weave LOS" for the corresponding Existing AM/PM, Design Year "No-Build" AM/PM, and Design Year "Build" AM/PM for the appropriate Interstate through lane sections, on-ramps, off-ramps, and weave areas.
- Existing Peak Hour Levels of Service: Plan view map with ramps, Interstate through lanes, and crossroads labeled with calculated Existing "AM Peak Hour Level of Service" values and "PM Peak Hour Level of Service" values.
- Design Year No-Build Peak Hour Levels of Service: Plan view map with ramps, Interstate through lanes, and crossroads labeled with calculated Design Year No-Build "AM Peak Hour Level of Service" values and "PM Peak Hour Level of Service" values.
- Design Year Build Peak Hour Levels of Service: Plan view map with ramps, Interstate through lanes, and crossroads labeled with calculated Design Year Build "AM Peak Hour Level of Service" values and "PM Peak Hour Level of Service" values.
- Basic Freeway Segments Analyses of Existing Conditions
- Basic Freeway Segments Analyses of the Design Year "No-Build" Conditions
- Basic Freeway Segments Analyses of the Design Year "Build" Conditions
- Merge/Diverge Analyses of the Existing Conditions
- Merge/Diverge Analyses of the Design Year "No-Build" Conditions
- Merge/Diverge Analyses of the Design Year "Build" Conditions

- Weave Area Analyses of the Existing Conditions
- Weave Area Analyses of the Design Year "No-Build" and "Build" Conditions
- Weave Area Analyses of the Design Year "Build" Conditions
- Ramp Junction Analyses of the Existing Conditions
- Ramp Junction Analyses (including queue analysis) of the Design Year "No-Build" Conditions
- Ramp Junction Analyses (including queue analysis) of the Design Year "Build" Conditions
- Adjacent Intersection Analyses of the Existing Conditions
- Adjacent Intersection Analyses (including queue analysis) of the Design Year "No-Build" Conditions
- Adjacent Intersection Analyses (including queue analysis) of the Design Year "Build" Conditions
- A copy of the raw input and output data used in the traffic analyses, both in hard-copy form and electronic form.

If software is used to supplement the HCM, the following information needs to be provided with the analysis:

- All files associated with the analysis.
- A description of the method used to calibrate the software model.
- An explanation of what default values were changed and why.
- A summary of the software results in graphical or tabular format.
- A summary chart showing the Level of Service results from the operational analysis.