

IMR Purpose and Need and Assumptions	Existing and Proposed Geometrics	Proposed Traffic Analysis Tools and Approach	Study Area
<p>Location: I-95 from south of the Route 3 Interchange (Exit 130) to north of the Route 17 Interchange (Exit 133) including the south-facing ramps at the Centreport Parkway (Exit 136) Interchange</p> <p>Purpose and Need: The purpose of the project is to:</p> <ul style="list-style-type: none">• advance the recommendations, objectives, and policy identified in the Fredericksburg Area Master Planning Organization (FAMPO) Long Range Transportation Plan, adopted April 2013;• address recurring congestion and safety deficiencies associated with peak period travel along the northbound I-95 mainline;• provide additional traffic capacity for travel between Route 3 and Route 17 along northbound I-95; and• provide additional northbound I-95 traffic capacity over the Rappahannock River to allow for needed redundancy and flexibility during incidents, required maintenance, and bridge rehabilitation activities.	<p>The existing I-95 typical section consists of a six-lane divided interstate highway with a grass median. A collector-distributor roadway is provided along northbound I-95 at the Route 17 interchange. The I-95 interchanges at Route 3 and Route 17 both have a cloverleaf configuration.</p> <p>Proposed geometrics for the northbound I-95 improvements are undetermined at this time, but will include improvements to reduce the potential for recurring congestion along the northbound I-95 mainline lanes.</p> <p>Up to 6 conceptual build alternatives will be developed to narrow the range of alternatives to a preferred alternative to be evaluated in the IMR.</p>	<p>Operations Analysis</p> <ol style="list-style-type: none">1. VISSIM Version 8 will be used for the evaluation of traffic operations. The calibrated base year VISSIM model prepared for the I-95 Express Lanes Fredericksburg Extension Study (Fred Ex) IJR will be used for the I-95 Rappahannock River Crossing Northbound (I-95 RRC NB) project. The Fred Ex model will be expanded to include the intersections of Route 3 at Central Park Boulevard and Route 17 at Falls Run Drive, McLane Drive, and Olde Forge Drive. At the expanded study intersections, the VISSIM model will be calibrated consistent with the approved Fred Ex IJR calibration thresholds to ensure the simulated traffic volumes are within allowable tolerances.2. HCS and Synchro 9 will be used as screening tools to evaluate interchange and intersection alternatives and to develop signal timings, but will not be documented.3. 2016 Existing conditions, 2022 opening/interim year No Build and Build conditions and 2042 No Build and Build conditions will be analyzed.4. Attachment 1 summarizes the measures of effectiveness (MOEs) to be documented in the IMR. <p>Safety Analysis: A qualitative and quantitative safety assessment will be performed according to the Highway Safety Manual (HSM) using available crash modification factors (CMFs). FHWA's ISATe and IHSDM will not be used.</p>	<p>Attachment 2 depicts the study area and study intersections. The northern limit of the I-95 RRC NB study area is established north of the Route 17 Interchange (Exit 133) including the proposed tie in points with the future Fred Ex project and the south-facing ramps at the Centreport Parkway (Exit 136) Interchange. The VISSIM model area will extend along I-95 to north of the Centreport Parkway Interchange to capture the impact of downstream northbound I-95 congestion outside of the study area; however, MOEs will only be documented for the south-facing ramps at the Centreport Parkway Interchange.</p> <p>The southern limit of the I-95 RRC NB study area is established south of the Route 3 Interchange (Exit 130). The VISSIM model extends approximately 3.6 miles south of Exit 130. Based on the Fred Ex IJR results for the 2042 design year Build conditions, free flow travel speeds are predicted along northbound I-95 at the southern model limits.</p> <p>Analysis Locations: Attachment 3 summarizes the analysis locations to be documented in the IMR.</p>

Peak Periods for Analysis	Traffic and Crash Data	Opening Year and Design Year	Travel Demand Forecasts
<p>Typical fall/spring/winter operations (excluding holidays) will be assessed; summertime operations will not be assessed. The peak hours and periods were established to be consistent with the Fred Ex IJR analysis periods including an additional two-hour AM seeding period and one-hour PM seeding period.</p> <ol style="list-style-type: none">1. AM Peak Period – 6 AM - 9 AM (7 AM - 8 AM peak hour) (4 AM – 6 AM seeding period)2. PM Peak Period – 3 PM - 7 PM (5 PM - 6 PM peak hour) (2 PM – 3 PM seeding period)	<p>Traffic volume data collected for the Fred Ex IJR will be used. VDOT has provided traffic count data and intersection signal timings at the intersections of Route 17 at Falls Run Drive and McLane Drive, and Route 3 at Central Park Boulevard, which were not previously included in the Fred Ex IJR. Traffic data at Route 17 and Olde Forge Drive will be obtained from the Route 17 STARS study. No additional data collection will be performed.</p> <p>Crash data along I-95, Route 3, and Route 17 within the study area will be obtained from VDOT’s Tableau for the most recent 5 years of available data (January 2013 - December 2017).</p>	<p>Interim Year is assumed to be 2022.</p> <p>Design Year is assumed to be 2042.</p> <p>The interim year and design years were established consistent with the forecasts prepared for the Fred Ex project. The project is anticipated to be advertised and awarded in 2019. Assuming a 3 to 4 year construction timeframe, the project should be completed by 2022 or 2023. The 2022 Fred Ex IJR forecasts are adequate for the project opening/interim year and a potential one year difference in the forecasts would not make a meaningful difference on the conclusions of the IJR.</p>	<p>Traffic forecasts will be based on the approved forecasts prepared for the Fred Ex IJR and reassigned to the roadway network to establish future year No Build and Build conditions. Traffic forecasts for the intersections of Route 17 at McLane Drive, Route 17 at Falls Run Drive, Route 17 at Olde Forge Drive, and Route 3 at Central Park Boulevard, which were not included in the Fred Ex study area, will be prepared based on model growth rates provided by the Fred Ex Study Team and information contained in the Route 17 STARS Study.</p> <p>Forecasts for both No Build and Build scenarios will be identical (see Attachment 4).</p> <p>Attachment 4 summarizes the future year forecast scenarios and the source for each scenario from the Fred Ex IJR.</p>

Baseline Conditions	Interim Year Conditions	Design Year Conditions	IMR Report Content
<p>Baseline conditions will include the existing six lane typical section along I-95 and the existing cloverleaf interchanges located along I-95 at Route 3 (Exit 130) and Route 17 (Exit 133).</p>	<p>Interim Year (2022) conditions will be evaluated both with (Build) and without (No Build) the selected build alternative for the I-95 RRC NB project.</p> <p>No Build projects consist of the following:</p> <ol style="list-style-type: none"> 1. I-95 Safety Improvements at Route 3 2. I-95 Rappahannock River Crossing Southbound project 3. Fred Ex project 4. Route 17 STARS Improvements including the removal of the Short Street signal and a new signal at Olde Forge Road <p>The Fred Ex study team conducted a sensitivity study for a fourth northbound general purpose lane on I-95 from Exit 140 to Exit 143; however, to reflect a worst-case scenario and because the future status of this project is unknown at this time, the I-95 RRC NB project will not include this additional lane in the 2022 No Build or Build conditions.</p>	<p>Design Year (2042) conditions will be evaluated both with (Build) and without (No Build) the selected build alternative for the I-95 RRC NB project.</p> <p>No Build projects consist of the following:</p> <ol style="list-style-type: none"> 1. I-95 Safety Improvements at Route 3 2. I-95 Rappahannock River Crossing Southbound project 3. Fred Ex project 4. Route 17 STARS Improvements including the removal of the Short Street signal and a new signal at Olde Forge Road <p>The Fred Ex study team conducted a sensitivity study for a fourth northbound general purpose lane on I-95 from Exit 140 to Exit 143; however, to reflect a worst-case scenario and because the future status of this project is unknown at this time, the I-95 RRC NB project will not include this additional lane in the 2042 No Build or Build conditions.</p>	<p>IMR Organization: The IMR will follow the outline noted in IIM-LD-200.9 with revisions in accordance with FHWA's memorandum dated May 22, 2017 which discusses <i>Changes to FHWA's Policy on Access to the Interstate System</i>. Based on the latest FHWA policy, the IMR will address the two established FHWA requirements, rather than the previously defined eight policy points.</p> <p>Land Use and Transportation Plans: The IMR will document that the proposal is consistent with local and regional land use and transportation plans.</p> <p>Environmental Processes: The IMR will include supporting information regarding the status of the environmental process.</p> <p>Limited Access Line: The IMR will show the location of the existing Limited Access Lines and discuss and depict any proposed modifications to the Limited Access Lines on mapping.</p>



FHWA Considerations and Requirements: Access to the Interstate System

Consideration 1: Operational and Safety Analysis

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 should, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, should 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 (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access should 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 (23 CFR 625.2(a) and 655.603(d)). Each request should also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

Traffic operational analyses will be performed and documented in the IMR.

Existing crash data will be summarized and both a qualitative and quantitative safety analysis will be performed to document the anticipated safety impacts of the proposed improvements.

A conceptual signing plan depicting all major guide signs will be prepared and included in the IMR.

FHWA Considerations and Requirements: Access to the Interstate System

Consideration 2: Connects to Public Road and Provides for All Movements

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, such as 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 (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)). 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.

The existing and proposed interchanges at Route 3 and Route 17 connect to public roads and will provide for all traffic movements.

All elements of the project will be designed in accordance with AASHTO and VDOT standards to the extent practical. Design exceptions and waivers will be identified in the IMR.

The scoping items described in this document meet the standards of the reviewing entities or their assigned designees listed below and are found acceptable for use in preparation of an Interchange Justification Report to be submitted for approval by VDOT.

VDOT District Traffic Engineer: _____

VDOT Asst. State L&D Engineer: _____

VDOT District L&D Engineer: _____

FHWA Area Engineer: _____

I-95 Rappahannock River Crossing Northbound Interchange Modification Report: Scoping Assumptions

Attachments

Attachment 1: Measures of Effectiveness

In accordance with the VDOT Traffic Operations and Safety Analysis Manual (TOSAM) – Version 1.0, measures of effectiveness (MOEs) will be documented using VISSIM for the model scenarios summarized in the Proposed Traffic Analysis Tools and Approach section. The MOEs will be reported for three analysis hours in the AM (6 AM - 9 AM) and four analysis hours in the PM (3 PM - 7 PM). Level of service (LOS) will not be used as a performance measure. According to the TOSAM, “level of service shall not be used to support results from microsimulation models.”

All movements

- Volume input versus volume throughput to establish unmet demand (vehicles)

I-95 Freeway Mainline Segments:

- Corridor and segment travel time (min)
- Average travel speed (mph) by segment and overall corridor
- Average density (veh/lane/mile)

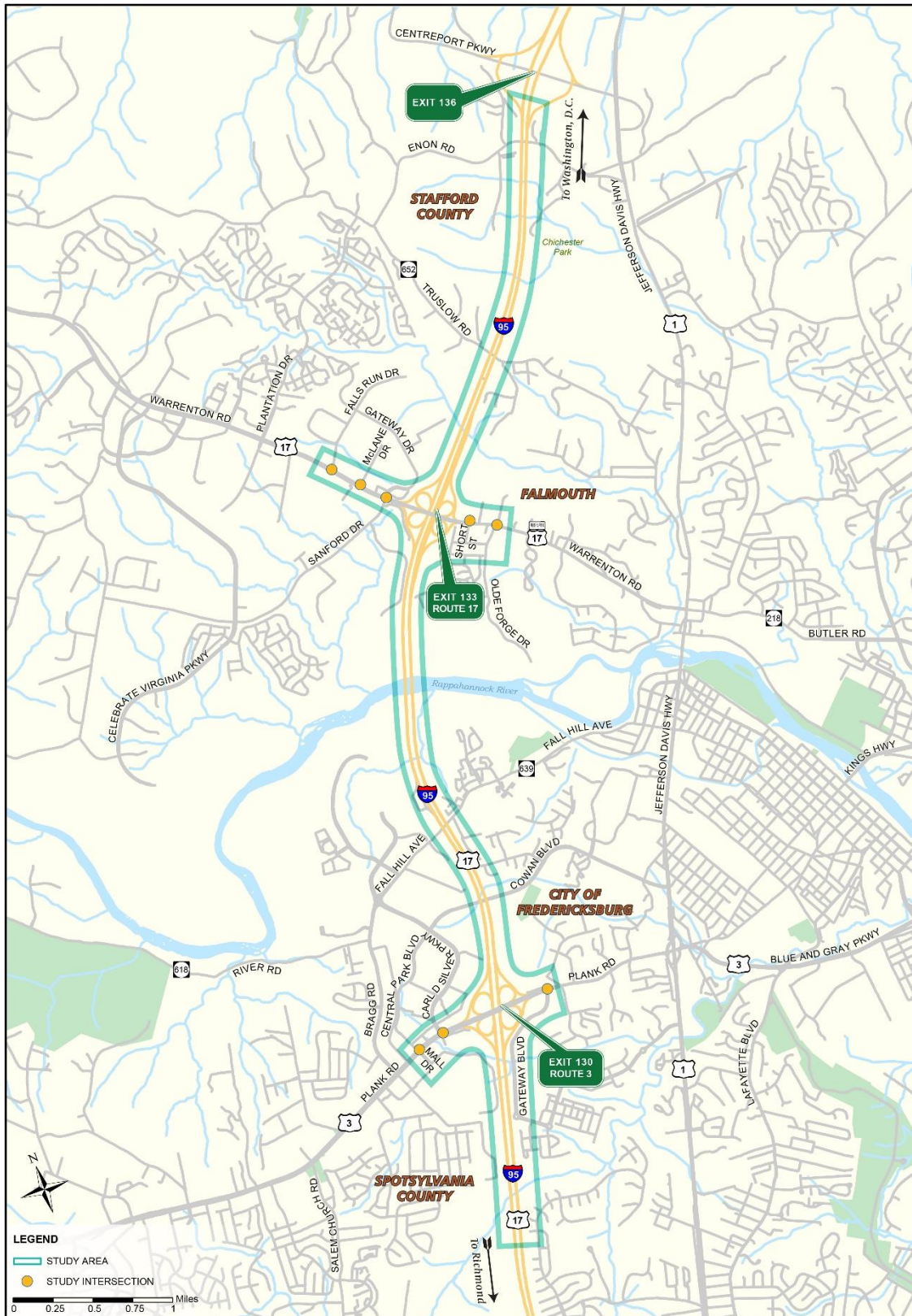
I-95 Freeway Ramp Merge, Diverge, and Weave Segments:

- Average travel speed (mph)
- Average density (veh/lane/mile)

Ramp Terminals/ Arterial Intersections:

- Average Delay (sec/veh) for overall intersection, approach, and movement
- Maximum queue length (feet) by lane group
- Average queue length (feet) by lane group

Attachment 2: Study Area and Project Limits



Attachment 3: Analysis Locations

Freeway Segments: All existing and proposed freeway segments, merges, diverges, and weaves along I-95 from south of Route 3 (Exit 130) to north of Route 17 (Exit 133) including the proposed tie in points with the future Fred Ex project and the south-facing ramps at the Centreport Parkway (Exit 136) interchange.

Existing Signalized Intersections:

1. Route 3 and Central Park Boulevard/ Mall Drive
2. Route 3 and Carl D. Silver Parkway
3. Route 3 and Gateway Boulevard/ Ramseur Street
4. Route 17 and Falls Run Drive
5. Route 17 and McLane Drive
6. Route 17 and Sanford Drive/ Gateway Drive
7. Route 17 and Short Street (signal to be removed)

Future Signalized Intersections

1. Route 3 at SB I-95 Off-Ramp
2. Route 3 at NB I-95 On-Ramp
3. Route 17 at Olde Forge Drive
4. Other potential future intersections along Route 17 (TBD)

Attachment 4: Future Year Forecast Scenarios

Traffic forecasts for the I-95 Rappahannock River Crossing Northbound (I-95 RRC NB) project will be based on the approved forecast prepared for the Fred Ex project which have a 2022 opening/interim year and a 2042 design year. No additional travel demand model runs will be performed.

The table below summarizes the forecast scenarios for the I-95 RRC NB IMR and the source of the forecasts. Since the Fred Ex project is included in the No Build conditions for the I-95 RRC NB project, the Build forecasts from the Fred Ex project must be used (in other words, the No Build forecasts from the Fred Ex project are not applicable since they do not include the I-95 RRC NB project). As a result, the No Build and Build conditions for 2022 are identical as are the No Build and Build conditions for 2042 as depicted in the table below.

I-95 RRC NB Forecast Scenario	Source
2022 No Build and 2022 Build	Fred Ex IJR 2022 Build Conditions Forecasts
2042 No Build and 2042 Build	Fred Ex IJR 2042 Build Conditions Forecasts

It should also be noted that the extension of the Express Lanes south of Route 17 will not be included in the future year scenarios consistent with the Fred Ex IJR.