

ATTACHMENT 5B

REGIONAL CONNECTORS STUDY

PHASE 3 – STUDY COMPLETION

SCOPE OF WORK REVISED (November 2021)

Introduction

Phase 3 of the study will entail the evaluation of the mandatory segments on the basis of cost and construction complexity; permitting challenges; project readiness; and congestion relief in order to provide a stratification of the segments for further study and consideration. The segments are anticipated to be divided into three tiers:

- Those segments that are ready for advancement and should be recommended for consideration in the fiscally constrained portion of the 2050 Long Range Transportation Plan, as developed by the HRTPO. (Tier 1)
- Those segments which require further refinement and maturation, and will be recommended for consideration in the 2050 Vision Plan as projects requiring further evaluation for permitability and constructability. (Tier 2)
- Those segments that due to technical issues or other items will be retained but will warrant further consideration by the community at the appropriate time. (Tier 3)

Further, the Tier 1 and 2 segments will be analyzed with regard to future “Greater Growth” scenarios as defined in Phase 2 of this study and an appropriate level of traffic operational analysis to provide insights for their consideration in HRTPO Long Range Planning.

The study will be conducted in four steps which apply across the scope tasks. This process is shown in Figure 1.

The Phase 3 scope is intended to include all tasks required to bring the Regional Connectors Study (RCS) to a successful conclusion. Phase 3 tasks are described in the following paragraphs. Paragraphs that are in gray italic font have been completed as of November, 2021.

Figure 1: Summary of Phase 3 Updated Scope in Four Steps*

	2022												2023					
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
	Step 1				Step 2				Step 3				Step 4					
Study of:	Segments				Up to 4 Bundles				Up to 3 Bundles of Tier 1 and Tier 2 Segments				Documentation					
Task 2 (Design)	Qualitative Review				Revised Design* Cost Estimates				Refined Tier 1 Design and Cost Estimate				Documentation					
Task 3 (Evaluation)	Permit Challenges Readiness DRAFT TIERING				Congestion Relief Econ. Performance FINAL TIERING								Documentation					
Task 4 (Scenarios & Traffic Operations)									Congestion and Economic Evaluation of Tier 1 and Tier 2 Segments in up to 3 Bundles (Baseline + 3 Greater Growth Scenarios) Traffic Operations Analysis (see Scope) Full Recommendations to HRTPO				Documentation					
Task 1 (Public Engagement)	Website Updates				Round of Meetings				Regional Connectivity Symposium				Round of Meetings					
Committee Meetings	2 (January, April)				2 (June, July)				2 (December, February)				1 (May)					

* Extent of conceptual design varies by tier

Note: Meeting timeframes subject to change

TASK 1 – Execute Engagement Plan

This task outlines the process for continuing the implementation of the Public Engagement Plan developed in Phase 1 of the Hampton Roads Regional Connectors Study (RCS). The subtasks associated with implementation of the Public Engagement Plan seek to inform, educate and engage stakeholders, residents, businesses, and travelers in the Hampton Roads Region. The Consultant Team will adhere to all applicable policies and procedures as directed by HRTPO and applicable federal guidelines covering MPOs and recipients of federal funds for planning purposes. Social media will be a highly emphasized medium through which study information and public meeting information will be made available in the Hampton Roads area (see Task 1.3g).

Task 1.1: Task Management

The engagement task lead will provide a task-based progress report, participate in monthly team meetings and bi-weekly calls as appropriate with HRTPO staff and the Working Group. Progress reports will summarize and report the percentage complete of each task and provide the basis for the monthly invoice. The engagement task leader will attend Consultant team meetings as needed, including but not limited to bi-weekly Consultant team meetings, internal team meetings, and meetings with HRTPO staff

as required. The engagement task leader will provide schedule updates to inform the master project schedule.

Task 1.2: Engagement Plan Review

The Public Engagement Plan will be reviewed on a quarterly basis to ensure alignment with the goals and objectives of the study and to address any additional information obtained through the engagement process. This review will include evaluation of the demographic profile, tools and tactics, metrics, stakeholder groups and key messages. Any revisions will be provided to the Steering Committee/ Working Group and HRTPO staff in track changes for review and acceptance. An electronic copy of major plan revisions will be submitted.

Task 1.3: Implementation of Engagement Program

The Consultant team will conduct stakeholder outreach tasks to engage regional stakeholders as directed and approved by the HRTPO, the Steering Committee, and the Working Group. This will consist of outreach to the targeted stakeholders representing or living in the jurisdictions covered by HRTPO agreements. Activities to be implemented include:

Task 1.3a Study Mailing list and Comment Database

The Consultant team will maintain the project database and mailing list to house contact details for agency representatives, elected officials, civic groups, businesses, and other important stakeholders. The Consultant team will work closely with HRTPO to update the agency and locality mailing list. The list will be used to disseminate project status information such as a study brochure and to notify people of upcoming in-person and online engagement opportunities.

Throughout the course of the study, the Consultant team will expand and update the mailing list and database by encouraging interested parties to refer others to the Consultant team or through mailing list signups via the study website. The Consultant team will utilize database software such as MailChimp to maintain the database.

This database can also be used to house public meeting comments for extraction and future response development. The Consultant team will accept all public comments submitted during public outreach efforts and at public meetings. This effort will include: developing a public comment section of the database; collecting and cataloging all correspondence sent to the Consultant team; categorizing all comments for inclusion in comment analysis or reports and creating the public outreach comment table summary for inclusion in the Engagement Report.

Task 1.3b Scenario Planning Virtual Meeting (Task Completed)

At the conclusion of Phase 2, the Consultant team will prepare and lead a Virtual Public Meeting (VPM) to share information regarding the scenario planning process and the initial scenario performance results with the existing + committed transportation network.

The VPM will consist of educational material and an interactive interface that can record reactions and feedback related to the scenario planning process and results. The meeting will be hosted on the project

website, with links to the component materials such as a recorded webinar and interactive material in a platform such as MetroQuest. The virtual meeting will be available online for a period of 3-4 weeks, and the educational component will be available thereafter on the project website.

The Consultant team will coordinate with HRTPO staff and study jurisdictions to promote participation in the virtual meeting through social media, email, and other forms of electronic communication. The Consultant team will monitor the patterns of participation in the interactive component to identify areas to supplement with Facebook advertising or similar cost-effective means within the stipulated budget to encourage balanced participation from within the region and demographic subgroups. Also, the Consultant team will prepare a simple display board to facilitate publicizing the virtual meeting at community events. The HRTPO and study jurisdictions can use the display with their own laptop or tablet computer to gather input at community events, and the Consultant team will utilize up to two of the pop-up meetings in Task 1.3g to enhance participation in the Virtual meeting [pop-up meetings not utilized due to COVID restrictions at the time].

The Consultant Team will summarize the participation in the VPM, and input received through the interactive component in a presentation to the Working Group and for inclusion in the Engagement Report.

Task 1.3c Community Briefings and Presentations

The Consultant team will schedule and attend up to 25 community nonprofit and organization meetings to provide an overview of the project. Presentation task elements will include the development of handouts, PowerPoint presentations, maps, and the recording of meeting minutes as appropriate. A total of up to 25 presentations will be conducted in Phase 3, as deemed necessary at the time per Steering Committee and HRTPO guidance.

Task 1.3d Brochures, Factsheets and Handouts

The Consultant team will prepare one (1) draft meeting brochure per round of public meetings (2 total) to report on key project elements, milestones, and recommended meeting dates. The brochure will be distributed at public meetings in Phase 3 and made available on the project website. The content will include background information, schedule, study area maps, and other pertinent project information to support full participation by the public at the meetings. In addition, the Consultant team will prepare postcards or rack cards for distribution to be featured at community facilities. These smaller, more portable formats could highlight topics or special interests and could be distributed at outreach events, community facilities, and as notification tools in advance of public meetings. The study team will print a total of 20,000 postcards or rack cards for distribution.

The Consultant team will develop posters, flyers and meeting presentation templates for the study. The team will generate up to six (6) comment cards, fact sheets and/or flyers that highlight topics, promote events, or announce key milestones in the process. They may target specific audiences or interests or be oriented more generally. The fact sheets and flyers will support and supplement key messages throughout the process to keep the public and stakeholders informed.

Task 1.3e Public Meetings

The Consultant team will work with HRTPO to plan, host and facilitate two rounds of nine (9) public meetings during Phase 3 of the study for a total of eighteen (18) public meetings. The need to flex these meetings away from in-person meetings to more robust online meetings will be evaluated as deemed necessary at the time per Steering Committee and HRTPO guidance. Each round of meetings will have an informational component and targeted and purposeful input opportunities. Meetings will be developed in a way that manages stakeholder expectations, promotes transparency and accountability for the process, creates understanding, and builds consensus for decisions and recommendations. The team will incorporate appropriate tools and techniques to engage and inform minority, low-income, and Title VI populations. The team anticipates each meeting series to be held as follows: three (3) Peninsula meetings (Williamsburg, Newport News, and Hampton) and six (6) Southside meetings (north Norfolk, south Norfolk, Virginia Beach, Chesapeake, Western Branch/Churchland area, and Suffolk). The Consultant team will identify meeting locations for HRTPO approval, conduct onsite walk throughs and verify ADA accessibility, book meeting locations, provide light refreshments, book court reporters, advertise meetings in various media (newspapers, social media, ad buys, etc.) and secure, if required, any sign language interpreter and/or language translator as appropriate. All meetings will be accessible by public transit.

Meeting content will include, but not be limited to, scenario planning methodology, segment and bundle packaging, and analysis results. The meeting format will be a charette style public meeting and/or small group table style.

The Consultant team will offer an online open house or live stream session for each meeting series for a total of two (2) online events. Meeting notifications will be made in accordance with HRTPO policies and will use the full mailing list. Social media (see Task 1.3g) and web announcements will be used. Additionally, in advance of the first round of meetings, a printed ad announcement with meeting information will be published in local media as approved by HRTPO and the Working Group.

An online open house is very much like a traditional public open house, but information and community discussions are offered through a web forum or webinar. A variety of options are available. With a webinar option, participants would register using the GoToMeeting software. Once registered for the online open house, participants would be able to access a library of information, view a PowerPoint presentation, and ask questions of staff through an interactive messaging feature. Interactive polling is also available. Another option is to live stream a public meeting via Facebook Live or another online tool. Providing these easy and accessible online tools will encourage community members to convene online to learn more about a project, share their ideas, and provide input to decision-makers.

Task 1.3f Regional Connectivity Symposium

To engage traditionally underserved populations the Consultant team will plan a symposium with the HRTPO EJ Roundtable, students and faculty from local Historically Black Colleges and Universities, and Title VI advocacy groups. The two- to three-hour meeting will be a facilitated conversation focused on regional connectivity for the purposes of informing the study recommendations and priorities.

The Consultant team will plan the Regional Connectivity Symposium, select the event location, develop an event management plan, speaker talking points, review of collateral materials, and provide day-of-

event coordination. The Symposium is in addition to the other outreach tools such as direct mail, community briefings, public meetings, and pop-up events to reach and engage EJ populations.

Task 1.3g Community Events and Outreach

The Consultant team will plan up to five (5) informal in-person pop-up events to introduce the project and to obtain stakeholder perspectives on regional mobility, transportation planning, and connectivity. The team will select event locations, schedule, develop event activity plans, determine required staffing, and review collateral material.

In addition, the Consultant team will investigate the use of ad space on kiosks in the region and a project informational video to be priced for HRTPO and Working Group consideration and approval. (completed)

Task 1.3h Social Media Engagement

The consultant team will maintain the social media program to support outreach to a variety of stakeholder groups across the region including environmental justice, Title VI and student populations for the purposes of promoting the study, events, and public meetings. The Consultant team will develop a social media content calendar to coincide with study engagement efforts and milestone announcements. Information posted on the RCS Facebook account will link the audience to the RCS website for additional details. HRTPO staff will review and approve draft social media content in addition to the content calendar. HRTPO will repost applicable social media content to the HRTPO social media pages. The Consultant team will be reimbursed for social media advertising. HRTPO will pay for social media advertising, if desired, on HRTPO's Facebook media account.

Task 1.3i Engagement Report

The final outreach documentation for the project will clearly highlight all activities, what we heard, and how it was considered and addressed. The final outreach summary will aid in communications for the project by telling the story of the engagement process and how the plan represents an inclusive and community-supported vision for the future.

Task 1.4: Website Upgrades and Maintenance

The team will develop additional content for use and subsequent uploading to the study website by the study team to include information developed in 2022 regarding the segments, bundles, about the 2022 segments and bundles, and final analysis information. This effort includes initial content development to be reviewed and approved by HRTPO along with the development of content updates by the study team at project milestones and other pertinent events.

Task 1.4a Prepare Website Content

The Consultant team will develop a creative brief for Phase 3 to orient readers to the Regional Connectors Study and its phases. (completed) (Scenario Planning Build Outs)

As a part of Phase 3, the study website will be populated with fresh information as it becomes available, including analysis results, meeting dates, reports, and meeting/briefing dates. Updates and reporting documents such as one-pagers will be shared as they become available. Templates for these updates will be designed and developed as a part of this task. New content, including microsimulation of alternatives' traffic operating conditions, will be integrated into the site, and new components will be

added to the site as needed to accommodate this content. Original copywriting will be delivered as a part of these updates, and publication will be managed by the Consultant team. Regular hosting and maintenance of the study website (including the posting of meeting minutes and presentation materials) will also be covered under this scope.

Phase 3 will also feature a new Scenario Planning pages which will appear at the top-level navigation on the site. New copy will be developed, and technical analysis elements performed by team members will be uploaded. This page will be designed to feature animations and other graphical elements. The budget is an estimate based on the assumption that the subpages will require interactive functionality surpassing what is possible in the templates created for Phase 1 and Phase 2. Additionally, this budget assumes support and maintenance up to the project completion date of April 2021. (completed)

As the Study gathers momentum, a plan will be created to report events on a regular schedule, and a post template for these events posts will be created. (completed)

Survey results will be shared in the form of a final report. Survey-generated publications will be added, and categories for these publication types will be created and added to the website backend. (completed)

Finally, bi-monthly website analytics summaries will be submitted to HRPTO provide information regarding the number of visits to the RCS website, number and type of public comments and other pertinent information.

Timing: 27 months

Meetings:

- 18 public meetings (in-person or robust on-line)
- Up to 25 community briefings and presentations
- 5 “pop-up” events
- 1 Regional Connectivity Symposium
- Meetings with HRTPO staff: 0
- Working Group Meetings: 4
- Steering Committee Meetings: 2
- Other/Stakeholder Meetings: None

Deliverables:

- Study mailing list (electronic format)
- Comment database (electronic format)
- Meeting notes for stakeholder briefings, presentations, and public meetings
- Brochures, fact sheets, and handouts and comment sheets for public meetings
- Social media content calendar
- *Virtual Public Meeting educational materials for project website (completed)*
- *Virtual Public Meeting interactive component for 3-4-week deployment (completed)*
- *Summary presentation of VPM participation and input (completed)*

- *Display board for use at community meetings to publicize the VPM (flyer provided/completed)*
- *Up to \$1000 in social media advertising of the VPM (completed)*
- Engagement Summary Report
- Website deliverables

TASK 2 – Development of Preliminary Segments for Evaluation

The intent of this task is to develop the mandated segments to a sufficient level of detail to support tiering of the segments. Further, this task will develop sufficient level of detail following the bundling of segments to demonstrate their feasibility and identify additional geometric, constructability and environmental constraints. The level of detail in this task will be sufficient to create construction and right-of-way planning-level costs, as well as to be able to determine each segment’s potential to be permitted. Permitting Issues and Construction Complexity are two criteria that will be used to help tier the mandatory segments. More information on that screening is provided in Task 3.2 – 3.4.

The five (5) segments evaluated in the HRCS SEIS but not programmed for funding by HRTPO/HRTAC at the conclusion of the SEIS (2017) will be developed further in this task and are listed below:

- I-664
- I-664 Connector
- I-564 Connector
- VA 164
- VA 164 Connector

The segments above will be initially evaluated using the alignments from the HRCS SEIS with one exception. Considerable work has been completed on I-664 to adjust the alignment and incorporate the use of managed lanes, either two (2) or four (4), from I-64 to the Bower’s Hill interchange. This is consistent with the regional strategy for managed lanes. Therefore, work completed to date on I-664 will be used in the initial evaluation to tier the segments. Following the tiering of segments and once the segments have been bundled, additional design and analysis will be conducted to further the design of the segments in the bundles.

Task 2.1a: Summarize Background Information

The Consultant team will compile documentation on the non-programmed roadway segments from the SEIS. The information gathered will be summarized and presented to the Working Group and HRTPO staff. Estimates of cost should be redone to account for any increases in planning level unit costs since the original estimates. The rest of the information associated with these 5 segments should still be applicable to the RCS. (Note, this task has been completed.)

Task 2.1.b: Conduct Unconstrained Travel Demand Model Analysis

The Consultant team will develop AM and PM peak period demand estimates for the 2045 baseline land use scenario and the E+C roadway network in order to understand the travel market in the region. These estimates will reveal how vehicles would be distributed with no capacity constraints affixed to the roadway network. Analysis results will be summarized in a technical memorandum. (Note, this task has been completed.)

2.1.c.: Preliminary Alternatives Investigation

The Working Group will review the results of Phase 2 Scenario Analysis of the E+C network and the results of Task 2.1.b to identify the preliminary alternatives for investigation through travel demand analysis. The travel demand model will be used to generate traffic estimates for the selected Preliminary Alternatives. The Working Group will select the set of performance measures, a subset of the full performance dashboard for the scenario analysis, to be used to evaluate performance in Tasks 3.1 and 3.5. A summary of the identified Preliminary Alternatives will be prepared. (Note, this task has been completed.)

Task 2.2: Develop Geometry of Segments

To the greatest extent possible, the Consultant team will use existing information available for the conceptual design of the segments, which includes: typical cross sections, alignments for roadways on new location, and geometric configurations of connection points to existing roadways from the SEIS.

The Consultant team will develop segments at a conceptual level in MicroStation format utilizing aerial photography and available GIS data. The Consultant will begin with the SEIS segment configurations that best match current knowledge of viable location and components.

In maintaining the continuity of the managed lane network in the region, I-664 will be analyzed with managed lanes as a part of any potential improvement. A configuration of 4 managed lanes, 2 in each direction of travel, and 4 general purpose lanes, 2 in each direction of travel, will be used in the design and evaluation of the I-664 segment. Utilizing the 4+4 configuration provides the safest and most economical re-configuration of the MMMBT tunnels in the event of a widening of I-664.

The geometry of the segments will be advanced incrementally through the development of the information described in the Task 2 subtasks that follow. The incremental development will follow three steps in the evaluation of segments and segment bundles (See Figure 1 on page 2). Note that the evaluations for segment tiering are described in Task 3 of the scope of work.

Step 1: Initial evaluation of construction complexity for draft segment tiering in Task 3 (Task 3.3 and 3.4) based on existing information

Step 2: Refined evaluation of construction complexity in Task 3 (Task 3.3 and 3.5.c), taking segment bundling into account, with more refined conceptual engineering for Tier 1 and Tier 2 segments. At this stage, the mandatory segments will be differentiated from any overlapping projects that are included in the HRTAC Plan of Finance for 2045¹.

Step 3: Final conceptual engineering refinements during Task 4 for Tier 1 and Tier 2 segments, based on insights from traffic operational analysis (Task 4.8.d)

Task 2.2a Design Criteria

Engineering design criteria for the Preliminary Segments will be established based on VDOT and AASHTO standards for the design speed and type of facility. Alignments will be developed to minimize known environmental impacts, minimize the need for right-of-way, minimize costs, and accommodate forecast traffic volumes. Horizontal alignments and vertical profiles will follow existing geometry where existing

¹ June 2021 Plan of Finance referenced at the following link; updates to be considered at the time of decisions.
[HRTAC 6 17 21 Annual Organization Mtg Agenda Package Published - Web.pdf](#)

roadways are being widened. The beginning and ending stations of the alignments will be tabulated as well as proposed curve data.

The design of the segments will also include traffic analyses of connection points to existing facilities. These analyses will be undertaken to ensure that the design can adequately accommodate projected traffic volumes. The traffic analyses will be limited to Highway Capacity Manual (HCM) methodologies for merge, diverge, and weave sections on freeways and capacity analyses for arterial intersections.

Task 2.2b Typical sections and cross-sections

Typical sections for each segment will be developed to meet VDOT and AASHTO requirements. Materials will match existing facilities (concrete or asphalt pavement). New facilities will be assumed to be asphalt pavement, unless otherwise directed. Cross-sections will be developed at 500' intervals for the purposes of developing earthwork quantities.

Task 2.3: Hydraulics and Hydrology

Conceptual review will be performed for major drainage structures, to determine feasibility and cost impacts. A description of floodplain impacts will be included where there is proposed encroachment on a floodplain. Roadway drainage will generally be assumed to be an open system (ditches). Where bridge structures, roadway barriers, sound walls, or retaining walls are required, closed drainage systems (inlets and pipes) will be assumed. These areas and approximate limits will be determined as part of the segment development. Stormwater management will be estimated based on pollutant loading calculations for new impervious area. Approximate sizing of Stormwater management facilities to mitigate increases in Stormwater runoff will be performed based on "rule of thumb" estimates, but no design will be performed.

Task 2.4: Structures

Any new, widened, or reconstructed structures will be described. The approximate size and location of proposed bridge work will be developed at a conceptual level. The location, limits, and height of retaining walls and sound walls will also be developed at a conceptual level.

Task 2.5: Utilities and Railroad Crossings

Any major overhead utilities (such as electrical transmission lines, and transformer stations) will be identified, and the impact of any conflicts will be discussed. Any railroad crossings within the proposed roadway improvements will be identified and impacts described.

The conceptual plans will be turned into graphics for inclusion into the study report.

Task 2.6: Planning Cost Estimates

A planning level cost estimate (present year costs) will be developed for segments in Tiers 1 and 2 based on the conceptual designs and potential mitigation estimates (note that the tiering of segments is described in Task 3 of the scope of work). These cost estimates will take into consideration projects included in the HRTAC Plan of Finance for 2045. Quantities for major items such as roadway pavement,

earthwork, drainage structures, bridges and walls will be based on the conceptual designs. The quantities will be multiplied by the average unit costs for the Hampton Roads District to arrive at the construction cost for these items. The cost of the remaining disciplines will be based on allowances or lump sum costs as follows:

- Mobilization
 - Mobilization will be presented as a lump sum cost based on a percentage of construction cost.
- Traffic Control & Maintenance of Traffic (MOT)
 - Ground Mounted signs will be estimated on a “per mile” basis
 - A planning level estimate will be prepared for ITS systems along all interstates. The ITS system will be presented as a lump sum amount.
 - Traffic MOT will be based on a percentage of the total construction cost of the project, typically 4-5% of construction cost.
 - Lighting will be based on a “per mile” basis where applicable.
- Stormwater Management, E&S and Wetlands
 - It will be assumed that Nutrient Credits will be purchased for approximately 25% of the increased pollutant load
 - Plantings for constructed wetlands or bioretention facilities will be based on a lump sum cost based on VDOT District averages.
 - The presence of wetlands and streams will be based on publicly available wetland inventories (NWI) and topographic maps and coordinated with the work described in Task 3.2. The impacts will be based on limits of disturbance. Wetland mitigation costs will be based on a per acre cost for both tidal and non-tidal wetland impacts; stream impacts will be based on a linear foot cost.
 - Erosion & Sediment Control (E&SC) costs will be presented as a lump sum cost.
- Preliminary Engineering (Design) costs will be based on a percentage of the total construction cost of the project.
- Right-of-Way estimated costs will be determined by categorizing the property (residential vs. commercial), quantifying the right-of-way taking and applying per acreage costs for partial takes. Total takes will include relocation costs where applicable. Unit costs for right-of-way and relocation costs will be based on VDOT unit costs for the Hampton Roads District.
- Utility Protection and Relocation costs will be based on observations of above ground features, and record research. Utilities will be aggregated by type (water, sewer, power, gas, communication) and assigned to a range of sizes. An allowance will be made for smaller utilities/distribution lines. Larger utilities/transmission lines will be based on a linear footage basis.
- Railroad crossings – A cost for railway flaggers and watchperson service will be estimated for proposed railroad crossings. The cost will be presented as a lump sum cost.

Timing: 13 months (not sequential)

Meetings:

- Meetings with HRTPO staff: 0
- Joint Working Group / Steering Committee Meetings: 2
- Other/Stakeholder Meetings: 0

Deliverables:

- Travel Market analysis
- Roadway typical sections
- Roadway alignment plans
- Cost estimates

TASK 3 – Tiering of RCS Mandated Segments

Criteria will be determined for use in evaluating the segments. The criteria will include, but not be limited to:

- Congestion relief
- Permitting Issues
- Construction Complexity
- Project Readiness

The intent of this evaluation is to provide logical information, supported by qualitative and quantitative observations, that will support the designation of the mandatory segments into three tiers as described on page 1 of this scope of work. For example, Permitting Issues will include (but not be limited to) key National Environmental Policy Act (NEPA) - related issues including community impacts, environmental justice (EJ), and cultural and natural resources, derived from existing data sources. An evaluation matrix will be prepared to illustrate the characteristics of each segment and to facilitate comparison among them.

Task 3.1 Conduct Congestion Relief Assessments (Completed)

In this task, the Consultant Team will run each alternative using the travel demand model for the 2045 Baseline future and organize the outputs based on the approved performance measures characterizing congestion relief. Congestion relief performance measures determined through interaction with the Working Group and HRTPO staff in Phase 2 will be used to evaluate initial draft alternatives and their respective segments based on daily traffic estimates. The initial draft alternatives reflect both the MMMBT 6+2 and MMMBT 4+4 design options. The congestion relief performance measure(s) are direct model outputs and do not require any traffic analysis. These regional performance measures reflect average weekday conditions and include:

- Harbor crossing volumes
- Vehicle-Miles Traveled
- Vehicle-Hours Traveled
- Delay
- Average congested speed

Task 3.2: Conduct Permitability Assessments

Overview

The purpose of this task is to evaluate the regulatory permitability of referenced segments and a general assessment of potentially significant community impacts. All regulatory permitability evaluations will be

conducted by reviewing Federal, State, and Local regulatory requirements in conjunction with existing environmental conditions of the referenced segments. The study team will determine potential significant regulatory flaws by ranking evaluation factors to include timing implications, resource impacts, permitting complexity, and potential mitigation costs for each of the referenced segments.

The Consultant Team understands that the Corps of Engineers (Corps) will not permit a bundle of segments that would obstruct or restrict navigation to the Craney Island Dredged Material Management Area (CIDMMA), or that would otherwise impair the Corps' ability to maintain and operate the CIDMMA. Likewise, the Corps will have to assess the impact of the different bundles on the federally authorized Norfolk Harbor and Channel Federal Navigation Project and coordinate with maritime stakeholders on the impacts of those bundles of segments. The Corps will offer comments on permitability issues associated with the bundles and additional comments may be received by the Department of Environmental Quality (DEQ), Virginia Marine Resources Commission (VMRC), or other permitting agencies. These comments will not commit the Corps to any permitting of action, nor will they be interpreted as endorsement of any bundle of segments.

The Corps can only permit the Least Environmentally Damaging Practicable Alternative (LEDPA) and cannot permit bundle of segments that will adversely affect other federal navigation projects.

Task 3.2a. Data Collection Review

The focus of this task will be to review and analyze environmental (community, natural and cultural resources) data created to develop the regional mapping, with the goal of establishing a unified dataset for GIS based environmental alternatives review. The regional mapping and environmental overlays will define where sensitive community, natural and cultural resources are located to determine if segments can avoid and /or minimize impacts as part of the risk analysis. In addition, should resources not be able to be avoided and/or minimized, mitigation concepts will be evaluated as part of the analysis. This information will form the basis for regulatory permitability evaluations as part of the segment and subsequent bundle analyses. The data will be evaluated to provide regional leaders and analysts with accurate information from which to make strong, technically-supported decisions regarding regulatory viability.

Task 3.2b: Develop permitability requirements and evaluation parameters

In this task, a set of evaluation parameters will be developed to evaluate environmental and regulatory viability of the segments. Each evaluation parameter will relate to the targeted human and natural environmental resources and potential impacts in conjunction with Federal, State, and Local laws and regulations to create a framework for risk analysis and segment prioritization. Land use/property impacts and environmental justice will be included along with the issues driving federal, state, and local permits that may be required.

In addition, this task will establish a series of regulatory permitability factors that will be used to measure how each alternative contributes to the direct and indirect environmental impacts to ensure there is not a negative environmental impact to the resources of the region. A matrix will be developed that aligns each metric according to an established objective for the region. Ranking evaluation factors include timing implications, resource impacts, permitting complexity, and potential mitigation costs for each of the referenced segments.

The final evaluation measures will be vetted with the Steering Committee, Working Group and HRTPO staff. The result will be a consensus on the methods and metrics that will be used to gauge success in the regulatory evaluation of each of the segments.

Task 3.2c: Evaluate Segments

The next step in the regulatory permitability analysis is to evaluate environmental factors in conjunction with the design and construction factors. The goal of this task is to assemble and evaluate the performance measures for the baseline scenario only based on land use/environmental metrics, design alternatives, and reasonable constructability. This is a key step in understanding the comprehensive environmental impacts of each segment. As determined by the Steering Committee in Task 3.2b, evaluation measures will include (but are not limited to) land use/property impacts; environmental justice; issues driving wetland, water quality, and other permits; anticipated construction challenges; compatibility with design criteria; independent utility; and project development status.

All regulatory permitability parameters and evaluations will be conducted by reviewing Federal, State, and Local regulatory requirements in conjunction with existing environmental conditions, timing implications, resource impacts, permitting complexity, and potential mitigation costs for each of the referenced segments. This information will be used to determine potential regulatory challenges as well as develop draft tiering of the analyzed segments.

Task 3.3 Conduct Constructability Assessments

Task 3.3a: Initial Qualitative Review of Mandatory Segments (Step 1 of Revised Phase 3 Process)

As identified in Task 2, the high-level constructability assessments of the unfunded SEIS mandatory segments will be conducted during the initial screening evaluation. This will consist of written descriptions of constructability-related challenges.

Task 3.3b: Quantitative Review of Draft Tiered Segments (Step 2 of Revised Phase 3 Process)

Following the draft tiering (Task 3.4) and bundling of segments, constructability assessments will be advanced in Step 2 of the Revised Phase 3 Process. This evaluation will consist of a cost analysis using the planning level cost estimates prepared in Task 2.5 and costs associated with mitigation measures identified in the permitability assessment.

Task 3.4 Evaluate Readiness and Prepare Draft Tiering of Segments

Based on the assessment results from Task 3.2 and the qualitative construction complexity results from Task 3.3, the Consultant team will evaluate the Readiness of the segments. The Readiness evaluation will be based on the timing considerations identified in the construction complexity and permitting challenges evaluations, as well as factors such as independent utility, overall system and express lane continuity, necessity to the development of other segments, and consistency/compatibility with local land use. The readiness criteria will also include project development status and status of inclusion in the HRTAC Plan of Finance for 2045.

The Consultant team will prepare a summary of the segment evaluations and recommend a draft tiering of the segments into the three tiers described on page 1 of this revised scope of work. The draft segment tiering will be presented to the Steering Committee for approval.

Task 3.5 Evaluate Congestion Relief and Finalize Tiering of Segments

The Consultant Team will evaluate up to four segment bundles of the Tier 1-3 segments based on congestion relief and utility as well as economic performance. Based on this evaluation and previous evaluations in Tasks 3.2-3.4, a maximum of three segment bundles will advance to the scenario planning evaluation (Task 4).

3.5 a: Travel Demand Modeling and Congestion Relief Measures

In this task, the Consultant Team will evaluate segment bundles by performance measures characterizing congestion relief compared to the 2045 Baseline land use scenario. The *2045 RCS Baseline transportation network* will be established by the Steering Committee, based on the Step 1 Tiering evaluation (Tasks 3.2 – 3.4), and will include the E+C network plus any selected portions of the mandatory segments that overlap with the HRTAC Plan of Finance for 2045². All segment bundles will assume the MMMBT 4+4 design option only. The performance measures will include a combination of regional and segment specific measures reflecting AM and PM peak period, as well as average weekday travel conditions. Regional measures will include those utilized in Task 3.1. Segment specific measures will include volume, congested speed, and level-of-service.

Where possible, the Consultant will utilize travel demand model outputs generated in Task 3.1 for the Candidate Alternatives congestion relief assessment.

3.5.b: Economic Performance Evaluation

The Consultant team will use the travel demand model runs with Baseline 2045 land use from Task 3.5a as inputs to conduct an economic evaluation of the segments. TREDIS economic model outputs consistent with the subset of performance measures identified in Task 2.1.c will be delivered in the dashboard format to capture the regional societal benefits and economic growth impacts of each of the 4 segment bundles. These will be used to inform the tiering of segments. As appropriate based on definition of the bundles, differencing of economic results may be used to inform the analysis of segment independent utility.

3.5c: Finalize Segment Tiering

The Consultant team will summarize the results of the advanced Constructability Assessment in Task 3.3 and the findings of Tasks 3.5.a and 3.5.b and will recommend a final tiering of segments to the HRTPO, Working Group, and Steering Committee.

Timing: 7 months

² Based on the findings of the Step 1 evaluation and as determined by the Steering Committee, the segments (or portions thereof) included in the HRTAC Plan of Finance may be differentiated on the basis of project development status or other aspects of the Step 1 evaluation.

Meetings:

- Meetings with HRTPO staff: 1
- Joint Working Group / Steering Committee Meetings: 2
- Other/Stakeholder Meetings: 2-3 for Permitting Challenges Evaluation

Deliverables:

- Segment Evaluation Matrix
- Memo Summarizing Environmental Data, Regulatory Permit Review, and Parameters for Evaluation
- Segment Bundle Evaluation Summary of Final Segment Tiering
- Presentation materials, posters and slide decks of Deliverables for public outreach process
- All GIS data files developed as part of effort
- Documentation on methodology and changes made to Travel Demand model

TASK 4 – Conduct Scenario Planning

The Regional Connectors Study (RCS) Regional Scenario Planning process will provide insight to decisionmakers regarding the need for and the benefits of alternative transportation investments considering potential alternative future trends. The Scenario Planning process will consider a baseline 2045 land use scenario and three alternative 2045 “Greater Growth” land use scenarios that present plausible futures with respect to economic, demographic and technology drivers. The scenario analysis will link alternative future economic and demographic trends with land use, and the resulting socioeconomic forecasts will be tested with the regional travel demand model to understand the impacts to transportation and other performance measures. The scenario outcomes will provide a series of benchmarks against which to test the resilience of different transportation investments. A potential benefit of this process will be to identify those transportation investments and projects that fare best in the analysis - that provide the most cumulative benefit to the region regardless of which alternative future scenario is tested. This will be done by testing each of the up to three bundles of segments against each scenario to gauge how robust each investment is with respect to the range of possible futures.

Throughout the RCS Regional Scenario Planning process, the RCS Working Group will work closely with HRTPO staff and the Consultant team to provide guidance, affirm scenarios, select drivers and performance measures, and evaluate interim and final results (Completed for Phase 2). The RCS Steering Committee that is overseeing the overall RCS process will be updated on the progress on the Regional Scenario Planning effort and will receive the results of the scenario testing of the segment bundles for evaluation and consideration in the Phase 3 RCS process. The results will also be shared with the public to provide input as part of the final assessment of investment and policy insights in the study.

The Phase 3 scope of work only includes Task 4.8 and 4.9 to complete the assessment of transportation investment impacts. Tasks 4.1-4.7 were completed in earlier Phases of the contract.

Task 4.8: Evaluating the Tier 1 and 2 Segments in Alternative Bundles

Overview

The final step in the scenario analysis is the assessment of transportation investment impacts by scenario. In this task, the Consultant Team will run up to three segment bundles for each scenario (the 2045 Baseline Scenario and the three Greater Growth Scenarios). The scope assumes that one of the segment bundles will include only the Tier 1 segments, and the others will include combinations of Tier 1 and Tier 2 segments. Combined with the 2045 RCS Baseline network model run for each scenario, this will comprise 16 model runs (2045 RCS Baseline network and 3 bundles combined with 4 land use scenarios) that will together inform the value of the Segments in various combinations and under alternative futures.

Task 4.8a: Confirmation/Network Coding of Segment Bundles for testing

Segment bundles will be "coded" into the 2045 RCS Baseline network using planning data available from HRTPO. Coding will include information such as facility description, alignment, and capacity information associated with improvements. Network coding will also specify locations of toll assessment and toll values, if applicable. The Consultant Team will review and confirm segment coding assumptions with HRTPO. There will be one network for each segment bundle. Note, the schedule assumes the segment bundles will have already been coded into the travel demand model network by Michael Baker some time prior to the beginning of this task.

Task 4.8b: Travel Demand Modeling for Baseline and 3 Greater Growth Scenarios (each Candidate Alternative)

Using the networks developed in earlier tasks and scenario specific socio-economic data and parameters, The Consultant team will run the travel demand model for each segment bundle over the 2045 Baseline land use and each of the 3 Greater Growth scenarios. The team will provide quality control checks on associated output. The modeling results for the newly coded segment bundles will be compared against results of similar alternatives or benchmarks (if available) to determine appropriateness of the results. Ad-hoc sensitivity testing may be performed under certain circumstances if the results of the segment bundles are not intuitive. The results for each bundle will be compared against all bundles, all land use scenarios and the 2045 RCS Baseline network demand estimates to uncover and flag any potential issues in the results.

Task 4.8c: Evaluate Performance of Bundles of Segments under Baseline and 3 Greater Growth Scenarios

In this task, the Consultant team will complete the regional performance dashboard for each of the three bundles. The Consultant Team will select performance measures to provide a ranking of each bundle by scenario, as illustrated with hypothetical ranking in the table below. This information will provide an important basis for assessing how robust the bundles are for potential future conditions.

Segment Bundle Rank	2045 Baseline Land Use	Greater Growth on the Water Land Use	Greater Growth in Urban Places Land Use	Greater Growth in Suburban/ Greenfield Places Land Use
2045 RCS Baseline + RCS 1	3	2	2	1
2045 RCS Baseline + RCS 2	2	1	1	2
2045 RCS Baseline + RCS 3	1	3	3	3

HRTPO seeks to evaluate the transportation benefits of bundles of segments and the extent to which they achieve the goal of enhancing economic vitality and improving the quality of life in the region. To do so, the Consultant Team will use TREDIS to translate travel model results describing travel time, distance, reliability, and market access, into regional economic impacts expressed in terms of jobs, labor income, business sales, and GDP, with detail available by industry sector, and over time, as specified in the performance measures developed in Phase 2. The TREDIS FREIGHT module will allow targeted analysis of the implications of transportation performance for freight-reliant industries. Given the number of bundles, and the desire to test performance of every alternative under the baseline as well as all land use scenarios, the Consultant Team will make use of TREDIS’s batch mode to support easy import of project details and export of key economic performance results.

Differencing of economic results will be used as appropriate based on cumulative definition of the three bundles to inform the analysis of segment value. If deemed informative, information on potential timing of segments and bundles from Task 3.3 Constructability Assessment may be paired with the economic results to communicate differences in likely accumulation of benefits and economic growth impacts over time.

Task 4.8d: Evaluate Traffic Operating Conditions

The **HCS 7** software will be used to evaluate the **full interstate network and limited access facilities** (mainline and ramp junctions) for the AM and PM peak hours within the study area for the conditions listed below. There will be a total of 16 conditions evaluated in this process.

(2 peak hours x 8 conditions = 16 total conditions)

- Existing Conditions
- 2045 RCS Baseline Condition
- 2045 RCS Baseline Condition + RCS Bundle 1 (assumed Tier 1 segments)
- 2045 RCS Baseline Condition + RCS Bundle 2 (assumed Tier 1 and Tier 2 segments)

- 2045 RCS Baseline Condition + RCS Bundle 3 (assumed Tier 1 and Tier 2 segments)
- 2045 RCS Baseline Condition + Tier 1 – Greater Growth on the Water Land Use
- 2045 RCS Baseline Condition + Tier 1 – Greater Growth in Urban Places Land Use
- 2045 RCS Baseline Condition + Tier 1 – Greater Growth in Suburban/Greenfield Places Land Use

Existing Conditions (Completed)

This task will involve developing AM and PM peak hour HCS models based on the traffic conditions for the existing study area roadway network. The HCS model will evaluate the interstate and freeway network in Hampton Roads. The existing condition HCS models will be calibrated to the greatest extent possible using travel times and queue lengths obtained from INRIX data.

2045 RCS Baseline Condition

Similar to the task of updating the Regional Travel Demand Model to a 2045 baseline scenario, the existing conditions AM and PM HCS models will be updated to establish baseline 2045 models. Based on the direction from the Steering Committee at the completion of Step 1 of the Tiering evaluation, this network update will include adding committed roadway projects and portions of segments included in the HRTAC Plan of Finance for 2045 (see Task 3.5a) and updating traffic volumes and travel patterns based on the outputs from the Regional Travel Demand Model for the 2045 RCS Baseline network and baseline land use scenario.

This task will also involve affirming the assumptions and outputs to-date via email distribution to HRTPO staff and the Working Group as an important check before proceeding to the next steps.

2045 RCS Baseline Condition + RCS Bundles

AM and PM peak hour HCS models will be developed for up to three RCS segment bundles. This will include updating the 2045 Baseline Condition (E+C) HCS models with the same bundle segments and junctions that were coded into the Regional Travel Demand Model. Traffic data output from the Regional Travel Demand Model runs will be post-processed and coded into the HCS models for each of the three RCS segment bundles. The outputs from these three segment bundle analyses will be used for comparison against the 2045 Baseline Scenario outputs to determine the congestion relief achieved by each RCS bundle.

2045 Traffic Analysis for 3 Greater Growth Scenarios

It is important to note that each of the Greater Growth Scenarios will allocate traffic volume growth that is in addition to the growth inherent in the 2045 Baseline condition. This means that each Scenario is dealing with an additional increment of traffic increases above and beyond the assumed growth for the 2045 baseline condition. The work for this task will include updating the AM and PM HCS models for the preferred RCS bundle for up to three greater growth scenarios and reporting the results for comparison against the 2045 Baseline Condition results and the results from the three 2045 RCS bundle scenarios.

Timing: 6.5 months

Meetings:

- Meetings with HRTPO staff: 3
- Joint Working Group / Steering Committee Meetings: 2
- Other/Stakeholder Meetings: 0

Deliverables:

- Technical Memorandum on analysis results
- Travel Demand model, economic model, and prioritization tool runs
- Dashboard Outputs for Model Runs and web posting
- Tech Memo on RCS project evaluation
- Final scenario planning land use, travel demand model and TREDIS files

Task 4.9: Reporting Results

Overview

The Consultant Team will work with HRTPO Staff, the Working Group, and the Steering Committee to distill the insights from the scenario process and package them for sharing with the public.

Task 4.9a Scenario Results Workshops

In this task, the Consultant Team will take the materials and input generated in Task 4.8 and prepare a work session to be held individually or jointly with the Working Group and Steering Committee to discuss the scenario analysis results, risks, costs, and public comment associated with the segment bundles. This information will be presented in a concise format with engaging visuals and will illustrate the risks and opportunities revealed by the scenario analysis. This information will be used by voting members of the Working Group and Steering Committee to affirm final tiering of segments, which is the intended outcome of this subtask and the most important outcome of the entire study as the recommendations will provide input to regional investment and policy decisions.

Task 4.9b Recommendation Documentation

The Consultant Team will document the results of the Task 4.9a workshop in the form of a presentation, website content, and a draft report that capture the full scenario planning steps and findings. This information will be used for ongoing outreach. After a period of initial outreach and input, the Consultant Team will present final recommendations to the Working Group and Steering Committee at the conclusion of Task 4.9.

Timing: 8 months

Meetings:

- Meetings with HRTPO staff: 1
- Joint Working Group / Steering Committee Meetings: 2
- Other/Stakeholder Meetings: 0

Deliverables:

- Draft and final presentation of scenario planning results
- Draft and final website content of scenario planning results
- Draft and final scenario planning report

TASK 5– Prepare for and Attend Meetings (Working Group and Steering Committee)

Task 5.1: Working Group Meetings

The Consultant team will be represented by the Project Manager at all meetings (barring unforeseen conflicts) and supplemental team members depending upon the type of expertise being presented/discussed at each meeting. Discipline experts have estimated the number of Working Group meetings they will attend in each of the task/subtask summaries in this scope of services. (Independent Working Group Meetings are completed)

Task 5.2 Steering Committee and Working Group Meetings

At part of this Fall 2021 study rescoping, the decision has been made to combine all Working Group meetings with Steering Committee Meetings. The Consultant team will be represented by the co-Project Manager(s) at all meetings and supplemental team members depending on the types of expertise germane to the discussion topics.

Timing: 27 months

Meetings:

- Meetings with HRTPO staff: 0
- Joint Working Group / Steering Committee Meetings: 10
- Other/Stakeholder Meetings: 0

Deliverables:

- Power Point slides and meeting handouts

TASK 6 – Manage the Project

Task 6.1: Weekly Coordination with HRTPO leadership

Consultant co-Project Manager(s) will participate in weekly coordination calls with HRTPO staff and Project Manager (assume 108 conference calls).

Task 6.2: Schedule and Budget Oversight

Consultant co-Project Managers will monitor schedule and budget on monthly basis and make changes to schedule, as needed. Budget monitoring will occur monthly during preparation of monthly progress reports so that any budget issues can be included in those reports.

Task 6.3: Quality Assurance of Deliverables

Consultant co-Project Manager(s) will review all documentation and deliverables before they are forwarded to the HRTPO Project Manager for distribution to the Working Group and HRTPO staff.

Timing: 27 months

Meetings:

- Meetings with HRTPO staff: 108 (weekly calls for 27 months)
- Working Group Meetings: 0
- Steering Committee Meetings: 0
- Other/Stakeholder Meetings: 0

Deliverables:

- Coordination meeting minutes

TASK 7 – Prepare Documentation

Task 7.1: Draft Study Report

The study report will include summaries of Phases 1-3 activities and be supplemented via appendices, which will include, but not be restricted to, the technical reports and technical memorandums for each of the major tasks in Phases 1-3. The report outline is shown below:

- Executive Summary
- Introduction
- Existing Conditions
- Regional Survey
- Stakeholder Interviews
- Travel Demand Model
- Engagement
- Scenario Planning/Alternatives
- Recommendations

Review comments will be solicited from the Working Group, Steering Committee, and HRTPO staff. Comments from the Working Group, the Steering Committee, and HRTPO staff will be discussed in the respective Working Group and Steering Committee meeting forums (unless a joint meeting is preferred). Those meetings will provide direction regarding the revisions to be made to the draft report that will subsequently be made available to the public prior to the second round of public information meetings. An electronic version of the draft report will be made available through channels outlined in the engagement plan.

Following the second round of public meetings, comments received at the meetings will be presented to the Working Group, Steering Group and HRTPO staff for discussion that will lead to decisions regarding the revisions to be made. If the revisions are substantive (i.e. – new alternatives are agreed to be studied, or more detailed analyses are required), another draft report will be prepared for review by the Working Group, Steering Committee, and HRTPO staff. An electronic version of the revised draft report will be made available. 50 hard copies will be produced, complete with appendices.

If the revisions are not substantive, the Consultant Team will initiate the preparation of the final report.

Task 7.2: Final Study Report

Following discussion of the comments received on the Draft Report and the notice to proceed on the preparation of the Final Report from the Working Group and Steering Committee, the Consultant Team will prepare the Final Report.

An electronic version of the final report will be made available through engagement channels. 50 hard copies will be produced, complete with appendices.

Timing: 6 months

Meetings:

- Meetings with HRTPO staff: 1
- Joint Working Group / Steering Committee Meetings: 1
- Other/Stakeholder Meetings: 0

Deliverables:

- Draft study report (200 Executive Summaries and 50 complete reports)
- Final study report (200 Executive Summaries and 50 complete reports)
- Draft and final study report appendices (50 copies for draft and 50 copies for final)
- Draft and final website content of study report