

CHAPTER 5 SECONDARY AND CUMULATIVE EFFECTS

5.0 Introduction

This chapter identifies the potential secondary (indirect) impacts and cumulative (incremental) impacts of the project. Detailed secondary and cumulative effects analysis would be conducted for the Preferred Alternative during subsequent analysis.

5.1 Methodology

5.1.1 Secondary Effects

Secondary (indirect) effects are defined as “effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to changes in the pattern of land use, population density or growth rate, and related effects on air and water on other natural systems, including ecosystems” (40 CFR 1508.8(b)). An example of a secondary effect is when a new rail station is built in an undeveloped area and commercial development that would have not otherwise been built ensues around the station area.

Secondary effects typically include impacts to human and natural systems from changes in land use patterns and growth induced by proposed public and private development plans. Assessing the potential secondary effects involves defining the scope and geographical boundaries for the analysis. For the purposes of this Tier I Draft EIS analysis, potential secondary effects were estimated for the Peninsula/CSXT route and Southside/NS route study areas for the project design year of 2025. The potential secondary impacts were analyzed on a broad scale due to the general nature of the project description. Consideration of local area secondary effects would be undertaken as part of subsequent analysis when the route and station areas, construction footprints, and the amount of right-of-way needed are further defined.

5.1.2 Cumulative Effects

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions. In the simplest terms, analyzing cumulative effects means considering and accounting for the impacts of a proposed action in the context of everything else that is going on, has gone on, or is reasonably foreseeable in the vicinity. Once the effects have been determined, appropriate mitigation strategies can be defined to wholly or partially manage effects contributed by the proposed project.

This Tier I Draft EIS generally analyzes the potential environmental effects of the proposed passenger rail service on a broad scale at a conceptual level. Site-specific environmental review of the Preferred Alternative would be conducted during subsequent analysis. The purpose of this analysis is to identify the potential environmental effects of each alternative in combination with other major improvements in the corridor. The results presented here are qualitative. Consideration of the specific cumulative effects of the Preferred Alternative at a more quantitative level, including development effects, would be undertaken as part of the subsequent analysis.

Improvement projects included in the cumulative effects analysis are relevant transportation improvement projects approved for implementation under the Status Quo and No Action Alternatives. The cumulative project list focuses on those that, when combined with the Richmond/Hampton Roads Passenger Rail Project, could contribute to cumulative impacts. The following criteria were used to narrow the list of projects considered in the analysis:

- Projects that are under active consideration.

- Projects that have recently been completed or are in some active stage of completing project-level environmental documentation.
- Projects that would be completed or operational within the timeframe being considered for the Richmond/Hampton Roads Passenger Rail Project.
- Projects in proximity to and of a size/scale that, in combination with the Build alternatives, have the potential to affect the same resources.

Note that only transportation improvement projects are considered in this analysis. Additional types of projects, depending on their relevancy, could be included in the subsequent analysis of secondary and cumulative effects. Projections for population, employment and urbanization were used to describe the probable cumulative effects on land use and development.

5.2 Legal and Regulatory Context

5.2.1 Secondary Effects

The Council on Environmental Quality (CEQ)/NEPA regulations require that potential secondary effects be analyzed for federally funded projects. The CEQ implementing regulations (40 CFR 1500-1508) require that an EIS include a discussion of environmental consequences including “indirect effects and their significance” (40 CFR 1502.16). In addressing potential uncertainties in this type of analysis, the CEQ regulations require the EIS to make a “good faith effort” to identify and disclose indirect or secondary effects (CEQ, 1981).

5.2.2 Cumulative Effects

The CEQ/NEPA regulations also require that potential cumulative effects be analyzed for federally funded projects. Cumulative impacts result when the effects of an action are added to, or interact with, other effects in a particular place and within a particular time. The combination of these effects and any resulting environmental degradation is the focus of this cumulative impact analysis. The CEQ/NEPA implementing regulations (40 CFR 1500-1508) require that an EIS include a discussion of environmental consequences including “...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). In addressing potential uncertainties in this type of analysis, CEQ requires the EIS to make a “good faith effort” to identify and disclose cumulative effects (CEQ, 1981).

5.3 Potential for Secondary and Cumulative Effects

5.3.1 Secondary Effects

Secondary effects are those effects that would be caused by a proposed Build alternative and would happen some time *after* or some distance from where the proposed project is built. Secondary effects attributable to the Richmond/Hampton Roads Passenger Rail Project would be mainly due to the construction of the proposed stations. This is due to residential and commercial development potentially induced by the project that could occur on undeveloped land within a three-to-five-mile radius of access points to the proposed rail service. The proposed stations would serve as those access points. Implementing higher speed rail within a corridor does not, in and of itself, cause secondary development to occur. Typically, local jurisdictions have plans in place that may allow greater development to occur around such transportation improvements, however development may occur regardless of whether or not stations are built. The potential positive and negative secondary effects of the Build alternatives are shown in Table 5-1. The table reflects those areas where impacts are most likely to occur.

It is important to note that the alternatives presented in this Tier I Draft EIS are not clearly defined routes, and that the route for the selected alternative would be further developed during the subsequent analysis phase (Section 2.5). Thus, potential secondary effects presented here are overviews of likely impacts expected along the two routes being considered. Actual secondary impacts may be greater or lesser once an alternative has been selected and the configuration is more specifically determined during the subsequent analysis.

Table 5-1: Potential Secondary Effects

Issue/Concern	Potential Secondary Effect
Transportation Effects	<ul style="list-style-type: none"> Increased traffic from potential induced development
Air Quality	<ul style="list-style-type: none"> Localized air quality impacts from increased traffic due to potential induced development
Noise	<ul style="list-style-type: none"> Noise impacts from increased traffic due to potential induced development
Land Use Patterns	<ul style="list-style-type: none"> Change in development and property value around stations Local economic effects from change in development and property value around stations
Economic Development Potential	<ul style="list-style-type: none"> Economic development around rail stations, with increased employment opportunities and increased tax revenues
Communities and Environmental Justice	<ul style="list-style-type: none"> Effects on communities due to change in development and property values, and associated traffic impacts due to induced development
Wetlands	<ul style="list-style-type: none"> Potential wetland impacts from induced development
Prime Farmland	<ul style="list-style-type: none"> Potential loss of prime farmland soils as a result of induced development
Wildlife Habitat	<ul style="list-style-type: none"> Potential wildlife habitat impacts from induced development

5.3.2 Cumulative Effects

Table 5-2 lists each project considered as part of the cumulative effects analysis. The table also provides the geographic location of each project and project status.

Table 5-2: Summary of Other Transportation Projects for Cumulative Effects Assessment

Other Transportation Projects	Location	Relationship to Richmond/Hampton Roads Passenger Rail Project	Implementation Status
DRPT Projects			
Southeast High Speed Rail Project (SEHSR)	Washington, DC to Charlotte, NC - Connections in Richmond and Petersburg	This project would connect to the SEHSR project and the Northeast Corridor	To be completed by 2020
CSX Acca Bypass	Peninsula/CSXT route - Richmond, Newport News	Includes adding a bypass track for passenger trains around Acca Yard and building a second track on the Peninsula/CSXT route to improve on-time performance and service frequencies of existing Amtrak trains.	Alternative Considered but Dismissed, May 2009; PE and design underway.
Route 460/Heartland Corridor Initiative	Crewe to Suffolk	Will increase freight rail traffic on the Southside/NS route; includes new turnouts and crossovers for the proposed in Suffolk and Petersburg.	Complete 2009
Norfolk Portsmouth Belt Line Improvements	Norfolk	Includes the acquisition of 33.5 acres of land and the repair and upgrading of track and rail infrastructure of the Norfolk & Portsmouth Belt Line railroad. The project is proximate to the proposed Norfolk Station on the Southside/NS route.	To be completed in 2011
VDOT Projects			
I-64 Widening	Newport News to New Kent	I-64 runs parallel to the Peninsula/CSXT route	PE and right-of-way acquisition under way
Route 60 Relocation and Upgrade	James City County	Route 60 runs parallel to Peninsula/CSXT route	PE complete 2005. right-of-way acquisition underway
I-64 Bridge over Acca Railroad	Henrico County	Rehabilitation and widening of bridge that runs over the Acca Railroad near the Peninsula/CSXT route	Completed 2007

Other Transportation Projects	Location	Relationship to Richmond/Hampton Roads Passenger Rail Project	Implementation Status
Route 460 Location Study	Suffolk	Route 460 runs parallel to the Southside/NS route	Draft EIS completed 2005; FEIS underway
I-295 Widening	Henrico	Project is just south of the Southside/NS route	Under construction
Hampton Roads Transit (HRT) Projects			
Ferry Expansion	Downtown Newport News to Naval Station	Proposed downtown Newport News rail station on the Peninsula/CSXT route may provide a connection to the ferry	To be completed by 2013
Peninsula Rapid Transit Project	Newport News	Proposed BRT or LRT, which would use the portion of the Peninsula/CSXT route	To be completed by 2015
Norfolk Light Rail (The Tide)	Norfolk, VA - Park-and-ride lot shared with Harbor Park Stadium	Proposed station location on the Southside/NS route	To be completed by 2010

Notes: PE: Preliminary Engineering; Draft EIS: Draft Environmental Impact Statement; FEIS: Final Environmental Impact Statement; BRT: Bus Rapid Transit.

Source: Department of Rail and Public Transportation, Virginia Department of Transportation, and Hampton Roads Transit websites, accessed April 2008.

A general description of the potential types of cumulative effects on resources is included in the cumulative effect analysis in Table 5-3. A summary of all potential effects of the project is provided in Chapter 6, Evaluation of Alternatives.

Table 5-3: Summary of Potential Cumulative Effects

Issue/Concern	Status Quo Alternative	No Action Alternative	Proposed Alternatives and Other Projects		
			Alternative 1	Alternative 2a	Alternative 2b
Freight rail operations	Potential cumulative effect in conjunction with other projects due to increased freight rail shipping proposed under other projects and proposed passenger rail operations.	Potential cumulative effect in conjunction with other projects due to increased freight rail shipping proposed under other projects and proposed passenger rail operations.	Potential cumulative effect in conjunction with other projects due to increased freight rail shipping proposed under other projects and proposed passenger rail operations.	Potential cumulative effect in conjunction with other projects due to increased freight rail shipping proposed under other projects and proposed passenger rail operations.	Potential cumulative effect in conjunction with other projects due to increased freight rail shipping proposed under other projects and proposed passenger rail operations.
Traffic	There would be increased congestion and adverse impacts on passenger travel and goods movement along the existing roadways.	Implementation of the passenger rail service would not lead to a considerable contribution to the cumulative impact related to highway use but could contribute to the cumulative impact related to surface streets leading to and from proposed stations. Southside/NS Route: Cumulative traffic impacts could be pronounced at the proposed rail station in downtown Norfolk as part of this project and the Norfolk Light Rail Project. Potential cumulative effects could also result at the proposed Petersburg and Richmond station areas, which would be shared with the SEHSR project. The proposed Bower's Hill station traffic impacts could also be pronounced.	Implementation of the passenger rail service would not lead to a considerable contribution to the cumulative impact related to highway and airport use but could contribute to the cumulative impact related to surface streets leading to and from proposed stations. Peninsula/CSXT Route: Cumulative traffic impacts could be pronounced at proposed rail stations in downtown Newport News as part of this project, the Peninsula Rapid Transit Project, and the Ferry Expansion Project. Southside/NS Route: Cumulative traffic impacts could be pronounced at proposed rail stations in downtown Norfolk as part of this project and the Norfolk Light Rail Project. Potential cumulative effects could also result at the proposed Petersburg and Richmond Stations areas, which would be shared with the SEHSR project. The proposed Bower's Hill station traffic impacts could also be pronounced.	Implementation of the passenger rail service would not lead to a considerable contribution to the cumulative impact related to highway and airport use but could contribute to the cumulative impact related to surface streets leading to and from proposed stations. Cumulative traffic impacts could be pronounced at proposed rail stations in downtown Newport News as part of this project, the Peninsula Rapid Transit Project, and the Ferry Expansion Project.	Implementation of the passenger rail service would not lead to a considerable contribution to the cumulative impact related to highway and airport use but could contribute to the cumulative impact related to surface streets leading to and from proposed stations. Cumulative traffic impacts could be pronounced at proposed rail stations in downtown Newport News as part of this project, the Peninsula Rapid Transit Project, and the Ferry Expansion Project.
Air Quality	Cumulative effects expected.	Regional benefit by attracting riders away from long-distance auto travel; local emissions impacts from automobile travel to access stations in conjunction with other projects within the study area.	Regional benefit by attracting riders away from long-distance auto travel; local emissions impacts from automobile travel to access stations in conjunction with other projects within the study area.	Regional benefit by attracting riders away from long-distance auto travel; local emissions impacts from automobile travel to access stations in conjunction with other projects within the study area.	Regional benefit by attracting riders away from long-distance auto travel; local emissions impacts from automobile travel to access stations in conjunction with other projects within the study area.

Issue/Concern	Status Quo Alternative	No Action Alternative	Proposed Alternatives and Other Projects		
			Alternative 1	Alternative 2a	Alternative 2b
Noise and Vibration	Potential cumulative impacts due to freight rail and additional roadway capacity improvements in the study area.		Potential adverse local effects on both routes from the cumulative increase in passenger and freight train operations, particularly at grade crossings.	Potential adverse local effects on both routes from the cumulative increase in passenger and freight train operations, particularly at grade crossings.	Potential adverse local effects from the cumulative increase in passenger and freight train operations, particularly at grade crossings.
Land Use	Land use changes within the Richmond/Hampton Roads study area would continue to occur as a result of planned transportation improvements. Major improvement projects would influence the location, density and type of development that would occur. Planned residential and commercial development would also continue.		<p>Peninsula/CSXT Route: Freight rail improvements would primarily occur within the existing right-of-way. Therefore, no cumulative land use effects would occur. Roadway improvement projects within the study area would have an additional effect, particularly at major intersections/interchanges where potentially both planned developments and less desirable land uses could occur.</p> <p>Southside/NS Route: Freight rail improvements would primarily occur within the existing right-of-way, with the exception of the Norfolk Portsmouth Belt Line Improvements. As such, it is expected that cumulative land uses would occur. Roadway improvement projects within the study area would have an additional effect particularly at major intersections/interchanges, where potentially both planned developments and less desirable land uses could occur. The proposed Downtown Norfolk station location is in the same location as one proposed for the Norfolk Light Rail project. Cumulative effects on land uses and parking would occur at this location. Potential cumulative land use effects could also result at the proposed Petersburg and Richmond station locations that would be shared with the SEHSR project, in addition to the proposed Bower's Hill station.</p>	<p>Peninsula/CSXT Route: Freight rail improvements would primarily occur within the existing right-of-way. Therefore, no cumulative land use effects would occur. Roadway improvement projects within the study area would have an additional effect, particularly at major intersections/interchanges where potentially both planned developments and less desirable land uses could occur. The proposed downtown Newport News Station would be located near a proposed light rail station for the Peninsula Rapid Transit Project. Land use changes in the vicinity of the stations would result in mixed-uses consistent with local development plans.</p> <p>Southside/NS Route: Freight rail improvements would primarily occur within the existing right-of-way, with the exception of the Norfolk Portsmouth Belt Line Improvements. As such, it is expected that cumulative land uses would occur. Roadway improvement projects within the study area would have an additional effect, particularly at major intersections/interchanges where potentially both planned developments and less desirable land uses could occur. The proposed Downtown Norfolk station location is in the same location as one proposed for the Norfolk Light Rail project. Cumulative effects on land uses and</p>	<p>Peninsula/CSXT Route: Freight rail improvements would primarily occur within the existing right-of-way. Therefore, no cumulative land use effects would occur.</p> <p>Roadway improvement projects within the study area would have an additional effect, particularly at major intersections/interchanges where potentially both planned developments and less desirable land uses could occur. The proposed downtown Newport News Station would be located near a proposed light rail station for the Peninsula Rapid Transit Project. Land use changes in the vicinity of the stations would result in mixed-uses consistent with local development plans.</p>

Issue/Concern	Status Quo Alternative	No Action Alternative	Proposed Alternatives and Other Projects		
			Alternative 1	Alternative 2a	Alternative 2b
				parking would occur at this location. Potential cumulative land use effects could also result at the proposed Petersburg and Richmond station locations that would be shared with the SEHSR project, in addition to the proposed Bower's Hill station.	
Population and Employment, Environmental Justice, and Community Resources	Population and employment growth would continue as projected. Other major projects would affect employment density, type, and timing of commercial development, especially at planned interchanges, rail stations, or designated commercial growth areas. No cumulative environmental justice effects are expected.	<p>Peninsula/CSXT Route: No cumulative effects expected; same as No Action Alternative.</p> <p>Southside/NS Route: <u>Population and Employment:</u> Population and employment in the area may increase above the current projections in conjunction with other projects within the study area, especially around station locations in the vicinity of proposed rail station areas. This would influence the density, employment mix, design and timing of commercial development. The potential also exists for housing needs to increase to accommodate the likely increases in population and employment.</p> <p><u>Environmental Justice:</u> Benefit from improved mobility options provided by all transportation projects under construction or planned within the study area. Potential cumulative effects would be related to quality of life, which could include noise and vibration impacts, barrier effects, aesthetics, and safety, particularly at grade crossings.</p> <p><u>Communities and Community Facilities:</u> Potential cumulative effects would be related to quality of life, which could include noise and vibration impacts, barrier effects,</p>	<p>Peninsula/CSXT Route: <u>Population and Employment:</u> Population and employment around the proposed Newport News Station for this project and the proposed transit station for the Peninsula Rapid Transit Project may increase above the current projections. This would influence the density, employment mix, design and timing of commercial development. The potential also exists for housing needs to increase to accommodate the likely increases in population and employment.</p> <p><u>Environmental Justice:</u> Benefit from improved mobility options provided by all transportation projects under construction or planned within the study area. Potential cumulative effects would be related to quality of life, which could include noise and vibration impacts, barrier effects, aesthetics, and safety, particularly at grade crossings.</p> <p><u>Communities and Community Facilities:</u> Potential cumulative effects would be related to quality of life, which could include noise and vibration impacts, barrier effects, aesthetics, and safety, particularly at grade crossings.</p> <p>Southside/NS Route: <u>Population and Employment:</u></p>	<p>Peninsula/CSXT Route: <u>Population and Employment:</u> Population and employment around the proposed Newport News Station for this project and the proposed transit station for the Peninsula Rapid Transit Project may increase above the current projections. This would influence the density, employment mix, design, and timing of commercial development. The potential also exists for housing needs to increase to accommodate the likely increases in population and employment.</p> <p><u>Environmental Justice:</u> Benefit from improved mobility options provided by all transportation projects under construction or planned within the study area. Potential cumulative effects would be related to quality of life, which could include noise and vibration impacts, barrier effects, aesthetics, and safety, particularly at grade crossings.</p> <p><u>Communities and Community Facilities:</u> Potential cumulative effects would be related to quality of life, which could include noise and vibration impacts, barrier effects, aesthetics, and safety, particularly at grade crossings.</p>	

Issue/Concern	Status Quo Alternative	No Action Alternative	Proposed Alternatives and Other Projects		
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			aesthetics, and safety, particularly at grade crossings.	<p>Population and employment in the area may increase above the current projections in conjunction with other projects within the study area. This would influence the density, employment mix, design and timing of commercial development. The potential also exists for housing needs to increase to accommodate the likely increases in population and employment.</p> <p><u>Environmental Justice:</u> Benefit from improved mobility options provided by all transportation projects under construction or planned within the study area. Potential cumulative effects would be related to quality of life, which could include noise and vibration impacts, barrier effects, aesthetics, and safety, particularly at grade crossings; however, no disproportionate adverse impacts are expected.</p> <p><u>Communities and Community Facilities:</u> Potential cumulative effects would be related to quality of life, which could include noise and vibration impacts, barrier effects, aesthetics, and safety, particularly at grade-crossings.</p>	
Parklands	No cumulative effects expected.		Potential cumulative impacts could include proximity effects, such as noise impacts, on the resource.	Potential cumulative impacts could include proximity effects, such as noise impacts, on the resource.	Potential cumulative impacts could include proximity effects, such as noise impacts, on the resource.
Hazardous and Contaminated Materials	No cumulative effects expected.		No cumulative effects are expected as each project must assess and meet applicable requirements regarding potential effects from sites of concern or the use of hazardous and contaminated materials.	No cumulative effects are expected as each project must assess and meet applicable requirements regarding potential effects from sites of concern or the use of hazardous and contaminated materials.	No cumulative effects are expected as each project must assess and meet applicable requirements regarding potential effects from sites of concern or the use of hazardous and contaminated materials.

Issue/Concern	Status Quo Alternative	No Action Alternative	Proposed Alternatives and Other Projects		
			Alternative 1	Alternative 2a	Alternative 2b
Cultural and Archaeological Resources	Proximity effects due to increased freight train frequencies on historic architectural resources.		Potential cumulative effects would be primarily due to increased noise and vibration as a result of increased passenger and freight train frequencies on both routes.	Potential cumulative effects would be primarily due to increased noise and vibration as a result of increased passenger and freight train frequencies on both routes.	Potential cumulative effects would be primarily due to increased noise and vibration as a result of increased passenger and freight train frequencies on both routes.
Hydrologic and Water Resources	No cumulative effects expected.		Possible cumulative effects due to increased impervious ground surfaces, stormwater run-off and water quality.	Possible cumulative effects due to increased impervious ground surfaces, stormwater run-off and water quality.	Possible cumulative effects due to increased impervious ground surfaces, stormwater run-off and water quality.
Biological Resources	No cumulative effects expected.		Possible cumulative effects due to land use conversion resulting in habitat loss.	Possible cumulative effects due to land use conversion resulting in habitat loss.	Possible cumulative effects due to land use conversion resulting in habitat loss.

5.3.3 Conclusions

The potential for secondary and cumulative effects exists for all Build alternatives under consideration. The effects, however, are not expected to substantially alter development patterns within the corridor outside the vicinity of the proposed station locations. The effects that would be associated with either route would primarily be attributable to projects considered part of the Status Quo and No Action Alternative and secondary development that may occur at the proposed station areas with the proposed project. More in-depth evaluations of these topic areas would be conducted during subsequent analysis once an alternative is selected and proposed locations for facilities are determined.

5.4 Subsequent Analysis

Secondary effects for the selected route would occur some time *after* the proposed project is built. Potential effects are outlined in Table 5-1. As stated previously, the secondary effects attributable to the proposed project would be due mainly to the construction of the proposed stations. During subsequent analysis, secondary effects of the proposed project as they relate to traffic, development, land use and pollution would be evaluated.

Additionally, to determine the cumulative effects of the selected alternative, all development projects expected to occur within the study area will be reviewed in conjunction with the social, environmental, economic and transportation effects that would result from implementation of the project.