

through reestablishing access between Dover and Newington and enhancing the larger bicycle route network in the seacoast area. The final *New Hampshire Statewide Pedestrian and Bicycle Transportation Plan* is anticipated to be completed in November 2019.

As described in **Section 3.3, Floodplain and Hydrodynamics**, Alternatives 6 and 7 would remove and replace the GSB's Pier 1, causing a permanent change within the Little Bay and Great Bay Estuary system. The permanent new pier may result in changes to the hydrodynamic conditions, for example, tidal maxima, currents, and wave patterns in the intertidal zone and other areas surrounding the new pier. However, the size of this area would be small in relation to the overall floodplain area and would not affect the long-term productivity of the Little Bay and Great Bay Estuary. Alternatives 1, 3, and 9 do not propose permanent changes to structures in the intertidal zone; therefore, these three alternatives would not affect the long-term productivity of the Little Bay and Great Bay Estuary.

Alternatives 6, 7, and 9 would benefit long-term productivity for marine traffic due to the improvements to navigational clearances of the 200 foot channel, as compared to the No-Action Alternative or Alternatives 1 and 3. The increase in the vertical clearance above the water surface would provide larger marine vessels with more maneuverability through the bridge crossing. This long-term beneficial effect of improvements to navigational clearances under Alternatives 6, 7, and 9 would outweigh the short-term impacts to marine traffic resulting from periodic temporary closure of the navigational channel during construction.

With regards to long-term impacts on historic structures, Alternatives 3, 6, 7, and 9 would result in a permanent loss of, or adverse effects to, the GSB. Appropriate mitigation to resolve adverse effects will be established in a new Section 106 MOA, which would be signed by FHWA, NHDHR, NHDOT and anticipated to be signed by the Consulting Parties.

3.17 Irreversible and Irrecoverable Commitment of Resources

Implementation of the Project would involve a commitment of a range of natural, physical, human, and fiscal resources. Fossil fuels, labor, and construction materials such as cement, steel, timber decking, aggregate, and bituminous material would be expended. Additionally, labor and natural resources would be used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use would not have an adverse effect upon continued availability of these resources. Any construction would also require a substantial one-time expenditure of both state and federal funds, which are not retrievable.

The decision to commit these resources is based on the concept that residents in the immediate area, region, and state, as well as visitors or tourists, would benefit from the reestablished pedestrian and bicyclist access between Dover and Newington. This benefit is expected to outweigh the commitment of these resources.

3.18 Cumulative Impacts

Cumulative impacts are defined as "impacts that result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions, without regard to the agency (Federal or non-Federal) or individual who undertakes such other

actions." (40 CFR 1508.7) Cumulative impact analyses capture the effects resulting from the proposed action in combination with the effects of other actions completed or future actions in the same geographic area. Cumulative impacts can result from individually small or minor impacts but collectively equal more significant adverse impacts over time.

The analysis of cumulative impacts includes projects within the Study Area that are were completed in the past, are currently under construction, or are reasonably foreseeable—in other words, projects that are planned or programmed for construction within the time frame of this analysis or which are likely to occur. Reasonably foreseeable actions do not include those actions that are highly speculative or indefinite. (43 CFR 46.30)

Cumulative impacts can include both direct and indirect effects. Direct effects occur at the same time and place as when a Proposed Action is being implemented. (40 CFR 1508.8) These effects are discussed in previous section of this chapter, and may include noise impacts from construction equipment, traffic disruptions or detours, impacts to natural resources, or property impacts. Indirect effects are caused by the action and are later in time or further removed in distance (from the Project) but are still reasonably foreseeable, and are also discussed above. Indirect effects can also include growth-inducing impacts, changes in land use patterns, increased population density or growth rates, and impacts on natural resources. (40 CFR 1508.7)

Because this section evaluates the cumulative impacts for multiple resources, the structure of this section differs from the previous sections of **Chapter 3** that focused on impacts on a single resource area.

The 2007 FEIS evaluated the cumulative impacts of the Spaulding Turnpike Improvements, which have the potential to cause more cumulative impacts from the construction of additional lanes through the Seacoast Region of New Hampshire. As the Project does not pose any changes to roadway or highway infrastructure, the potential for cumulative impacts is far less.

3.18.1 Affected Environment

The evaluation of cumulative effects encompasses the geographic area affected by the Project because cumulative effects are focused on those areas where the impacts of the Project overlap with impacts of other past, present, and reasonably foreseeable future projects. These impacts are evaluated within the Study Area used for all resources evaluated in the DSEIS.

3.18.1.1 Historical Development Context

The larger Newington-Dover, Spaulding Turnpike Improvements Project has been under construction since 2010. The purpose of the Spaulding Turnpike Transportation Improvements Project is to improve long-term mobility and safety along the Spaulding Turnpike between Exit 1 and the Dover toll plaza, just north of Exit 6, which was designed to be accomplished through