

13. Indirect and Cumulative Impacts

13.1 Introduction

The Massachusetts Department of Transportation's (MassDOT) stated purpose of the implementation of South Coast Rail (SCR) Phase 1 (the Project) is consistent with the Full South Coast Rail Project, as documented in the Final Environmental Impact Statement (FEIS)/ Final Environmental Impact Report (FEIR) released in September 2013 (see Chapter 1, *Introduction & Project Purpose* for more information on the Full Build). This purpose is to meet the existing and future demand for public transportation between Fall River/New Bedford and Boston, Massachusetts, to enhance regional mobility while supporting smart-growth planning and development strategies in affected communities. Phase 1 allows MassDOT to serve these objectives in a timelier manner than would be possible if service was delayed until the completion of the Full SCR Project.

*The South Coast Rail Economic Development and Land Use Corridor Plan*¹ (Corridor Plan) was the result of widespread collaboration between the Commonwealth, 31 Corridor communities, and three Regional Planning Agencies (RPAs); Old Colony Planning Council (OCPC), Metropolitan Area Planning Council (MAPC), and Southeastern Regional Planning and Economic Development District (SRPEDD). As documented in the Corridor Plan, the Full SCR Project is anticipated to result in economic benefits and growth in jobs and households within the South Coast region. While these changes are economically beneficial, induced growth has the potential to affect land use and other resources. To guide future development, the Corridor Plan created "a blueprint for clustering jobs and homes around stations, maximizing the economic benefits of rail investment, minimizing sprawl development, and preserving the farms, fields, and forests of the South Coast."² To promote such smart growth, it identified Community Priority Areas of Regional Significance, including Priority Development Areas (PDAs) and Priority Protection Areas (PPAs). According to the Corridor Plan, PDAs are areas "with the greatest capacity or potential to accommodate new development," while PPAs "include land or environmental resources that are not permanently protected but are worthy of increased levels of protection through planning, regulation, conservation or acquisition."³

In fall 2010, Gov. Patrick issued Executive Order 525 (E.O. 525) providing for the implementation of the Corridor Plan and Corridor Map through state agency actions and investments. The Executive Order calls for state investments to be consistent with the Corridor Plan's recommendations to the maximum extent feasible. These state actions have the potential to leverage local and private investments in the priority areas. The Executive Order also directs state agencies to conduct a retrospective analysis to

1 Goody Clancy. 2009. *South Coast Rail Economic Development and Land Use Corridor Plan*. Goody Clancy: Boston, MA. June 2009.

2 *Ibid.*

3 *Ibid.*

determine how consistent their actions and investments in the region have been. with the Corridor Plan goals.

As part of the SCR FEIS/FEIR, MassDOT incorporated smart-growth planning consistent with the Corridor Plan and its associated PDAs and PPAs into the Project to provide communities with the opportunity to organize new growth and direct it away from sensitive areas with significant natural and cultural resources. The Project area associated with Phase 1 service has already been studied as part of the SCR smart-growth planning efforts and is included in the Corridor Plan. The use of the Middleborough Secondary line, a relocated Taunton Station, and new Pilgrim Junction Station in Middleborough are new elements that can be added to the Corridor Plan to ensure consistency in approach for analysis of the Phase 1 service.

After the publication of the SCR FEIS/FEIR, MassDOT released the *South Coast Rail Corridor Plan Update*, in cooperation with the Executive Office of Housing and Economic Development (EOHED) and the three RPAs associated with the development of the Corridor Plan. The focus of this five-year update was to review and revise, as necessary, the Community Priority Areas of Regional Significance. The proposed design modifications to the Freetown and Fall River design will have no impact on considerations included in the 2008 Corridor Plan and the 2013 Update. Through extensive public engagement led by the RPAs and updated mapping technologies, the 2013 Corridor Plan Update adjusted the boundaries of the PDAs and PPAs such that the number of PDA acres was reduced 63 percent, while the number of PPA acres increased by 13 percent. Overall, acreage within Community Priority Areas of Regional Significance declined by just one percent between 2008 Corridor Plan and the 2013 Update.

Section 13.2 of this chapter discusses the indirect effects of the proposed Phase 1 service compared to the No-Action Alternative (Non-Phased Service). It addresses the new elements associated with Phase 1 service only, and does not re-assess Project elements associated with the Full SCR Project that were already analyzed as part of the SCR FEIS/FEIR. Section 13.3 discusses the implementation of the Corridor Plan, including related performance metrics and the associated monitoring and reporting program, as well as the consistency of State investment commitments with the Corridor Plan. Section 13.4 provides an analysis of the cumulative impacts of Phase 1 service on natural, social, cultural, and physical resources.

This chapter specifically addresses the Secretary's Certificate on the Notice of Project Change (NPC), as described in Chapter 1, Section 1.3, which requires this DSEIR to include several specific analyses and information related to indirect and cumulative effects, as listed below.

- The impact assessment should include temporary and permanent impacts, direct and indirect impacts, and secondary and cumulative impacts. Impact analysis provided in the DSEIR should be conducted consistent with the methodology applied in the DEIS/R and the FEIS/FEIR, to the extent possible and updated as necessary, to support comparison of impacts and benefits.

- Changes associated with phasing of the project should be incorporated into the long-term evaluation and monitoring plan, which will include periodic reporting to the public and other agencies on progress. The DSEIR should identify how Phase 1 will be incorporated into the reporting (for example, publication of a separate/interim report) and how phasing may shift commencement of timelines. The first report was scheduled to be issued four years after the South Coast Rail project is put into service, and subsequent reports were to be issued every three years, for a maximum of 20 years.
- The DSEIR should provide an update on the monitoring and collection of data.
- The DSEIR should address how sustainable growth associated the South Coast Rail project will be affected by Phase 1, including relocation and/or delayed construction of stations.
- It should identify public infrastructure investments, land preservation funding, identification of PDAs and PPAs that may shift or be introduced as a result of routing interim service along the Middleborough Secondary line.
- MassDOT should describe how efforts to provide technical assistance to municipalities in Phase 1 will be implemented.
- Smart Growth benefits under Phase 1 should be assessed in the DSEIR. Given the reduction of three stations under Phase 1, as compared to the Full SCR Project, the SEIR should include an assessment of how, or to what extent, Smart Growth goals may be altered by this project change. As part of this assessment, MassDOT should provide a status report on the public infrastructure investments, land preservation funding, identification of priority development and protection areas, as well as any advances in municipal zoning changes which have occurred since E.O. 525 was issued in 2010.

13.2 Indirect Effects

Indirect effects “are caused by the action and are later in time and/or farther removed in distance, but are still reasonably foreseeable.” Indirect effects “may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems,” (as defined in federal regulations 40 CFR 1508.8).

Induced-growth indirect effects are changes in the location and/or magnitude of future development attributed to changes in accessibility caused by the transportation Project. Accessibility is the ease of movement from an origin (to all other places) or to a destination (from all other places). Transportation improvements change accessibility by reducing the time cost of travel between destinations. Changes in accessibility can affect the location decisions of residents and businesses if favorable economic, regulatory and infrastructure conditions are also supportive of new development. An example of an induced-growth indirect effect is commercial development occurring around a new rail station and

the environmental impacts associated with this development. The transportation project is a necessary condition for this development to occur (by providing new or improved access), but is not a sufficient condition. For the development to occur, other favorable conditions may be required, including:

- economic conditions that support development (such as markets, acceptable rate of return on investment in land purchase, design, construction, and other costs);
- zoning and other land use controls and policies suitable for the type of development suggested by market conditions;
- other infrastructure that supports development (for example, water and sewer service); and
- amenities (such as good schools and access to recreational opportunities).

As stated in the SCR FEIS/FEIR, potential indirect effects (beneficial and adverse) of the Rail Alternatives were evaluated with and without smart-growth measures (including transit-oriented development [TOD]) within a study area that included the 31 Corridor communities (such as, where induced growth will be likely to occur because of the SCR Project [the “commute shed”]). Phase 1 service does not introduce any new communities to this commute shed.

The Phase 1 study area that this DSEIR analyzes includes only those communities that will receive the new elements associated with Phase 1 service: Middleborough, Lakeville, Raynham, and Taunton. This DSEIR discusses the potential of Phase 1 service to change the induced growth projections that the SCR FEIS/FEIR presents. This DSEIR does not address the communities where no new elements are planned. The SCR FEIS/FEIR already evaluated these communities and their respective development plans. This included the communities in the Southern Triangle that were expected to receive the same benefits from the Project that the SCR FEIS/FEIR describes and communities north of Taunton that were also expected to receive the same benefits though in delayed fashion (no sooner than 2030). Although modifications to the design of the Freetown and Fall River Depot Stations will take place, these stations will be developed within the same previously-identified parcels and are therefore the modifications are not anticipated to change induced growth effects from those previously disclosed.

The analyses in the SCR FEIS/FEIR considered reasonably foreseeable indirect effects of implementing the SCR Project. Induced growth that will result from the Rail Alternatives included the creation of new residential development and jobs. To assess the indirect effects of this induced growth, two scenarios were developed to allocate growth in the South Coast region. The first scenario (Scenario 1) allocated induced growth under business-as-usual conditions, including baseline growth, and assumed that induced growth would occur in a traditional pattern. The second scenario (Scenario 2) assumed that growth would be directed to PDAs and away from PPAs based on the planning efforts of each municipality in the South Coast region. Refer to Chapter 5, *Indirect and Cumulative Impacts* of the 2013 SCR FEIS/FEIR for details on the associated methodology.

Potential indirect effects to environmental resources with the implementation of Phase 1 service are not anticipated to change significantly from those that the SCR FEIS/FEIR describes. The Middleborough Secondary route is an active freight line and will therefore not lead to new segmentation or fragmentation of habitat. Phase 1 may lead to the conversion of undeveloped lands to developed land uses; however, such conversions will be limited to Pilgrim Junction Station, Middleborough/Lakeville Station, and East Taunton Station. Moving the existing commuter rail station from the Middleborough/Lakeville Station to Pilgrim Junction Station is not expected to create new development opportunities, as such opportunities would just shift from one station to the other. Development opportunities proximate to the Pilgrim Junction Station are constrained due to a lack of lands available for development; most of these lands are either already developed or are within the Town's Water Resource Protection Districts that aim to protect existing and potential drinking water supplies. Any new development at the Middleborough/Lakeville Station will take place on land previously developed as surface parking. At East Taunton Station, similar levels of residential development are possible as compared with the concept plan for Taunton Depot Station that the Corridor Plan presents.

13.2.1 No-Action Alternative (Non-Phased Service)

If MassDOT does not implement phased service to the region, then the Full SCR Project, as the FEIS/FEIR describes, will proceed, though in delayed fashion, from the originally anticipated commencement of operations no sooner than 2030.

13.2.2 Build-Alternative (Phased Service)

The implementation of phased service will not bring any new communities into the service plan that the SCR FEIS/FEIR did not already evaluate. Phase 1 service, therefore, does not necessitate the full re-evaluation of the projections presented in the SCR FEIS/FEIR. All Phase 1 stations except for Pilgrim Junction Station are in communities that had a new station proposed as part of the Full SCR Project. Phase 1 service will bring commuter rail service to Taunton and the communities in the Southern Triangle earlier than originally anticipated, thus providing economic and transportation benefits in the near term. The Towns of Middleborough and Lakeville already have access to a commuter rail station (Middleborough/Lakeville) and have already experienced a certain amount of induced growth as a result of having such access. Communities north of the City of Taunton are still expected to realize the projected growth in households and jobs that the SCR FEIS/FEIR describes as part of the Full SCR Project.

Transit-Oriented Development

This section discusses anticipated changes to TOD opportunities as the Corridor Plan presents them and the potential for new TOD from the implementation of Phase 1 service. Allocations of projected jobs and housing reported in the SCR FEIS/FEIR are not anticipated to change, however, levels of TOD similar to those presented in the Corridor Plan are anticipated in communities with Phase 1 stations. Projected ridership at Pilgrim Junction Station in the Town of Middleborough is similar to, if not slightly

lower than, existing levels at the Middleborough/Lakeville Station.⁴ It is anticipated that current riders who use the Middleborough/Lakeville Station will instead use stations that are closer to them throughout the Southern Triangle once Phase 1 goes into service.

Pilgrim Junction Station

The proposed Pilgrim Junction Station is only three quarters of a mile from the existing Middleborough/Lakeville Station in Lakeville. Due to limited availability of undeveloped land proximate to Pilgrim Junction Station, opportunities for TOD are not expected to be significant. These lands are largely developed, fragmented by existing rail infrastructure, or are subject to zoning that restricts the types and scale of development without a zoning variance or special use permit, including the overlying Water Resource Protection District.⁵ Middleborough has already seen development pressures from the existing commuter rail station, and any TOD at Pilgrim Junction Station will likely represent a shift from the existing station and not result in additional induced jobs and households beyond what the SCR FEIS/FEIR presents. There is no existing concept plan for potential TOD at Pilgrim Junction Station.

Middleborough/Lakeville Station

The existing Middleborough/Lakeville Station, which could remain open to service existing Cape Flyer riders and to support a potential future Cape shuttle service connection, may also see new TOD. The daily demand for parking spaces will be lower, and the parking lot could become partially available for redevelopment.

East Taunton Station

Although the Taunton Depot Station will be relocated to East Taunton (less than 1 mile from its original planned location), similar TOD opportunities and range of modes for access as those considered in the Corridor Plan are possible at the new station location. This is due to the availability of land proximate to the new station that is under the same ownership with an owner who has expressed interest in TOD development. The development program in the Corridor Plan for Taunton Depot Station envisioned up to 250 additional housing units at that location.

Aside from land availability and ownership, the potential for TOD at the proposed East Taunton Station is dependent on the City of Taunton. The proposed East Taunton Station is outside of the Transit Oriented Overlay District that the City adopted in 2007.⁶ If the City wants to continue to promote and facilitate TOD, it could revise its zoning ordinance to include the area around the proposed East Taunton Station in its Transit Oriented District. East Taunton Station is in an area currently zoned for industrial uses, and accordingly, special permits are required for new residential developments and many types commercial uses.

⁴ CTPS Ridership Projections for SCR Phase 1, 2017 (Appendix A).

⁵ Town of Middleborough. 2012. Middleborough Zoning Bylaws.

⁶ City of Taunton. 2007. City of Taunton, Transit-Oriented Development District (TOD).

<http://www.srpedd.org/manager/external/ckfinder/userfiles/resources/Comprehensive%20Planning%20and%20Zoning/By-Laws/TauntonTOD43007.pdf>. Accessed October 24, 2017.

Freetown and Fall River Station

It is anticipated that riders who currently commute to the Middleborough/Lakeville Station will instead board the train at stations that are closer to them, and as such, the potential development opportunities discussed in the Corridor Plan can carry forward with minor layout modifications that are not anticipated to change their overall development programs. As the Corridor Plan presents, these programs include up to 25,000 square feet of new retail/office space and 200 housing units within a ¼ mile radius of the Freetown Station, and up to 200,000 square feet of commercial space and 200 housing units at the Fall River Depot Station. Since the publication of the Corridor Plan and the SCR FEIS/FEIR, the area around the Fall River Depot Station has experienced partial redevelopment that includes a medical office building of approximately 19,500 square feet at 775 Davol St., the site of the former Massasoit Steam Mill.⁷ This Project type is generally consistent with the mixed-use focus of the original concept plan, although its location was the site of a planned parking structure that will have supported station functions. The proposed station parking has been reconfigured as a result of this development.

Effects of Phase 1 to the Corridor Plan and Community Priority Areas of Regional Significance

The proposed Phase 1 station locations align with the intent of the PDAs, as defined in the Corridor Plan. Chapter 2, *Alternatives Analysis*, discusses how the site locations of the proposed Pilgrim Junction and East Taunton Stations were chosen because they met certain site-selection criteria, which overlap with the criteria of PDA screening, including good transportation access, few environmental constraints, and smart-growth potential.

Since the modifications to the design for Freetown and Fall River Stations take place within the same parcels, they remain within their PDAs and outside the PPAs. As the Corridor Plan Update depicts, however, the proposed Pilgrim Junction and East Taunton Stations are outside of existing PDAs, though not within PPAs. The proposed Pilgrim Junction and East Taunton Stations are slightly more than ¼ mile (about a five-minute walk) from their nearest PDAs, including Downtown Economic Opportunity Area [182-03] in Middleborough and Target Station Site [293-12] in Taunton, respectively. This distance limits the potential for TOD in these areas, as it reduces their attractiveness for new transit-oriented homes and businesses. In consideration of Phase 1 service, as part of the next update to the Corridor Plan, the City of Taunton and Town of Middleborough should engage residents, business owners, officials, and organizations, assisted by MassDOT and SRPEDD, in updating their Community Priority Areas. These communities should consider revising the areas they have designated as most important to them for development (PDAs) to include areas at or within ¼ mile of the proposed Pilgrim Junction and East Taunton Stations. Such revisions will ensure that future Commonwealth investments, primarily infrastructure investments, continue to support smart growth within their communities.

⁷ Fall River Office of Economic Development, City of Fall River. 2016. TIF Board OKs Three Projects, Including New Mall: \$2M in Tax Breaks Aim to Spur Development. <http://froed.org/2016/09/09/tif-board-oks-three-projects-including-new-mall2m-tax-breaks-aim-spur-development/>. Accessed October 24, 2017.

13.3 Implementation of the South Coast Rail Economic Development and Land Use Corridor Plan

This section discusses the implementation of the Corridor Plan, including the provision of technical assistance to ensure future sustainable development in concert with the Project, monitoring and reporting of performance metrics to measure the anticipated environmental and smart-growth benefits, and consistency of State commitments with the Corridor Plan.

13.3.1 Technical Assistance

Through Fiscal Year (FY) 2015, MassDOT provided technical assistance grants totaling more than \$1.7 million to the Corridor communities in support of advancing smart-growth land use policies in the South Coast region.⁸ Such technical assistance is intended to enable these communities to prepare for the induced growth associated with the SCR Project in a manner that is sustainable from a land development and environmental impact perspective.

The communities that will be served by commuter rail service under Phase 1 will have the most to gain from the implementation of smart-growth measures, as they will face the greatest development pressures from the introduction of such service. The following are examples of technical assistance grants awarded to communities within the Phase 1 service area; they are presented here to add context to the grant program and do not represent the full list of projects that have received such grants to date.

- The Town of Middleborough received \$8,000 in FY2015 to complete its Open Space and Recreation Plan;
- The Town of Lakeville received \$25,000 in FY2015 for studying the redevelopment of the State Hospital site and adjacent areas along Route 105;
- The Town of Raynham received \$10,000 in FY2013 to develop a Mixed-Use Overlay District Bylaw;
- The City of Taunton received \$15,000 in FY2015 to develop a Use and Occupancy Inventory of properties and companies located in the Myles Standish Industrial Park/Dever School Expansion and the Liberty and Union Industrial Park;
- The Town of Freetown received approximately \$15,000 in FY2012 for rezoning efforts along South Main Street in the areas surrounding the proposed Freetown commuter rail station; and
- The City of Fall River received \$25,000 in FY2011 for TOD planning and design and waterfront development at the Battleship Cove Priority Development Area.

⁸ Massachusetts Department of Transportation. 2014. South Coast Rail: Technical Assistance Grants. <https://blog.mass.gov/transportation/south-coast-rail/south-coast-rail-technical-assistance-grants/>. Accessed October 24, 2017.

Funding for technical assistance temporarily stopped after the FY2015 awards due to project uncertainty. As Phase 1 service will bring about transportation benefits to the communities in the Southern Triangle sooner, these communities are anticipated to receive priority in the awarding of technical assistance grants to prepare them for the advanced schedule. Northern communities are still anticipated to experience the full range and extent of benefits associated with the Full SCR Project; these communities will also be eligible for technical assistance to help them realize the project's full benefits in alignment with sustainable development patterns.

Phase 1 service does not introduce any new communities to the service area; therefore, no shifting of technical assistance funds outside of the Corridor communities will take place. Consistent with the Secretary's Certificate on the SCR FEIS/FEIR, MassDOT will continue to provide funding of an average of \$200,000 per year to the RPAs to provide technical assistance to South Coast communities for the next several years.

13.3.2 Evaluation and Monitoring Plan

MassDOT consulted with the Interagency Coordinating Group (ICG) to develop a long-term Evaluation and Monitoring Plan for the anticipated environmental and smart-growth benefits of the SCR Project. This included working with EOEEA, the ICG, RPAs, and local communities to develop evaluation indicators and metrics tailored to the SCR Project. It also proposed a mechanism for periodic reporting out to the public and other agencies on progress in achieving the smart-growth and environmental goals of the Project, including its commitments to the protection of ecologically significant habitat.

This section summarizes the performance metrics as well as the proposed monitoring and reporting programs as required in the Secretary's Certificate on the SCR FEIS/FEIR that will be carried forward during Phase 1. In response to the Secretary's Certificate on the NPC, this section also provides an update on the monitoring and collection of data, and discusses how the phasing of the Project will be incorporated into the long-term Evaluation and Monitoring Plan.

Performance Metrics

The purpose of the Evaluation and Monitoring Plan is to verify the accuracy of impact projections, which will allow for mid-course corrections and adaptive strategies as needed. Section 5.5.2, *Performance Metrics* in the SCR FEIS/FEIR identifies the performance metrics associated with the SCR Smart Growth Evaluation Plan of the SCR FEIS/FEIR, along with detailed information on the methodology associated with their development and how related data could be collected. These cover general metrics such as growth projections, as well as impacts to forestland, farmland, and wetlands. They also cover PDA metrics, PPA metrics, TOD metrics, and social equity metrics. Section 5.5.3, *Monitoring and Reporting Program* in the SCR FEIS/FEIR describes the responsibilities for such data collection among the RPAs and state agencies, including MassDOT, the Executive Office of Administration and Finance (A&F), EOEEA, EOHED, and the Department of Housing and Community Development.

Since data collection was set to begin during the first year of construction of the Full SCR Project, MassDOT and its evaluation partners have not begun monitoring the performance metrics. For Phase 1 service, MassDOT is not proposing changes to the performance metrics or associated data collection processes. In accordance with the Secretary's Certificate on the SCR FEIS/FEIR, however, MassDOT does intend to expand the social equity metrics beyond just Chapter 40B and inclusionary zoning to include other socio-economic factors, as appropriate. For the Full Build, the Certificate on the SCR FEIS/FEIR required MassDOT to "develop an additional biodiversity metric to evaluate the change in Index of Ecological Integrity value of impacted areas and mitigation sites." Because Phase 1 elements are located on active rail track, this biodiversity metric is not applicable to the Project, but it will be relevant when the Full Build expands to areas that do not currently have active freight service.

Reporting

As the SCR FEIS/FEIR states, MassDOT will be responsible for the reporting of results of performance metrics evaluation. MassDOT will draft a report, which will be published on MassDOT's website. The first report will be published approximately four years after the commencement of SCR Service, and subsequent reports will be available every three years after this first report for a maximum of 20 years. The first report will include data collected for the baseline year (the first year of construction) and data collected three years after the baseline data collection year. Each subsequent report will include the historical data, as well as data collected for the additional reporting period.

In response to the Secretary's Certificate on the NPC for Phase 1 service, MassDOT proposes to follow the same general structure for the proposed monitoring and reporting program as the SCR FEIS/FEIR outlines. The same responsibilities among MassDOT, the RPAs, state agencies, and municipalities will apply. Due to Project phasing, however, MassDOT proposes a modified reporting schedule. The first year of data collection will commence during the first year of construction of Phase 1 service.

13.3.3 Consistency of State Commitments with the Corridor Plan

Executive Order (E.O.) 525 mandates policy commitments made in the Corridor Plan for "Strategic Investments" by committing the Commonwealth to use its discretionary grant funds and its investments to target technical assistance and infrastructure investments to priority areas, to the maximum extent practicable. This E.O. requires annual reporting by directing A&F to develop a retrospective analysis to measure the consistency of state investment commitments with the Corridor Plan in addition to a web-based tracking tool.

Released in February 2012, the retrospective analysis covered over 245 state investment commitments made between FY2009 and FY2011.⁹ This report found that 78.5 percent of state spending advanced

⁹ South Coast Rail Inter-Agency Working Group. State Investment in the South Coast Region and Implementation of the Corridor Plan: A Retrospective Analysis. February 23, 2012.

the development and preservation goals of the Corridor Plan. As noted in this report, agencies have taken the following implementation actions to ensure compliance:

- Developing a strategic plan, by agency, for implementing E.O. 525, which will include considerations and issues raised in this report;
- Collecting data to report the implementation of E.O. 525 by agency, which will be summarized in an annual report;
- Seeking approval from other agencies for investments that are inconsistent with the *Corridor Plan* (for example, EOEEA would need to justify an exception to the E.O. 525 for land conservation in a PDA); and
- Targeting technical assistance and infrastructure investments to priority areas, to the maximum extent feasible.

Aside from the Retrospective Analysis and web-based tracking tool, E.O. 525 also directed A&F to collect and report state investment commitments each year in the South Coast region. Due to uncertainty surrounding the Full SCR Project, however, such measurements have not been conducted to date.

13.4 Cumulative Impacts

According to the U.S. Environmental Protection Agency (EPA), an adequate cumulative effects analysis of impacts that are due to past, present, and reasonably foreseeable future actions needs to consider the following factors: 1) whether the environment has been degraded, and if so, to what extent; 2) whether ongoing activities in the area are causing impacts; and 3) the trends for activities and impacts in the area.

A cumulative impact analysis should examine actions that are relevant to reasonably foreseeable significant adverse impacts (i.e., those that are probable or likely, not merely possible), are "essential to a reasoned choice among alternatives," and can be obtained without exorbitant cost.¹⁰ A cumulative impact analysis identifies:

- The area in which the effects of the proposed project will be felt;
- The impacts that are expected in that area from the proposed project;
- Other past, present, and reasonably foreseeable actions that have or are expected to have impacts in the area;

¹⁰ Connaughton, James L., "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis." Memorandum to Heads of Federal Agencies. June 24, 2005.

- The impacts or expected impacts from these other actions; and
- The overall impact that can be expected if the individual impacts are allowed to accumulate.

Phase 1 service associated with the SCR Project is anticipated to result in direct or indirect, adverse and/or beneficial effects to a range of resources, as described in Chapters 3 through 12. Additional effects may result from induced growth, as described in the indirect effects portion of this chapter. Much of the Project Area to be utilized for Phase 1 Service was already studied as part of the SCR overall Smart Growth Plan. The Phase 1 alignment will include 7.1 miles of new track area (the Middleborough Secondary) and a new station at Pilgrim Junction. The station in Taunton previously studied as part of the Corridor Plan will be relocated.

Potential cumulative impacts related to Phase 1 service were analyzed as compared to the No-Action Alternative. The evaluation was conducted for a selected set of resources that are within certain temporal and spatial boundaries, result from historical trends or effects from specific other projects, and (for the most part) are regulated by various governmental agencies.

Resources Evaluated

Chapters 3 through 12 describe the potential direct and indirect effects of Phase 1 service for a broad range of resources. Some resources have historically experienced substantial impacts from other projects or human activity; may experience substantial future impact from other projects or activities; and/or are of specific interest to decision-makers, regulators, and residents of the South Coast region. To be generally consistent with the cumulative impact analysis provided in the FEIS/FEIR, the evaluation for the new Phase 1 elements focuses on land use, wetlands, biodiversity, threatened and endangered species, water quality, and air quality. Other resources evaluated in Chapters 3 through 12 either did not meet the selection criteria; are expected to be little-affected by Phase 1 service; and/or do not hold specific interest to stakeholders. They are therefore not explored here.

Temporal or Spatial Boundaries

Current impacts have been evaluated based on 2017 conditions, taking into consideration publication delays for the availability of the most recent data. Future impacts have been evaluated to 2030, the design year of Phase 1 service. The Phase 1 design year represents the year in which the Project is planned and designed to meet the future, anticipated needs and characteristics.

Spatial boundaries for the analyses varied by resource according to the specific characteristics of the resource, regulatory jurisdictions, and the availability of meaningful data.

- **Land Use**—Land use was evaluated at the local (municipal) and regional levels.
- **Wetlands and Waterways**—Wetlands were evaluated at the watershed level when useful data were available. State or regional data were used for historical perspective.

- **Biodiversity**—Biodiversity was evaluated at the ecosystem level (the Bristol Lowlands Ecoregion), considering the biotic communities present in the South Coast region but using the geographic boundaries of the 31 South Coast communities.
- **Threatened and Endangered Species**—Threatened and endangered species were evaluated at the ecosystem level, but also considering the range of each identified species.
- **Water Quality**—This resource was evaluated at the watershed level.
- **Air Quality**—The air quality of the South Coast region is strongly influenced by predominant winds from the southwest and west, bringing air pollutants from upwind states Connecticut, Rhode Island, and New York.¹¹ Based on regulatory agency jurisdictions and reporting conventions, the three counties within the SCR study area (Bristol, Norfolk, and Plymouth) are considered to constitute the airshed.

Trends and Reasonably Foreseeable Future Actions

The analysis used readily available data sources for past and future changes, EEA data and publications, EPA list of local EIS documents, MassDEP wetland change mapping, federal and state agency major permit applications, and other readily available resources. For each resource, the analysis took into consideration:

- Past changes to the selected resources that resulted from development trends or major projects within the study area; and
- Future changes to the selected resources from anticipated growth based on historic or recent trends, or specific projects, including all reasonably foreseeable projects (for example, those that are undergoing or have completed major environmental permitting actions or MEPA and/or NEPA reviews), such as:
 - First Light Resort and Casino (East Taunton);
 - Fall River Executive Park (Freetown); and
 - Riverfront Business Park (Freetown).

Regional transportation planning was taken into consideration to the greatest extent possible. The most current regional plan covers the period from 2013 to 2016, and is primarily composed of road and bridge resurfacing and reconditioning projects.¹² Although several are identified as congestion relief projects, and specifically reference air quality improvements, quantified impacts to the resources evaluated in this analysis are not provided. Some projects, identified as “congressional earmarks

¹¹ DEP. 2008. Final Massachusetts State Implementation Plan to Demonstrate Attainment of the National Ambient Air Quality Standard for Ozone. Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs, Department of Environmental Protection: Boston.

¹² Southeastern Massachusetts Metropolitan Planning Organization. 2009. FFY 2013-2016 Transportation Improvement Program. Prepared by the Southeastern Regional Planning and Economic Development District: Taunton, MA.

waiting for project approval and full funding” are also listed, and include projects such as Route 79 Improvements in Fall River and highway interchange and freight rail improvements throughout the South Coast region. It also identifies the relocation of Route 79 in Fall River to create a 4-lane urban boulevard with a landscaped median and improved access to developable areas along the waterfront. Potential impacts associated with these projects are incorporated in the general resource trends described in the cumulative impact assessment.

Although not a “reasonably foreseeable future action” in the traditional sense of cumulative impacts analysis, the possible effects of climate change on resources such as biodiversity, threatened and endangered species, and wetlands have been taken into consideration to the extent possible.

The cumulative impacts evaluation analyzes the past and future changes to the selected resources from development trends and other specific projects within the resource-specific study areas, together with the added impacts of Phase 1 service.

Federal, state, or local governmental agencies regulate most of the resources evaluated for cumulative impacts. The regulatory programs drive many of the trends for improving resource values (for example, air quality, water quality, and wetlands area) and are therefore important in determining resource impacts of Phase 1 service and other regional projects. Regulatory programs typically prohibit impacts except as authorized by a permit, are charged with reviewing permit applications, and, generally, only authorize activities that provide the least impact to the resource while still meeting the proposed project’s purpose and need. For this evaluation, existing permitted facilities and proposed actions indicate the current and likely future impacts to the resources.

The agencies responsible for administering these programs are typically charged with managing the resources on a project-by-project basis but in the context of the common good. For example, the federal government has a “no net loss” policy on wetlands; project proponents seeking permits to fill wetland areas are commonly required to offset losses by replacing filled wetlands at a negotiated ratio, such as 2:1 or 3:1. These replacement ratios recognize the inherent unpredictability in creating or restoring replacement wetlands that offset the wetland functions from the project-specific loss, as well as the necessary passage of time between establishing adequate wetland hydrology, and succession to vegetative stability and ultimately functional maturity. This passage of time is particularly lengthy for forested wetlands. Thus, certain regulated resources can experience improvements, rather than degradations, over time.

Active Land Use

The cumulative impacts of the Phase 1 elements in addition to the Full Build will not additively result in a significant environmental impact. The Phase 1 elements that were not considered in the Stoughton Straight Alternative consist of active rail lines and an additional station in Middleborough. Although a new Taunton Station is included in Phase 1 in a new location, it effectively replaces the station in Taunton already considered under the Full Build and already documented in the FEIS/FEIR cumulative impact assessment.

The proposed station site at Pilgrim Junction is within the existing wye formed by the convergence of the Middleborough Secondary and the Middleborough Main Line. Portions of the wye are currently used for rail-related activities, while others are disturbed, undeveloped land. As described in section 13.2.2 above, opportunities for TOD at this site are not expected to be significant. According to the Town of Middleborough's Fiscal Year 2018 Strategic Plan, one of the Town's goals is to facilitate economic development on Route 28 and in the Route 495 business corridor. Another goal is to improve downtown Middleborough's economic development prospects. Implementation of Phase 1 may help the Town to meet these two goals. However, no specific proposed actions related to land use are anticipated at this time.

As indicated in Section 13.2.2 above, there may be TOD opportunities at the East Taunton Station similar to those considered in the Corridor Plan for the previously proposed station location at Taunton Depot. Such development will be dependent on the City of Taunton's interest in revising its zoning ordinance to include the area around the proposed East Taunton Station in its Transit Oriented District. If this were to occur, shifts in land use from undeveloped land to residential or mixed uses. However, there are no specific changes in land use proposed in the vicinity of the proposed station at this time.

A portion of the parcel at 870 North Main Street in Fall River is required in order to provide expanded parking based on ridership projections for the Full Build. Currently, the City of Fall River is developing an Urban Renewal Plan that includes this parcel. Once the Urban Renewal Plan is approved by the City Council, the City's land acquisition process will begin and relocation assistance will be provided to impacted businesses.

Wetlands

Wetland impacts from Phase 1 Service, including the Southern Triangle portion of the Project, are significantly reduced from original impact estimates in the FEIS/FEIR. Cumulative impacts from both the Phase 1 and Full Build will not exceed what was originally estimated in the FEIS/FEIR.

With Phase 1, there will be a minor loss of wetlands with the reconstruction of the tracks and culverts, with little effect on the existing fragmentation of important wetland complexes. Hydrologic interaction and wildlife habitat connectivity among Project Area wetlands will be improved through the improved culverts which will have a larger openness ratio and will improve conveyance of surface water across the Middleborough Secondary.

The Middleborough Secondary was constructed in 1856, and can be assumed to have fragmented wetland habitats along the alignment creating an elevated railroad berm and a gap in forest cover. The small culverts will have restricted hydrologic connections among formerly contiguous wetland systems. In the subsequent years, additional wetland loss and hydrologic alteration occurred due to the development of cranberry bogs, commercial and industrial development, impoundment of waterways, and later development of residential areas along the roads crossing the right of way (ROW). Despite this history of development, substantial areas of contiguous wetland habitats remain both north and south of the ROW.

Residential development is anticipated to continue, and planned developments will likely result in direct and indirect wetland alteration. The railroad will continue to influence the hydrology of adjacent wetland systems and reduce wildlife connectivity within the corridor. Therefore, no increase in cumulative impacts to wetland resources is expected to result from Phase 1.

Biodiversity

With the Project, there will be a minor loss of vegetation associated with the reconstruction of the tracks and culverts, with little effect on the existing habitat fragmentation. Turtle and amphibian passage will be improved through the addition of wildlife crossings, and the improved culverts will have a larger openness ratio and will improve fish and wildlife connectivity along the Middleborough Secondary.

Residential development is anticipated to continue, and planned developments will result in the loss of undeveloped lands. The proposed East Taunton Station site will be developed for commercial or industrial uses, resulting in the loss of 3.7 acres of forest and early successional habitats. Therefore, no increase in cumulative impacts to biodiversity is expected to result from Phase 1.

Threatened and Endangered Species

The addition of Phase 1 Project areas is not anticipated to have a significant effect on Threatened and Endangered Species. Improved connectivity across the right of way through culvert replacement will enhance wildlife mobility across the Middleborough Secondary Corridor. The culverts along the Middleborough Secondary will be replaced and provide improved connectivity across the existing rail line.

Water Quality

The Project is not expected to have a negative impact on water quality. Due to use of Best Management Practices (BMPs) the Phase 1 Project will result in minor improvements to water quality along the existing freight system and at the proposed station locations. BMPs will be used whenever possible to maximize ground water recharge, reduce stormwater volumes, and remove contaminants.

Air Quality

The Phase 1 Project will reduce emissions of carbon monoxide (CO), volatile organic compounds (VOC), and carbon dioxide (CO₂) earlier than they will otherwise be reduced without the SCR Project. For particulate matter (PM_{2.5} and PM₁₀), the increase in locomotive emissions generally offset the reduction in motor vehicle emissions as described in Chapter 6, *Air Quality & Greenhouse Gas*. The additional rail service will result in a *de minimis* increase in regional nitrogen dioxide (NO_x) emissions. When the Stoughton Straight Electric Alternative commences, there will be a decrease in regional NO_x emissions due to additional reductions in vehicle miles traveled and replacement of diesel service with electric.



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