3.19 Sustainability

3.19.1 CHANGES TO THIS CHAPTER SINCE THE DEIS

Since the Draft Environmental Impact Statement (DEIS), this chapter has been revised to update the acreage of the greyfield and greenfield impacts due to project design refinement. Since the release of the DEIS, a new version of the Envision Manual was released and is being used for the Carolina Crossroads project. References to Envision Version 2 have been updated to Envision Version 3. This chapter also includes the sustainability action plan as the project transitions from planning to final design and construction.

3.19.2 WHAT IS SUSTAINABILITY?

Federal Highway Administration (FHWA) describes sustainability using the "triple bottom line", which considers three principles: Social (also known as equity or people), Environmental (also known as ecology or planet), and Economic (also known as money or profit).[1] The goal of sustainability is the satisfaction of basic social and economic needs, both present and future, and the responsible use of natural resources, all while maintaining or improving the well-being of the environment on which life depends.

"Triple Bottom Line" Principles:

- **Social**
- **Environmental**
- **Economic**

3.19.2.1 What is a sustainable highway?

FHWA views sustainable highways as an integral part of sustainable development.[2] A sustainable highway should satisfy lifecycle functional requirements of societal development and economic growth while striving to enhance the natural environment and reduce consumption of natural resources. The sustainability characteristics of a highway or roadway project should be assessed and considered for implementation throughout its lifecycle, from conception through construction, operations, and maintenance.

Sustainability in highways should be addressed with the understanding that highways are one part of transportation infrastructure, and transportation is one aspect of meeting human needs. In addition to addressing environmental and natural resource needs, the development of a sustainable highway should focus on access (not just mobility), moving people and goods (not just vehicles), and providing people with transportation choices, such as safe and comfortable routes for walking, cycling, and transit.

Sustainable transportation may be described or defined in many ways that broadly address environmental, social and economic impacts, safety, affordability, and accessibility of transportation services. Transportation agencies address sustainability through a wide range of initiatives, as well as addressing requirements of the National Environmental Policy Act (NEPA). Measures of project success include a wide range of indicators, such as travel performance, gains achieved through material selection, and construction methods.

[1] https://www.sustainablehighways.org/296/what-is-sustainability.html

[2] https://www.sustainablehighways.org/203/what-is-a-sustainable-highway.html

3.19.3 WHAT ARE THE SUSTAINABILITY GOALS FOR THE PROJECT?

A project team consisting of representatives from FHWA, SCDOT, and design, environmental, and public involvement leads have established sustainability goals and monitored progress during project development. Initial sustainability goals established during initial workshops in June 2015 include:

- Align the project with FHWA's Partnership for Sustainable Communities [3]
- Achieve net gain when offsetting environmental impacts
- Consider river systems and regulated floodways
- Consider floodplain and culvert design innovations
- Address aging stormwater infrastructure
- Evaluate the resiliency of the corridor and the ability to maintain cargo routes, mobility, and access
- Implement compensatory stream and wetland mitigation
- Implement context sensitive solutions, public involvement and outreach [4]
- Consider research and construction innovation
- Implement erosion and sediment control
- Conduct environmental compliance

3.19.4 HOW IS SUSTAINABILITY BEING DOCUMENTED FOR THE PROJECT?

3.19.4.1 Envision

Envision is a sustainability rating system and planning guide for introducing sustainability considerations into infrastructure projects.[5] Envision was developed in joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure (ISI). ISI is a not-for-profit education and research organization founded by the American Public Works Association, the American Council of Engineering Companies, and the American Society of Civil Engineers.

The Envision Guidance Manual (Version 3) covers the use of the Envision rating system for the planning and design phase. Envision has 64 sustainability indicators (called 'credits') organized into five categories:

- Quality of Life: Wellbeing, Mobility, Community
- Leadership: Collaboration, Planning, Economy
- Resource Allocation: Materials, Energy, Water
- Natural World: Siting, Conservation, Ecology
- Climate and Resilience: Emissions, Resilience

Sustainability ratings for infrastructure projects are established through a performance assessment that awards points for up to five levels of achievement within each credit. Additional points for innovative performance can be earned in each category. Projects that apply Envision and opt to go through ISI's independent, third-party

[3] https://www.fhwa.dot.gov/livability/partnership/leveraging_the_partnership/leveragingandpartnership.pdf
[4] www.fhwa.dot.gov/planning/css/
[5] http://sustainableinfrastructure.org/envision/

review (called 'Verification') may be eligible for Envision awards. SCDOT anticipates submitting documentation for ISI Verification of planning and design efforts upon completion of the ROD, should a build alternative be selected, and completion of final design plans.

3.19.4.2 FHWA INVEST

FHWA's Infrastructure Voluntary Evaluation Sustainability Tool (INVEST) Version 1.3 is a web-based self-evaluation tool comprised of voluntary sustainability best practices, called criteria, which cover the full lifecycle of transportation services, including system planning, project planning, design, and construction, and operations and maintenance.[6] To cover the full transportation lifecycle, the INVEST criteria are divided into four modules: System Planning for States (SPS), System Planning for Regions (SPR), Project Development (PD), and Operations and Maintenance (OM). SCDOT is using the PD module to assess the Carolina Crossroads project, which includes criteria that span the entire project development process from early planning, alternatives analysis, environmental documentation, preliminary and final design, and construction. The PD module consists of multiple scorecards designed to recognize the varying scope, scale, and context of projects across the country. The PD module includes 33 criteria that are generally organized from planning to design to construction. Criteria within the PD module include topic areas such as context sensitive project development, ecological connectivity, pedestrian and bicycle facilities, and construction waste management.

INVEST has 7 project scorecards available for the evaluation of projects based on both the type of project (paving, basic, extended, or scenic/recreational) and the location (rural or urban). The Extended Urban scorecard applies to major reconstruction projects that add travel lanes to an existing roadway and is being used for the Carolina Crossroads project.

3.19.5 WHAT ARE KEY SUSTAINABILITY CONSIDERATIONS FOR THE PROJECT?

The following sections provide a broad overview of the key sustainability considerations for the project. Detailed sustainability considerations can be found in the Envision Manual (Version 3) and FHWA INVEST PD Extended Urban scorecard.

3.19.5.1 Communities and Public Outreach

3.19.5.1.1 Stakeholder involvement

Sustainability considers the social effects of a project, including the establishment of sound and meaningful programs for stakeholder identification, engagement and involvement during decision making. NEPA requires that agencies "make diligent efforts to involve the public in preparing and implementing their NEPA procedures."[7] Public and agency participation has been an important part of the proposed Carolina Crossroads I-20/26/126 Corridor Improvement Project (Carolina Crossroads), and the project team made a commitment at the beginning of the project to encourage and solicit public participation and feedback. Chapter 4 of the FEIS

[6] https://www.sustainablehighways.org
[7] 40 CFR 1506.6(a)

provides a detailed summary of communications tools and stakeholder involvement during scoping and preparation of the DEIS and FEIS. The comprehensive public involvement process is an essential component of the project's sustainability, and meets the project team's sustainability goal of implementing context sensitive solutions, public involvement, and outreach.

3.19.5.1.2 Community mobility

SCDOT is evaluating how to locate, design and construct the proposed project to ease traffic congestion, improve mobility and access, and otherwise improve community livability. Community mobility is measured by the extent to which the project improves access, reductions in commute times, and traverse times to existing facilities and transportation.

SCDOT is considering community mobility by evaluating anticipated traffic flows and volumes (Chapter 3.1), preferred modes of access, and effects on mobility. Discussions have been held with stakeholders and decision-makers to optimize design choices. SCDOT has also worked decision-makers in adjacent facilities, such as CSX railroads, and transportation hubs, such as COMET, to determine best modes of access. Access and mobility principles, concepts, requirements, and specifications have been incorporated in the design, and expected outcomes.

3.19.5.1.3 Impact assessments

As part of the DEIS and FEIS process, the project team conducted numerous technical studies and impact assessments to determine how the proposed project would affect community resources. Minimizing noise during construction and operation of the proposed project, preserving historic and cultural sites, and maintaining the local character of a community are key components of sustainability. Noise studies, cultural resource studies, and community impact assessments are examples of ways the project team evaluated community resources.

3.19.5.2 Natural World

3.19.5.2.1 Prime habitats

Prime habitat are areas of high ecological value such as, but not limited to, old-growth forest, national parks and wildlife refuges, and wild and scenic rivers. Saluda River is a South Carolina state scenic river and was identified as a prime habitat within the PSA. SCDOT has evaluated potential effects on the Saluda River as part of the alternatives screening and DEIS. RA 7 and RA 8 (described in Chapter 2) were eliminated from further consideration during the alternatives screening, in part, because of their potential impacts on the Saluda River and encroachments on the river floodplain. Avoiding and minimizing impacts to the Saluda River has been a key sustainability component of the project.

3.19.5.2.2 Greenfields

SCDOT evaluated the project's potential effects on land use (Chapter 3.1). Land use is also a component of sustainability and SCDOT evaluated how the proposed project would affect greenfields compared to brownfields. Greenfields are defined as undeveloped land, while greyfields are defined as previously developed land. Sustainability promotes the conservation of undeveloped land by locating projects on previously

developed greyfield sites. The Recommended Preferred Alternative (RPA) and the Refined RPA are predominantly located on greyfields, and avoid the development of greenfields compared to alternatives outside the existing project corridor. SCDOT used GIS and land use data to estimate the percentage of the RPA and the Refined RPA within greenfields and greyfields. Results of the analysis are presented in Table 3.19-1. The Refined RPA would have greater impacts to greyfields and greenfiends than the RPA. These additional impacts are due to design changes necessary to accommodate the proposed project (see Chapter 2).

Table 3.19-1 Recommended Preferred Alternative & Refined Recommended Preferred Alternative Greyfield and Greenfield Analysis

	Total alternative area (AC)	Total impacted parcels (AC)	Greyfield ROW (greyfield) (AC)	Impacted greyfield parcels (AC)	total greyfield (AC)	%	Greenfield Total greenfield (AC)	%
RPA	904.6	111.7	792.9	76.17	869.1	96.1%	35.5	3.9%
Refined RPA	1,482.1	521.7	960.4	409.4	1,369.8	92.4%	112.3	7.6%

3.19.5.2.3 Wetlands and Floodplains

SCDOT evaluated how the proposed project would impact wetlands (Chapter 3.8) and floodplains (Chapter 3.9) as part of the DEIS and FEIS. During the DEIS and FEIS processes, the project team evaluated alternatives based on their potential effects on wetlands and surface water. While the proposed project does not completely avoid wetlands and waters, impacts have been minimized by eliminating alternatives that parallel the Saluda River. As discussed in Chapter 3.7, impacts to wetlands and waters would be mitigated through the restoration, enhancement, and/or preservation of wetlands, streams and other aquatic resources.[8]

During the DEIS and FEIS processes, the project team also evaluated ways to preserve floodplain functions by limiting development and development impacts to maintain water management capacities and capabilities. Evaluating the project's potential effects on river systems and regulated floodways, and considering floodplain and culvert design, were initial sustainability goals of the project team. During the alternatives screening, each reasonable alternative was evaluated, in part, based on the potential effects within the FEMA floodplain. RA 7 and RA 8 that paralleled the Saluda River and resulted in the greatest impacts to floodplains were eliminated from further evaluation in the DEIS. SCDOT proposes to design water dependent infrastructure, such as bridges and culverts, to minimize floodplain impacts, maintain pre-development floodplain storage, and maintain or reduce flood elevations.

3.19.5.2.4 Biodiversity

A key sustainability consideration has been avoiding and minimizing impacts to sensitive ecological habitats in an effort to preserve species biodiversity. SCDOT has worked with federal, state, and local agencies to identify

[8] 33 CFR §332.2

existing habitats in or near the proposed project. The Natural Resources Technical Report (Appendix L) and agency coordination has confirmed that the proposed project would not impact federally protected species. Alternatives that paralleled the Saluda River and would have adversely affected riparian and riverine habitats were eliminated from further evaluation in the DEIS and FEIS. As noted in Chapter 3.9, SCDOT would further minimize impacts to species biodiversity by complying with the ESA, BGEPA, and MBTA.

3.19.5.3 Climate and Risk

The Carolina Crossroads Project is being planned and designed to be resilient to short- and long-term climate risks specific to its location and geography. Air pollutants, including carbon dioxide, methane, sulfur dioxide, and nitrogen oxides are major contributors to climate change. Carbon dioxide, a greenhouse gas (GHG), is the main pollutant responsible for causing a gradual heating of the Earth's atmosphere and surface, accounting for nearly three-quarters of global greenhouse gas emissions and 84 percent of U.S. greenhouse gas emissions.[9] One of the benefits of the Carolina Crossroads project is a potential reduction in GHG emissions through increased traffic flow and a decrease in traffic congestion and idling vehicles due to reduced traffic flow.

A Climate Change Risk Assessment and Adaptation Plan was prepared by the project team to account for the impacts of a changing climate on the range of operating conditions assumed in the design of the proposed project. Specifically, the Climate Impact Assessment and Adaptation Plan includes a risk analysis, vulnerability assessment, and adaptation plan.

A risk analysis was conducted to understand the range of potential changes in future climate variables such as air temperature, rainfall intensity, humidity, flood/drought, and corrosion. Table 3.19-2 summarizes the four greatest climate change risks identified in the aforementioned reports that are most relevant to the Carolina Crossroads project design and operations.

[9] https://www.epa.gov/ghgemissions/overview-greenhouse-gases

Table 3.19-2 Climate Risks Relevant to the Carolina Crossroads Project Corridor

NCA climate change impacts to the southeast	Short- and long-term considerations for the Carolina Crossroads project
Increased heat wave/humidity intensity and frequency	Required to operate at high temperatures. TSM/TDM continuation to elevate traffic congestion and promote traffic flow Project goal is to improve traffic flow and reduce wait times
Extreme precipitation events and flooding have increased during the last century, and these trends are expected to continue, causing erosion, declining water quality, and negative impacts on transportation, agriculture, human health and infrastructure.	Design criteria for stormwater retention/conveyance in accordance climate change projections for increase precipitation intensities Flood protection considerations and hardening 50-year flood event design criteria
Increased threat of tornadic activity in extreme storms	Hardening of all components of the project and project systems Improved signage and warning mediums for severe weather
Increased high wind events, which are primarily related to the increased threat of Tropical Cyclone activity	Hardening of all components of the project and project systems Aerodynamic design of structural components Improved signage and warning mediums for severe weather

A vulnerability assessment was conducted based on the risks identified in the risk analysis. An adaptation plan was prepared for resilient infrastructure that takes into account the impacts of a changing climate on the range of infrastructure configurations and operating conditions assumed in the design of the proposed Carolina Crossroads project. The Carolina Crossroads project siting and design is being guided by both regulatory requirements and the identification of additional vulnerabilities assessed using historic climate data and from future climate extremes for the project study area identified during the design process. Assessed vulnerabilities include, but are not limited to: increased heat wave intensity, extreme rainfall, and severe storm/wind and tornadic events.

3.19.5.3.1 Increased Heat Wave Intensity

In order to mitigate the effects of heat waves and increasing temperatures and extreme cold temperatures, materials should be used within the tolerance for thermal expansion/contraction expected in the range of current and future temperatures anticipated in the project study area. A number of components of the Carolina Crossroads system would be designed to withstand high/low temperatures, including the structural members, concrete supports, roadbed and road surfaces.

3.19.5.3.2 Extreme Rainfall and Severe Storm/Wind and Tornadic Events

As is further described in the 2014 National Climate Assessment,[10] an analysis of the rainfall patterns across South Carolina has shown that there has been a large increase in the number of days with heavy rainfall, but no significant increase in total annual precipitation. An increase in heavy downpours has contributed to flooding,

[10] https://nca2014.globalchange.gov/

discharge of untreated sewage due to excess water in combined sewage overflow systems, erosion, and declining water quality. Changing land uses combined with an increase in heavy downpours has resulted in reduced water infiltration into the soil and an increase in surface runoff.

Increases in the frequency and intensity of extreme precipitation result in an increased risk of river and flash floods, which affects the integrity of road systems and interchanges. Detailed flood studies of stream and river crossings would be required as part of the final roadway design. For project impacts within regulated floodways, structures would be designed to avoid increases in the base flood elevation. As design progresses, SCDOT would complete an assessment of how the project could impact stormwater runoff and erosion to help inform design and layout decisions. Design criteria for the proposed Carolina Crossroads project would be held to the 50-year precipitation and runoff threshold to ensure accommodations for extreme precipitation events now and into the future in the project study area. The SCDOT design standard requires that structures be designed to avoid increases in the 100-year storm event water surface elevation.

3.19.6 HOW WOULD SUSTAINABILITY BE DOCUMENTED DURING CONSTRUCTION AND OPERATION OF THE PROJECT?

As the project moves into final design and construction, SCDOT intends to pursue Envision Version 3 verification and to track FHWA INVEST progress for this project. FHWA, SCDOT, and the project team conducted preliminary evaluations of how INVEST and Envision could apply to the project, what credits are applicable, and a range of points that could be earned for each credit based on the current design. This preliminary evaluation was done to consider how sustainable strategies could add value to the infrastructure project and to identify additional sustainable design features that could be included in the project.

Envision credits and INVEST criteria that the Owner intends to pursue are listed in the Sustainability Action Plan (Table 3.19-3). FHWA and SCDOT will coordinate with the construction contractor(s) on implementation of the Sustainability Action Plan. The Sustainability Action Plan is not prescriptive or considered environmental commitments. Instead, the Sustainability Action Plan provides guidelines for how FHWA, SCDOT, and the construction contractor(s) will work towards the Envision verification and INVEST goals. The following sections provide a summary of various ways that sustainability will be documented during construction of the project.

3.19.6.1 Sustainability management plan

SCDOT would develop a project management system that can manage the scope, scale and complexity of the Carolina Crossroads project while seeking to improve sustainable performance. The plan would include project roles, responsibilities and authorities within the project team for addressing the issues of sustainability for the project. The plan would also include a sustainability management policy commensurate with the scope, scale and complexity of the project. The plan would build upon the sustainability goals developed during the DEIS and FEIS process and include:

- Federal, state, and local agency roles, as well as the roles of project stakeholders within the affected communities.

- Environmental commitments made as an outcome of the FEIS
- Commitments from SCDOT and the project team to meet or exceed health and safety standards and implement the project's sustainability objectives and targets.
- List of project goals, objectives, and performance targets related to sustainability within the community.
- Processes and management controls in the form of procedures, flowcharts, checklists, and other documented control measures

3.19.6.2 Documentation of materials and resources

Tracking materials and resource usage during construction are key sustainability considerations of the project. SCDOT would consider innovation in construction and operation methods to meet the project's sustainability goals. The construction contractor(s) would be required to prepare a Construction Waste Management Plan and develop waste and materials usage reporting protocols.

3.19.6.2.1 Use of regional materials

The use or regional materials helps to minimize transportation costs and impacts and retain regional benefits by specifying local sources. During construction, SCDOT and the project team would document the following, as applicable:

- Total cost of materials.
- Inventory of materials, plants, aggregates, and soils for construction sourced near the site.
    - Soils: Extraction, harvest, or recovery and manufacture preferably within 50 miles.
    - Aggregate: Extraction, harvest, or recovery and manufacture preferably within 50 mi.
    - Plants: All growing facilities for the plants preferably within 250 miles.
    - All other materials: Extraction, harvest, or recovery and manufacture preferably within 500 mi.
- Calculations of percentage of total project materials by costs that are sourced locally.

3.19.6.2.2 Use of recycled materials

The use of recycled materials helps to reduce the use of virgin materials and avoid sending useful materials to landfills. During construction, SCDOT and the project team would document the use of recycled materials and material with recycled content. Recycled materials would meet state or local solid waste agency requirements for using recycled materials in construction. Any recycled materials used must not pose significant risks to human health and safety or the environment. Types of documentation may include:

- Total quantity of recycled materials by weight or volume.
- Name of the product, the name of the manufacturer, the weight or volume of the material, and the percentage of recycled content (either postindustrial or post-consumer recycled content).
- Calculations of percentage of total project materials by weight or volume that are reused or recycled.

3.19.6.2.3 Earthwork balance

SCDOT and the project team would minimize the movement of soils and other excavated materials off site to reduce transportation and environmental impacts. Balancing the volume of excavated material and the volume

of fill material is often referred to as an earthwork balance. The project team would document the amount of material retained on site.

3.19.6.2.4 Water and energy use

During final design, SCDOT and the project team would use lighting assessments to evaluate potential opportunities to reduce energy usage during operation of the proposed project. SCDOT and the project team would also document and monitor the usage of water during construction.

3.19.6.3 Environmental compliance

This FEIS and the ROD define required mitigation for the I-20/26/126 Carolina Crossroads project. In addition, environmental permits would be obtained during the design of the project, which would specify additional requirements to be adhered to during construction. SCDOT's Compliance Division is tasked with ensuring all environmental commitments are adhered to during the construction phase and any monitoring commitments are met post-construction. A detailed Environmental Monitoring Plan would be developed and updated to include environmental commitments from this FEIS and ROD, environmental permits, and other environmental approvals are implemented.

A compliance team would provide support to SCDOT staff during construction of the project and assist in keeping activities in compliance with environmental requirements. The compliance team would compile environmental commitments, permit standard/special conditions, and maintain environmental journal with the appropriate environmental compliance forms. The compliance team would also complete environmental close-out packet at the end of every USACE permitted project.

Typical tasks in the Environmental Monitoring Plan may include:

- Attend project pre-bid meeting for environmental inquiries.
- Attend preconstruction/partnering meeting to highlight staging, access, initial BMP site preparation, reporting requirements, special conditions, etc.
- Participate as needed in regular contractor meetings on site to address questions and environmental concerns; participate as needed with resource agencies to address questions and concerns.
- Review construction site with environmental compliance forms; provide copies of all reports to the
- Review Weekly Sediment and Erosion Control Site Inspection Reports as needed.
- Respond within 24 hours to any requests from the SCDOT project authority regarding changing site conditions.
- Review permit plans, construction plans, construction contracts, and reconcile differences.
- Track compensatory mitigation (on-site or confirm receipt of bank credit transfer).
- Coordinate with the SCDOT project authority and contractor(s) to ensure project jurisdictional boundaries are clearly identified and marked.
- Coordinate with SCDOT project authority and contractor(s) to review debris pile areas, staging areas, borrow pits, and lay-down sites in environmentally sensitive locations.
- Review construction access through jurisdictional crossings.

- Act as the liaison for jurisdictional violations and develop resolution agreements as needed.
- Coordinate major environmental concerns through the SCDOT Environmental Compliance Division Manager.
- All coordination with state and federal agencies must be done through the SCDOT Environmental Services Office.
- Deliverables would likely include completed environmental compliance forms and the environmental construction close-out packet (compliance forms, site photographs).

3.19.6.4 Public outreach during construction

Public outreach during construction is an integral component of the sustainability plan. SCDOT and the project team would develop a communications plan during construction to notify the public about changes in traffic patterns. Consideration would be given to the use of alternative modes of transportation, routes of construction vehicles and materials, and reduction of construction noise.

Table 3.19-3 Sustainability Action Plan

	Envision Credit Name (V3)	Minimum LOA (Envision V3)	Primary Source of Documentation		Credit Intent	Associated INVEST Criteria	Role of Construction Contractor(s) for Envision and INVEST
Quality of Life	QL1.1 Improve community quality of life	Restorative	SCDOT	CC	Improve the net quality of life of all communities affected by the project and mitigate negative impacts to communities.	PD-03: Context Sensitive Project Development, PD-05: Educational Outreach, PD-10: Pedestrian Facilities, PD-11: Bicycle Facilities, PD-16: Scenic, Natural, or Recreational Qualities	- Collect, evaluate and incorporate community input into the planning and design process - Incorporation of community input into project design
	QL1.2 Enhance Public Health & Safety	Restorative	SCDOT		Protect and enhance community health and safety during operation.	PD-03 Context Sensitive Project Development, PD-04: Highway and Traffic Safety	- Complete design to meet health & safety requirements, assess safety performance of design exceptions
	QL1.3 Improve Construction Safety	Conserving	SCDOT	CC	Enhance public and worker safety during construction.	PD-04 Highway and Traffic Safety; PD-28 Construction Quality Control Plan	- Project execution plan tracks health and safety performance and promotes best practices during construction - Implement safety/security training for all field personnel.

	Envision Credit Name (V3)	Minimum LOA (Envision V3)	Primary Source of Documentation		Credit Intent	Associated INVEST Criteria	Role of Construction Contractor(s) for Envision and INVEST
Quality of Life	QL1.1 Improve community quality of life	Superior	SCDOT	CC	Minimize noise and vibrations during operations to maintain and improve community livability.	PD-03 Context Sensitive Project Development, PD-27 Construction Noise Mitigation, PD-33: Noise Abatement, PD-13: Freight Mobility	- Complete design to meet noise and vibration requirements - Work with community to set or adopt target noise levels - Noise mitigation plan during construction
	QL1.5 Minimize Light Pollution	Enhanced	SCDOT	CC	Reduce backlight, uplight, and glare without jeopardizing safety during operations.	PD-03 Context Sensitive Project Development, PD-32: Light Pollution	- Design and implement strategies to reduce light pollution - Implement lighting plan and mitigation measures - Design lighting fixtures to prevent lit emission above 90 degrees and meet BUG rating uplight requirements.
	QL1.6 Minimize Construction Impacts	Conserving		CC	Minimize or eliminate the temporary inconveniences associated with construction.	PD-06 Tracking Environmental Commitments; PD-26 Construction Equipment Emission Reduction; PD-27 Construction Noise Mitigation; PD-28 Construction Quality Control Plan	- Create a construction management plan that addresses the four construction impacts listed in the Envision Guidance Manual (noise, safety/ wayfinding, access/mobility, and lighting,), and includes a feedback mechanism, monitoring and reporting.

	Envision Credit Name (V3)	Minimum LOA (Envision V3)	Primary Source of Documentation		Credit Intent	Associated INVEST Criteria	Role of Construction Contractor(s) for Envision and INVEST
Quality of Life	QL1.1 Improve community quality of life	Conserving	SCDOT	CC	Plan the project as part of a connected network that supports all transportation modes for the efficient movement of people, goods, and services.	PD-03: Context Sensitive Project Development, PD-10: Pedestrian Facilities, PD-11: Bicycle Facilities, PD-12: Transit and HOV Access, PD-13 Freight Mobility	- Support SCDOT plans and designs
	QL2.2 Encourage Sustainable Transportation	Enhanced	SCDOT		Expand accessibility to sustainable transportation choices including active, shared, and/or mass transportation.	PD-03: Context Sensitive Project Development, PD-10: Pedestrian Facilities, PD-11: Bicycle Facilities, PD-12: Transit and HOV Access	- Support SCDOT plans and designs
	QL2.3 Improve Access & Wayfinding	Conserving	SCDOT	CC	Design the project to provide safe and appropriate access in and/or around the project in a way that integrates the project with the surrounding community.	PD-03: Context Sensitive Project Development, PD-04 Highway and Traffic Safety, PD-10: Pedestrian Facilities, PD-11 Bicycle Facilities, PD-14 ITS for System Operations	- Construction contractor(s) complete signage and wayfinding techniques used to integrate project with surroundings - Design for evacuation and emergency personnel - Design to protect nearby sensitive sites - Consider physical safety, as well as crime and vandalism

	Envision Credit Name (V3)	Minimum LOA (Envision V3)	Primary Source of Documentation		Credit Intent	Associated INVEST Criteria	Role of Construction Contractor(s) for Envision and INVEST
Quality of Life	QL1.1 Improve community quality of life	Conserving	SCDOT		Ensure that equity and social justice are fundamental considerations within project processes and decision making.	PD-03: Context Sensitive Project Development	- Provide evidence of commitments to equity and social justice within their organization(s)
	QL3.2 Preserve Historic & Cultural Resources	Enhanced	SCDOT	CC	Preserve or restore significant historical and cultural sites and related resources.	PD-03: Context Sensitive Project Development, PD-15: Historic, Archaeological and Cultural Preservation	- Implement strategies to document and protect historic and cultural resources; and/or mitigation efforts.
	QL3.3 Enhance Views & Local Character	Improved	SCDOT	CC	Preserve or enhance the physical, natural, and/or community character of the project site and its surroundings.	PD-03: Context Sensitive Project Development, PD-16 Scenic, Natural, or Recreational Qualities	- Implement strategies that consider the preservation of natural landscape features and balance safety vs. the protection of views and local character.
	QL3.4 Enhance Public Space & Amenities	Enhanced	SCDOT	CC	Improve amenities and publicly accessible spaces to enhance community livability.	PD-03: Context Sensitive Project Development,PD-10 Pedestrian Facilities, PD-11 Bicycle Facilities, PD-16: Scenic, Natural, or Recreational Qualities	- Support SCDOT plans and designs

	Envision Credit Name (V3)	Minimum LOA (Envision V3)	Primary Source of Documentation		Credit Intent	Associated INVEST Criteria	Role of Construction Contractor(s) for Envision and INVEST
Leadership	LD1.1 Provide effective leadership and commitment	Conserving	SCDOT	CC	Provide effective leadership and commitment to achieve project sustainability goals.	PD-06 Tracking Environmental Commitments, PD-25 Construction Environmental Training; PD-28 Construction Quality Control Plan	- Provide evidence of written TBL commitments - Create a plan to report progress and updates on project sustainability commitments throughout the project. - Environmental compliance tracking system and environmental training or pre-construction conference
	LD1.2 Foster Collaboration & Teamwork	Conserving	SCDOT	CC	Enhance project sustainability through interdisciplinary collaboration and teamwork.	PD-06 Tracking Environmental Commitments, PD-25 Construction Environmental Training	- Participate in sustainability kick-off meeting and regular collaborative meetings - Provide feedback, including suggesting sustainability improvements - Environmental compliance tracking system and environmental training or pre-construction conference - contractor quality control plan
	LD1.3 Provide for Stakeholder Involvement	Conserving	SCDOT	CC	Early and sustained stakeholder engagement and involvement in project decision making.	PD-03: Context Sensitive Project Development, PD-05: Educational Outreach	- Document any stakeholder engagement - Document any design impact/changes due to stakeholder feedback

	Envision Credit Name (V3)	Minimum LOA (Envision V3)	Primary Source of Documentation		Credit Intent	Associated INVEST Criteria	Role of Construction Contractor(s) for Envision and INVEST
Leadership	LD1.4 Pursue Byproduct Synergies	Improved	SCDOT	CC	Critically reconsider whether traditional waste streams can be beneficially reused.	PD-19 Reduce, Reuse, and Repurpose Materials	
	LD2.1 Establish a Sustainability Management Plan	Conserving	SCDOT	CC	Create a project sustainability management plan that can manage the scope, scale, and complexity of a project seeking to improve sustainable performance.	PD-06 Tracking Environmental Commitments; PD-26 Construction Environmental Training; PD-28 Construction Quality Control Plan	- Assign sustainability POC - Create a plan to report progress and updates on project sustainability commitments throughout the project. - Environmental compliance tracking system and environmental training or pre-construction conference - contractor quality control plan
	LD2.2 Plan for Sustainable Communities	Superior	SCDOT		Incorporate sustainability principles into project selection/identification in order to develop the most sustainable project for the community.		- Support SCDOT plans and designs

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Leadership	LD2.3 Plan for Long-Term Monitoring & Maintenance	Enhanced	SCDOT	CC	Put in place plans, processes, and personnel sufficient to ensure that long-term sustainable protection, mitigation, and enhancement measures are incorporated into the project.	PD-06 Tracking Environmental Commitments, PD-19: Reduce, Reuse and Repurpose Materials, PD-22: Long-Life Pavement, PD-28 Construction Quality Control Plan	- Considered how to reduce ongoing operational impacts. Document discussion/decisions related to design, materials, maintenance access, etc. - Environmental compliance tracking system
	LD2.4 Plan for End of Life	Improved	SCDOT	CC	Ensure that the project team is informed by an understanding of the full impacts and costs of the project's end-of-life.	PD-01 Economic Analyses, PD-02 Lifecycle Cost Analyses, PD-19 Reduce, Reuse, and Repurpose Materials	- Support/contribute to end-of-life plan - Provide documentation for how design could allow for expansion, reconfiguration
	LD3.1 Stimulate Economic Prosperity & Development	Superior	SCDOT	CC	Support economic prosperity and sustainable development, including job growth, capacity building, productivity, business attractiveness, and livability.	PD-01: Economic Analyses	- Document the number and type of new jobs created during construction
	LD3.2 Develop Local Skills & Capabilities	Restorative	SCDOT	CC	Expand the knowledge, skills, and capacity of the community workforce to improve their ability to grow and develop.	PD-01 Economic Analyses	- Provide evidence of training programs associated with the project - Consider how to improve the LOA depending on programs Construction Contractor has in place for training and education.

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	LD3.3 Conduct a Lifecycle Economic Evaluation	Restorative	SCDOT	CC	Utilize economic analyses to identify the full economic implications and the broader social and environmental benefits of the project.	PD-02: Life-Cycle Cost Analyses	- Support SCDOT plans and designs
	LD0.0 Innovation	5					- No role
Resource Allocation	RA1.1 Support Sustainable Procurement Practices	NP	SCDOT	CC	Develop sustainable procurement policies and programs to source materials and equipment from manufacturers and suppliers that implement sustainable practices.		Not pursuing
	RA1.2 Use Recycled Materials	Superior	SCDOT	CC	Reduce the use of virgin natural resources and avoid sending useful materials to landfills by specifying reused materials, including structures, and material with recycled content.	PD-19 Reduce, Reuse, and Repurpose Materials; PD-20 Recycle Materials	- Provide inventory of materials and quantities (by cost, weight or volume), including materials with recycled content and/or reused existing structures or materials
	RA1.3 Reduce operational waste	N/A	SCDOT		Reduce operational waste and divert waste streams from disposal to recycling and reuse.	PD-19: Reduce, Reuse and Repurpose Materials; PD-20 Recycle Materials	No role

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RA1.4 Reduce construction waste	Superior		CC	Divert construction and demolition waste streams from disposal to recycling and reuse.	PD-19 Reduce, Reuse, and Repurpose Materials; PD-20 Recycle Materials; PD-29 Construction Waste Management	- Set a goal for construction waste diversion to meet or improve the LOA for this credit. - Develop comprehensive construction waste management plan - Document description of each type/category of construction and demolition materials generated, location of receiving agent, and quantity of waste diverted (by category) in weight (tons) - Provide calculations of total waste reduction measures and percentage of materials diverted to recycling or reuse

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RA1.5 Balance Earthwork On Site	Improved		CC	Minimize the movement of soils and other excavated materials off site to reduce transportation and environmental impacts.	PD-21 Earthwork Balance; PD-29 Construction Waste Management	- Develop plan to either reuse at least 30% of fill on site OR source/reuse 100% of fill and excavated materials within 25 miles of the site - Provide calculations and documentation to show this goal is met - Consider how to improve the LOA to 50% (Enhanced) *For the purpose of this credit, earthwork includes soil, rocks, and grubbed plant material. It does not include manufactured materials such as asphalt, concrete pavement, or other manufactured in-ground man-made structures (reuse of these items on site could apply to RA1.2). Contaminated soil should not be included in the total calculations.
RA2.1 Reduce Operational Energy Consumption	Improved	SCDOT	CC	Conserve energy by reducing overall operational energy consumption throughout the project life.	PD-17 Energy Efficiency, PD-23 Reduced Energy and Emissions in Pavement Materials	- Design and install energy efficient lighting and signal fixtures

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RA2.2 Reduce Construction Energy Consumption	Enhanced		CC	Conserve resources and reduce greenhouse gases and air pollutant emissions by reducing energy consumption during construction.	PD-17 Energy Efficiency	- Set goal for construction energy reduction strategies to meet or improve the LOA for this credit. - Conduct planning reviews to reduce energy consumption during construction. - Implement at least 2 energy conservation strategies as outlined in the Envision Guidance Manual
RA2.3 Use Renewable Energy	Improved	SCDOT		Meet operational energy needs through renewable energy sources.	PD-17 Energy Efficiency	No role
RA2.4 Commission & Monitor Energy Systems	NP			Ensure efficient functioning and extend useful life by specifying commissioning and monitoring of energy systems.	PD-17 Energy Efficiency	Not pursuing
RA3.1 Preserve Water Resources	NP			Assess and reduce the negative net impact on fresh water availability, quantity, and quality at a watershed scale to positively impact the region's water resources.	PD-18 Site Vegetation, Maintenance, and Irrigation	Not pursuing

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RA3.2 Reduce Operational Water Consumption	NP			Reduce overall water consumption while encouraging the use of greywater, recycled water, and stormwater to meet water needs.	PD-18: Site Vegetation, Maintenance and Irrigation	Not pursuing
RA3.3 Reduce Construction Water Consumption	Improved		CC	Reduce potable water consumption during construction.		- Conduct planning review(s) to reduce construction water consumption - Set a goal for construction water reduction strategies to meet or improve the LOA. - Implement at least one water conservation strategies as outlined in the Envision Guidance Manual
RA3.4 Monitor Water Systems	N/A	SCDOT		Improve operational performance by including monitoring capabilities.		No role
RA0.0 Innovation	5	SCDOT	CC	Reward exceptional performance and application of innovative methods.		- Support/promote ride-share and on-site housing

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Natural World	NW1.1 Preserve Sites of High Ecological Value	Enhanced	SCDOT		Avoid placing the project and temporary works on a site that has been identified as being of high ecological value.	PD-07: Habitat Restoration; PD-09 Ecological Connectivity	- Devise and implement mitigation measures for sites deemed of high ecological value - Document that temporary impacts from construction activities do not decrease ecological site capacity. -commit to improving/replacing culverts and crossings that have been identified as in disrepair or undersized.
	NW1.2 Provide Wetland & Surface Water Buffers	NP			Protect, buffer, enhance, and restore wetlands, shorelines, and waterbodies by providing natural buffer zones, vegetation, and soil-protection zones.	PD-07: Habitat Restoration; PD-09 Ecological Connectivity	Not pursuing
	NW1.3 Preserve Prime Farmland	N/A	SCDOT		Identify and protect soils designated as prime farmland, unique farmland, or farmland of importance.		No role
	NW1.4 Preserve Undeveloped Land	Superior	SCDOT		Conserve undeveloped land by locating projects on previously developed land.		- Support SCDOT plans and designs
	NW2.1 Reclaim Brownfields	N/A	SCDOT		Locate projects on sites classified as brownfields.		No role

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NW2.2 Manage Stormwater	NP		CC	Minimize the impact of development on stormwater runoff quantity, rate, and quality.	PD-08: Stormwater Quality and Flow Control; PD-24: Permeable Pavement - Innovation; PD-30: Low Impact Development	- Currently not pursuing - Consider how to improve
NW2.3 Reduce Pesticide & Fertilizer Impacts	NP			Reduce non-point-source pollution by reducing the quantity, toxicity, bioavailability, and persistence of pesticides and fertilizers.	PD-18: Site Vegetation, Maintenance and Irrigation	Not pursuing
NW2.4 Protect Surface & Groundwater Quality	Improved	SCDOT	CC	Preserve water resources by preventing pollutants from contaminating surface water and groundwater and monitoring impacts during construction and operations.	PD-08 Stormwater Quality and Flow Control, PD-25 Construction Environmental Training	- Determined and document potential for surface water and/or groundwater contamination during construction. - Provide spill and leak prevention plan fitting details in Criterion B in the Envision Guidance Manual. - Consider criterion C for risk reduction measures to improve LOA.
NW3.1 Enhance Functional Habitats	Improved		CC	Preserve and improve the functionality of terrestrial (land) habitats.	PD-07: Habitat Restoration, PD-09: Ecological Connectivity	- Design and documentation of mitigation efforts for functional terrestrial habitats.

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NW3.2 Enhance Wetland & Surface Water Functions	Superior		CC	Maintain and restore the ecosystem functions of streams, wetlands, waterbodies, and their riparian areas.	PD-07: Habitat Restoration, PD-09: Ecological Connectivity, PD-30: Low Impact Development	- Design and documentation of strategies to mitigate or minimize disturbance to wetland and surface water functions. - Implement strategies to protect 3-4 ecosystem functions as outlined in the Envision Guidance Manual
NW3.3 Maintain Floodplain Functions	Improved	SCDOT	CC	Preserve floodplain functions by limiting development and impacts of development in the floodplain.	PD-09 Ecological Connectivity, PD-30: Low Impact Development	- Design and documentation of strategies to maintain at least 75% of natural/vegetated area within the floodplain.
NW3.4 Control Invasive Species	NP			Use appropriate noninvasive species, and control or eliminate existing invasive species.	PD-18: Site Vegetation, Maintenance and Irrigation	Not pursuing
NW3.5 Protect Soil Health	NP			Preserve the composition, structure and function of site soils.	PD-21 Earthwork Balance	Not pursuing

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Climate & Resilience	CR1.1 Reduce Net Embodied Carbon	NP			Reduce the impacts of material extraction, refinement/manufacture, and transport over the project life.	PD-02 Lifecycle Cost Analyses, PD-19 Reduce, Reuse, and Repurpose Materials, PD-23: Reduced Energy and Emissions in Pavement Materials	Not pursuing
	CR1.2 Reduce Greenhouse Gas Emissions	NP			Reduce greenhouse gas emissions during the operation of the project, reducing project contribution to climate change.	PD-13: Freight Mobility, PD-23: Reduced Energy and Emissions in Pavement Materials	Not pursuing
	CR1.3 Reduce Air Pollutant Emissions	NP			Reduce emissions of air pollutants: particulate matter (including dust), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, lead, and volatile organic compounds.	PD-13 Freight Mobility; PD-23 Reduced Energy and Emissions in Pavement Materials; PD-26 Construction Equipment Emission Reduction; PD-31 Infrastructure Resiliency Planning and Design	Not pursuing
	CR2.1 Avoid Unsuitable Development	Superior	SCDOT	CC	Minimize or avoid development on sites prone to hazards.	PD-31 Infrastructure Resiliency Planning and Design	- Support SCDOT plans and designs

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CR2.2 Assess Climate Change Vulnerability	Superior	SCDOT	CC	Develop a comprehensive climate change vulnerability assessment.	PD-31 Infrastructure Resiliency Planning and Design	- Participate in comprehensive threat/hazard assessment for project, related infrastructure, and broader community
CR2.3 Evaluate Risk & Resilience	Superior	SCDOT	CC	Conduct a comprehensive, multihazard risk and resilience evaluation.	PD-31 Infrastructure Resiliency Planning and Design	- Participate in risk and resilience evaluation.
CR2.4 Establish Resilience Goals & Strategies	Enhanced	SCDOT	CC	To support increased project and community resilience through the establishment of clear objectives and goals.	PD-31 Infrastructure Resiliency Planning and Design	- Participate in resiliency goals discussion - Assist in development of risk management strategies to meet project performance goals
CR2.5 Maximize Resilience	Enhanced	SCDOT	CC	Increase resilience, life-cycle system performance, and the ability to withstand hazards by maximizing durability.	PD-31 Infrastructure Resiliency Planning and Design	- Develop a system to carry out implementation of resilience strategies during construction and how to monitor and manage initiatives.
CR2.5 Improve Infrastructure Integration	Superior	SCDOT	CC	Enhance the operational relationships and strengthen the functional integration of the project into connected, efficient, and diverse infrastructure systems.	PD-14 ITS for System Operations	- Support SCDOT plans and designs

CC = Construction Contractor(s).