

SRPEDD CPRG Implementation Grant Proposal Workplan

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1.0 Overall Project Summary and Approach

1.1 Description of Greenhouse Gas Reduction Measures

The Southeastern Regional Planning and Economic Development District (SRPEDD) is seeking funding through the Environmental Protection Agency's (EPA) Climate Pollution Reduction Grant (CPRG) Program to reduce regional vehicle emissions by encouraging a mode shift from driving to more walking and biking around and between communities in the Providence-Warwick Metropolitan Statistical Area (Providence MSA), which includes all of the state of Rhode Island and 27 communities in Southeastern Massachusetts (Figure 1).

EPA Climate Pollution Reduction Grant Work Program Preparation
SRPEDD Final Planning Geography, May 12, 2023
Providence-Warwick MSA + Additional SRPEDD Area Municipalities

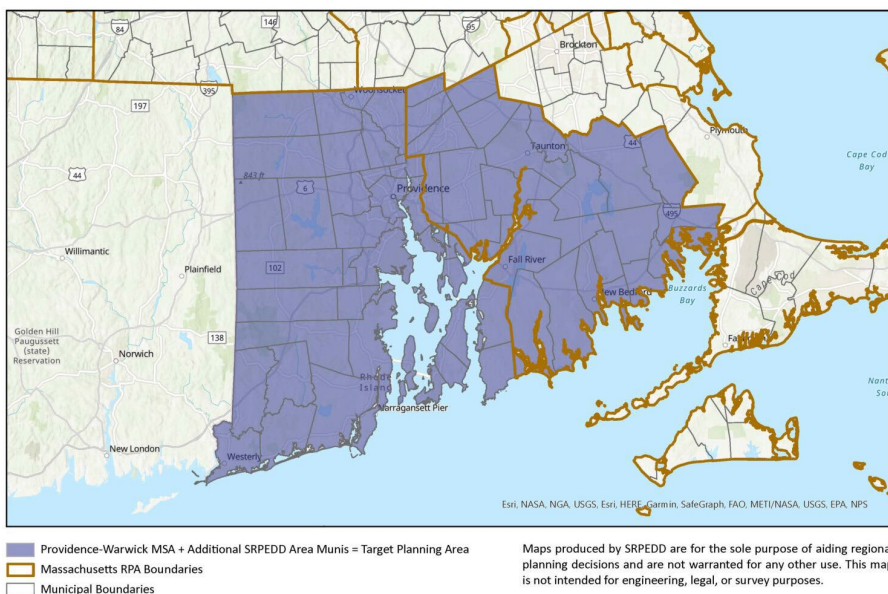


Figure 1: Target Planning Area for the Providence-Warwick Metropolitan Statistical Area

SRPEDD's plans to reduce greenhouse gas (GHG) emissions and other co-pollutants from the plan area through two main actions: (1) creation of safer pedestrian and bicycle routes to encourage these types transportation over automobiles, and (2) creating opportunities for equitable green infrastructure across multiple programs targeted towards tree planting and supporting municipal and regional greening programs. By targeting low income and disadvantaged communities for implementation consistent with the CPRG program objectives, these measures will result in fewer vehicle emissions, improved air quality, expansion of green spaces in urban areas and local workforce development for the long term maintenance of green infrastructure. Furthermore, implementation of the strategies outlined below will sustain cleaner, greener, walkable, bikeable and healthier communities in 2030 and beyond.

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

SRPEDD will partner with the City of Providence Planning Department to identify and implement safer intersection crossings and other roadway and sidewalk improvements for pedestrians and bicyclists across SRPEDD's 27 member communities in Southeastern Massachusetts and the City of Providence. Up to 35 total road safety improvements will be constructed (dependent on final design & construction costs) to make biking and walking across the region more inviting, accessible, convenient and safe, in order to create a mode change away from automobiles, reducing vehicle traffic and emissions. Additionally, the City of Providence will complete a City-wide signal efficiency analysis considering both vehicle efficiency and pedestrian and bicycle signaling, and implement coordinated timing improvements across all 193 of its intersections.

This measure was selected for implementation because the Providence MSA's Priority Climate Action Plan (PCAP) identified the transportation sector as the largest contributor to regional emissions at 43% of total annual emissions. With a lack of other implementation-ready transportation projects that would not duplicate implementation efforts already planned by the States of RI and MA, and two major complementary transportation planning projects already underway, the below projects were identified as the most realistic and significant actions that can achieve ambitious emissions reductions by the year 2030. The planning strategies implemented through this work can be scaled and replicated to other municipalities in the region, with cumulative emissions reductions and other co-benefits accumulating further as more and more people across the region opt to walk and bike more rather than drive.

Potential improvements to be implemented may include, but are not limited to: separated bicycle infrastructure such as shared use paths, bicycle lanes, and cycle tracks; closing gaps in sidewalk networks and improving sidewalk conditions; improved crossing conditions with highly visible crosswalks, signage, curb extensions, and flashing beacon technology where warranted; intersection treatments for bicycles, such as bike boxes, stop bars, lead signal timings; intersection treatments for pedestrians, such as highly visible crosswalks, accessible pedestrian signals, tactile warning panels; pedestrian and bicycle scale lighting; landscaping; pedestrian and bicycle oriented wayfinding; removing barriers for accessibility and designing for ADA accessibility; and bicycle parking and storage facilities.

Both SRPEDD and the City of Providence are already in the process (under separate funding sources, both from the US Department of Transportation) of assessing road safety for all users and identifying opportunities to improve safety measures to reduce injuries and fatalities across each entity's respective planning area. This proposal aims to leverage those planning processes already underway and provide implementation funding enabling immediate design and construction of top priority safety improvements identified in those plans.

SRPEDD is in the process of developing its Regional Safety Action Plan, funded by the U.S. Department of Transportation's (USDOT) Safe Streets and Roads for All (SS4A)

grant program (with 20% matching funding provided by the Massachusetts Department of Transportation). This Action Plan is intended to be a comprehensive safety plan for the 27 cities and towns SRPEDD serves in Southeastern Massachusetts, aimed at reducing and eliminating serious-injury and fatal crashes affecting all roadway users, with a particular focus on vulnerable road users such as bicyclists and pedestrians.

The ultimate goal of this Action Plan is to use data-driven analyses, both from a quantitative (e.g., number of pedestrian/bicyclist injuries and fatalities) and qualitative (e.g., stretches of roadways that are perceived to be unsafe by cyclists and pedestrians), to identify the intersections and roadways that will most benefit from safety improvements. The qualitative assessment is particularly important to avoid missing key infrastructure, as a quantitative-only approach will miss many areas that are currently perceived as unsafe, resulting in minimal pedestrian and/or bicyclist usage and therefore low injury/fatality rates due to intentional avoidance.

As part of the Action Plan, potential cost-effective solutions for these areas will be identified; however, this work does not currently include funding to implement these potential projects. Further, it is ultimately up to the controlling/owning entity (e.g., state, city, or town) to implement any identified solutions, as SRPEDD is only in a position to provide technical guidance. CPRG Implementation funding will enable SRPEDD to work with our member municipalities and the MA Department of Transportation to select up to 5 priority projects for immediate implementation, providing funding for designs, permits and construction.

The City of Providence has undertaken an ambitious goal to eliminate all traffic fatalities and serious injuries by 2030 with the launch of its Vision Zero Program, adopted unanimously by City Council and signed by Mayor Brett Smiley in February 2024. Accordingly, the City has just began the planning process for a Vision Zero plan, similar to SRPEDD's process detailed above, to identify opportunities for safety interventions to help achieve this goal. The resulting Vision Zero Plan, expected in February 2025, will identify priority areas for safety improvements, but funding has not yet been secured for implementation. This proposal would make funding available for immediate design, permitting and construction of priority projects to help the City achieve its Vision Zero goal and simultaneously encourage more city residents and visitors to bike and walk.

All 193 traffic signals in the city will be evaluated for pedestrian safety enhancements to enable more trips to be made without using a motor vehicle. At up to 30 intersections, determined by a risk analysis, best-practice improvements will be made to further increase the safety of the intersections and encourage mode shift. Potential intersections identified for speed mitigation pedestrian safety improvements as part of this project represent approximately one quarter of those intersections with any serious injuries or fatalities in the past ten years, while all intersections with traffic signal are planned for timing improvements. Improvements proposed through this project will enhance safety of all road users by selecting the most relevant proven safety

countermeasures and similar designs with proven success from around the country for each selected intersection.

Common safety issues present in the intersections under consideration for this project include motor vehicle speeds above the posted speed limit, high-speed vehicular turning movements, long waiting times and long crossing distances for pedestrians, lack of bicycle infrastructure, frequent right-turns on red without sufficiently coming to a stop, insufficient illumination of crosswalks, and other deficiency of facilities for vulnerable road users. Proposed safety measures will include, where applicable, crosswalk enhancements, continued implementation of separated bicycle infrastructure in line with the City's urban trail design, sidewalk improvements, road diets, and other enhancements deemed necessary. These proposed safety improvements, along with increased efficiency of signal timing at all intersections across the City, will make biking and walking a more inviting mode of transportation, while also providing the added benefits of reduced vehicle congestion and any associated idling that may contribute to reduced local air quality in urban areas.

GHG Reduction Measure 2: Urban Tree Planting

SRPEDD plans to partner with several partners in both Rhode Island and Massachusetts who are already working on localized tree planting efforts aimed at improving quality of life for residents in low income and disadvantaged urban areas to significantly scale up their efforts across the region. The proposed work will provide funds to immediately begin tree planting programs where planning has already identified priority areas in the City of Providence where strategic planting will expand the City's urban forest in an equitable and just way that prioritizes low income and disadvantaged communities that tend to have less tree canopy and suffer disproportionately from correlated health and safety impacts (such as poorer air quality, more extreme heat, higher asthma rates, etc.). It will also fund the transfer of Providence's planning process to other communities in the region and additional planting programs to both replicate and scale up Providence's equity based urban forestry plan. At the end of the 5 year project, 8,300 new trees will have been planted and 30,600 existing trees will have been maintained to ensure survival.

This measure was a high priority identified by the municipal leadership and members of the public who participated in the development of the Providence MSA's PCAP. Not only can trees absorb and sequester a significant portion of the region's emissions, but they also provide many co-benefits to the community, such as improving air quality, providing shade and reducing extreme heat, capturing and purifying stormwater runoff, reducing noise pollution, supporting wildlife and supporting general community health and wellbeing. This measure was also selected because it was the only completely implementation-ready project identified that would achieve significant greenhouse gas emissions by the year 2030.

The proposed scope of this project would thoughtfully and intentionally complement and support ongoing tree planting efforts underway across the region. It builds off previous planning efforts completed by the City of Providence to expand its tree canopy and transfers their approach to additional municipalities in both Rhode Island and Massachusetts. SRPEDD will partner with those already working in this program area to expand their efforts, while coordinating with other organizations so as to not duplicate or overlap other planting efforts. SRPEDD is aware that the State of Rhode Island is applying for implementation funds under this same program to implement similar planning and tree planting efforts in several municipalities in RI; however they do not plan to work in Providence, the primary focus of this proposal in RI. SRPEDD and the RI Department of Environmental Management (RIDEM) will coordinate throughout implementation of this work to ensure the additional municipalities SPREDD and their partners decide to work with do not overlap with the municipalities that RIDEM decides to work with to ensure our ongoing efforts are complimentary and not duplicative.

Furthermore, SRPEDD collaborated with, and intends to continue to do so throughout the implementation of this project, the Greening the Gateway Cities Program (GGC) in MA in the design of the proposed workplan. GGC plants and stewards trees in target Environmental Justice neighborhoods in the Gateway Cities of Taunton, Fall River and New Bedford in Southeastern Massachusetts. SRPEDD intends to coordinate with GGC throughout the project period to avoid duplicating planning or planting efforts in the areas where GGC is already active, and instead work to provide trees to additional neighborhoods not already served by this program.

SRPEDD is requesting funding for implementation support for the City of Providence's PVD Tree Plan, a joint planning effort headed by the Providence Neighborhood Planting Program (PNPP) and the City of Providence Forestry Department, released in the Fall of 2023. SRPEDD will partner with PNPP, The City of Providence, Groundworks Rhode Island, and Garden Time, all who contributed to the development of the PVD Tree Plan and who will play a role in implementing its goals of equitably increasing tree cover, reducing heat island effects, and creating carbon capture/decarbonization through community tree plantings. These partners will also provide green jobs training to local youth and formerly incarcerated individuals in order to provide local job opportunities and improve local capacity for tree planting and stewardship, which is critical to ensuring the survival rate of newly planted trees.

In addition to financial support for physical tree planting, education, and capacity building for the City of Providence's Tree Equity Plan, SRPEDD, under the guidance of a regional steering committee, will apply the planning principals utilized for the PVD Tree Plan to develop a similar plan for equitable expansion of tree canopy in high priority, low canopy urban areas across the 27 SRPEDD communities in Southeastern MA. SRPEDD's subrecipients working in Providence will also work with two additional municipalities in RI to engage in similar planning processes and provide seed funding to immediately begin the implementation process. SRPEDD will also partner with

Groundwork Southcoast (GWSC) in Massachusetts and provide funding to expand their ongoing tree planting, stewardship and local youth workforce training programs to plant and maintain trees in New Bedford and Fall River.

SRPEDD will also administer funds to not only plant additional trees elsewhere in the region that are not already served by GWSC's and GCC's planting programs, but to expand capacity at the local level for sustainable long-term stewardship of the region's urban forests, including maintenance of the newly planted and existing trees. SRPEDD will work with forestry consultants to provide training and financial support to help municipalities care for their tree canopies with arborist staff positions and/or through volunteer stewardship programs, depending on the local needs and interests of each participating community.

Throughout the planning and planting phases of this measure, SRPEDD intends to partner with the University of Massachusetts Dartmouth's Department of Public Policy and Charlton School of Business on stakeholder and public engagement and program design and evaluation to ensure implementation efforts are benefiting low income and disadvantaged (LIDAC) communities. Furthermore, there is concern that with several new and growing programs funding tree planting efforts in the coming years, supply chain issues could become a challenge during implementation. To address this, UMass Dartmouth will conduct market research on nursery supply and demand in the region and begin to identify and assess the feasibility of potential new nurseries or "incubator" locations in the region to meet growing demand.

1.2 Demonstration of Funding Need

Both proposed measures build off of planning grant funding for which implementation funds have not been secured yet. We intend to leverage multiple sources of funding to fully implement the work, given no one grant program could cover all of the work necessary to complete either project.

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

As previously discussed, SRPEDD and the City of Providence are in the process of developing regional road safety plans with separate funding already secured. While these plans are intended to characterize and identify roadway safety problems, as well as provide direction as to the types of projects and strategies that can address the most significant safety risks, these funds are only intended to cover the initial planning phase, identifying the need for these types of projects, and where they would be most beneficial to promote pedestrian and bicyclist safety. Funding has not yet been secured to cover the physical implementation of these recommendations.

USDOT does offer implementation grant funding through its SS4A program to implement the projects identified in Safety Action Plans; however, the available funding would not be sufficient to implement all of the projects identified. Furthermore, with SS4A funds only appropriated through the year 2026, it is uncertain whether this funding

program will remain available for implementation after SRPEDD and the City of Providence complete their Action Plans and begin to pursue implementation funding. CPRG funding will ensure initial implementation funding to be matched with SS4A and other potential grant programs in the future to fully implement both plans.

GHG Reduction Measure 2: Urban Tree Planting

The City of Providence Tree Plan was a project completed with PNPP, The Nature Conservancy, and The City of Providence to address environmental justice and creation of green jobs. The capacity required for implementation are well beyond the resources available through PNPP donations or the City's Capital Improvements budget, Department of Urban Forestry, and zoning code permit funds can provide financially. According to the PVD Tree Plan, an estimated \$2.5 million dollars outside of scheduled annual funding from the City of Providence is needed to reach the goal of 50% increase and maintenance of new and existing trees (from 2017 baseline). An immense amount of funding, which the City can not cover alone, is required to expand and care for the City's tree canopy.

In 2023, the PVD Tree Plan partners attempted to get Inflation Reduction Act (IRA) grant money but were unfortunately not chosen. Alternate federal grants addressing carbon capture and GHG emission reductions, such as the HUD Green and Resilient Retrofit Program, target green buildings rather than green infrastructure, tree plantings, and educational workshops, which are the focus of this proposal (for the proposed activities in both MA and RI). The many agricultural focused grants created through the IRA may be applicable to planting, but the organizations SRPEDD is working with would not all necessarily qualify for agricultural benefits, given this is an urban initiative. Environmental justice focused grants provided by the IRA may apply to the environmental justice aspects of this Tree Plan, but because the programs apply to the entirety of the Providence region, not just in EJ communities, a climate mitigation and GHG focus is more suitable for a comprehensive understanding of all of the plan's GHG emission reduction and carbon capture efforts.

IRA funding was secured for tree planting in Southeastern MA by the Greening the Gateway Cities Program (GGC). GGC plants and stewards trees in target Environmental Justice neighborhoods in the Gateway Cities of Taunton, Fall River and New Bedford in Southeastern Massachusetts. Additional communities in the region, including low income and disadvantaged (LIDAC) communities could benefit from tree planting and maintenance that current IRA funding would not provide. Even within the Cities of Fall River, New Bedford and Taunton, there are additional Environmental Justice and LIDAC communities that are not included in GGC's planting areas. SRPEDD intends to coordinate with GGC through the project to select planting areas that are complimentary to and do not overlap with GGC's, where there is already funding available. This project, again, would help to expand the impact of other ongoing efforts and funding sources.

Lastly, SRPEDD acknowledges the recently released NOFO from the USDA Forest Service Urban and Community Forestry program, which will fund projects similar to the regional nursery capacity assessment proposed in this workplan. Neither SRPEDD nor any of the partners involved in this work are participating in the separate funding source or taking part in similar study for our region. We plan to watch the results of that funding opportunity, and see whether any relevant work for our region emerges that we can coordinate efforts with but, ultimately, we intend a more local market study into local tree supply to help determine the need for additional nursery capacity to expand future tree planting efforts.

1.3 Transformative Impact

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

- **Demonstration projects:** Making funding available upfront for implementation of the priority safety improvements identified in Providence's and SRPEDD's plans currently in development will result in immediate results without the loss of momentum. Completed projects will serve as model demonstration projects for other communities to follow with other future funding sources.
- **Modal change:** Safer conditions for pedestrians and bicyclists on roadways across the region would promote a modal change in transportation from automobile to biking and pedestrian routes in the market for key high-density areas. A modal shift away from automobiles is essential for this Providence-Warwick region in lowering GHG emissions from fossil fuels to net-zero energy usage.
- **Potential future corridors:** As more safety improvements are made for pedestrians and bicycles along roads throughout the region, the cumulative impacts of larger multi-modal corridors will result in more drivers transitioning to biking and walking over time. Networks of pedestrian and bike infrastructure planned intentionally along commuter corridors could significantly decrease the region's reliance on fossil fuels in automobiles, decreasing GHG emissions in the region's top contributing sector.
- **Replicability:** The planning and prioritization process for selecting road and intersection safety improvements that address high priority safety concerns, address vulnerability and fatality data and contribute to connected multi-modal networks will be documented for transferability to other planning geographies and could apply anywhere. Additionally, the implementation projects will serve as demonstration sites and models for other communities to follow.

GHG Reduction Measure 2: Urban Tree Planting

- **Workforce development:** Increasing funding and providing training to local residents and municipal staff develop local Green Job workforce opportunities, creating local jobs while also addressing a local capacity limitation for green infrastructure maintenance. The emissions reductions benefits of additional trees

planted and cared for will continue to grow beyond the lifetime of this project with a growing workforce.

- Regional tree nursery capacity & feasibility assessment: Identifying potential current and future capacity gaps and exploring opportunities to expand local nursery capacity and supply will provide materials for this work program as well as other regional green infrastructure efforts, such as Greening the Gateway Cities program in Massachusetts, the City of Providence, and the Rhode Island Urban Forest Plan.
- Increasing tree canopy: Adding more tree canopy will reduce heat island effects, increase pedestrian safety as alternate mode of transportation to fossil fueled automobiles, and reduces energy use in buildings by 20-50%, according to the US Forest Service. Health and equity benefits of a greater tree canopy are significant, especially in historically excluded and environmental justice neighborhoods which both the Regional Tree Plan and the PVD Tree Plan would be addressing.
- Regional tree cover analysis: A regional analysis of tree canopy created by SRPEDD, which can be updated as changes take place, can be used beyond the scope of planting trees for further analysis of the whole Providence MSA region for future EJ and Climate Mitigation projects like stormwater plans, future grant applications and to further the mission of urban forestry within Massachusetts and Rhode Island.
- Education and informing the public: The City of Providence Tree Plan and supporting non-profits, such as Groundwork RI, Groundwork Southcoast, and Garden Time, provide valuable and vital workshops and educational programs that specifically target areas in environmental justice communities. The lasting impact of introducing people to this work and providing knowledge and skills to become stewards of their local trees will expand the impact of future tree canopy maintenance efforts.
- Private land opportunities: Extending green infrastructure through tree planting in private land through workshops and subsidized planting opportunities are some of the goals that partners like Groundworks RI, Groundworks Southcoast, and PNPP provide. These private opportunities would otherwise be out of the City of Providence's or any municipal government's jurisdiction to plan themselves and result in a great number of trees planted and cared for.

2.0 Impact of Greenhouse Gas Reduction Measures

2.1 Magnitude of Greenhouse Gas Reductions from 2025 - 2030

The total cumulative greenhouse gas emissions reductions anticipated from all proposed measures, between 2025 and 2030, is **16,961 MT CO₂e** (Table 1).

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

Measure 1 is anticipated to result in total cumulative emissions reductions of 16,270 MT CO₂e. This figure is likely underestimated, due to lack of available methods for calculating the anticipated emissions reductions associated with many of the proposed safety improvements, and lack of ability to confidently measure the actual number of individuals that transition from driving to biking or walking. To address this uncertainty, SRPEDD plans to measure vehicle, pedestrian and bike trips at the locations identified for improvements both before and after implementation to better understand the mode shift that takes place as a result.

GHG Reduction Measure 2: Urban Tree Planting

Measure 2 is anticipated to result in total cumulative emissions reductions of 690 MT CO₂e from 2025 to 2030. Of this, 87 MT CO₂e is expected from planting 6,500 new trees in the City of Providence through implementation of the PVD Tree Plan; 496 MT CO₂e is expected from maintaining 30,000 existing trees in the City of Providence to ensure survival; and 107 MT CO₂e is expected from planting 1,800 additional trees across the project area through replication of the PVD tree plan with other communities in RI and MA.

2.2 Magnitude of Greenhouse Gas Reductions from 2025 - 2050

The total cumulative greenhouse gas emissions reductions anticipated from all proposed measures, between 2025 and 2050, is **90,047 MT CO₂e** (Table 1).

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

Measure 1 is anticipated to result in total cumulative emissions reductions of 81,348 MT CO₂e from 2025 to 2050. This figure is likely underestimated, due to lack of available methods for calculating the anticipated emissions reductions associated with many of the proposed safety improvements, as discussed above.

GHG Reduction Measure 2: Urban Tree Planting

Measure 2 is anticipated to result in total cumulative emissions reductions of 8,699 MT CO₂e from 2025 to 2050. Of this, 2,493 MT CO₂e is expected from planting 6,500 new trees in the City of Providence through implementation of the PVD Tree Plan; 2,986 MT CO₂e is expected from maintaining 30,000 existing trees in the City of Providence to ensure survival; and 3,220 MT CO₂e is expected from planting 1,800 additional trees across the project area through replication of the PVD tree plan with other communities in RI and MA.

Table 1: Estimated cumulative emissions reductions by measure

Carbon Reduction Measure	2025 – 2030 Cumulative CO₂e reduction (MT)	2025 – 2050 Cumulative CO₂e reduction (MT)
1. Pedestrian and Bike street improvements for safety	16,270	81,348
2a. Implement Providence Tree Plan: Plant 6,500 new trees	87	2,493

2b. Implement Providence Tree Plan: Maintenance of 30,000 existing trees	496	2,986
2c. Replicate Providence Tree Plan in 2 RI towns & 3 MA towns (200 new trees per year per town during 2027 – 2029, total 1,800 new trees)	107	3,220
<i>Total for measure 2:</i>	<i>690</i>	<i>8,699</i>
TOTAL CUMULATIVE FOR ALL MEASURES:	16,961	90,047

2.3 Cost Effectiveness of Greenhouse Gas Reductions

In implementing both measures, the cost effectiveness is estimated to be approximately \$3,088 per Metric Ton of CO₂e for the period from 2025 to 2030. From 2025 to 2050, the cost effectiveness increases to \$581 per Metric Ton of CO₂e removed.

2.4 Documentation of Greenhouse Gas Reduction Assumptions

The full methodology, including assumptions and the basis of calculations, for estimating the anticipated greenhouse gas emissions reductions are detailed in *Attachment B: Technical Appendix*. As follows is a summary for each measure.

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

The GHG reduction will occur by constructing street safety improvements that reduce delay and idle time of vehicles at signalized intersections. Through discussion with SRPEDD and municipal transportation and traffic staff, the primary carbon reduction method will be improving the left turn phase that causes delay at intersections with traffic signals. The only model used to calculate anticipated emissions reductions is the Federal Highway Administration (FHWA) Congestion Mitigation and Air Quality Emissions Calculator (CMAQ) toolkit. More details can be found in Attachment B.

Additional safety measures beyond improving signal and left-hand turning timing are anticipated, however, methodologies for calculating the benefits associated with these other vehicle efficiency measures could not be located in order to estimate the associated reductions with confidence at the time of application. Neither could a reliable methodology for estimating the number of vehicle trips replaced with pedestrian or bicycle trips as a result of safety measures, and so the associated reductions in emissions for these other project types could not be measured. Therefore, it is likely that the anticipated greenhouse gas reductions for measure 1 are underestimated. The total estimated reductions only account for up to 30% of the expected improvement projects to be implemented.

GHG Reduction Measure 2: Urban Tree Planting

The anticipated emissions reductions associated with Measure 2 are based on the assumption that 8,300 new trees will be planted (6,500 in Providence, 200 in each of two additional communities in RI, 150 each in the Cities of Fall River and New Bedford,

and an addition 1,100 elsewhere in MA) and 30,600 existing trees maintained. The project budget includes funds for site preparation, staff and crew time, workforce training and maintenance costs to ensure the long-term survival of 6,500 trees. Trees will be roughly 1.5” in diameter at time of planting. The estimated survival rate assumed is 92% (though recent data collected by PNPP from previous planning efforts suggests a higher success rate of 94-95%).

GHG reduction estimates will use i-Tree Design to determine the baseline tree carbon sequestration as well as added sequestration from new tree plantings. Assumptions for tree species, tree size, and species population percentages are summarized in Attachment B. GHG reduction associated with scheduled maintenance of trees will use i-Tree Design to predict the added sequestration under the assumption the health of trees in maintenance is improved compared to trees not in maintenance. The GHG reduction estimate is the difference between the sequestration predicted for trees with condition input to i-Tree Design of “Good” and “Excellent”.

3.0 Environmental Results – Outputs, Outcomes, and Performance Measures

3.1 Expected Outputs and Outcomes

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

Through this measure, there will be a reduction in hazards as well as enhancements in ease and safety for non-motorized travelers along high-risk intersections and road segments across the region. This process will make alternative methods of travel such as walking and biking more accessible to a variety of users, including LIDAC who may not have reliable access to motorized vehicles, resulting in fewer emissions from travelers who opt to walk or bike to get to their destinations with these improvements. Specific outcomes include:

- Cumulative GHG reductions: 16,270 MT CO₂e through 2030 and 81,348 MT CO₂e through 2050
- Cumulative Carbon Monoxide (CO) reduction: 574 kg through 2030 and 2,874 kg through 2050
- Cumulative Particulate Matter reduction: 27 kg through 2030 and 136 through 2050
- Up to 5 high-risk roadway areas in MA redesigned to prioritize safety for bikers and pedestrians (including design, permitting and construction)
- Up to 30 intersections in Providence, RI redesigned to prioritize safety for bikers and pedestrians (including design, permitting and construction)
- All 193 traffic lights in Providence, RI adopt signal timing improvements to reduce congestion

GHG Reduction Measure 2: Urban Tree Planting

Through this measure, the Providence Tree Plan (PVD Tree Plan) will be implemented. The PVD Tree Plan was released in 2023 and through thorough collaboration and research, it identified the priorities, needs, and preferred strategies for creating additional tree cover within high-priority, low-canopy, neighborhoods. The PVD Tree Plan will then become the guiding document to creating a similar tree plan for the entire Providence-Warwick MSA. By utilizing the planning principals of the PVD Tree Plan, along with the guidance of a regional steering committee, this similar plan will aid in the development of the identification of high-priority, low-canopy, areas within the region. Newly identified recipients for trees will be identified in both MA and RI to expand the regional tree canopy. Specific outcomes include:

- Cumulative GHG reductions: 690 MT CO_{2e} through 2030 and 8,699 MT CO_{2e} through 2050
- Cumulative Ozone (O₃) reduction: 459 kg through 2030 and 17,181 kg through 2050
- Cumulative Particulate Matter reduction: 3 kg through 2030 and 372 kg through 2050
- 8,300 total new trees planted in RI and MA
- 30,600 total existing trees maintained to ensure longevity
- 1 regional tree canopy assessment and equitability analysis completed for entire Providence MSA (entire state of RI and 27 communities in MA)
- Equitable tree planting implemented in 7 municipalities in RI and MA
- Co-benefits provided to LIDAC & other communities as a result of expanded tree canopy: reduced local summer temperatures, reduced energy bills, reduced stormwater runoff
- Over 200 local jobs supported
- Expansion of local expertise and capacity to steward urban trees
- 1 regional nursery tree capacity assessment conducted and one or more potential locations identified for expanding the supply of local trees

3.2 Performance Measures and Plan

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

Measures for tracking progress include (1) the number of roadway improvements implemented and (2) the number of vehicles removed from the road from participants opting to walk or bike. SRPEDD and partners will track details about each roadway improvement constructed, including whether or not it was located within a LIDAC community. SRPEDD will also monitor vehicle, pedestrian and bicycle trips at each of the five roadway safety implementation projects in MA, both before and after construction, to measure the number of users who switched from vehicle travel.

GHG Reduction Measure 2: Urban Tree Planting

Measures for tracking progress include (1) the number of trees planted, including within disadvantaged communities and in new and redeveloped land, (2) the number of trees cared for to ensure longevity, (3) the number of community members engaged in stewardship activities, (4) the number of trainees who complete green workforce training programs, and (5) the number of urban forestry jobs created in participating municipalities. SRPEDD and partners will track each tree planted and cared for by location, tracking which benefit LIDAC communities directly. Partners conducting workforce development training programs will also keep records of all program participants and local staff hired for implementation.

3.3 Authorities, Implementation Timeline, and Milestones

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

Authorities:

- **SRPEDD**, whose roles and responsibilities will include identifying and prioritizing road safety improvement projects. SRPEDD does not have the authority to implement identified improvements, but will coordinate closely with the respective owners of each road under consideration (whether MassDOT for state-owned roads or the municipality for local roads) to obtain authority for design and construction of each project. This authority will be obtained during the selection of projects in years 2 and 3.
- **City of Providence Planning Department**, whose roles and responsibilities will include identifying, prioritizing and implementing road intersection safety improvements. The City of Providence does have the authority to carry out this measure, so no additional authorities are required, unless projects are located on a state-owned road, in which case the City will coordinate with RIDOT before selecting the project to move forward with.

Implementation Timeline and Milestones:

- **Years 2 – 3: Identification and Prioritization of Roadway Safety Improvements**
 - **Milestones:** Identification of 35 high-risk roadway segments.
- **Years 2 – 5: Public Engagement and Input on Selection of Roadway Improvements**
 - **Milestones:** 1 public engagement / stakeholder event with translated materials into the 3 most prevalent languages in the region (Portuguese, Spanish, and French Creole) each year.
- **Years 3 – 5: Procurement Management and Implementation Oversight / Coordination with Local Partners**
 - **Milestones:** Successful procurement and completion of roadway improvements.
- **Years 3 – 5: Road User Monitoring Before and After Implementation**
 - **Milestones:** Documentation of the total road users before and after the roadway improvements to quantify the implementation difference.

- **Years 1 – 5:** Grant Administration and Partner Coordination
 - **Milestones:** Semi-annual reports summarizing the technical progress, accomplishments, milestones achieved, planned activities for the next six months, and a summary of expenditures, as well as a detailed final report.

GHG Reduction Measure 2: Urban Tree Planting

Authorities:

- **SRPEDD**, whose roles and responsibilities will include conducting a regional tree canopy assessment, identification of priority areas for tree planting, and distributing trees for planting throughout southeastern MA. SRPEDD does not have the authority to plant trees on private or municipal properties. SRPEDD plans to conduct community outreach throughout all 5 years of the project to identify willing property owners who can provide authority for tree planting on their properties.
- **City of Providence Parks Department**, whose roles and responsibilities will include maintenance of existing trees in the City right-of-way. The City of Providence does have the authority to carry out this measure.
- **Providence Neighborhood Planting Program (PNPP)**, who's roles and responsibilities will include tree planting and maintenance. PNPP does have the authority to carry out this measure, due to its close relationship with City and partnership on tree care within the City's right-of-way.
- **Groundwork RI**, who's roles and responsibilities will include tree planting and maintenance. Groundworks RI does not have the authority to plant trees on private property, but through community engagement will select sites for planting where the property owner has granted access/authority.
- **Garden Time**, who's roles and responsibilities will include tree maintenance. Garden Time does have the authority to carry out this measure in the public right-of-way.
- **Woonasquatucket River Watershed Council**, who's roles and responsibilities will include tree planting and maintenance. The Woonasquatucket River Watershed Council does not have the authority to plant trees on private property, but through community engagement will select sites for planting where the property owner has granted access/authority.
- **Groundwork South Coast**, who's roles and responsibilities will include tree planting and maintenance. Groundworks South Coast does not have the authority to plant trees on private property, but through community engagement will select sites for planting where the property owner has granted access/authority.
- **Umass Dartmouth**, who's roles and responsibilities will include project tracking and market-based research. UMass Dartmouth does have the authority to carry out this measure.

Implementation Timeline and Milestones:

- **Years 1 – 5:** Implementation of the PVD Tree Plan
 - **Milestones:** 6,500 trees planted, trainings conducted, and 30,000 trees maintained
- **Years 2 – 4:** Transfer of PVD Tree Plan to other RI municipalities
 - **Milestones:** Tree plans completed in 2 RI municipalities and an additional 400 trees planted
- **Years 1 – 2:** SRPEDD Regional Tree Canopy Mapping and Analysis
 - **Milestones:** Identification of Priority Tree Planting Zones.
- **Years 3 – 5:** MA Tree Planting Contract Oversight and Coordination
 - **Milestones:** Successful coordination with identified partners and completion of tree planting efforts.
- **Years 1 – 5:** Public Engagement and Input on Tree Planting
 - **Milestones:** 1 public engagement / stakeholder event with translated materials into the 3 most prevalent languages in the region (Portuguese, Spanish, and French Creole) each year.
- **Years 1 – 5:** Grant Administration and Partner Coordination
 - **Milestones:** Semi-annual reports summarizing the technical progress, accomplishments, milestones achieved, planned activities for the next six months, and a summary of expenditures, as well as a detailed final report.

4.0 Low-Income and Disadvantaged Communities

4.1 Community Benefits

GHG Reduction Measure 1: Pedestrian & Bike Roadway Safety Improvements

SRPEDD and partners' implementation of road safety improvements for pedestrians and bikers will provide community wellbeing and safety benefits that prioritize improving areas identified as low-income or disadvantaged communities (LIDAC) identified by the CEJST tool from US Climate and Resilience toolkit. The communities identified are listed in Attachment C. Which communities specifically will benefit is not yet determined, because specific project locations have not yet been identified; however, these communities will be prioritized first for planting initiatives. Prioritization criteria for selecting projects will include known occurrences of injuries or deaths, perceived risks by the community, local need for multi-modal options and whether the community is classified as low income or disadvantaged. The benefits these communities will experience is increased accessibility to alternative methods of travel besides vehicles, improved safety and comfort during travel, and reduced occurrences of collisions, injuries and deaths. Indirect benefits will include improved air quality, noise and traffic congestions if more travelers opt to walk or bike instead of driving.

Potential disbenefits could include increased vehicle trips, incentivized by reduced congestion and improved vehicle travel efficiency. All efficiency improvements, however,

will be comprehensive and prioritize pedestrian and bicycle efficiency in addition to vehicle, so all users should benefit. Increased outreach, signage and publication of safer walking and biking routes can help to encourage more community members to opt for walking and biking and avoid the increase on vehicles on the road.

GHG Reduction Measure 2: Urban Tree Planting

SRPEDD and partners' implementation of the PVD Tree plan, creation of a Regional Tree Equity Assessment and additional planning and implementation measures are all focused on improving areas identified as LIDAC communities (see Attachment C). Which communities specifically will benefit is not yet determined, because specific planting location have not yet been identified; however, these communities will be prioritized first for planting initiatives. In the Providence Tree Plan, environmental justice communities are the highest priority intended recipients of tree planting areas, which regional planning efforts intend to replicate.

Direct benefits of tree planting in LIDAC communities include reduced heat and heat island effects due to tree shade by 5-10 degrees Fahrenheit [4]; carbon sink benefits as shown in our Greenhouse gas calculations in section 3.1; air pollution reduction of PM2.5 [4][5]; increased resilience of flash flooding from plantings absorbing stormwater runoff over previous impervious pavement [3-4]; increase wildlife habitat [1][2]; community beautification of tree canopy, and increased comfort for pedestrians and bicyclists. Indirect benefits include up to 30% decrease in energy use due to the reduction in heat and wind impacts on buildings [1][5]; increased pedestrian, bicyclist, and where applicable, bus stop attendance due to better comfort along sidewalks[3][5]; and green job creation, with Groundwork (RI & South Coast) and Garden Time providing education and jobs for youth and previously incarcerated community members (respectively). Both indirect and direct benefits include better health implications for communities with more tree cover [2] from less air pollution and hospital visits, greater pedestrian access and mobility, less stress due to community beautification, and lower heat-related issues [1-5].

Disbenefits are something our climate pollution reduction plan will also attempt to address through community engagement (below). Those disbenefits that would impact low income or disadvantaged communities may include increased property values due to neighborhood beautification, resulting in potential displacement of those communities [1]. General disbenefits would include increased need for maintenance where trees have damaged sidewalks and public works facilities where tree plantings would occur, but extreme care will be taken to site the right tree in the right location to avoid such unintended consequences.

4.2 Community Engagement

SRPEDD community engagement plans include continued stakeholder engagement and multiple public meetings with community partners for qualitative and quantitative feedback on all planning and implementation programs. SRPEDD and community

partners will hold structured meetings, with municipal leaders and members of the public to collect input on the selection of road safety projects and tree planting locations and to monitor their experience, program mechanics, and potential longevity of programs during and after the terms of the grant. Additionally, SRPEDD and partners will attend ongoing community events throughout the project phase to share information about the projects and collect additional public input. Priority will be given to engaging LIDAC community groups and members, specifically, throughout all outreach efforts.

To minimize potential disbenefits to low income or disadvantaged communities, SRPEDD with our partners from the University of Massachusetts Dartmouth will track sites where plantings occur for physical changes potentially including surveys of resident experience and monitoring changes in rents and/or cost of living expenses. Additionally, the outreach plan can include comparisons to areas where planting has not occurred with areas where it has for impact areas like rent, property tax, or cost of living changes.

5.0 Job Quality

Across all proposed actions, federal guidelines will be followed for contract work to ensure fair compensation for work, including requiring prevailing wage or similar for all contracts and sub-awardees contracts. Furthermore, greenhouse gas measure 2 will specifically focus on the creation of local jobs through extensive workforce development trainings. Jobs will also be created through the tree planting and maintenance work through the hiring of local crews for implementation, as well as funding to support additional municipal and regional arborist positions to increase regional tree canopy maintenance. The project aims to both create local jobs while also growing the local capacity and experience to fill those same jobs, jointly increasing local capacity for tree planting and maintenance.

6.0 Programmatic Capability and Past Performance

6.1 Past Performance

SRPEDD has a proven track record of implementing region-wide plans which reflect the needs of their communities and improves their quality of life, such as with the Regional Transportation Plan (updated every four years) and Transportation Improvement Program, both funded through federal allocations. SRPEDD has also successfully implemented federal and non-federal grants. In the past we have received an EDA grant of \$141,225 and a state Regionalization and Efficiency grant of \$78,725 to fund a Regional Resilience Plan which required organizing steering committees, establishing partnerships with UCONN regarding workshops and stakeholder engagement, providing community engagement, and analyzing environmental justice data. For the EPA's 2022 Brownfields Assessment Grant application SRPEDD was awarded \$500,000, which included collaborating with additional state and federal agencies DPH, State Police, DOT, Mass. Dept of Veterans, and HUD.

6.2 Reporting Requirements

SRPEDD has a proven track record of meeting its reporting requirements. We submit quarterly reports and quarterly invoices as required for all of our contract work. The project team makes timely progress, hitting benchmarks for subtask completion as described in the grant application. Quality Control for all SRPEDD deliverables will be overseen by Jeffrey Walker, SRPEDD's Executive Director, with over 20 years of experience in land use, environmental and transportation planning, economic development and regional planning agency administration. Ling Ling Chang, SRPEDD's CPA, is responsible for overall finance, as well as all project accounting at SRPEDD and will manage the project budget. She will ensure all invoices are paid within 30 days, and that all back-up documentation is on file to support expenditures of state and federal funds.

6.3 Staff Expertise

SRPEDD is the regional planning agency that serves 27 cities and towns in Southeastern Massachusetts in sustainable planning efforts around land use, transportation, economic development, and the environment. Our work is place-based and community-focused, to ensure that these plans reflect the expressed needs of local communities while managing plans at a regional scale. SRPEDD's regional planning mission is about building community and enhancing quality of life for everyone. SRPEDD has expansive expertise in understanding the anticipated impacts of climate change, keeping up to date with the latest climate related data and information, and project development to advance community resilience. Furthermore, SRPEDD intends to partner with the following sub-awardees, each experts in their perspective fields:

- City of Providence Planning Department: PVD Planning is a major partner in the implementation of the PVD Tree Plan plantings and safer streets for pedestrians and bikers initiative. The PVD Planning Department's priorities align with these climate pollution reduction measures as shown by recent actions: creating and implementing the PVD Tree Plan, strengthening the Complete Streets Ordinance, and leading a Vision Zero Policy with a goal of no pedestrian casualties within the City's jurisdictions by 2030. The PVD Planning department is supporting SRPEDD in these goals by analyzing relevant data and identifying and implementing intersection safety improvements, where their jurisdiction and authority allows. As a local partner, the City of Providence Planning Department would conduct community outreach, manage design, installation, and construction contracts, and needed administrative components.
- City of Providence Parks Department: PVD Parks receives \$1.77 million dollars from the City Budget. They are closely partnered and supplemented services with PNPP for the maintenance of all trees, totaling over 27,000 in 2023, in the City of Providence's jurisdiction. Their existing capacity to maintain new and mature trees is well below the number of trees within the jurisdiction, thus the need for

additional partners like PNPP and funding from government grants to implement the PVD Tree Plan effectively.

- **Providence Neighborhood Planting Program:** PNPP has been a long-time close partner with the City of Providence Forestry Department, including in creation and implementation of the PVD Tree Plan. Much of their funding comes from private donors and the City of Providence Forestry Department budget which goes towards block pruning programs, tree service requests, street tree planting, and the Tree Keeper program. PNPP's capacity to provide and maintain new and mature tree services for the City of Providence is directly related to the amount of funding outside the City of Providence Forestry Department's budget, therefore the more funding availability, the greater carbon capture results.
- **Woonasquatucket River Watershed Council:** WRWC is a non-profit whose mission is to create positive environmental, social, and economic change by revitalizing the Woonasquatucket River, its Greenway, and its communities. WRWC's work benefits EJ communities specifically, which requires a vastly different approach to resilience and climate mitigation. The WRWC bring this expertise to the project team.
- **Garden Time:** Garden Time is a Providence-based non-profit 501c organization whose goal is to educate and employ previously incarcerated populations in agricultural, arborist, and horticultural skills and practices. They are close partners with Groundwork RI and PNPP, established roughly 10 years ago. Garden Time's funding comes from a variety of individual donors in effort to provide a more grassroots led financing plan. Their work is two pronged in equity goals, helping reentry of incarcerated individuals and providing green infrastructure and carbon sequestration in EJ communities of Providence.
- **Groundwork Rhode Island:** Groundwork RI has a strong record of successful tree planting and stewardship initiatives in Providence and across the State of Rhode Island, including planting hundreds of trees, adult and youth training and employment programs. Groundwork USA is the larger parent organization that aids local branches, such as Groundwork RI, in helping educate and provide green infrastructure and community plantings locally with a focus on equity.
- **Groundwork Southcoast:** GWSC, like Groundwork RI, relies heavily but not entirely on its parent organization Groundwork USA's grants and personal donations for funding. Their 501c non-profit organization's mission is to bring about sustained regeneration, improvement, and management of the physical environment by developing community-based partnerships that empower people, businesses, and organizations to promote environmental, economic, and social well-being for communities in the Southeast region of Massachusetts. They are aiding SRPEDD in the implementation, outreach, and engagement for the region-wide tree plan and conducting tree planting efforts in their local communities of operation. GWSC was previously awarded the DOI's National Parks Service's Rivers, Trails, and Conservation Assistance Grant in 2023 for \$12,556 for capacity building. They are currently working with Southeastern Massachusetts

partners on regional resilience planning, which SRPEDD will leverage for regional planning and implementation efforts.

- University of Massachusetts Dartmouth: UMass Dartmouth is a public academic institution extension campus of the University of Massachusetts, whose Department of Public Policy is a partner for this CPRG proposal and implementation. UMass Dartmouth has aided SRPEDD in identifying implementation-ready activities, finding ways to utilize and increase participation in existing state and federal programs, and plan and assist community engagement for those programs. UMass Dartmouth will and has used historic data to evaluate municipal participation in state reduction programs, analyzing low income and disadvantaged populations and areas to prioritize in tree planting initiatives. UMass Dartmouth has and will continue to conduct workforce analysis to ensure high-quality jobs that align with the US Department of Labor's Good Jobs Principles as well as conducting a benefits analysis for the measures SRPEDD implements.

7.0 Budget

7.1 Budget Detail

SRPEDD's budget detail and sub-awardee details can be found in *Attachment A: Budget Narrative*. A summary by category is as follows.

Personnel

SRPEDD is requesting a total of \$438,433 in personnel costs to cover staff salaries in managing all grant activities, coordinating all partners, and overseeing all subawardees. Furthermore, personnel costs will cover staff completion of the following tasks: identifying road safety projects and overseeing implementation (in coordination with local authorities), monitoring road users before and after safety improvements, conducting a regional tree canopy assessment and equity analysis, identifying and coordinating tree planting efforts, and public engagement throughout all project phases.

Fringe Benefits

SRPEDD is not requesting fringe benefits costs because these costs are already included in our indirect rate. SRPEDD's NICRA agreement is set at 115%, as negotiated with the Department of the Interior; per agreement, fringe and indirect are bundled.

Travel

SRPEDD is requesting \$786 annually in travel expenses, for travel to and from community events, stakeholder meetings and to visit project locations for planning, implementation and monitoring purposes.

Equipment

SRPEDD is not requesting equipment funds.

Supplies

SRPEDD is requesting a total of \$385,000 total in supply expenses over the total project period. \$1,000 per year are requested for general office supplies and related software or materials to support public outreach and community meetings and other types of events. \$330,000 is requested to purchase 1,100 trees for planting throughout the region. Up to \$50,000 is requested to purchase EcoCounters to be installed at planned roadway safety implementation locations to monitor vehicle, bike and pedestrian traffic.

Contractual

SRPEDD is requesting \$2,609,000 in contractual costs. \$2.5M will be used to hire an engineering firm to prepare 100% designs, construction cost estimates and permitting for up to 5 road safety improvement projects. \$109,000 is requested to make translation and facilitation services available in community outreach materials and at community meetings, where requested.

Other

\$18,206,725 in subaward costs will fund our identified partners to implement the proposed workplan (further detail in Appendix A). \$170,000 will be provided to local arborists or tree stewards to provide training and stipends for tree planting and maintenance. \$62,500 will be provided to local partners (municipal and/or state staff) who are overseeing roadway construction work and to provide police details for construction and monitoring, as needed. \$30,000,000 in construction costs are requested to implement up to 5 roadway safety improvement projects in SE MA.

Indirect Charges

SRPEDD's NICRA agreement establishes our indirect rate at 115%, as negotiated with the Department of the Interior; per agreement, fringe and indirect are always included as bundled in indirect. \$504,198 is requested to cover SRPEDD's indirect rate.

7.2 Expenditure of Awarded Funds

SRPEDD staff will manage funds and spending of grant funds, including to its subaward recipients, consistent with all federal guidelines and requirements. SRPEDD staff have experience managing federal grant projects and complying with the associated procurement and other spending requirements. SRPEDD's Chief Procurement Officer will oversee bids and contracts for all consultant funds to ensure compliance with federal procurement guidelines. SRPEDD's CPA will manage the project budget and ensure all invoices are issued and paid in a timely matter consistent with grant reporting and invoicing deadlines, and that all back-up documentation remains on file to support expenditures.

7.3 Reasonableness of Cost

Budget estimates are based off of relevant previous planning efforts, scaled to the applicable planning area, and reflect accurate and reasonable planning efforts. Project management and public engagement costs are included in the project budget to ensure an appropriate level of public engagement and reasonable accommodations for low income and disadvantaged communities are provided. Tree planting and roadway design and construction costs are based on industry averages calculated from previous work in the region. In the case that costs were overestimated for implementation, at EPA's ultimate discretion, remaining funds can be utilized to further implementation impacts through additional tree plantings, additional project designs prepared or additional monitoring.

Citations

- [1] Arbor Day Foundation. Tree Facts: What can a tree do for you?
<https://www.arborday.org/trees/treefacts/> 2023
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- [3] Locke, Dexter H.; Grove, J. Morgan; Pickett, Steward T.A. The role of urban tree canopies in environmental justice and conserving biodiversity. *Urban Biodiversity and Equity*, Oxford, UK: Oxford University Press. 2023 97-114.
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- [4] Pataki, D.; et. Al. The Benefits and Limits of Urban Tree Planting for Environmental and Human Health. *Ecol. Evol.* 2021, 9
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