City of Hyattsville MD: Nature-Based Solution Project

Status: Submitted to recipient

Scope of work

The project Scope of Work (SOW) identifies the eligible activity, describes what will be accomplished and explains how the mitigation activity will be implemented. The mitigation activity must be described in sufficient detail to verify the cost estimate. All activities for which funding is requested must be identified in the SOW prior to the close of the application period. FEMA has different requirements for project, planning and management cost SOWs.

Subapplication title (include type of activity and location)	**City of Hyattsville MD: Nature-Based Solution Project**

Activities

Primary activity type	**Stabilization and restoration**
Primary sub-activity type	**Wetland restoration/creation**
Secondary activity type (Optional)	**Flood control**
Secondary sub-activity type	**Low impact development/nature based solutions**
Tertiary activity type (Optional)	
Geographic areas description	**The City of Hyattsville, MD is located in Prince George's County, adjacent to Washington, DC's northeast boarder. Two large tributaries to the Anacostia River bound the City's southern edge called the Northeast Branch and the Northwest Branch. (Please see location maps in Appendix # 3 FIRMette). In the late 1800s and 1900s the US Corps of Engineers straightened the path of the tributaries to reduce flood risk and constructed levees to protect the City. Behind the levees, at the southern most drainage point where the confluence of the two tributaries meet, industrial, commercial businesses developed, where the land is very low, leaving the higher elevations for residential neighborhoods. The local area where the project will be sited is within the Intense Development Overlay (IDO) zone of the Chesapeake Bay Critical Area (CBCA); this is a state of Maryland protected zone for areas within 100' of tidal waters. The site is located in the Block Group # 240338063001. The City is also located within a Coastal Zone Management Area. (Please see Appendix #13 map of the regional CZM). The 2017 Prince George's Hazard Mitigation Plan Update Appendices document that Council District #3 (district in which City of Hyattsville, MD is located) has 0.2 Percent Annual Chance of flooding risk. Information indicates that Total Exposure in Floodplain (TEIF) for the 100-Year flood and 500-Year flood is valued at nearly $23M and $316M, respectively, for District #3 related directly to flooding risk. (Please see Appendix #11 at PDF page 36 of 172, Dewberry slide 13, dated 3/10/17.) Because the use of the term "watershed" often denotes different scales and sizes, it is important to know that the area which drains to the Anacostia is quite large and characterized by highly urbanized, impervious cover which causes small storms to have the effect of high intensity, short duration and very damaging impacts. Storm water flows are rapid, flashy and destructive in small urban environments causing first**

flush impacts to local water quality and intense scour of sediments. The watershed of the site is approximately 75 square miles, however, the project size and its drainage are is considerably smaller; much like a micro watershed within a larger environment. (Please see App#15_Northeast Branch Tributary Drainage area size_22Oct2020). According to the Lower Ward 1 Study, which was developed by the Low Impact Development (LID) Center to identify opportunities for mitigation activities, there were about 14 potential sites to perform mitigation. The project site which is presented for this grant subapplication is described in the Lower Ward 1 Study in detail as "opportunity #9" on page 24. (Please see Appendix #1 at page 24.) This site is located at the intersection of two major roads -- 42nd Place and Armentrout Drive -- in this localized area the Hyattsville Department of Public Works (DPW) has observed the site is subject to standing water and intermittent flooding during short, high intensity storms. It is the intent of this project to mitigate the risk of flooding and pollution flow to the Anacostia River in this very small watershed, representing a drainage are of approximately 2 acres by creating a submerged gravel wetland.

Community lifelines

Primary community lifeline	**Transportation**
Primary sub-community lifeline	**Highway/roadway/motor vehicle**
Secondary community lifeline (optional)	**Hazardous material**
Secondary sub-community lifeline	**HAZMAT, pollutants, contaminants**
Tertiary community lifeline (optional)	

Hazard sources

Primary hazard source	**Uncategorized**
If Uncategorized please specify	**Due to the commercial business activity which involves car repair and heavy truck use, the runoff from these storms carries with it metals, grease and oil, bacteria, chlorides and various other pollutants. These pollutants flow via the storm drain system into the rivers and result in impairments to fauna an biota. This is reflected in the industrial permit to a business adjacent to the proposed site location issued by the Department of the Environment which identifies the know impairments. (Please see Appendix #6). The property of this permittee is with 25' of the project location. Additionally, the project location lies at the bottom of a steep slope that drains approximately 2 acres of industrial land, above the site in terms of elevation along 42nd Place. Due to the drainage pattern, the project will be to install one (1) submerged gravel wetland. This nature-based solution will capture and store run off containing pollutants and treat the impervious area so that the pollutants are diminished and do not further impair the local water quality.**

Secondary hazard source (optional)	
Tertiary hazard source (optional)	
Is this a phased project?	**Yes**
Are you doing construction in this project?	**Yes**
Population affected	**0.02**
Detail/description of stated percentage	**The proposed project will be a wetland in a highly urbanized area within the City of Hyattsville MD constructed on public land, where there is often scant area for natural features to be installed to improve local water quality. While the project is small, having a drainage area of slightly more than two acres, it treats an area that is equivalent to nine acres. To determine the population impacted, we used the US EPA Environmental Justice screening tool available at https://ejscreen.epa.gov/mapper/ (accessed 04Nov2020) to encompass a 1 mile area around the site location . We found that the population impacted was 288 people out the larger Hyattsville, MD population of 18,243 residents (as of 2018). (Please see Appendix #24). Admittedly, this is a small population but it is to be expected due to the nature of the commercial activity in the location. Industrial and commercial businesses in this area consist of auto body repair shops, sheet metal manufacturers, large hauling and cement industry operations. (Please see Appendix #12 for representative photos of 42nd Street). Notable in the EJScreen map and data report is the high concentration of minorities in the population of 69%. Only 27% of other areas of the same size in the EPA region have a higher concentration of minorities. Based on the minority population indicator/metric alone, it is clear that making environmental improvements in this area is likely to have a much higher environmental justice impact as minority populations in general face greater threats to health from pollution exposure and other environmental threats than the general US population. Combining with low income, this area has a higher burden of low income populations compared with other areas of similar size in the state of Maryland: only slightly less than a quarter of other areas have a higher burden of a low income population. (Please see Appendix #21).**
Provide a clear and detailed description of your proposed activity	**The City of Hyattsville DPW has identified the proposed mitigation site because it has been subject to historic drainage and localized flooding issues. (Please see Appendix 1, Figure 7. Existing floodplain and Hyattsville DPW-identified drainage issues). The City identified a submerged gravel wetland as a “high priority” with a “high water quality benefit” which provides a green infrastructure, nature-based solution to the identified problem. (Please see Appendix #1, Table 4. Identified retrofit opportunities, #9) “Green” infrastructure, in contrast to gray infrastructure, is a storm water management. approach that slows down, reduces, and treats storm water where it falls. Green infrastructure practices mimic natural systems using vegetation, soils and other elements. Examples include rain gardens, permeable pavement, bioswales and submerged gravel wetlands. A submerged gravel wetland is an engineered facility designed to mimic the plant and microbial benefits of a natural wetland. These**

	facilities re suitable for wet areas with poorly draining soils and act as a filter for pollutants before water is discharged into the existing storm water management system. The right-of-way along 42nd Place just north of Charles Armentrout Drive is owned by the City of Hyattsville. This area was identified by the City as one that often experiences standing later during and after heavy rain events. Hydrologic and hydrology model simulations of existing conditions provided similar results. The subcatchment area is more than 80% impervious and includes a mix of commercial and light industrial businesses (e.g., vehicle service centers, car dealerships). Pollutant runoff from these properties is assumed to be higher than in residential areas. (Please see Appendix #12, Google Maps Street View photos of 42nd Street) A submerged gravel wetland was identified as an appropriate storm water treatment practice because of its ability to maximize the removal of pollutants and to address concerns with localized flooding and standing water. It has also been identified by City DPW staff as a good candidate for outreach to nearby business owners to demonstrate how green infrastructure can be incorporated on commercial properties. Therefore, the Lower Ward I Study recommended the design and installation of a submerged gravel wetland or similar storm water practice to reduce issues with standing water along 42nd Place and reduce and filter storm water from upstream pollution-generating activities. (Please see Appendix 1, Opportunity #9 described on page 24) A technical specification for this best management practice is included in the County's regulatory storm water design manual (Please see App#16_Excerpts from the Prince George's County Storm water Design Manual_2014 at page 10-24.)
How will the mitigation activity be implemented?	**The City of Hyattsville follows standard, legal procurement rules set by Prince George's County, in addition to the State of Maryland and the federal government. The City will follow one of two paths to procure the services of a qualified, competent contractor to perform the work outlined in the storm water design plans (Please see Appendix #10) once they are completed and construction ready. The first path will be to put out an request for proposals and evaluate the received packages. The second path will be to evaluate whether the City's on-call contractor can perform the work adequately. On-call contractors are selected via open and competitive bids and a thorough process so the City has contractors on retainer. Once procurement is decided and accomplished the project will be carried out by the contractor with oversight from the City per the regular process of the the City. The project is estimated to take one year to complete and approximately six months to finalize design planning, permitting and City Council approval to proceed. Following construction, an important aspect of the wetland creation will be to promote it for educational purposes. The goals of this project are to alleviate roadway flooding along 42nd Place, demonstrate the strategic placement of green infrastructure to reduce localized flooding, improve water quality in Lower Ward 1, and engage the local business community. Initiating outreach to the local business community will also be implemented by the City's DPW. The City DPW has very good communication lines open with the adjacent businesses (Old Town Motors to the east of the site and Washington Air to the west of the mitigation site and has a practice of frequently canvasing businesses to assess their needs. These interactions help DPW to obtain feedback and set priorities to**

	provide better governmental service. (Please see Appendix #4 that sets out project outreach goals).
Describe how the project is technically feasible and will be effective in reducing the risk by reducing or eliminating damage to property and/or loss of life in the project area. Please include engineering design parameters and references to the following: preliminary schematic or engineering drawings/design; applicable building codes; engineering practices and/or best practices; level of protection (e.g., life safety, 100-yr flood protection with freeboard, 100-yr wind design, etc.):	**An H&H study is included with this proposal (Please see Appendix #9 for the storm water report and Appendix #10 for the engineered design plan). The project will be placed in a City owned right of way (ROW) with a width of approximately 40 feet wide. The low impact development (LID) facilities shall be located to avoid conflicts with surrounding underground utilities. All construction activities shall maintain a minimum distance of five (5) feet clear of any underground utility line. Runoff from 42nd Place and surrounding properties discharges directly into the Anacostia River with no treatment or controls. This project proposes to treat as much of this impervious runoff as practicable. Two (2) existing curb cuts are currently blocked with debris. These curb cuts will be cleared and improved to prevent further clogging. An existing yard inlet owned by the Maryland State Highway Administration (SHA) receives storm water runoff and discharges to an outfall on the south side of Charles Armentrout Drive. This project proposes to brick shut that inlet, install a new inlet that would be maintained by Prince George's County, and connect to the existing inlet via a concrete pipe. Two (2) structural pretreatment devices are proposed in place of the more commonly used forebay. These devices are designed to removed sediment and other pollutants and take up less space than a traditional forebay. The outfall pipes were sized assuming full passage of the 100-year storm. The goals of this project include increasing flooding resiliency in the area. (Please see Appendix #9 for the storm water report and Appendix #10 for the engineered design plan) To promote flooding resiliency, the gutter leading into the curb cut will be re-pitched to create a 1:10 slope. This will reduce the spread into the road during the 10-yr 24 hour storm to be less than four (4) feet. This exceeds Prince George's County requirements. Without this change the spread was calculated to be fifteen (15) feet and occupy the entire northbound travel lane. This calculation supports field observation of flooding in the area.**
Who will manage and complete the mitigation activity?	**Project administration and management will be conducted by the City's Department of Public Works (DPW) staff. This project site, the structure, road and ROW will be maintained by the City of Hyattsville and they have approved the design shown in Appendix #10. The City has volunteered to provide match in-kind for their services to administer and manage the project's construction phase.**
Will the project address the hazards identified and what risks will remain from all hazards after project implementation (residual risk)?	**Yes, the proposed submerged gravel wetland will address the runoff and contaminants contained within the runoff to the maximum extent practicable. The LID structure has been sized to result in the total retention of 2,980 cubic feet of storm water runoff during a major storm event. The project is designed to capture 0.58 inches of runoff depth per impervious acre resulting in a treated area of approximately 2.3 acres (1.43 impervious). The enhanced capacity and operational function of the wetland should ensure that for its size, it will do the job. The aspect of resiliency comes from the increase of the structure's ability to handle a 10 year storm. This is an increase from the 2 year storm and a significant increase from the ditch that is now present at the site. There is an inlet owned by SHA which will be sealed and a new, larger drainage apparatus will be installed to increase the**

	throat capacity, holding time and capacity to treat the storm water. It is important to state that this device cannot be expected to treat storms for which it is not sized so if there are larger events, the device would be expected to be overwhelmed. To the extent that the device fits the site (since public opportunities are often space limited), it will perform as designed and lessen the risk of flooding as well have positive environmental, aesthetic and educational functions. (Please see Appendix #9 for the storm water report and Appendix #10 for the engineered design plan)
When will the mitigation activity take place?	**The project is broken into three phases. The first phase is dedicated to developing 100% design plans and permits, scheduled for 2020-2021. This phase will be completed prior to the beginning of this grant, should it be selected and awarded, so the design phase should be considered accomplished for the purposes of this sub application. Phase 1 costs were paid by a grant from the Department of Natural resources (DNR) in 2019. The total costs of the design work was $62,491.36. This costs was included in the budget, however, pre-award costs are not being requested. The second phase is for construction and is scheduled for 2021-2022. This is the target date for construction. Costs for construction are estimated to be $300,000 and are included in the budget. The third phase is schedule to occur once construction is complete. It will provide observation, maintenance and project evaluation such as water quality monitoring if funds are available. Once the project is fully operational it will also have an educational component in that this project will serve as a demonstration project to showcase how green infrastructure can address local nuisance flooding and initiate outreach to the local business community. These costs will be covered by the City's DPW and are factored into the budget as match in-kind.**
Explain why this project is the best alternative. What alternatives were considered to address the risk and why was the proposed activity considered the best alternative?	**As shown in the Lower Ward 1 Study, thirteen restoration opportunities were identified for consideration to enhance environmental and infrastructure resilience. The City received a grant from the Department of Natural Resources in 2019 to engage the Low Impact Development Center, Inc. and Weston and Sampson to conduct the Hyattsville Resiliency Study, completed in March 2020. (Please see Appendix #1). Out of the possible opportunities identified, the City selected the proposed submerged gravel wetland because of its qualities, namely high visibility in an industrial setting where high water quality benefits and flooding risk reduction could be combined. Although the adjacent property, where a business currently operates, was considered, the Washington Air Compressor Rentals business is private venture and land permission would have been difficult to obtain. Benefits were not as favorable on that site compared to the proposed mitigation activity and there was also an issue because the property abutted CSX railroad tracks which made the project infeasible. (Please see Appendix #1 - under project opportunity #8). Another nearby site was considered on Rhode Island Avenue, however, the opportunity did not have high benefits and the Maryland State Highway Administration's (SHA) intends to replace roadside sidewalks in that area anyway. (Please see Appendix #1 - project #6b). Reviewing all of the opportunities recommended in the Study, the City chose to proceed with the current wetland creation project because it can accomplish the goals identified. Often, in urban settings, implementers have to be opportunistic**

	when choosing sites for implementation. This site was reviewed and scrutinized to meet the conditions of risk reduction, environmental improvement, resiliency and feasibility with respect to future maintenance and land ownership. It was selected, not only as the best opportunity to complete in the near term but also the best management practice for the site to achieve the goals and offer a nature-based solution.
Please identify the entity that will perform any long-term maintenance and provide a maintenance, schedule and cost information. The subapplicant or owner of the area to be mitigated is responsible for maintenance (including costs of long-term care) after the project is completed?	**The City of Hyattsville, as the owner of the property on which the restoration activity will occur, will perform any long-term maintenance required as its cost. The DPW will provide the staff to conduct inspections, maintenance and other necessary actions.**
Additional comments (optional)	**This project plays an important role with respect to the Lifeline of Transportation. The site location is essentially at the intersection two major roadways; 42nd Place and Armentrout Drive. The nature of the traffic pattern is one that makes Armentrout Drive the most southern east-west secondary artery in the watershed. It is located virtually on top of the levee that protects the Lower Ward 1 area from inundation by two converging tributaries - East and Northeast Branches - as they flow to the Anacostia River. As shown in the 2018 Hyattsville Transportation Study, Armentrout Drive is flanked by Baltimore Avenue on the east and Rhode Island Avenue to its west. The study states, "Baltimore Avenue serves as a commuter route for drivers traveling between Washington D.C. and points north such as the University of Maryland and suburban Maryland. The right-of-way is constrained on Baltimore Avenue in the study area and some intersections do not contain dedicated left-turn lanes. The intersection spacing and access also impact operations on the corridor. with side streets movements affecting arterial traffic flow. A small number of intersections on Baltimore Avenue or Route I Alternate operate at degraded conditions." The Technical Memorandum which accompanies the Study, states at Table 11 on page 50 that Armentrout Drive experiences "significant" hourly delays at peak traffic flow times on a regular basis under 2018/2019 existing conditions. It classified the Armentrout Drive intersection with a rated level of service (LOS) grade "F" and concluded that "intersections operating at LOS E and F are cause for concern." (Please see Appendix #5_Excerpts from Transportation Study_14Nov2020 at page 49). Most importantly, the Study does not consider potential impacts from nuisance flooding. These impacts can only worsen transportation dynamics for the several essential functions these arteries serve. For example, University of Maryland's College Park flagship campus is located on Baltimore Avenue 3.3 miles to the north; police, fire and hospital services are located in all directions within half a mile of this intersection; tourism traffic flows daily into Washington DC as well as commuters for daily work; and there is significant industrial traffic in and out of the proposed site location. (Please see Appendix #5_Excerpts from Transportation Study_14Nov2020 at page 42). This transportation lifeline can be disrupted by inclement weather, placing burdens on all the services which make life functional. Without efficient traffic flow, costs are inclined to rise. When a road is closed due to flooding, a driver could face three broad options: diversion, waiting or**

not-travelling. As noted in a 2018 prominent journal article by Ms. Baojin Wang, costs of diversion typically include: 1) Additional travel time on the longer diversion route, which can be estimated from the diversion route distance and average speed. Value of travel time can be estimated from travel speed, travel time and the standard value of time (VOT) parameters; 2) Additional vehicle operating cost (VOC) due to a longer distance. A diversion route would generally be longer and in a lower standard than the direct route. To appropriately assess the additional VOC, information of road condition is needed for both direct and diversion routes. Variables inputting to VOC calculation would include road gradient, curvature, roughness and travel speed. The VOC per kilometer would also increase when travelling on a steeper or a curvier road section. Road roughness in the VOC estimate is defined by the International Roughness Index (Index), which could be used to classify the surface condition to five categories (very poor, poor, fair, good and very good). A poor surface condition would incur a higher VOC on per kilometer basis. 3) Potential more road crashes due to longer route or a poorer road condition on diversion road. This would require an estimate of crash rates of the direct and diversion routes, either based on historical crash data, or based on typical crash rates by road stereotypes. 4) A higher road (environmental impact) externality cost due to longer diversion route or lower fuel efficiency on the diversion route. (Please see App#23_Transport Research Forum 2018 Proceedings). These considerations will be further explored in the cost effectiveness section of this application. As mentioned in a letter from the Hyattsville DPW Deputy Director, Armentrout Drive itself can see 15,000 cars per day. This is also stated in the Transportation Study which shows a table of peak morning and evening driving numbers. The study documents that the 2016 traffic volume on Baltimore Avenue was 31,100 cars daily. This information is all valuable for a traffic delay costing study, for example, the kind that The Federal Highway Administration (FHWA) Office of Operations presents in its 2014 publication titled Road Weather Management (RWM) Benefit Cost Analysis (BCA) Compendium, (FHWA-HOP-14-033), to emphasize impacts under different weather management strategies including connected vehicle applications. However, for this site, it is difficult to isolate the impact attributable to the function of the device on specific events other than to admit that the device would play a role in attenuating and reducing risk by reducing flow quality and improving quality (Please see Appendix # 31 file name: App#31_Hyattsville DPW Letter documenting flooding_18Nov2020).

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
App#31_Hyattsville DPW Letter documenting flooding_18Nov2020.pdf	11/18/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Letter from the City regarding historical storms and traffic delay	

Filename	Date uploaded	Uploaded by	Label	Description	Action
App#15_Northeast Branch Tributary Drainage area size_22Oct2020.pdf	11/18/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Watershed Map	
App#3_FIRMETTE_6d287186-d4aa-4905-b0d4-21ce8de09e78_28Oct2020.pdf	11/18/2020	paul.emmart@maryland.gov	Scope of Work Attachments	National Flood Insurance Map of the project site	
App#16_Excerpts from the Prince George's County Stormwater Design Manual_2014.pdf	11/18/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Technical specifications of the project device	
App#23_Transport Research Forum 2018 Proceedings.pdf	11/18/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Factors involved in traffic dynamics related to costing out delays	
App#1_Hyattsville Resiliency Study_09Mar2020.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	LID Center Study of opportunities for resiliency mitigation actions, including the project proposal site location	
App#4_DNR Project Design Contract_recd_28Aug2020.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	MD DNR Grant document to support design planning work for the project	
App#6_Compressed Air Rental_MDEIndustrialPermit12SW3350_30Oct2020.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Adjacent business stormwater permit and impairing pollutants	
App#9_Engineering Hydrology SW Report_25Aug2020.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Stormwater engineering report regarding hydrology and device modeled results	

Filename	Date uploaded	Uploaded by	Label	Description	Action
App#10_Engineering Design SGW-SWM Plan_25Aug2020.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Design plan for device	
App#11_Prince Georges County Hazard Mitigation Draft Plan Appendices.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Local HMP - background data	
App#12_Google streetview of 42nd Place_31Oct2020.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Google streetview photos of project site location	
App#13_Hyattsville_CZM zone_13Nov2020.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Map of CZM zone	
App#21_Socio-Economic Info_EPA EJScreen Tool_04Nov2020.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Socio-economic data for site location	
App#24_Population calculation_14Nov2020.pdf	11/14/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Map and data related to population	
App#5_Excerpts from Transportation Study_14Nov2020.pdf	11/15/2020	paul.emmart@maryland.gov	Scope of Work Attachments	Data on local transportation findings	

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