

MD 5 Great Mills Improvement Project

*Adding Capacity, Improving
Safety in Rural Maryland*

MDOT
MARYLAND DEPARTMENT
OF TRANSPORTATION™
STATE HIGHWAY
ADMINISTRATION



BUILD 2019 Project Information - Please complete all fields.
****PLEASE DO NOT CHANGE FILE NAME AND DO NOT COPY/PASTE**
TO AVOID COMPROMISING FORM INTEGRITY**



Field Name	Response	Instructions
Project Name	MD 5 Great Mills Improvement Project	Enter a concise descriptive title for the project. This should be the same title used in the Grants.gov SF-424 submission and the application narrative.
Project Description	The MD 5 Great Mills Improvement Project will replace an existing two-lane Urban Other Principal bridge (State Highway Administration structure #1800600) that extends over the St. Mary's River on Maryland 5 (Point Lookout Road) from Maryland 471 (Indian Bridge Road) to Maryland 246 (Great Mills Road) within the town of Great Mills in St. Mary's County.	Describe the project in plain English terms generally understood by the public, using no more than 100 words . For example, "The project will replace the existing bridge over the W river on Interstate-X between the cities of Y and Z" or "the BUILD Grant will fund construction activities for streetcar service from location X to location Y." Please do not describe the project's benefits, background, or alignment with the selection criteria in this description field.
Urban/Rural	Rural	Identify whether the project is located in a rural or urban area , using the drop-down menu. For BUILD 19, a project is designated as urban if it is located within (or on the boundary of) a Census-designated urbanized area that had a population greater than 200,000 in the 2010 Census. If a project is located outside a Census-designated urbanized area with a population greater than 200,000, it is designated as a rural project.
Urbanized Area	Lexington Park--California--Chesapeake Ranch Estates, MD	If you have identified the project as "urban," please select the associated 2010 Census-designated urbanized area (UA) from the drop-down. If you identified the project as "rural" but it is located in an UA with a population under 200,000, please select the UA from the drop-down. If you have identified the project as "rural" and it is not located in a non-urbanized area, please select "Not located in an urbanized area" from the drop-down.
Capital or Planning	Capital	Identify the project as capital or planning . The " capital " designation should be used for projects that are requesting funding primarily for the physical development, acquisition, or improvement of surface transportation capital infrastructure. The " planning " designation should be used for projects that are requesting funding primarily for aspects of planning, preparation, or design.
Project Type	Road - Bridge Repair/Replacement	Identify the Primary and Secondary project type combination that most closely aligns with your project from the choices in the drop-down menu. See the "Project Types" tab in this file for further information and project type definitions.
Primary Project Location Zip Code	20634	Identify the 5-digit zip code of the project location . If the project is located in multiple zip codes, please identify the most centrally located zip code.
Project Previously Submitted?	No	Identify whether the project was submitted in a prior BUILD/TIGER or INFRA round , using the drop-down menu.
Prior BUILD/TIGER Funds Awarded to Project?	No	Identify whether the project has previously received BUILD/TIGER funding , and if so, whether that funding was through a planning or capital grant, using the drop-down menu.

BUILD 2019 Project Information - Please complete all fields.
****PLEASE DO NOT CHANGE FILE NAME AND DO NOT COPY/PASTE**
TO AVOID COMPROMISING FORM INTEGRITY**



Field Name	Response	Instructions
FY19 INFRA Application?	No	Select "Yes" from the drop-down menu if this project is also being submitted to the Nationally Significant Freight and Highway Projects Program (also known as INFRA) for Fiscal Year 2019.
Amount Requested	\$14,950,000	Enter the total amount of BUILD funds requested for this project in this application. [For capital projects, the minimum urban entry is \$5,000,000 and the minimum rural entry is \$1,000,000. For planning projects, the minimum entry is \$1. The maximum entry for both types is \$25,000,000].
Total Project Cost	\$29,001,944	Enter the total cost of the project . This should equal the sum of Total Federal Funding and Total Non-Federal Funding. <i>This value may not be less than the amount requested.</i>
Total Federal Funding	\$14,950,000	Enter the amount of funds committed to the project from ALL Federal sources including the proposed BUILD amount . For BUILD projects designated as urban , Federal funding cannot exceed 80% of total project cost as outlined in section C.2 of the BUILD NOFO.
Total Non-Federal Funding	\$14,051,943	Enter the amount of funds committed to the project from non-Federal sources . For BUILD projects designated as urban , the total non-Federal funding amount must be greater than or equal to 20% of the project cost.
Tribal Government?	No	Select "Yes" from the drop-down menu if the applicant is a Federally recognized tribal government .
Tribal Benefits?	N/A	If the applicant is not a Federally recognized tribal government , is the project located on tribal land? And if not, does it have direct tribal benefits? Answer using the drop-down menu.
Private Corporation Involvement	No	Does this project involve (a) private entity(ies) that will receive a direct and predictable financial benefit if the project is selected for award? This includes, but it not limited to, private owners of infrastructure facilities being improved and private freight shippers or carriers directly benefitting from completion of the proposed project.
Private Corporation Name(s)		If this project directly involves or benefits a specific private corporation , please list the corporation(s).
TIFIA/RRIF?	No	Is the project currently, or does this project anticipate applying for Transportation Infrastructure Finance and Innovation Act (TIFIA) or Railroad Rehabilitation & Improvement Financing (RRIF) loans ?
Department Financing Program?	Yes	If your application is unsuccessful, would you like to be contacted about the Department's financing program ?



MD 5 Great Mills Improvement Project

Adding Capacity, Improving Safety Rural Maryland

EXECUTIVE SUMMARY

The Maryland Department of Transportation State Highway Administration (MDOT SHA) and St. Mary's County hereby request \$14.95 million in Better Utilizing Investments to Leverage Development (BUILD) funding to provide 52 percent of the \$29,001,944 cost of the MD 5 Great Mills Improvement Project ("Great Mills project").

The Great Mills project is a critically needed rural project that will:

- Produce significant safety outcomes by reducing crash rates by a fourth;
- Enhance economic competitiveness by reducing projected congestion by two-thirds, thereby improving commute time to the Naval Air Station Patuxent River Main Site (NAS PAX);
- Reduce projected travel time by an average of 8.5 mins per trip;
- Support the State of Maryland's efforts to maintain a state of good repair by replacing a bridge that was last rehabilitated in 1950;
- Promote environmental sustainability by mitigating flooding and increasing water quality; and,
- Deliver quality of life benefits to the Southern Maryland region.

The Great Mills project is will increase safety and mobility by expanding capacity for motorized traffic, creating multimodal transportation options, and replacing an obsolete bridge. Currently, MD 5 between MD 246 and MD 471 experiences long traffic queues during the peak travel periods, creating congestion and safety concerns, with a crash rate 40 percent higher than the statewide average for similar routes. New commercial and residential developments planned near the community of Great Mills are expected to generate 26 percent higher traffic volumes by 2040 producing failing levels of service along MD 5. The project will add two outside travel lanes, bicycle lanes, and Americans with Disabilities (ADA) compliant sidewalks, as well as replacing one-hundred year-old bridge over the St. Mary's River.

The project is located in St. Mary's County, which has the fastest-growing workforce in the State of Maryland. An April 2019 Forbes article stated that "...**California-Lexington Park in Maryland emerged as the city with the highest share of high-tech jobs in its local economy in the country**" (<https://www.forbes.com/sites/niallmccarthy/2019/04/17/the-u-s-cities-with-the-most-stem-jobs-infographic>). The high concentration of science, technology, and math (STEM) jobs in this region is driven by the presence of several critical military installations in Southern Maryland. The Naval Air Station Patuxent River Main Site (NAS PAX) in Lexington Park is three miles east of the project area. The Webster Outlying Landing Field (WOLF) at St. Inigoes, which houses a Coast Guard Station, is located 11 miles to the south of the project. These installations alone employ 21,500 active-duty personnel, civilians, and contractors, many of whom rely on MD 5 for access to destinations around the County; Washington, DC; Virginia; and Maryland. The Great Mills project will improve traffic patterns, travel time, and safety that directly impact this critical – and growing – workforce in St. Mary's County.

Table of Contents

1. Project Description - 6

1.1. Broader Investment Context - 7

2. Project Location - 11

2.1. Existing Conditions - 11

2.2. Project Improvements - 12

2.3. Project Need - 13

3. Grant Funds, Sources and Uses of Project Funds - 15

3.1. Sources and Uses of Funds - 15

4. Merit Criteria - 16

4.1. Safety - 16

4.2. State of Good Repair - 19

4.3. Economic Competitiveness - 19

4.4. Environmental Sustainability - 22

4.5. Quality of Life - 24

4.6. Innovation - 25

4.7. Partnership - 26

5. Project Readiness - 27

5.1. Technical Feasibility - 27

5.2. Project Schedule - 27

5.3. Required Approvals - 28

5.4. Assessment of Project Risks and Mitigation Strategies - 28

6. Benefit – Cost Analysis - 29

7. Appendices - 30

A. Benefit-Cost Analysis Technical Memorandum - 30

B. Benefit-Cost Analysis Spreadsheets - 30

C. Letters of Support - 30

Figures

Figure 1: Great Mills Project's Proximity to NAS PAX, Federal Lands, and Urbanized Areas - 7

Figure 2: St. Mary's County, MD Major Employers - 9

Figure 3: Gate 2 at NAS PAX - 9

Figure 4: Great Mills Project and Location of Bridge - 11

Figure 5: Pedestrians on St. Mary's

Bridge within Project Limits - 12

Figure 6: Location and Description of Planned Improvements - 13

Figure 7: Great Mills Crash Summary (2015-2017) - 18

Figure 8: Population Growth in St Mary's CountySource: U.S. Census Bureau, Population Division and State Data Center, August 2017 - 20

Figure 9: Project Wetlands Area - 22

Figure 10: Flooding and Erosion at St. Mary's Bridge within Project Limits - 22

Figure 11: Existing Pump Facility within Project Limits - 23

Figure 12: Community Facilities Impacted by Great Mills Project - 24

Figure 13: Great Mills Project Relationship to Opportunity Zone and Sustainable Communities - 26

Tables

Table 1: NAS PAX Personnel Totals (1985 - 2011) - 8

Table 2: Project Budget Summary by Use -15

Table 3: Level of Service at Two Intersections within Project Limits - 17

Table 4: Description of Risks, Impacts, and Mitigation Strategies for the Great Mills Project - 28

Table 5: Project Impacts and Benefits Summary, Monetary Values in Millions of Discounted 2017 - 29

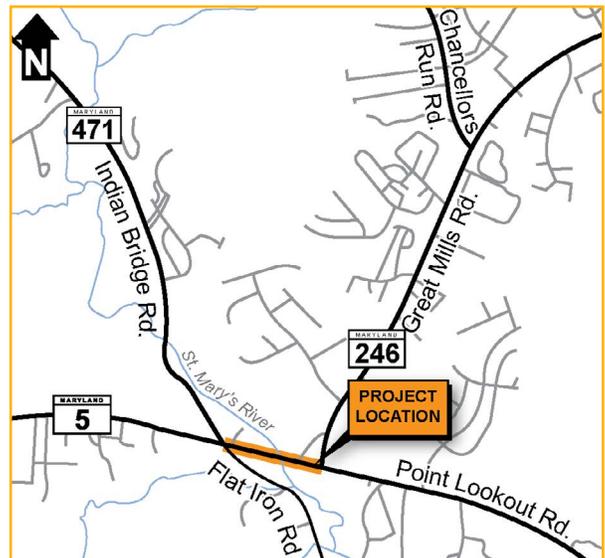


1. PROJECT DESCRIPTION



The Great Mills project provides a much-needed safety and traffic flow solution to critical intersections in rural Maryland to improve the connection between key military and private sector employment centers facilitating growth in the region. The Great Mills project is located on MD 5 (Point Lookout Road), between MD 246 (Great Mills Road) and MD 471 (Indian Bridge Road) in Great Mills, St. Mary's County ("County").

The Great Mills project improvements include widening MD 5 (Point Lookout Road) to an undivided four-lane closed section roadway. The travel lanes will be widened to eleven-feet, with bicycle lanes and sidewalks measuring five-feet each. The project will also replace an existing bridge. The goals of the project are to mitigate congestion that impacts local military installations; improve safety for motorists, bicyclists, and pedestrians; and, improve travel times for County residents. **When built, the project's monetized value to the local economy will exceed the cost of construction.**



WHY GREAT MILLS?

- Overall traffic operations are approaching failing conditions, with stop-and-go conditions at peak hours.
- Traffic in project area is expected to increase by 27% by 2040.
- The documented crash rate exceeds the statewide average for similar types of roadways.
- The project improves critical connections to U.S. military facilities.

The project is critical to facilitate population and workforce growth in St. Mary's County. The County has grown by 7.15 percent over ten years - the fifth highest in the State of Maryland - well above the U.S. national average of 5.96 percent. The County has the fastest-growing workforce in the State, with the highest share of high-tech jobs in the country, mostly attributed to growth at the NAS PAX and WOLF, and to population moving from the Washington DC area. This growth has resulted in increased traffic volumes in and surrounding the Great Mills project area, which is projected to grow by 27 percent by 2040.

New commercial and residential developments planned near and within the Great Mills project area are expected to generate higher traffic volumes and congestion, especially during peak travel periods. High traffic volumes resulting from existing development already contribute to operational failure. The additional traffic generated by



MD 5 Great Mills Improvement Project

Adding Capacity, Improving Safety Rural Maryland

future development will worsen congestion along the corridor. The intersections of MD 5/MD 471 and MD 5/MD 246 are projected to experience failing Levels of Service (LOS) in the design year of 2040.

The proposed transportation improvements will –

Reduce Travel Time: The Benefit-Cost Analysis shows that the greatest monetized value derived from the project result from travel time savings and the reduction in crashes, illustrating the project's focus on facilitating economic competitiveness and improving safety for road users and pedestrians. The project will reduce travel time by 8.5 minutes per trip.

Reduce Crashes: The overall crash rate is 40 percent higher than the statewide average for similar roadways. Specifically, the rear-end, left-turn, and sideswipe collisions within the project area are significantly higher than the statewide average. The project will reduce the crash rate by a fourth.

Alleviate Congestion: There are multiple mile-long traffic queues at intersections within the Great Mills project area during peak hours. As St. Mary's County continues to grow, congestion will impede the movement of people and goods throughout the area.

Address Flooding: The majority of the project area is within the 100-year floodplain of the St. Mary's River. The approaches to the bridge from each direction flood multiple times each year, causing safety concerns for motorists, bicyclists, and pedestrians. The project's improvements will mitigate flooding with the construction of a new bridge that facilitates a better flow of water in addition to constructing drainage and other stormwater improvements.

1.1 Broader Investment Context

1.1.1 Relationship to Military Installations and Growing Businesses

The Great Mills project is an important link to nearby military facilities and will be even more important as the area's population continues to swell. The economic driver of St. Mary's County and lower Calvert County, MD is NAS PAX, which supports \$2.4 billion in wages on an annual basis and \$7.5 billion in output to the Maryland state economy. NAS PAX is located on a peninsula in St. Mary's County, Maryland, approximately 65 miles southeast of Washington, D.C., where the Chesapeake Bay and Patuxent River converge. The installation includes the Main Site, approximately 6,500 acres located in Lexington Park, Maryland, and WOLF, approximately 857 acres located nine miles south of the Main Site

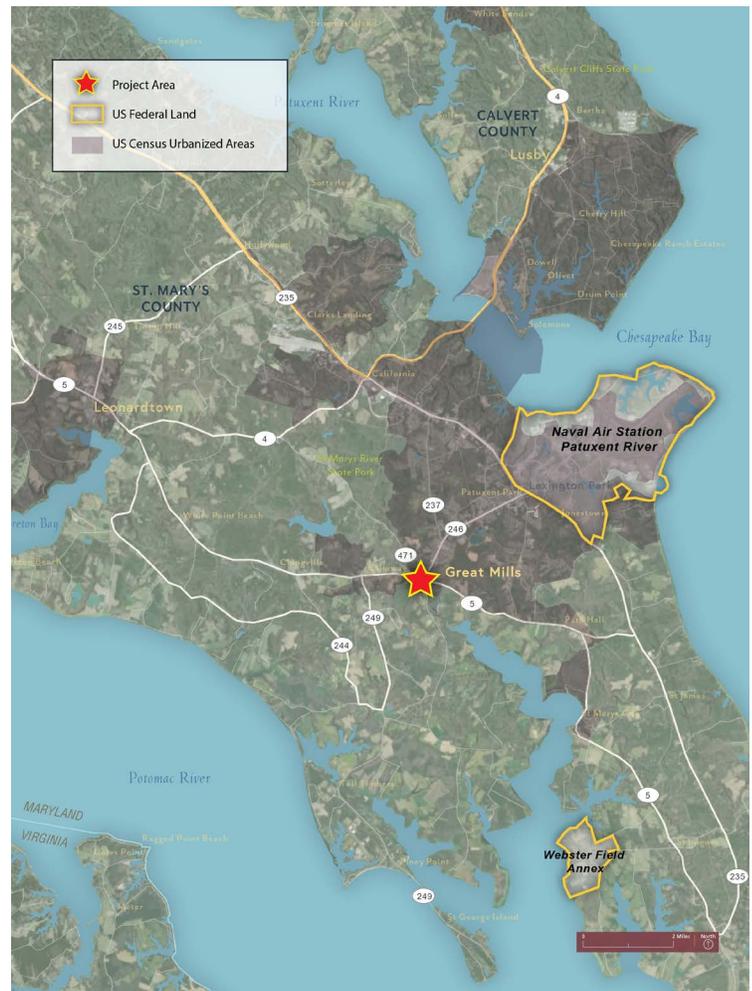


Figure 1: Great Mills Project's Proximity to NAS PAX, Federal Lands, and Urbanized Areas



MD 5 Great Mills Improvement Project

Adding Capacity, Improving Safety Rural Maryland

in St. Inigoes, Maryland. The NAS PAX installation includes five runways and approximately 935 buildings. Since its commissioning on April 1, 1943, NAS PAX has evolved into the Center of Excellence for Naval Aviation. Approximately 80 percent of St. Mary’s County’s revenue is due to its direct and indirect economic relationship to NAS PAX. The County’s economic development plan, adopted in 2017, highlights the importance of NAS PAX to the County and showcases a commitment to preserving and protecting the mission of NAS PAX in the plan. Figure 1 shows the relationship between the project limits and the military installations.

The base’s arrival in 1943 and growth due to base realignment and closure (BRAC) changed the landscape of St. Mary’s County and Southern Maryland. The County had been rooted in agriculture and seafood industries since its founding, and the base brought advanced science, research, development and military personnel and culture into the into the area. In the mid-1990s, NAS PAX became home to the Naval Air Systems Command (NAVAIR) and the Naval Air Warfare Center Aircraft Division (NAWCAD), as well as 50 other tenants. NAVAIR is responsible for the research, design, and acquisition of naval aviation resources serving the Navy and Marines. NAWCAD is the test, evaluation, development and research entity serving NAVAIR and is the base’ and St. Mary’s County’s larger employer. What had been a two-lane road down to NAS PAX from Charles County and the Washington, D.C. area transformed into an 8-lane road as the base’s importance and its workforce grew and as private industries expanded or located in the County to serve its activities.

Webster Outlying Landing Field (WOLF) is an extension of NAS PAX. At WOLF, NAWCAD employees conduct all combat identification, including identification of friend or foe, C5I (Command, Control, Communication, Computers, Collaboration and Information) systems, and all Navy air traffic control operations. Subject matter experts in lead systems integration, these employees conduct critical rapid engineering projects for all branches of the Department of Defense and perform over \$1 billion worth of work every year. WOLF is also home to the Unmanned Aircraft Systems Test Directorate, which does research, development, test and evaluation for all of the Navy and Marine’s unmanned aircraft systems.

Today, 21,500 people work at NAS PAX, 1,550 people work at WOLF, and 300,000 people come into the region to visit the base annually. Table 1 illustrates the growth of NAS PAX between 1985 and 2011. Eighty percent

“ The concern that we have is that the Great Mills-Route MD 5 intersection has been one of the two worst intersections we have in the county. Through the opportunity to work with federal and state agencies, we’re looking to be able to alleviate that traffic congestion by finding the funds necessary to get the problem fixed once and for all.”

Commissioner Todd B. Morgan
4th District, St. Mary’s County,
Maryland

	1985	1995	2005	2011
<i>Labor Force</i>	<i>Estimate 1985</i>	<i>Estimate 1995</i>	<i>Estimate 2005</i>	<i>Estimate 2011</i>
<i>Contractor</i>	4,004	5,400	9,400	10,053
<i>Military</i>	3,308	2,600	3,000	2,829
<i>Civilian</i>	3,893	4,300	7,800	9,541
<i>Total</i>	11,205	12,300	20,200	22,423

Table 1: NAS PAX Personnel Totals (1985 – 2011)



MD 5 Great Mills Improvement Project

Adding Capacity, Improving Safety Rural Maryland

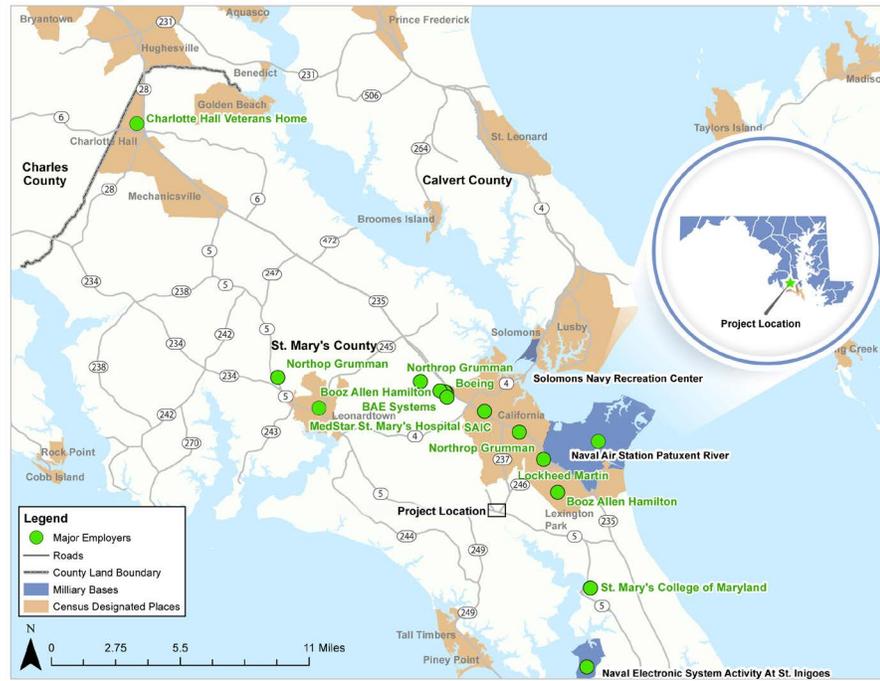


Figure 2: Great Mills Project, Military Bases, and Major Employers

of St. Mary's County's economy is derived from the flow of dollars from NAS PAX into salaries of the civilian and industry workforce. The Great Mills project improvements directly impact the commute times and safety for the workforce concentrated at NAS PAX and WOLF, thereby impacting the economic competitiveness of the County.

The Great Mills project's proximity to the base and its high-tech offerings make the project especially important to the local workforce. NAS PAX supports full spectrum acquisition management, research and development capabilities, air and ground test evaluation, aircraft logistics, and maintenance management. This synergy of missions supports land-based and maritime

aircraft engineering, testing and engineering (T&E), integration, and life-cycle support for ship/shore electronics. Combined, these capabilities are unique within the Department of Defense and ensure NAS PAX's status as an aviation leader. The facilities and infrastructure on the installation are also used by foreign governments, academic institutions, and private industry for similar projects. NAS PAX is the only base on which these crucial activities occur. As a result, the County is a hub for STEM and high technology jobs that rivals only Silicon Valley in California and Seattle-/Bellevue, Washington. Figure 2 shows the relationship between the project area, major employers and military bases. Much of the workforce lives north of the project area, meaning thousands of people are driving through that intersection every morning and every afternoon. The time spent in traffic is consistently referenced as an impediment to an exceptional quality of life. As in any region, the ability to get people quickly to and from their destinations is imperative.

The Great Mills project feeds NAS PAX's Gate 2, which is located across from Great Mills Road. Over 10,000 vehicles a day pass through this gate alone. Much of the traffic volume proceeds through the Great Mills project limits, causing these failing levels of service and significant queues during both the morning and afternoon commute. Furthermore, most of the 1,500 employees at WOLF traverse Route MD 5 to St. Inigoes. A military construction (MILCON)



Figure 3: Gate 2 at NAS PAX



MD 5 Great Mills Improvement Project *Adding Capacity, Improving Safety Rural Maryland*

project for upgrades to Gate 2 at NAS PAX has been a priority for several years. With these improvements, Gate 2 will become the Main Gate with 24-hour access and that increases the likelihood that traffic volumes will increase within the Great Mills project limits. Figure 3 shows the queue in both directions at Gate 2 located at NAS PAX.

The Great Mills project, consequently, will accommodate the increased flow of traffic and reduce build-up onto the public roadways. The project's ability to facilitate greater traffic flows will improve the relationship between NAS PAX, the community as well as provide members of the public a less congested route to work and retail establishments outside the gates.

Relationship to Designated Investment Areas

In addition to its relationship to nearby military installations and businesses that drive the county's growth, the project area is inside the State of Maryland-designated Sustainable Community and the State of Maryland designated Priority Funding Area. The project is also located the County's Development District and is 1.5 miles from the federally-designated Opportunity Zone. Much of the traffic that passes through that intersection will also drive through the Opportunity Zone. More information about the project's broader context is in Section 4.7.

Relationship to Other Improvements

The Metropolitan Commission (METCOM), the provider of public Water and Sewer Utility Commission in St. Mary's County, is currently replacing and relocating the sewer pumping station located at 20254 Point Lookout Road, Great Mills on the northeast corner of the bridge over the St. Mary's River within the project's limits. The Great Mills project replaces a bridge that experiences frequently flooding. Combined, the pump project and Great Mills project improves the intersections ability to move traffic during heavy rains. More information on this project is located in Section 4.4.

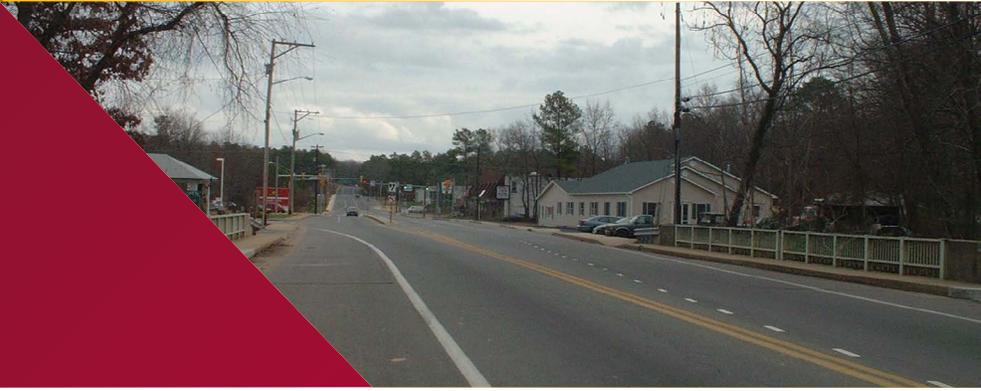
The East Run Medical Center sits just 0.8 miles north of the project location. The proposed development would allow for a community-based outpatient clinic that serves veterans as well as expanded residential development around the East Run Medical Center.

Another effort that is related to improving the functionality of the intersection located in the Great Mills project is the collaboration between St. Mary's County Government and State Highways that has resulted in the installation of a camera at the MD 5/Great Mills Road intersection.





2. PROJECT LOCATION



2.1. Existing Conditions

The Great Mills project comprises a two-lane Urban Other Principal Arterial (OPA), with either a wide shoulder open section or closed section with sidewalk, and uncontrolled access to the local businesses. The posted speed limit is 40 miles per hour (mph). Between the two intersections, MD 5 crosses the St. Mary’s River on a bridge, MDOT SHA structure #1800600, which was originally built in 1913, and widened in the 1955. The bridge has a width of approximately 48 feet and is currently in fair condition. It is considered “structurally sufficient” (Sufficiency rating of 6 out of 9 for superstructure, substructure and deck¹) and has some serviceable life remaining. Replacement or reconstruction of the bridge is anticipated within the next 20 years. Figure 4 shows the location of the project and its relationship to the bridge within the project limits.

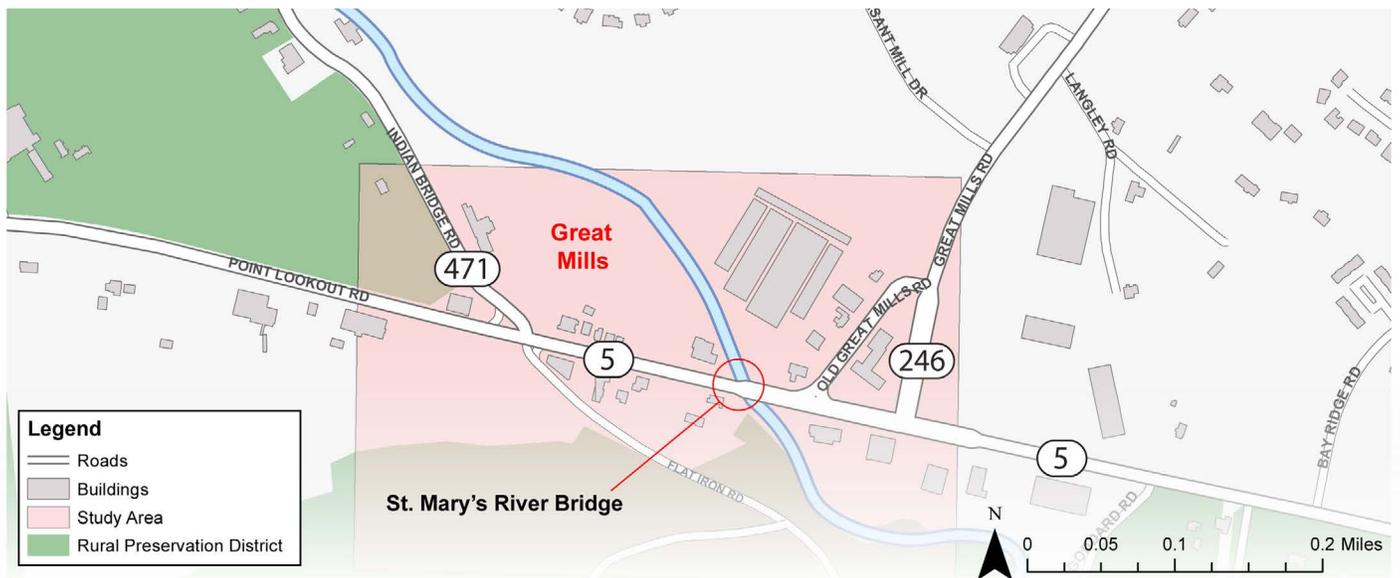


Figure 4: Great Mills Project and Location of Bridge

MD 5 includes single, left turn lanes at the four-way signalized intersection with MD 471. This intersection with MD 471 is at a 30-degree skew angle. This skew impacts traffic operations and creates sight line concerns. This section of MD 5 between MD 471 and MD 246 provides the most convenient roadway connection for the residents of Drayden, Piney Point, Tall Timbers, Valley Lee, and Callaway to reach northern and eastern destinations including Great Mills High School, Lexington Park, and NAS PAX.

¹ FHWA Bridge Sufficiency Rating Scale, Rated by MDOT SHA, 2019



MD 5 Great Mills Improvement Project

Adding Capacity, Improving Safety Rural Maryland

The Great Mills project has several routes that feed MD 5: MD 471 and MD 246. MD 471 is a two-lane urban collector with a posted speed limit of 40 mph. The north leg of MD 471 leads to MD 4 (St. Andrews Church Road), past the St. Mary's River State Park, and the south leg leads to a mostly residential area along the Potomac River. MD 246 intersects with MD 5 to the north only, at a 3-way signalized intersection, about 1,400 feet east of MD 471. MD 246 is a four-lane Urban Principal Arterial with a posted speed limit of 40 mph and leads to Lexington Park and the NAS PAX, which are major trip destinations in the area.

Currently, there are limited sidewalks provided for pedestrians in the project area. Sidewalks are provided on the east side of the St. Mary's River bridge around the MD 246 intersection, while almost no sidewalk is provided on the west side of the bridge, with the exception of small sections of driveway entrances to some of the businesses. Figure 5 illustrates the lack of sidewalks and difficult that pedestrians encounter when crossing the bridge within the project's limits.



Figure 5: Pedestrians on St. Mary's Bridge within Project Limits

Public transportation is operated by the St. Mary's County Department of Public Works and Transportation, the St. Mary's Transit System (STS). STS operates the Route 3 buses along MD 5 and MD 246 between Leonardtown and Lexington Park via Great Mills during the weekday peak periods. The public transportation routes are also served by complementary ADA services. NAS PAX operates one weekday round-trip shuttle bus from the base to Washington, D.C. area to access Reagan National Airport and the Bethesda Naval Hospital. With Great Mills High School along MD 246 and less than a mile from MD 5, multiple school buses use the MD 5/MD 246 intersection during the peak periods as well.

2.2. Project Improvements

The MD 5 Great Mills Project will improve traffic operations, safety, and pedestrian and bicycle connectivity. Furthermore, it will accommodate increasing traffic due to planned residential and commercial growth and ensure continued access to and from NAS PAX. The scope of this project includes:

- Widening and resurfacing of MD 5 (Point Lookout Road) to a divided four-lane closed section roadway;
- Eleven-foot wide outside travel lanes with five-foot bicycle lanes;
- Five-foot wide sidewalk along both sides of MD 5 with improvements to ADA ramps and the installation of pedestrian crossing signals;
- A new bridge over the St. Mary's River at the same grade as the existing bridge; and,
- Drainage improvements, installation of new stormwater management facilities, and landscaping.

As a result of these improvements, the level of service will be elevated to Level C in the morning and evening at MD 471 and MD 246, meeting MDOT SHA's goals as stated in the Purpose and Needs Statement. The project's bridge replacement and construction of connections at the two intersections then reduces congestion, provides



MD 5 Great Mills Improvement Project

Adding Capacity, Improving Safety Rural Maryland



Figure 6: Location and Description of Planned Improvements

continuous sidewalks on both sides of the road, and on-road bicycle lanes. Figure 6 shows the improvements to be constructed.

More information on Project Readiness and Feasibility is located in Section 5.

2.3. Project Need

The need for this project is based on the following:

Failing Levels of Service at Intersections: The intersections of MD 5 / MD 471 and MD 5 / MD 246 experience failing LOS in both the existing year and the future design year of 2040.

Long Queues During Peak Hours: There are multi-mile long traffic queues at these intersections during peak hours with a lack of robust transportation options. St. Mary's Transit System (STS) operates the Route 3 buses along MD 5 and MD 246. There are no convenient nearby Park and Ride lots for ride-sharers. NAS PAX operates one weekday round-trip shuttle bus from the base to Reagan National Airport and Bethesda Naval Hospital. There are no other shuttle services currently planned or in operation for use of the employees of NAS PAX. Further, the lack of pedestrian and bicycle facilities further constrains transportation choices.

High Crash Rates: The project area overall crash rate is 40 percent higher than the statewide average for similar roadways. Specifically, the rear end, left turn, and sideswipe collisions within the project area are significantly higher. The project would result in a 21 percent reduction in rear ends and a 15 percent reduction in left turn crashes.



MD 5 Great Mills Improvement Project

Adding Capacity, Improving Safety Rural Maryland

Geometric Deficiencies: The intersection of MD 5 / MD 471 has a skew angle of 30 degrees creating an undesirable geometric configuration. The skew angle configuration impacts traffic operations and creates safety concerns.

Roadway Flooding: The majority of the project area is within the 100-year floodplain. The approach roads to the bridge flood multiple times every year causing safety concerns for motorists, cyclists, and pedestrians. Replacing the bridge will mitigate 5-year flood impacts and will lessen stormwater overflow.

Disconnected Sidewalks/Bicycle Lanes: Most of this section of MD 5, through the residential and commercial district of Great Mills, does not have continuous accommodations for pedestrians and cyclists. There are limited sidewalks provided for pedestrians in the project area. Sidewalks are provided on the east side of the St. Mary's River bridge around the MD 246 intersection, while almost no sidewalk is provided on the west side of the bridge, with the exception of small sections at driveway entrances to some businesses.





3. GRANT FUNDS, SOURCES & USES OF PROJECT FUNDS



3.1. Sources and Uses of Funds

MDOT SHA and St. Mary's County are seeking a BUILD investment of \$14.95 million to provide 52 percent of the \$29,001,944 million cost of the Great Mills project. The remaining funds will be provided by Maryland's Transportation Investment Trust. Table 2 shows how funds will be expended for project improvements.

Category	State Funded	Fed Funded	Total Cost
Design and Engineering	\$ 2,100,000	\$ -	\$ 2,100,00
Right of Way Aquisition	\$ 4,651,165	\$ -	\$ 4,651,165
Construction Costs	\$ 7,300,778	\$ 14,950,000	\$ 22,250,779
Bridge	\$ 1,391,945	\$ 2,783,055	\$ 4,175,000
Maintenance of Traffic	\$ 916,990	\$ 1,833,431	\$ 2,750,421
Drainage	\$ 916,990	\$ 1,833,431	\$ 2,750,421
Landscape	\$ 261,997	\$ 523,838	\$ 785,835
Traffic Design/Sign/ Pavement Marking	\$ 272,221	\$ 544,279	\$ 816,500
Utilities	\$ 1,496,452	\$ 2,992,005	\$ 4,488,457
Roadway	\$ 1,228,028	\$ 2,455,319	\$ 3,683,347
Overhead (14.4%)	\$ 816,155	\$ 1,984,642	\$ 2,800,797
Project Total	\$14,051,943	\$ 14,950,000	\$29,001,944

Table 2: Project Budget Summary by Use and Source



4. MERIT CRITERIA



4.1. Safety

The existing traffic patterns indicate that most traffic travels eastbound on MD 5 to northbound MD 246 in the morning peak-hours and westbound on MD 5 from southbound MD 246 in the evening peak-hours. These patterns reflect commuter traffic traveling from residential areas in the southern portions of Great Mills and residential areas west of Great Mills, north to downtown Lexington Park, commercial areas along the northern portion of the MD 246/MD 235 corridor, and NAS PAX.

Traffic counts were compiled by MDOT SHA for two consecutive 24-hour periods, and average daily traffic (ADT) volumes and traffic delays were calculated for both intersections within the project area. In addition, peak period observations (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) were performed in the study corridor to examine existing traffic operations and vehicular queues.

MD 471/MD 5 Intersection

The existing traffic volume through the MD 471 intersection is 19,475 vehicles per day (vpd), and the average intersection delay is 58.8 seconds in the morning peak-hours and 45.8 seconds in the afternoon peak-hours. Overall traffic operation for this intersection is Level of Service (LOS) E in the morning peak-hours and LOS D in the evening peak-hours. Particularly, the traffic operations through MD 471 and Flat Iron Road are LOS F for both morning and evening peak-hours for both northbound and southbound directions. Peak hour observations indicate that during the AM peak the eastbound MD 5 queues at the intersection extend up to approximately two miles. The observed travel time from the end of the queue to the MD 471 intersection was approximately 12.5 minutes. These queues dissipated by the end of the AM peak period.

MD 246/MD 5 Intersection

The existing traffic volume through the MD 246 intersection is 18,600 vpd, and the average intersection delay is 43.7 seconds in the morning peak-hours and 37.6 seconds in the afternoon peak-hours. The overall traffic operation for this intersection is LOS D in both the morning and evening peak-hours. Each leg of the intersection is LOS D other than the through traffic on MD 5; where westbound and eastbound through traffic is LOS C in the morning peak-hours and evening peak-hours, respectively. Peak hour observations indicate that during the PM peak, the southbound queues along MD 246 are extensive, particularly for the right turns to westbound MD 5. In addition, the westbound MD 5 PM peak queues are extensive at this intersection, particularly westbound through-traffic. Consistent cycle failures were observed for this movement. The bridge over St. Mary's River acts as a bottleneck along westbound MD 5, since traffic on two through lanes merge into one lane approaching the bridge.



Future Traffic Demand Forecasts

Traffic volumes are projected to increase by 27 percent by the year of 2040. This projection is based on the calibrated regional travel forecast model developed by MDOT SHA, which accounts for projected development, employment, and population growth. Therefore, traffic operations would worsen at the MD 471 intersection, while the overall traffic operation remains the same at the MD 246 intersection.

For the MD 471 intersection, the overall traffic operation would be LOS F during both morning and evening peak-hours under the current roadway conditions. Traffic operations at MD 471 and Flat Iron Road would remain LOS F, except for northbound traffic morning peak-hours. Traffic operations at MD 5 would worsen to LOS F for both eastbound and westbound traffic in the morning peak-hours and evening peak-hours, respectively.

For the MD 246 intersection, the overall traffic operation would remain LOS D for both morning and evening peak-hours under the current roadway conditions. Traffic operations on MD 246 would remain at the same level, while traffic operations would worsen to LOS E in peak-hours traffic directions, though not enough to worsen the overall traffic operation at the intersection. Table 3 shows the level of service at the two intersections within the project limits at existing and no-build conditions.

<i>Intersection</i>	<i>Level of Service</i>	
	<i>Existing (2016) AM / PM</i>	<i>No-Build (2040) AM / PM</i>
<i>MD 5 at MD 471</i>	<i>E / D</i>	<i>E / F</i>
<i>MD 5 at MD 246</i>	<i>C / F</i>	<i>C / F</i>

Table 3: Level of Service at Two Intersections within Project Limits

Crash History Analysis

From 2009 to 2018, 154 crashes occurred within a half-mile of the project segment around the intersections of MD 5 with MD 246 and MD 471, including 69 serious injuries. **The expansion of the roadway and changes of roadway geometry on MD 5, in addition to the improved facilities for bicycles and pedestrians, are projected to reduce crashes by an average of about 20%, or an average of three incidents annually. The prevention of these crash incidents is calculated to be \$173 million in discounted 2017 dollars.**

The overall crash rate from 2015 to 2017 within the project area is 315.0, which is significantly higher than the statewide crash rate of 169.8. Moreover, most of the collision types have a significantly higher crash rate in

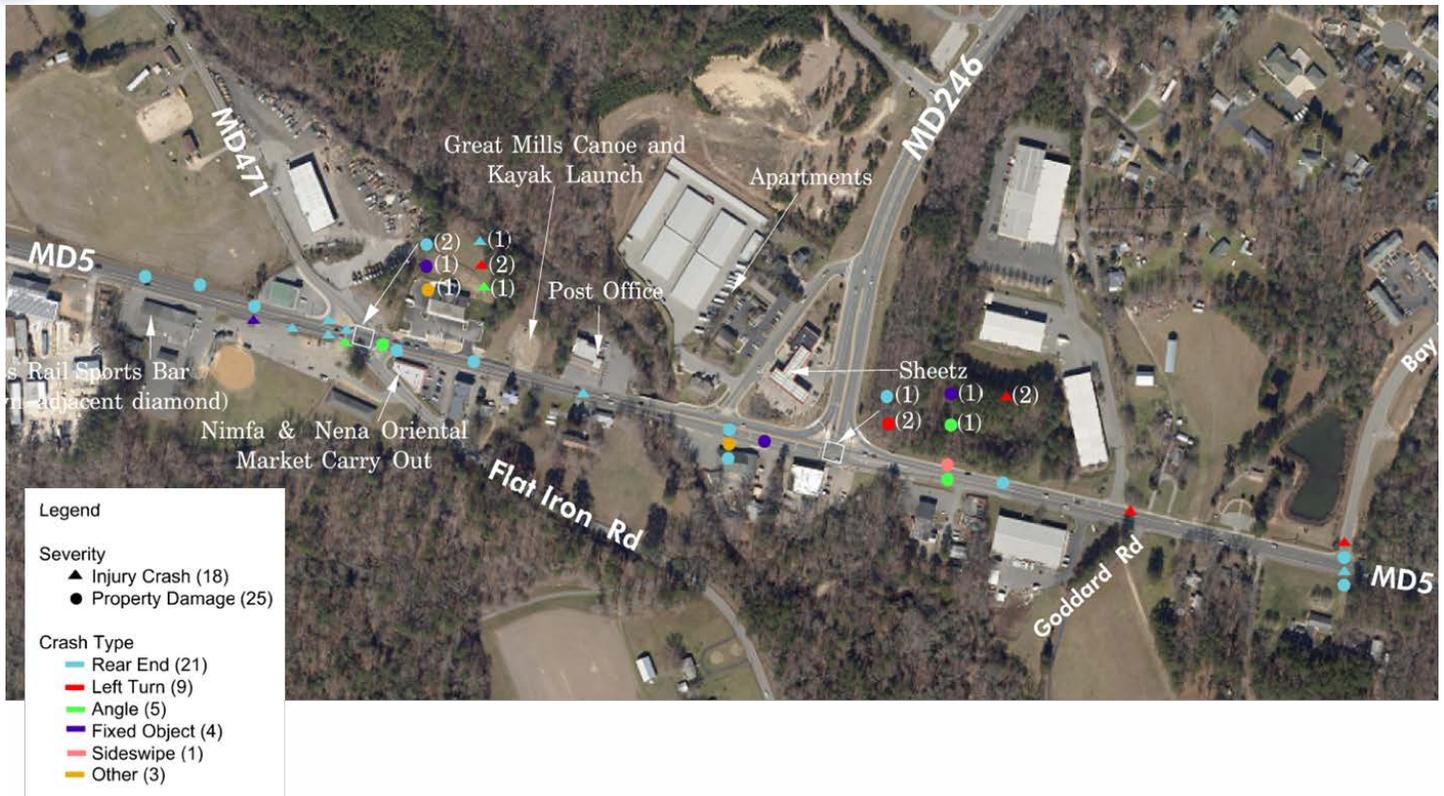


Figure 7: Great Mills Crash Summary (2015-2017)

comparison to statewide crash rates. Rear-end, sideswipe, and left-turn collisions occurred frequently with a crash rate of 173.8, 21.7, and 32.6 respectively, compared to 55.3, 11.4, and 13.3 statewide rates. Figure 7 shows the type and location of crashes occurring within the project limits from 2015 to 2017.

In terms of collision types, 60 percent that occurred during the 2015 to 2017 period resulted from rear-end collisions, which is a 15 percent increase from crash data covering 2010 to 2014. According to the crash data for the project area, the contributing factor for most of the rear-end collisions was following too closely. The numerous access points along MD 5 are a main factor for the high rates of sideswipe and left turn collisions. The total crash rates and the rates for rear-end, left-turn, and sideswipe collisions are significantly higher than statewide rates for state maintained highways with similar functional classifications. In addition, during the 2015 to 2017 period, truck-related (21.7 percent) and wet surface (34 percent) crash rates were significantly higher than statewide rates (10.5 and 21 percent respectively).

No significant crash data on pedestrian or bicycle related collisions were recorded within the project area for either data period.

Emergency Evacuation Route

The project area is located near the tip of a long peninsula on the Western Shore of Maryland, ending at the southern end of the Chesapeake Bay. There are only two evacuation routes off the St. Mary’s County peninsula – MD 5 and MD 235. Should a national emergency occur, MD 235 (which accommodates more capacity than MD 5) would lead evacuees *toward* the National Capital Region (NCR), which is an unlikely path during a state of emergency. MD 5 would facilitate the more likely evacuation across the Harry W. Nice Memorial/Thomas “Mac” Middleton Bridge (Nice Bridge) across the Potomac River into Virginia.



In a national emergency scenario, the project area in Great Mills would be a critical bottleneck for the estimated 21,000 people who would need access to the MD 5 evacuation route.

St. Mary's would ask the Federal Emergency Management Agency for support of the National Guard in the following situations:

- Rt. MD 5 flooded and impassable for multiple days or based on event extended period of time
- Evacuations on Atkins Road, to include Atkins Trailer Park
- Evacuations and Traffic Control at the intersection of Great Mills Road and Point Lookout Road; and,
- Evacuations for Dam Breach.

4.2. State of Good Repair

MDOT SHA takes a proactive position to ensure a long-term state of good repair and appropriately plans for increases in traffic volume. As initially found in the 2016 Purpose and Need Statement, the project need is substantiated by traffic operations and safety. This BUILD project is consistent with MDOT SHA's efforts to improve the condition of existing transportation facilities and systems, maintain assets in a state of good repair to minimize life cycle costs, and improve resilience. All operation and maintenance on Maryland's state highways are performed by MDOT SHA. With over 17,000 lanes miles to operate and more than 25 percent of those roads rated in poor condition, MDOT is keenly aware of the critical need to maintain its system to safely and effectively move people in a variety of modes.

4.3. Economic Competitiveness Rapid Growth in Population and Tech Industry

Nestled just 38 miles southeast of Washington DC lies St Mary's County – home to NAS PAX, WOLF, over 200 high-tech firms, Maryland's first Federal Aviation Administration (FAA) unmanned aircraft system test site, and a workforce that has grown by 19 percent over the past decade.² In a study conducted by *24/7 Wall St.* that reviewed U.S. cities' labor forces to determine the cities with the most high-tech jobs, California-Lexington Park, MD was found to be the city with the highest share of tech-jobs in the county – with nearly a quarter (24.8 percent) of the area's entire workforce employed in a STEM field.³ The County's rapid growth in the technology industry has also contributed to its large influx in population. Since 2010, St. Mary's County has experienced population growth at a rate of 7.15 percent since 2010 – fifth highest in the State of Maryland - well above the U.S. national average of 5.96 percent.⁴ In addition, by 2040, the Maryland Department of Planning has predicted that St. Mary's County will see an increase in population by nearly 40 percent (Figure 8), the largest increase of any county within the state.⁵ Resulting in induced demand on many of the County's roadways; in particular MD 5. Creating a major strain on an already taxed transportation grid.

Research shows that the MD 5 corridor has been one of the primary areas most affected by the increase in population. Since 2010, the stretch of MD 5 between MD 246 and MD 471 has experienced a 27 percent increase in Annual

² <https://www.stmarysmd.com/ded/techbook/media/docs/TechBook-2018-FINAL.pdf>

³ <https://www.usatoday.com/story/money/business/2019/03/25/stem-jobs-15-cities-hiring-most-high-tech-workers-us/39125247/>

⁴ U.S. Census Bureau, Population Division and Maryland Department of Planning, Projections and State Data Center, August 2017

⁵ Maryland Department of Planning, Projections and State Data Center, August 2017



POPULATION GROWTH IN ST. MARY'S COUNTY

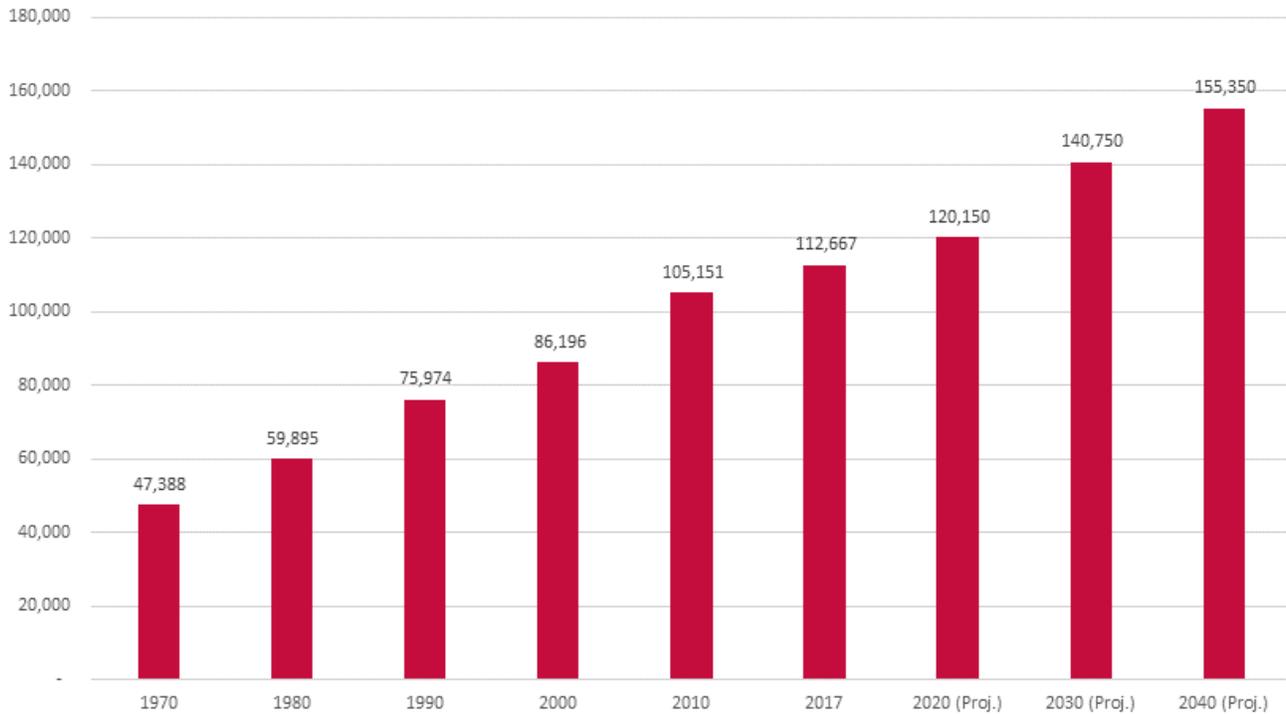


Figure 8: Population Growth in St Mary's County

Source: U.S. Census Bureau, Population Division and Maryland Department of Planning, Projections and State Data Center, August 2017

Average Daily Traffic (AADT).⁶ The increase in AADT can be attributed to heightened U.S. military activity at NAS PAX and WOLF in the vicinity of Great Mills that has spurred on an influx of military personnel, contractors, and associated services. In particular, the BRAC in the mid-1990's generated an increase of about 64 percent in military and civilian employment at NAS PAX.⁷ This had a profound effect on the California-Lexington Park urbanized area, which today has the second-highest employment cluster strength (0.80) in the state of Maryland – just behind Montgomery County.⁸ Currently, the three aforementioned military installations employ approximately 21,500 people, including civilian employees, contractors and active duty personnel. Restaurants and retail services have also boomed in the area to accompany this growth.

Access to these employment centers is critical to job retention and growth. In a study that looked at the impact of commuting, survey results showed that over a quarter (26 percent) of the survey respondents had gotten to the point of looking for another job due to their commute. In addition, a recent study in Maryland reveals that traffic congestion is a top priority for the workforce in greater Washington, D.C. region; potential employees and employers look to St. Mary's County, and the project area as a "best of both worlds" alternative to locating in the greater Washington, D.C. region, with lower housing costs, a less stressful lifestyle, and shorter commutes. Due to a lack of modal options and more induced demand on St. Mary's roadways, the MD 5 Great Mills Improvement

⁶ Maryland State Highway Administration via <https://data.imap.maryland.gov/datasets>

⁷ https://www.cnic.navy.mil/regions/ndw/installations/nas_patuxent_river.html

⁸ <http://www.clustermapping.us/region>

⁹ http://www.transitchek.com/uploadedFiles/Transit_Resources/IndustryInformation/2008_Business_Week_Survey.pdf.pdf



MD 5 Great Mills Improvement Project *Adding Capacity, Improving Safety Rural Maryland*

Project will ensure prospective employers and employees can achieve the quality of life, high tech job opportunities, and ease of access to life's opportunities that they have come to expect in the project area.

Currently, nearly 20 percent of the St Mary's population lives within two-miles of the proposed project site.¹⁰ In addition, over 5,000 of St Mary's 28,000 residents between the ages of 18 and 54 reside in this two-mile buffer.¹¹ These numbers will continue to rise; as it is estimated that over 6,000 new jobs will enter Southern Maryland by 2024.¹² This will make it difficult for residents to access essential destinations such as jobs, schools, and activity centers along MD 5. Based on 2015, inflow/outflow job count data, the California-Lexington Park metropolitan area currently sees an influx of 13,060 employees that live outside the area, an outflow of 23,864 employees that live within the area, and a constant workforce of 20,387 that lives and works in the California-Lexington Park metropolitan area.¹³

Economic Development Investments Impacted by the Project

Given NAS PAX's role in the economy of the region, the County is working to integrate with the installation's high technology specialization. The County, as a result, has made economic development investments in light manufacturing. For instance, JF Taylor Engineering & Integration Facility was constructed within the project limits and it is an 84,699 square foot production facility. The production facility is for the manufacturing of finished products or parts, primarily from previously prepared materials with a focus on unmanned aerial vehicles and aircraft prototypes, training systems and aircraft modifications kits and parts. Allowed uses at the facility include processing and fabrication.

Additionally, engineering, design development and integration of communication and intelligence systems at WOLF is expected to increase. There are no more available facilities or space on the base to support its expansion. At the same time, other private contractors are looking for space along the Great Mills Corridor for their expansion in light manufacturing. The County views the Great Mills Corridor as ideally situated to meet the demand for light manufacturing and the Great Mills project will assist in this expansion.

There are also two housing developments that are close to the Great Mills project. The approval and planning process for sixty townhouses, known as Bay Ridge Estates, is underway at 45671 Pleasant Mill Drive, Great Mills. A Planned Unit Development (PUD), entitled Wildewood, covering approximately 400 acres and is envisioned to contain 40 acres of commercial development and 1,600 housing units. Both developments will require access to the Great Mills corridor and the intersection within the project limits will be a critical throughput.

The Great Mills project also facilitates development at the County's airport. Several key economic initiatives are underway at the St. Mary's County Airport, including construction of new airport West Apron and new airport electrical vault; relocation of Airport Road in preparation for taxiway relocation; continued construction of airport office buildings; creation of an Innovation District Master Plan; and Transformation of the Southern Maryland Higher Education Center to the University of Maryland at Southern Maryland. The airport is an economic engine and center of academic excellence in the county, as well as a source of recreation for the general aviation community.

¹⁰ U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

¹¹ U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

¹² Maryland Department of LLR: Workforce Region Occupational Projections - Maryland Occupational Projections - 2014-2024 - Workforce Information & Performance

¹³ U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2015)



4.4. Environmental Sustainability

4.4. Environmental Context

The project area is located within the Lower Potomac River watershed, with tributaries draining to the St. Mary's River. Streams within the project area are classified as Use I. Johns Creek within the project area is a Tier II designated high-quality watershed. Figure 9 illustrates the environmental context and the location of the project. National Wetland Inventory (NWI) and DNR mapping identifies wetlands located along MD 5, east of MD 246, as well as wetlands within the vicinity of MD 471, both north and south of MD 5. Field delineations were completed in October 2015. The majority of the project area is located within the St. Mary's River and Johns Creek 100-year floodplain. MDOT SHA records indicate that MD 5 needs to be closed for traffic one to two times per year due to roadway flooding during tropical storms or hurricane events. The water levels on MD 5 can be in the range of 2 inches to 16 inches during these events. The areas that have been closed due to flooding include MD 5 from MD 246 to the western edge of the project area, and north along MD 264 and MD 471 approximately one third of a mile. Examples of the flooding and erosion occurring at the site of the bridge within the project limits are shown in Figure 10.

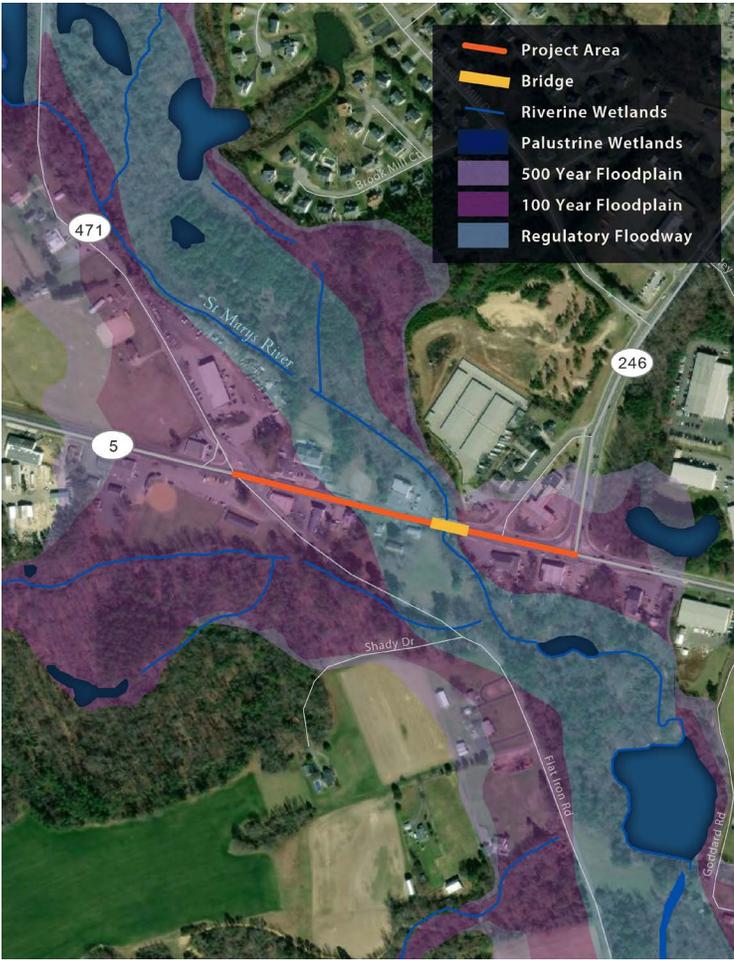


Figure 9: Watersheds within Project Limits



Figure 10: Flooding and Erosion at St. Mary's Bridge within Project Limits

This is corroborated by the preliminary hydraulic analysis that indicated that the bridge would be overtopped by flood water in a five-year storm event, and a two-year storm would raise the water elevation to reach the bottom of the bridge structure. A more detailed hydraulic analysis would be completed as part of this planning effort.



Environmental Impacts and Project Improvements

The project intends to deliver stormwater and environmental benefits to the project area. Replacing the bridge on the same profile would mitigate five-year storm impacts. Further, the project will remove the center pier on the bridge, thus increasing the opening size for the flow of water. Since there is a potential for additional erosion with higher stream velocities, the project will also construct stream riffles upstream of the bridge.

Related Improvements that Enhance Environmental Sustainability

Within the project limits, METCOM is replacing and upgrading an existing pump station originally constructed in the early 1908s. This \$7.6 million wastewater pump will increase capacity from 676 to 1,500 Equivalent Dwelling Units (EDUs). It is designed to pump an estimated 1,000 gallons per minute and is equipped with an emergency back-up generator and pump. The new facility will be relocated out of the St. Mary's River floodway and out of possible future MDOT SHA construction / widening of the bridge and intersection near MD 246 and MD 5. Construction is approximately 35 percent complete at this time and should be completed by the fall of 2020. Funding is being provided by a Maryland Water Quality Finance Administration Loan (MWQFA), which was borrowed at the time of contract award.

“ This \$7.6M project will replace and upgrade the existing pump station originally constructed in the early 1980’s. The project is intended to help facilitate the State’s project, support the Commissioners of St. Mary’s County’s priority project list, and improve service to our customers.”

**George Erichsen, Executive Director
St. Mary’s County Metropolitan
Commission**

Figure 11 below shows the existing pump facility and its proximity to the bridge within the Great Mills project limits.



Figure 11: Existing Pump Facility within Project Limits



MD 5 Great Mills Improvement Project

Adding Capacity, Improving Safety Rural Maryland

St. Mary's County has collaborated with the Maryland Department of the Environment to use geographic information systems (GIS) technologies to map and predict flooding in the MD 5 / Great Mills area. Tidal and storm surge calculations were combined with topographic data to provide emergency management staff with data about emergency weather events.

4.5. Quality of Life

While the Great Mills project provides critical connections between military installations and growing businesses in the area, the corridor also connects important community landmarks, ranging from housing to public services to recreation spots. Land use within the vicinity of the Great Mills project limits is predominately commercial and residential, interspersed with wooded areas. Residential dwellings are mostly located along MD 5, west of the St. Mary's River crossing. Institutional and public land uses in the project area include the Old Holy Face Church, the Great Mills Post Office, Great Mills High School and the Little Flower School. Smaller areas of other land uses are spread throughout the project area. Recreational facilities interfacing with the project's limits include Great Mills Canoe and Kayak Launch, James W. Henderson Park, Great Mills Swimming Pool, St. Mary's River State Park. Improvements to the intersection and bridge within the project limits will help residents gain access to these community facilities and recreational amenities. Figure 12 shows some of these nearby amenities.

"This is a real opportunity for St. Mary's County to solve a traffic problem that we have been waiting for a long time. It will relieve congestion for our residents, whether their travel is work or recreation."

Randy Guy
St. Mary's County Commission
President



Figure 12: Community Facilities Impacted by Great Mills Project

The County has been steadily expanding and building road, pedestrian, and bicycle networks to meet the demand of the population. The project will add bike lanes to improve the National Park Service-designated Southern Maryland Potomac Heritage Trail on-road bicycling route that runs on MD 5 from the county seat of Leonardtown south to Point Lookout. The addition of bicycle lanes at this congested and hazardous section of the corridor will improve safety for bicyclists and motorists. The addition of continuous sidewalks on both sides of MD 5 will provide pedestrian connections between residents and local businesses. ADA-compliant sidewalks will improve access for wheelchair users.

In addition to sidewalks, the project will improve the safety and convenience of using public transportation. St. Mary's Transit System is a small fixed route and demand-response bus transit agency with a total of 19 vehicles and 380,000 unlinked passenger trips per year. STS operates its Great Mills Route (Route 3) bus service Monday through Friday along MD 5 from 6:00 a.m. to 7:00 p.m. Two bus stops are located within the project area at the MD 5/MD 246 intersection on the east and west side of MD 5, respectively, at the Sheetz Gas and Convenience



MD 5 Great Mills Improvement Project *Adding Capacity, Improving Safety Rural Maryland*

Store. There are no passenger amenities such as shelters, benches, or sidewalk connectivity to the bus stops.

A fully developed, multi-modal transportation system has the potential to induce growth, helping implement St. Mary's County's land use plans in the project area and beyond. It will shape development in the Lexington Park Development District and determine the area's character and quality of life. The result will be a coordinated, integrated, and safe transportation system which supports community revitalization; economic development, and environmental stewardship.

The project area is also within the Lexington Park Development District (the District boundary is similar to the priority funding area boundary). The 2010 St. Mary's County Comprehensive Plan envisions the Lexington Park Development District as the principal growth area for the County. The County updated the Lexington Park Development District Master Plan in 2015 to shape and direct growth in the next 30 years.

The Lexington Park Development District Master Plan focuses on the development district becoming the County's mixed-use center. NAS PAX is the anchor on the MD 235 side of the district and MD 5 is at the other end. The improvement in the Great Mills project is essential for allowing connectivity for all types of transportation: transit, bicycle, pedestrian, car, and car pool.

The Plan has designated that most of the MD 5 Great Mills project area is within the Great Mills Road Corridor (MD 246) focus area. The District Master Plan identifies the Great Mills Road Corridor, along with the Downtown focus area, as providing the gateway to NAS PAX. In addition, the Plan identified the corridor as one of the focus areas having significant existing development that would benefit from infill development, redevelopment, and design and infrastructure enhancements.

4.6. Innovation

The Maryland Department of Transportation is committed to leveraging innovative techniques to deliver high impact transportation projects. Over the last several years, MDOT SHA has incorporated numerous innovative processes to more efficiently deliver projects. As part of MDOT SHA's innovative culture, each project is reviewed to determine if innovative methods in project deliver or construction can be applied. In the case of this project, a review was conducted that determined significant project delivery benefits could be obtained through the innovative use of Construction Management at Risk / Construction Manager General Contractor (CMAR/CMGC) process.

There are several benefits to the project that are expected by utilizing the CMAR/CMGC delivery process:

- By bringing the contractor on board during the design phase, MDOT SHA is expected mitigate issues up front leading to a lower overall cost. By including the contractor review, the designer can produce better

“The Great Mills project is at one of the two major terminal points of the Lexington Park Development District. The project will make the bridge one of the signature, gateway features for the Development District. It will show off the best of St. Mary's County through a multi-modal facility that can be used and enjoyed by all: cars, bicycles, pedestrians. A transportation feature that can be used by all expresses the County's goal to provide healthy transportation alternatives that will help attract and keep a dynamic work force in the Lexington Park Development District.”

Bill Hunt

Director, St. Mary's County Department of and Use & Growth



MD 5 Great Mills Improvement Project

Adding Capacity, Improving Safety Rural Maryland

designs that reduce issues in construction and prevent change orders that can lead to project overruns.

- MDOT SHA expects a quicker construction schedule as the CMAR/CMGC process allows the contractor to begin planning the construction schedule during the design phase. By planning during the design phase the team can view how construction will impact traffic and adjust the construction schedule accordingly to minimize traffic impacts.
- CMAR/CMGC will allow construction to start sooner on earlier phases of work, without having to wait for the completion of the entire design.

By employing this innovative project delivery method, MDOT SHA expects to realize significant benefits in mitigating cost overruns through change orders as well as mitigating risks to schedule due to utility or right-of-way impacts. If a CMAR/CMGC construction cost cannot be negotiated, the plans developed through the CMAR/CMGC will be delivered using traditional low-bid procurement by the obligation date.

4.7 Partnership

The State of Maryland has recognized the importance of St. Mary's County to Southern Maryland and the greater State and regional economy. The State has designated the area between MD 5 and MD 235 as an "Opportunity Zone" and the Great Mills project limits are within 1.5 miles of the zone. The Opportunity Zone program is a nationwide initiative administered by the U.S. Treasury created under the 2017 Tax Cuts and Jobs Act. The program provides federal tax incentives for investment in distressed communities over the next 10 years. Areas designated as Opportunity Zones will be able to reap the benefits of capital gains to help redevelop underserved communities. Figure 13 shows the Great Mills project in relation to the Opportunity Zone and Sustainable Communities within the area.

In combination with the Lexington Park Development District Master Plan for a development district and the needs of a growing County workforce and population, the project's proximity to the Opportunity Zone further underscores the economic development potential within the Great Mills project limits. The Great Mills project, consequently, will help facilitate the movement of people and goods within the areas, making this Opportunity Zone and development district a place most attractive to potential employers and investors.

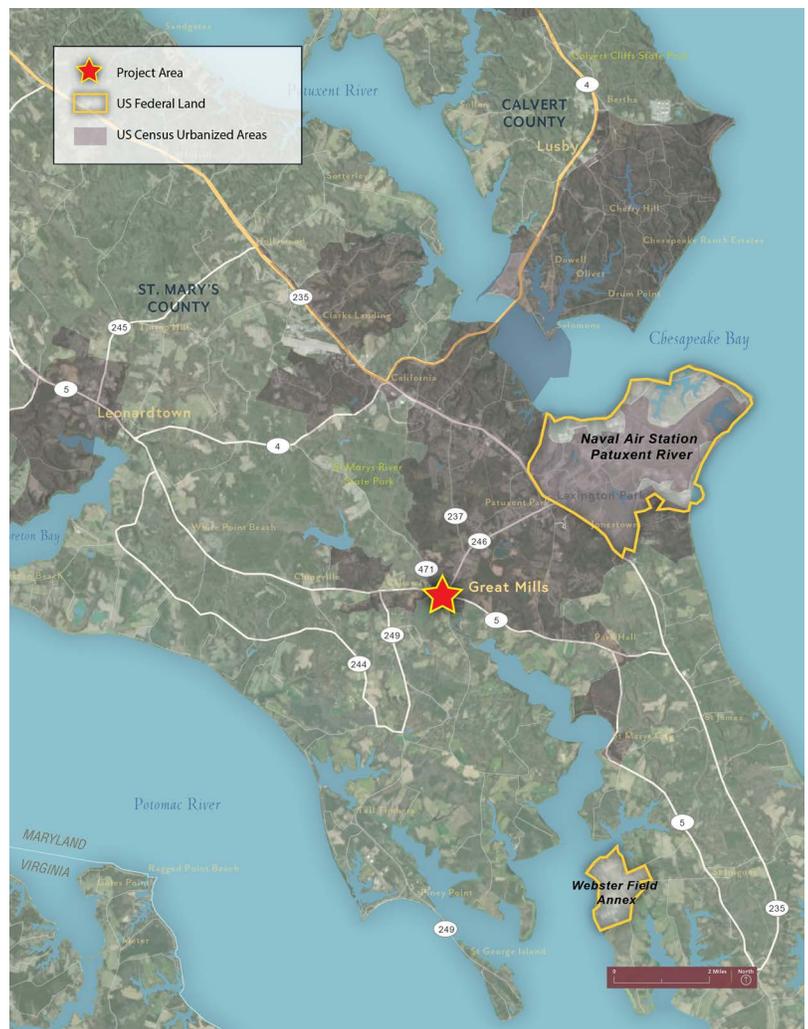


Figure 13: Great Mills Project Relationship to Opportunity Zone and Sustainable Communities



5. PROJECT READINESS



5.1. Technical Feasibility

MDOT SHA completed the MD 5 Great Mills Feasibility Study (January 2015) to identify transportation improvements to the section of MD 5 in Great Mills from MD 471 to MD 246. The feasibility study compiled data from existing sources and documented new information (e.g., traffic data) to effectively provide a roadmap for future phases of a MDOT SHA project planning study. The primary goal of the concepts developed in the feasibility study was to explore options to improve traffic operations, and secondly to alleviate roadway capacity and design deficiencies.

Subsequent to the development of the January 2015 Feasibility Study, the project moved into the NEPA/planning phase and project planning activities commenced. A Purpose and Needs Study was finished in March 2016. An Alternatives Public Workshop was then held in March 2016 to present the project’s purpose and need and receive public feedback on the improvement alternatives under consideration. In 2016, the project coordinated with the Smart Growth Working Group. The project was found to comply with the Priority Finding Areas law and no additional coordination was required.

In 2018, a Phase 1 archeological survey was completed. No sites were identified. Phase II would be required if the project expanded into Cecil’s Mill Historic District. In 2017, MDOT SHA coordinated with Maryland Historical Trust to determine a finding of “No Adverse Effect” is made on nearby architectural resources (Cecil’s Mill Historic District, Holy Face Catholic Church and Little Flower School. FHWA concurred with *de minimis* finding for minor impacts to church property in August 2017.

5.2. Project Schedule

Under the CMAR/CMGC process described above in section 4.6, the project schedule is expedited, with construction starting sooner on earlier phases of work as compared to a traditional design-bid-build process. If the MD 5 Great Mills project receives Categorical Exclusion approval in Summer 2019 as anticipated, the milestone dates for the project schedule are:

Semi-final Review	March 2020
Final Review	August 2020
Plans, Schedules and Estimates	December 2020
Construction Start	Summer 2021



5.3. Required Approvals

MDOT SHA is seeking a Categorical Exclusion for minor impacts (0.1 acre fee simple, 0.1 acre TCE) to park and recreational resources and approval is expected in Summer 2019. The project is also at the end of the Preliminary Engineering phase, moving forward to 65 percent design complete in fall 2019.

5.4. Assessment of Project Risks and Mitigation Strategies

Table 4 shows the primary risks for the Great Mills project, its potential impact and mitigation strategies.

RISK	IMPACT	MITIGATION STRATEGY
A Joint Permit Application will be required from MDE and USACOE due to bridge replacement associated impacts to St. Mary's River.	<ul style="list-style-type: none"> Application will require agency review and 30-day state public notice; additional time may be needed to address comments on stream stabilization work associated with the new bridge. Wetland mitigation will be required. 	<ul style="list-style-type: none"> Project schedule accounts for review time. Advanced mitigation credit is available at an existing mitigation site in the watershed.
Proposed project occurs in a FEMA floodplain designated a Zone AE, with floodway. A CLOMR may be required if the proposed bridge would result in an increased Base Flood Elevation (BFE) of more than zero foot.	<ul style="list-style-type: none"> Project schedule could be impacted since coordination with FEMA to obtain CLOMR takes about a year. 	<ul style="list-style-type: none"> It is anticipated based on all modeling performed to date, and the fact that we are improving hydraulic efficiency of the bridge that there will not be a CLOMR required. Instead a LOMR will be required following construction to update FEMA maps based on the new data. Therefore, the FEMA coordination task is not anticipated to affect the project schedule.
Three to four business displacements are anticipated.	<ul style="list-style-type: none"> Start of construction date could be impacted since ROW needs to be cleared before construction can start. Anticipate approximately 18 months to clear ROW. 	<ul style="list-style-type: none"> Design schedule is accelerated, which allows team to begin getting ROW plats earlier in the process.
Utility impacts are anticipated. Existing county sewer line is in conflict with the proposed bridge and will require relocation.	<ul style="list-style-type: none"> Construction schedule could be delayed. 	<ul style="list-style-type: none"> Design schedule is accelerated, which allows team to begin coordination with utility companies earlier in the process. County sewer pumping station is currently being relocated, so is not anticipated to be impacted by the project.

Table 4: Description of Risks, Impacts, and Mitigation Strategies for the Great Mills Project



6. BENEFIT – COST ANALYSIS



A benefit-cost analysis (BCA) was conducted for the MD 5 Great Mills Improvement Project for submission to the U.S. Department of Transportation (U.S. DOT) as a requirement of a discretionary grant application for the BUILD 2019 program. The analysis was conducted in accordance with the benefit-cost methodology as outlined by U.S. DOT in the 2019 Benefit-Cost Analysis Guidance for Discretionary Grant Programs. The period of analysis corresponds to 35 years and includes 5 years of construction and 30 years of benefits after operations begin in 2024.

The capital cost for this Project is expected to be \$29,001,944 in undiscounted 2019 dollars. At a 7 percent real discount rate, these costs are \$27.8 million in 2017 dollars. Net operations and maintenance costs are projected to average \$55,000 per year in undiscounted 2017 dollars in the “Build” and “No Build” scenarios. Over the entire 30-year operations period, these costs effectively result in a net zero change in operations & maintenance costs. Finally, net reductions in rehabilitation and replacement costs are expected to total approximately \$72,000 in 2017 dollars over this same period, or approximately \$58,000 when discounted at 7 percent.

The Project is expected to generate \$30.8 million in discounted 2017 dollars in benefits using a 7 percent discount rate. The roadway and bridge improvements on MD 5 will reduce the number of crash incidents within the project segment and reduce road congestion due to under-capacity. This leads to an overall project Net Present Value of \$8.9 million and a Benefit Cost Ratio (BCR) of 1.41. As such, the Project is expected to generate economic benefits that outweigh its costs.

Merit Criteria	Benefit	Monetized Value (with 7% Discount Rate)
Economic Competitiveness	Travel time savings	\$27.3
Safety	Crash reduction	\$ 2.1
State of Good Repair	Facility operations & maintenance/ rehabilitation savings	\$ 0.1
	Residual asset value	\$1.3
Total Benefits		\$30.8
Total Capital Costs		\$21.8
Benefit-Cost Ratio		1.41

As Table 5 shows, travel time savings and the reduction in crashes produce the greatest quantified benefits, illustrating the Project’s focus on facilitating economic competitiveness and improving safety for road users and pedestrians. The travel time savings includes in-vehicle travel time savings for drivers and passengers of autos. A reduction in travel time translates into more time available for work, leisure, or other activities. The reduction in crashes due to lane expansion and roadway improvements will mean fewer incidents of property damage and injuries for vehicle users and pedestrians; and, elimination of non-recurring congestion.

Table 5: Project Impacts and Benefits Summary, Monetary Values in Millions of Discounted 2017 Dollars



7. APPENDICES



- A. *Benefit-Cost Analysis Technical Memorandum***
- B. *Benefit-Cost Analysis Spreadsheets***
- C. *Letters of Support***

