



Maryland Department of the Environment
Antidegradation Review Report Form
**Social and Economic Justification –
Basic Outline for Public Entities**



Purpose

This form is designed to help applicants assemble a complete social and economic justification (SEJ) to complete the Antidegradation Tier II Review when there are certain unavoidable impacts to water quality. Pursuant to COMAR 26.08.02.04-1 (J), applicants must submit an SEJ if “(a) No cost effective alternative to the discharge is available; or (b) The cumulative degradation resulting from nonpoint source pollution and any other permitted discharges would diminish water quality”. Therefore, if impacts cannot be fully avoided, minimized, or mitigated, the applicant may have to provide MDE with an SEJ. The SEJ must demonstrate that an economic hardship and/or public benefit overrides the value of the ecological services or water quality benefit that the Tier II water segment provides. The applicant must also provide documentation to show that all reasonable avoidance, minimization, and mitigation alternatives have been considered, and where economically feasible, implemented.

The Department will use this information to determine whether or not the SEJ is complete, if it adequately justifies the impact to water quality, and to make a final permit determination. MDE may provide additional comments during the course of the review.

- **Introduction**

- Project Summary
- Impacts
- Antidegradation Policy
- Document purpose

- **Socioeconomic Contributions of the Project**

- Economic Importance and Benefit
 - Method of Financing and categorized project costs
 - Annualized cost of minimization implementation over estimated life of project.
 - Project cost allocation, i.e. costs related to financing that are passed along to end users
 - End users responsible for recouping financing
- Social Importance and Benefit
 - Widespread social benefits to the community affected, i.e. improved property values, community development potential, change in unemployment rates and household income, tax revenues, etc.

- **Socioeconomic Benefits of High Quality Waters (as applicable)**

- Social importance and benefit of maintaining high quality waters
 - Impacts on property value
 - Recreation value
 - Other quality of life benefits
- General Evaluation of Economic Impacts of waters of good quality
 - Costs of 1:1 in-kind mitigation for all net forest cover loss based on area market value
 - Estimated cost of stream restoration, per linear foot, based on area market value

- **Conclusion**

- **References & Appendices as needed**



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Board Members:

MEMORANDUM

DATE: January 29, 2021; February 25, 2021; April 7, 2021; **Revised June 28, 2022**
TO: Angel Valdez
FROM: Jason Harris
SUBJECT: I-95 at Belvidere Road Interchange
Cecil County, Maryland
MDTA Contract No: KH 3024-0000
FAP No.: BDG-95-1(517)N
RE: Tier II Social and Economic Justification – Basic Outline for Public Entities

1.0 INTRODUCTION

1.1 Project Summary

Maryland Transportation Authority (MDTA) is proposing the I-95 at Belvidere Road Interchange Project (Contract No. KH-3024-0000) which consists of constructing a new interchange in western Cecil County, Maryland where Belvidere Road crosses over I-95 between the MD 222 interchange to the west and the MD 272 interchange to the east. Improvements will include roadway widening, new ramps, new culverts and culvert extensions, utility relocations, and other construction work related to the new interchange. The project will accommodate already rapidly changing traffic demand and operations, address safety concerns within the roadway network, and support economic development in the area, while providing an environmentally sensitive multi-modal transportation system. The entirety of the project site is located within the Principio Creek 2 Tier II Watershed (Figure 1).

1.2 Impacts, along with Avoidance and Minimization

A worst-case Limit of Disturbance (LOD) was developed using the conceptual design to include both permanent and temporary impacts. Avoidance and minimization measures have already occurred to reduce impacts to environmental resources and are described in detail below. Impacts are anticipated to decrease as the design progresses and becomes more refined.

The following outlines impacts to streams, their buffers, and existing forest cover (details can be found in Tier II Alternatives Analysis - Minimization Alternatives form).

Streams:

Proposed impacts to streams and their buffers are mainly from roadway widening, new ramps, stormwater management (SWM) facilities and outfalls, and stream stabilization and restoration. The length of the streams within the LOD were calculated based on the delineated stream lines. There are approximately 4,641 linear feet of streams in the project area. The conceptual interchange LOD results in approximately 1,100 LF of proposed, post-development, impacted stream segments, and approximately 1,260 LF of potential Tier II Buffer impacts. The Tier II Alternatives Analysis - Minimization Alternatives form and narrative provide a detailed breakdown of the permanent riparian buffer impacts to state regulated waters.

Forest:

The conceptual interchange LOD results in 56.68 acres of forest impact. The Request for Proposal requires the Design-Builder to avoid tree impacts for stream restoration as much as possible. It also emphasizes avoidance and minimization of environmental resources throughout the project area, where possible.

Avoidance and Minimization:

The following avoidance and minimization measures were enacted during preliminary design to reduce impacts to existing forest cover, streams, and their buffers (details can be found in Tier II Alternatives Analysis - Minimization Alternatives form):

- The original interchange configuration was modified to use existing Belvidere Road as much as possible, which minimized impacts to the existing forest cover, waterways, and waterway buffers.
- Maintenance of traffic will be designed so that a temporary bridge to carry traffic on Belvidere Road over I-95 is not required, which also minimized impacts to existing forest cover, as well as waterways and their buffers.
- The entire in-fields of both loop ramps were originally included in the Limits of Disturbance (LOD) for staging and stockpiling; the LOD was reduced within the loop ramps, which reduces impacts to existing forest cover, waterways, and waterway buffers.
- The typical section of a portion of Belvidere Road was reduced through removal of one northbound travel lane; reduction of shoulders from 8 feet to 5 feet; and reduction of the median from 6 feet to 4 feet. This change reduced impacts to existing forest cover, waterways, and waterway buffers.
- The originally proposed culvert carrying a tributary to Principio Creek under Belvidere Road has been shortened and realigned to further reduce impacts to existing forest cover, this waterway, and its buffer.
- Retaining Walls have been provided in four locations which resulted in a reduction in impacts to existing forest cover, waterways, and waterway buffers.

The Request for Proposal provides the Design-Builder with incentives to avoid and minimize stream and forest impacts as much as possible. It also emphasizes avoidance and minimization of environmental resources throughout the project area, where possible.

1.3 Mitigation Measures

MDTA has created a mitigation package to help offset unavoidable impacts to Tier II Stream Buffers and existing forest cover within the Principio Creek 2 Tier II Watershed. Table 1 shows the proposed mitigation.

Table 1: Summary of Tier II Mitigation

I-95/Belvidere Road Interchange			
Proposed Tier II Mitigation Type		Mitigation Amount	Mitigation Location
In-kind, on-site	Reforestation	18.68 Acres	Principio Creek Tier II Watershed
Out-of-kind, on-site	Stream Restoration	1,928 LF	Principio Creek Tier II Watershed
Out-of-kind, on-site	Stream Buffer Preservation	14.87 Acres	Principio Creek Tier II Watershed
Out-of-kind, on-site	Wetland Preservation	2.20 Acres	Principio Creek Tier II Watershed
Out-of-kind, on-site	Wetland Recharge Protection	3.56 Acres	Principio Creek Tier II Watershed
Out-of-kind, on-site	Stream Stabilization	Waters P: 181 LF	Principio Creek Tier II Watershed

For details and maps of the proposed mitigation measures see the Tier II Alternatives Analysis - Minimization Alternatives form, narrative, and appendices.

1.4 Antidegradation Policy

The Maryland antidegradation implementation procedures are found in the Code of Maryland Regulations (COMAR) 26.08.02.04-1. These regulations also require states to maintain the condition of high quality (i.e. Tier II) waters that have water quality that is better than the minimum standard necessary to meet designated uses.

Assimilative capacity (AC) is defined in regulation as the difference between the Tier II water quality at the time the stream segment was designated as Tier II and the water quality criterion. In this instance, the water quality criterion is an Index of Biotic Integrity (IBI) of 3.00. The Tier II baseline IBI score is the score used to identify the stream as high quality.

The assimilative capacity analysis allows MDE to evaluate recent MBSS data to determine whether Tier II water quality has either been maintained or diminished. Regulations specify that the water quality of a Tier II water is considered diminished if the AC is reduced by more than 25% from the original Tier II designation baseline. This analysis identifies the Tier II stream's assimilative capacity threshold, which is the lowest acceptable benthic and fish IBI scores, after considering natural variability. When data is above the assimilative capacity threshold, MDE determines that there is some capacity remaining. Conversely, if there is a decline in scores to a level that is at or below the AC threshold, the stream is determined to have no remaining assimilative capacity.

The Principio Creek 2 Tier II Watershed has no assimilative capacity.

1.5 Document Purpose

The Project impacts have been avoided, minimized and mitigated to greatest extent practicable, but some impacts in the Principio Creek 2 Tier II watershed are unavoidable. The purpose of this document is to provide Social and Economic justification because there is no cost-effective alternative to the discharge in this Principio Creek 2 Tier II watershed. MDTA will demonstrate that the project provides an extraordinary economic and social public benefit which overrides the value of the ecological services or water quality benefit that the Tier II water segment provides.

2.0 SOCIOECONOMIC CONTRIBUTIONS OF THE PROJECT

The purpose of this project is to facilitate the safe and efficient flow of local, commuter, and commercial traffic and the movement of people and goods along I-95 in the Belvidere Road area. The project is needed to accommodate the increased traffic demand and operations associated with the current and ongoing development within the study area, address safety concerns related to additional traffic, and to ensure the ability of the roadway network in the vicinity of Belvidere Road to support economic development and job opportunities within the Cecil County Principio Enterprise Zone (CCPEZ).

The current and ongoing development in the study area consists of the Principio Business Park (PBP). The PBP is located between Principio Creek and Red Toad Road from US 40 north to the CSX tracks. It currently contains Perryville Cold Storage and distribution centers for GE, Amazon, Lidl, Medline, and Restoration Hardware. Additional buildings are under construction or planned for construction. These businesses require significant amounts of truck and commuter traffic. Additional development is expected in the area around the PBP.

This project is located within a Priority Funding Area within the Principio Tier II Watershed (Figure 1). The location of the planned new I-95/Belvidere Road interchange is classified in the 2010 Cecil County Comprehensive Plan as a future growth area. This project is also aligned with goals set out in the 2020-2023 Transportation Improvement Plan (TIP) for Wilmington Area Planning Council (WILMAPCO).

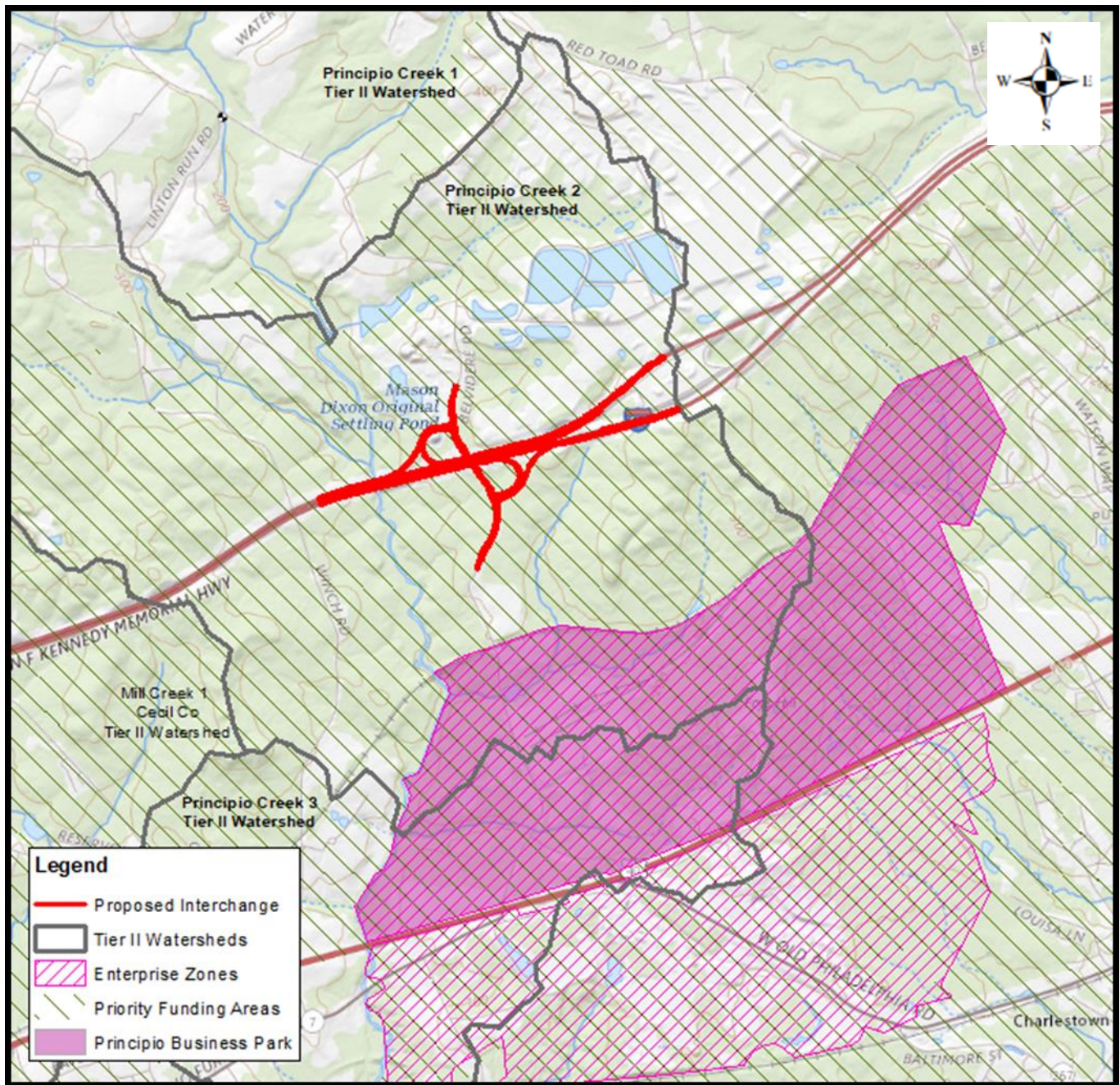


Figure 1 – Location Map

2.1 Social and Economic Importance and Benefit

The proposed project would bring many widespread social benefits to the surrounding communities, including safety, economic, and quality of life benefits. The Social and Economic benefits are detailed in the I-95 At Belvidere Road Interchange BUILD Transportation Discretionary Grant Application (Appendix A) and the project's Categorical Exclusion. A summary is provided below.

Firstly, from a safety standpoint, the proposed interchange would reduce local heavy traffic on US 40, MD 222, and MD 272 by as much as 40%, reducing truck-related accidents at high crash intersection locations. Additionally, it would reduce daily trips on the aforementioned existing roads entering and leaving the PBP by 1.1 miles in each direction, with an average total vehicle mile traveled (VMT) reduction of approximately 26,660 miles daily for cars and trucks between 2023 and 2042 (years of operation). The reduced Study Area traffic would reduce vehicle accidents. A major goal of the County is to provide economic development in rural areas. The proposed interchange is vital to the PBP and the County's economy, is the County's top transportation priority, and would be transformational for Cecil County's economy.

The total economic impact of this Proposed Interchange is significant, potentially yielding between 8,300 and 10,600 direct jobs, (2,520 of which are projected in 2019 from existing businesses and businesses under construction at PBP), that are directly related to existing and planned distribution, warehousing, manufacturing and retail businesses within the CCPEZ and adjacent development. Not considered in these figures are temporary interchange/business construction jobs and new service jobs generated to support CCPEZ employees. Additionally, the impact will generate between \$26,400,000 and \$28,800,000 in annual local revenue from property and income taxes and recordation and transfer fees, of which approximately \$7,600,000 will come from existing businesses and businesses under construction in 2019 at the PBP (Cecil County CCPEZ Economic Development Data). Cecil County has identified the Proposed Interchange as the key to unlocking the full economic potential of the CCPEZ and has highlighted the interchange as Cecil County's top transportation priority.

The Proposed Interchange would immediately support existing PBP large market cap tenants and occupants including Amazon, General Electric (GE), Medline and Lidl, among others. The Proposed Interchange would attract new business and help sustain existing businesses by reducing energy and operating costs that are essential to the warehousing and distribution industry. The total estimated benefits are \$83,200,000.

The increased revenue, mentioned above, will provide funding for quality of life amenities such as schools, improved infrastructure, and parks and recreation facilities. The expanded tax base could generate government resources needed to expand emergency services coverage, provide access to health care, improve infrastructure and roadway maintenance, and assist in educational programs. Additionally, the interchange would provide county residents and businesses with improved access to PBP and additional access to I-95, while reducing congestion at existing intersections.

2.2 Method of Financing and categorized project costs

The total estimated cost of the proposed interchange is \$64,400,000. Table 2 below shows the breakdown of the estimate costs by phase:

Table 2 – Costs by Phase

Phase	Amount*
Engineering	\$5.5 M
Construction	\$53.3 M
Right-of-Way	\$5.6 M
Total	\$64.4 M

**These costs were updated in June 2021.*

All project funds other than the requested BUILD Grant are non-federal. This includes monies from Cecil County, Stewart Companies (SC), and MDTA. Table 3 shows a summary of the funding entity, funding category, and amount of funds.

Table 3 – Funding Sources

Funding Entity	Funding Category	Amount*
Stewart Companies	Non-Federal	\$8.7 M
Cecil County	Non-Federal	\$1.0 M
MDTA	Non-Federal	\$34.7 M
Build Grant	BUILD	\$20.0 M
	Total	\$64.4 M

**These costs were updated in June 2021 since the BUILD grant application (Appendix A).*

Several sources of non-federal revenue for transportation infrastructure investment are being generated by the construction of the proposed interchange. Drivers utilizing the road provide toll revenue, which MDTA uses for transportation improvement projects. Through these non-federal revenues, drivers and taxpayers, the end users, recoup the project’s financing referenced above. Daily toll revenues for trucks would range between approximately \$315,540 and \$394,440, and car revenues would range between approximately \$36,816 and \$55,218. Based on these assumptions, gross toll revenues could potentially range between \$352,356 and \$449,658.

3.0 SOCIOECONOMIC BENEFITS OF HIGH-QUALITY WATERS

In general, high quality waters and the surrounding forested habitat within the watershed provide social and economic benefits to the surrounding community. They provide recreational opportunities such as fishing and hiking, and they can result in higher property values in the surrounding area. Clean tributaries to the Chesapeake Bay also improve the health of the Bay, which also results in social and economic benefits to the area.

Below, is an estimate of what it would cost to maintain the streams and forested habitat in the watershed by providing 1:1 mitigation for all forest cover loss and stream impact. Based on the area market value, we estimate the cost for 1:1 mitigation of 56.7 acres of forest cover loss to be \$8,891,499. The estimated cost of 1:1 restoration of 3,143 linear feet of stream impact to be \$3,682,793. Table 4 provides a more detailed breakdown of our estimates.

Table 4 – 1:1 Mitigation Cost Estimate

Mitigation Type	Cost Estimate Category	Amount
Tier II Reforestation	Real Estate	\$6,334,980
	Design and Permitting	\$231,122
	Construction	\$2,267,200
	Administrative Costs	\$58,197
	Total	\$8,891,499
Stream Restoration	Real Estate	\$1,627,830
	Design and Permitting	\$489,000
	Construction	\$1,197,130
	Administrative Costs	\$288,833
	Post-Construction Monitoring	\$80,000
	Total	\$3,682,793
	Grand Total	\$12,574,292

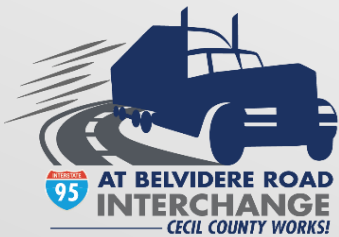
4.0 CONCLUSION

This narrative demonstrates the necessity for the proposed interchange in order to accommodate the projected developmental growth within the watershed that is consistent with the Cecil County Comprehensive Plan. The project, while located within a Tier II watershed, is also entirely located within a Priority Funding Area. Avoidance and minimization techniques are being used, to the extent feasible. Where avoidance of impacts to resources is not possible, compensatory mitigation is proposed. The I-95 at Belvidere Road Interchange project will be important to supporting economic development in Cecil County, while also addressing safety concerns within the roadway network, and improving the quality of life of residents and workers in and surrounding the PBP through improved access to major roads and development areas, reduced congestion, and increased revenue that would provide funding for local amenities.

5.0 APPENDICES

Appendix A – I-95 at Belvidere Road Interchange BUILD Transportation Discretionary Grant Application. June 19, 2018.

APPENDIX A
I-95 AT BELVIDERE ROAD INTERCHANGE
BUILD TRANSPORTATION DISCRETIONARY
GRANT APPLICATION
June 19, 2018



I-95 AT BELVIDERE ROAD INTERCHANGE BUILD TRANSPORTATION DISCRETIONARY GRANT APPLICATION



Maryland
Transportation
Authority



July 19, 2018

Cecil County

In partnership with:

MDOT Maryland Department of Transportation
Maryland Transportation Authority
Stewart Companies

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1. PROJECT DESCRIPTION

1.1 Introduction

In rural Cecil County, Maryland there is tremendous potential for improved safety, economic growth and development, and improved transportation and infrastructure through the proposed new I-95/Belvidere Road Interchange (Proposed Interchange), a public-private partnership between Cecil County, the Maryland Department of Transportation Maryland Transportation Authority (MDOT MDTA), and The Stewart Companies of York, Pennsylvania (SC). MDOT MDTA owns and maintains I-95 in Cecil County. An affiliate of SC owns the Principio Business Park (PBP) as well as 6,610 acres in the immediate vicinity of the Proposed Interchange.



A unique element of this rural transportation project is its strategic location along multi-modal freight transportation infrastructure (e.g., I-95 and CSX) and access to major metropolitan markets. PBP is situated approximately 50 miles from Baltimore, MD, 60 miles from Philadelphia, PA, 85 miles from Washington, DC, and 145 miles from New York, NY.

The total economic impact of this Proposed Interchange is significant, potentially yielding between 8,300 and 10,600 direct jobs, (2,520 of which are projected in 2019 from existing businesses and businesses under construction at PBP), that are directly related to existing and planned distribution, warehousing, manufacturing and retail businesses within the Cecil County Principio Enterprise Zone (CCPEZ) and adjacent development. Not considered in these figures are temporary interchange/business construction jobs and new service jobs generated to support CCPEZ employees. Additionally, the impact will generate between \$26,400,000 and \$28,800,000 in annual local revenue from property and income taxes and recordation and transfer fees, of which approximately \$7,600,000 will come from existing businesses and businesses under construction in 2019 at the PBP ([Cecil County CCPEZ Economic Development Data](#)). Cecil County has identified the Proposed Interchange as the key to unlocking the full economic potential of the CCPEZ, and has stated so to the Maryland Department of Transportation (MDOT) highlighting the interchange as Cecil County's top transportation priority in its [2018 Transportation Priority Letter](#).

The Proposed Interchange would immediately support existing PBP large market cap tenants and occupants including Amazon, General Electric (GE), Medline and LIDL, among others. The Proposed Interchange would attract new business and help sustain existing businesses by reducing energy and operating costs that are essential to the warehousing and distribution industry. *The*

SUPPORTS
8,300+
DIRECT JOBS IN
RURAL CECIL
COUNTY

Reduced heavy
truck traffic on
existing roads and
vehicles miles
travelled

total estimated benefits are \$83,200,000 as shown in the Benefit Cost Analysis (BCA). Key benefits/highlights of the Proposed Interchange include:

Safety:

The Proposed Interchange will reduce local heavy truck traffic on US 40, MD 222, and MD 272 by as much as 40%, reducing truck-related accidents at high crash intersection locations. A Diverging Diamond Interchange (DDI) is being considered, as it has significant benefits over traditional interchanges. These benefits are discussed in detail in **Section 4.14.1. An accident cost reduction of \$6,600,000 is detailed in the BCA.**

Vehicle delay would be reduced by 9,300,000 hours for cars & over 2,500,000 hours for trucks over the 2017-2042 analysis period.

State of Good Repair:

Construction of the Proposed Interchange will reduce the daily trips on existing US 40, MD 222 and MD 272 entering and leaving PBP by 1.1 miles in each direction, with an average total vehicles miles traveled (VMT) **reduction of approximately 26,660 miles daily** for cars and trucks between 2023 and 2042 (years of operation) as detailed in the **BCA** model. **A pavement maintenance cost reduction of \$1,500,000 is calculated in the BCA.**

VMT in the CCPEZ would be reduced by 109,000,000 car miles & 45,000,000 truck miles over the 2017- 2042 analysis period.

Economic Competitiveness:

Between 8,300 and 10,600 jobs and between \$26,400,000 and \$28,800,000 in annual revenue could be generated with the full build-out of warehouse, distribution and manufacturing development areas planned for the CCPEZ and adjacent development. ***In addition, the estimated benefit of travel time and out-of-pocket cost savings is \$79,300,000 as estimated in the BCA.***

Environmental Protections:

This project has been presented to numerous federal and state regulatory agencies early in its project development to identify and/or avoid or minimize potential impacts to natural, social, and cultural resources. These agencies have the opportunity to provide input throughout the project development process. Upon construction of the Proposed Interchange, the resultant reduced VMT and congestion delay would reduce vehicle emissions. This is notable as Cecil County is designated as a non-attainment area for 8-hour ozone. ***The estimated cost savings is \$1,200,000.***

The public-private partnership will identify land with capacity to provide compensatory mitigation to any project impacts. Additionally, land may be identified for environmental stewardship and/or future mitigation needs. The footprint of the Proposed Interchange is currently zoned for mineral extraction, which would likely have a greater natural resource impact than the Proposed Interchange.

Quality of Life:

The Proposed Interchange would provide Cecil County residents and businesses with improved access to PBP and additional access to I-95, while reducing congestion at existing intersections. With the new local annual tax revenue, Cecil County can provide additional community amenities and improve existing facilities.

Innovation:

1. A potential interchange alternative being studied is a Divergent Diamond Interchange (DDI). The DDI is a nationally recognized design concept that improves traffic flow and reduces congestion by accommodating left-turning movements onto arterials and limited-access highways while eliminating the need for left-turn bays and signal phases at the signalized ramp terminals.
2. A proposed Design-Build (DB) Delivery method will streamline interchange construction. Proposed financial incentives to the contractor team based on reduction of environmental impacts and adherence to construction performance schedules will accelerate delivery and the timeline for new businesses to open in the existing PBP and future development areas.

Partnership:

Three committed partners have come together on the Proposed Interchange project to achieve goals of economic development and improved mobility in this rural area of western Cecil County, Maryland. This is a tremendous opportunity for a predominantly rural county to team with a state transportation agency using a significant percentage of private non-federal money to deliver a project that will increase job opportunities in an area that has logistically demonstrated its ability to achieve Cecil County's economic goals and vision.

1.2 Project Overview

Cecil County in northeastern Maryland is a mostly rural county with just over 100,000 residents. Fewer than one half of employed Cecil County residents actually work in the county. The remaining employed residents work in neighboring jurisdictions ([Maryland Department of Commerce](#)). Economic development within the Proposed Interchange area would provide residents with employment opportunities in Cecil County that are not currently available.

The largest employment sector in Cecil County is the “trade, transportation and utilities” sector, which includes warehousing and distribution. The distribution industry is rapidly growing along I-95 due to its proximity to major metropolitan areas to both the north and south. **See Figure 1.**

Cecil County has strongly supported the distribution industry principally due to its strategic location to major metropolitan markets. Moreover, the distribution industry has comparatively minor water and wastewater infrastructure requirements. This makes it a viable land use in areas that have had limited public infrastructure ([2010 Cecil County Comprehensive Plan](#)). Additionally, Cecil County has an economic opportunity to increase its industrial and warehouse facilities in support of the robust e-commerce market.

The Proposed Interchange would serve the rapidly growing logistics and distribution industry along this portion of the I-95 corridor by attracting new businesses and employees to planned development in the CCPEZ.



Figure 1: Driving distance from Proposed Interchange to major cities.

While the CCPEZ represents the Cecil County's top employment initiative, it currently does not have direct access to I-95. Existing businesses at PBP are projected to employ over 2,520 people by 2019 and Cecil County estimates that full build-out of the CCPEZ and adjacent development would result in over 8,300 jobs. The Proposed Interchange project would provide direct access for trucks and other vehicles to the newly developed areas.

1.3 Project History

SC owns and maintains several diverse long-standing businesses within Cecil County, including a mining and materials business, a construction business and a real estate development company. Relative to SC's mining and materials division, SC owns and operates three sand and gravel plants in Cecil County under the tradenames Mason-Dixon Materials and York Building Products, as well as the legacy mining/buffer property that SC is proposing to transfer in-kind for the project.

The I-95/Belvidere Road Transportation Improvement Study is funded by SC and overseen by MDOT MDTA in partnership with Cecil County. MDOT MDTA owns, operates, and maintains a 50-mile portion of I-95 in Maryland, from north of Baltimore City to the Delaware state line. The Federal Highway Administration (FHWA) has approval authority over any changes to access points on I-95. Approval of any proposed modification to interstate access constitutes a federal action subject to review under the National Environmental Policy Act (NEPA). A NEPA study began in January 2018 and is fully funded by SC. MDOT MDTA, who is coordinating with the FHWA to determine whether a Categorical Exclusion (CE) or Environmental Assessment/Finding of No Significant Impact (EA/FONSI) will be prepared. In either scenario, the document will be prepared in accordance with the provisions and requirements of Chapter 1, Title 23 Code of Federal Regulations (CFR) Part 771, relating to implementation of the National Environmental Policy Act.

1.4 Project Purpose

The purpose of the Proposed Interchange is to improve safe and efficient vehicular access to I-95 at Belvidere Road, and to facilitate ongoing and planned economic development in Cecil County's CCPEZ Zone by addressing the associated increase in traffic volumes.

The Proposed Interchange will attract new business to CCPEZ and existing PBP which lies within the CCPEZ. The following benefits will be realized by improving Belvidere Road access to I-95:

1. **Jobs** – New businesses will benefit the people in this rural area by providing jobs and saving travel time for the County residents presently commuting out-of-county for work.
2. **Improved Mobility in the Design Year 2040** - Without making any improvements, the I-95/MD 222 interchange, along with seven study area intersections, will operate at undesirable levels-of-service with the projected 2040 full-build-out of the CCPEZ and planned adjacent development.
3. **Reduced trip delay** - The current north/south travel path between I-95 and PBP contains 12 traffic signals, which significantly delay the trip and increases fuel consumption from vehicle stops and starts.
4. **Reduced VMT** - A new I-95 Belvidere Road Interchange would reduce vehicle trips by 1.1 miles in each direction. **See Figure 2.** Reducing VMT will result in reduced energy consumption and costs. *The travel time savings are estimated at \$88,000,000 in the BCA.*

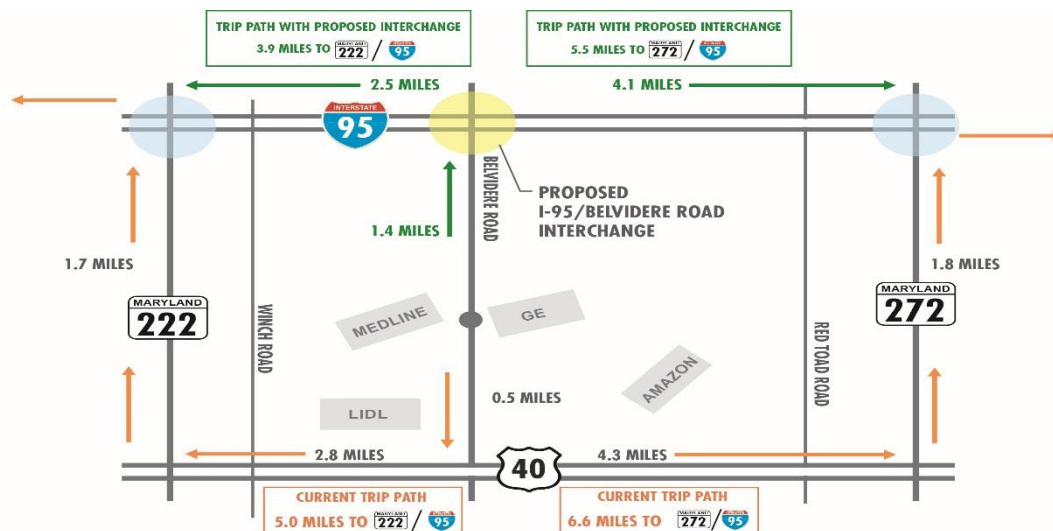


Figure 2: Current and Proposed Trip Path from PBP to I-95

5. **Safety** - A high percentage of truck-related accidents occur at [high crash intersection locations](#). An improved Belvidere Road access to I-95 would significantly remove the number of heavy trucks operating on US 40, MD 222 and MD 272 in the study area.
6. **Air Quality Benefits** - Cecil County is in an EPA designated ozone non-attainment area for 8-hour ozone. Air pollution from emissions would also decrease by reducing VMT.

2. PROJECT LOCATION

I-95 is the foremost north-south roadway in Maryland, providing access to Wilmington, Philadelphia, and points north, and to Baltimore, Washington, D.C. and points south. I-95 also provides direct access to major rail, port, and air facilities along the east coast from Maine to Florida. The project is located in rural western Cecil County, which is traversed by I-95 in an east-west orientation. **See Figure 3.** Belvidere Road crosses over I-95 between the MD 222 interchange to the west and the MD 272 interchange to the east.

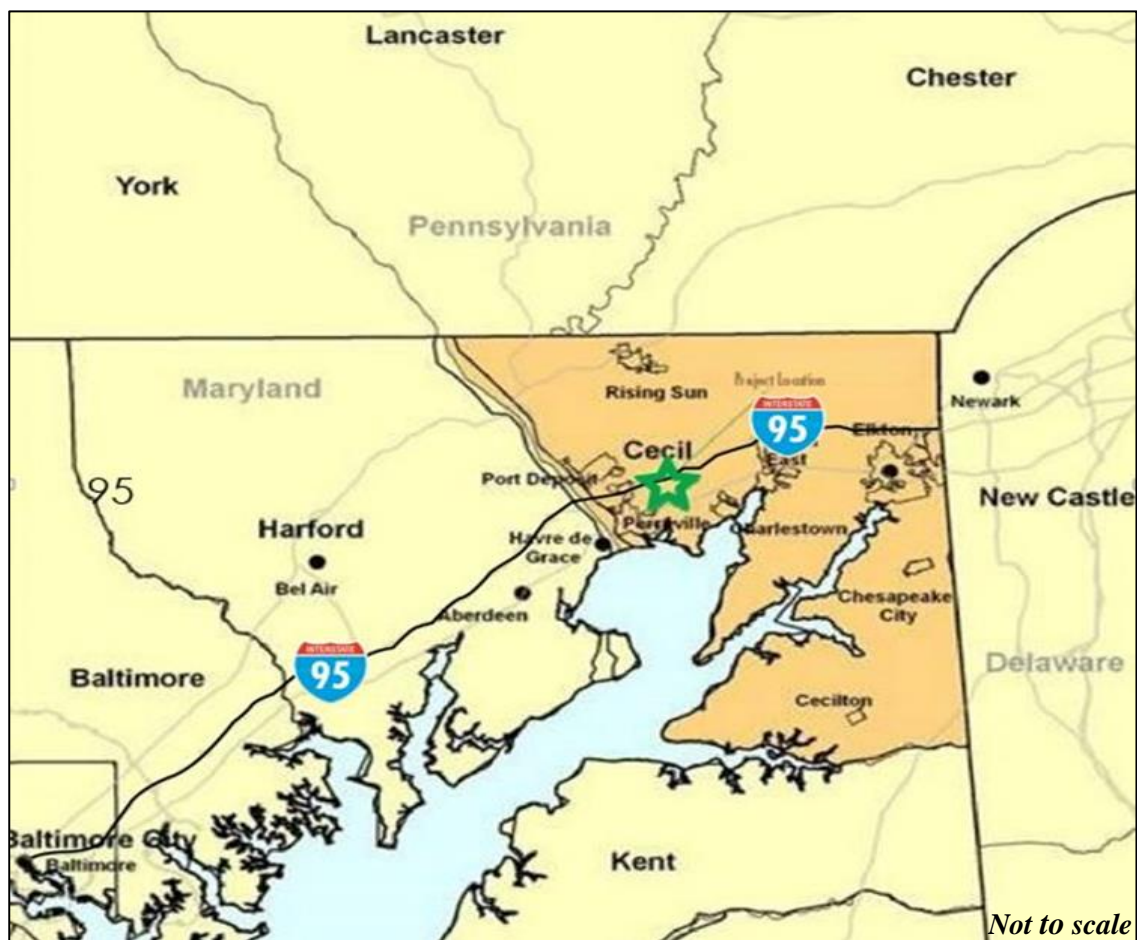


Figure 3: Proposed Interchange location, source: 2010 Cecil County Comprehensive Plan

The MDOT MDTA-owned and privately operated Chesapeake House Travel Plaza (Chesapeake House) is immediately east of the Belvidere Road bridge, between the northbound and southbound lanes of I-95. **See Figure 4.** While Cecil County is predominantly rural, it is a part of the Wilmington Metropolitan Area Planning Council (WILMAPCO) Metropolitan Planning Organization. According to the [US Census Bureau Urbanized Area Reference Map](#), the Proposed Interchange is not in an urban area and therefore considered to be rural.

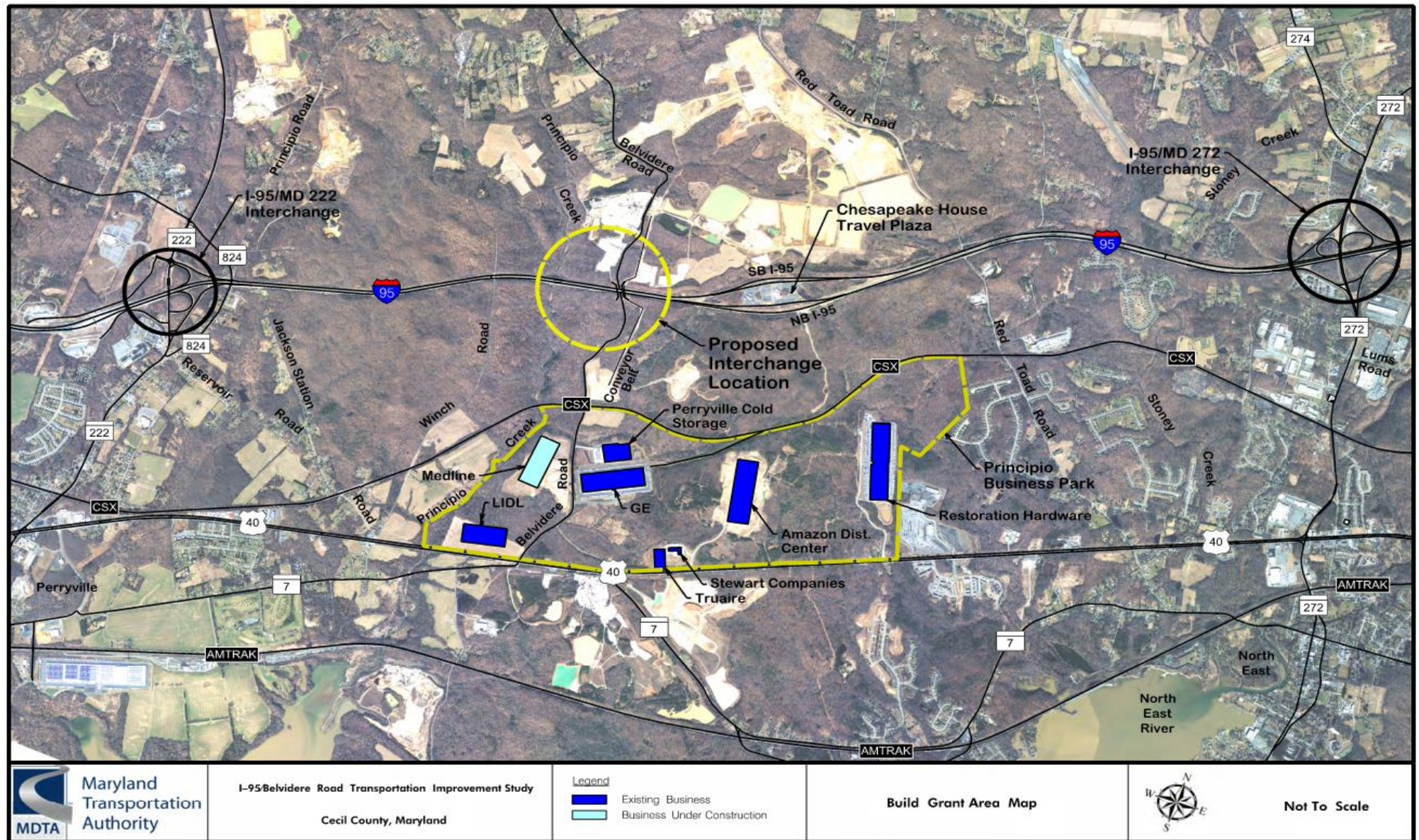


Figure 4: Study Area and I-95/Belvidere Road Interchange location

The green urban demarcation line is shown on the map as approaching the Proposed Interchange from the east. However, that line is simply following nearly two miles of the actual roadway of I-95 which is fully within MDOT MDTA right-of-way. The urban demarcation line also includes the Chesapeake House Travel Plaza which is in the median of I-95 and is also entirely within MDOT MDTA right-of-way. The Census Bureau apparently generated this line solely to classify the commercial and non-residential land use associated with the MDOT MDTA-owned Chesapeake House Travel Plaza and its associated ingress/egress lanes on I-95. The Proposed Interchange is in a rural section of Cecil County.

This section of I-95 is generally six lanes wide (three 12-foot lanes in each direction), with 10-foot inside and outside shoulders and a 25-foot grass median. The location of the Chesapeake House, between northbound I-95 and southbound I-95, requires left exit ramps and left entrance ramps in both directions of the highway. Exit 93 (MD 222) and Exit 100 (MD 272) currently provide indirect access between I-95 and businesses along Belvidere Road. Belvidere Road is a two-lane road, which crosses over I-95 approximately one mile south of the Chesapeake House.

I-95 is part of the National Highway System and is functionally classified as an “Interstate” in the Federal Functional Classification System. It is also included in the State Primary System. US 40, MD 272, MD 222 are all functionally classified as arterials and are owned and maintained by the Maryland Department of Transportation State Highway Administration (MDOT SHA). Belvidere Road and Red Toad Road are functionally classified as Collectors and are owned and maintained by Cecil County. MD 824 is functionally classified as a Collector and is owned and maintained by MDOT SHA. Winch Road is a local road owned and maintained by Cecil County.

Along I-95, there are approximately 6.6 miles between the MD 222 interchange and the MD 272 interchange. The Belvidere Road structure over I-95 is approximately 2.5 miles east of the MD 222 interchange and 4.1 miles west of the MD 272 interchange.

US 40 is generally four lanes wide, two 12-foot lanes in each direction, with 10-foot outside shoulders and two-foot inside shoulders with a variable width grass median. An active CSX railroad line crosses beneath Belvidere Road approximately 0.75 mile south of I-95. A spur from this railroad currently serves the GE Distribution Center and Perryville Cold Storage facility located in the Study Area at the PBP.

3. GRANT FUNDS, SOURCES, AND USES OF ALL PROJECT FUNDING

3.1 Project Costs

The total **estimated cost** of the Proposed Interchange is \$54,000,000. **See Table 1.** This does not include any previously incurred expenses. Project costs were estimated using MDOT SHA’s latest cost estimating manual using the major quantities method. This method quantifies major construction categories including Category 2 (Earthwork), Category 4 (Structures), Category 5 (Pavement) and Category 6 (Shoulders). Categories 1 (Preliminary), 3 (Drainage), 7 (Landscape) and 8 (Utilities) are calculated based on percentages of the major quantities listed above. Traffic items including signing, lighting, marking, and signals are quantified separately. All unit prices are based on bid history for substantially similar size projects in similar markets.

Table 1: I-95/Belvidere Road Interchange Estimate Breakdown	
Phase	Amount
Design-Build Construction	\$40.4M
Preliminary Engineering	\$4.0M
Construction Administration	\$4.0M
Right-of-Way	\$5.6M
Total	\$54.0M

All project funds other than the requested BUILD Grant are non-federal. MDOT MDTA will advertise and administer project construction and understands that BUILD Grant funds will reimburse expenditures.

3.2 Source and Amount of Funds for Eligible Project Costs

Non-federal funds include monies from Cecil County, SC, and MDOT MDTA. NEPA and IAPA approval will be required before commencement of final engineering and appropriate construction permits will be approved prior to commencing construction. **Table 2** shows a summary of the source, funding category, amount of funds, and percentage.

Table 2: I-95/Belvidere Road Interchange Funding Summary			
Source	Funding Category	Amount	Percentage
SC	Non-Federal	\$5.675M	10.5%
Cecil County	Non-Federal	\$1.0M	1.8%
MDOT MDTA	Non-Federal	\$22.325M	41.4%
Build Grant	BUILD	\$25.0M	46.3%
	Total	\$54.0 M	100%

3.3 Documentation of Funding Commitments

Cecil County Maryland, SC and the MDOT MDTA have all submitted [funding commitment letters](#) expressing their financial contribution to the Proposed Interchange project.

3.4 Federal Funds

There is no additional federal funding for this project other than the requested BUILD Grant funds.

3.5 Budget

SC (non-federal) will contribute \$5.675 million (10.5%) including right-of-way donation, engineering, construction and/or in-kind land contributions for wetlands or forest mitigation purposes.

Cecil County (non-federal) will contribute \$1 million (1.8%) towards construction.

MDOT MDTA (non-federal) will contribute \$22.325 million (41.4%) towards construction, utilities and construction administration.

The **BUILD Grant** (federal) funding would provide \$25 million (46.3%) towards construction.

Congress has permitted the US Secretary of Transportation to increase the federal share up to 100 percent for projects in rural areas. The County is requesting a federal share of only 46.3 percent and a non-federal and private share of 53.7 percent.

4. MERIT CRITERIA

4.1 Safety

Three interchange alternatives are being studied. See **Figure 5**. The DDI alternative has gained popularity in the US during the last decade. The Transportation Research Board (TRB) published [Report No. cmr15-006](#) documenting the safety advantages of a DDI. This study concluded that DDIs have significant advantages over traditional diamond interchanges and decreased crash frequency for all severities. The highest crash reduction was observed for fatal and injury crashes – 63.2%, property damage only crashes were reduced by 33.9% and total crash frequency decreased by 41.7%. A collision type analysis revealed that the DDI, as compared to a diamond, reduced the instance of high-severity crashes. While a DDI could eliminate the 34.3% of fatal crashes in a diamond that occurred due to the left turn angle crashes with oncoming traffic.

Design will apply the latest AASHTO and TRB publications including the AASHTO Highway Safety Manual, a predictive method to estimate crash frequency and severity. This method will be used to make informed decisions throughout the project development process including screening potential locations for improvement and choosing alternative roadway designs.

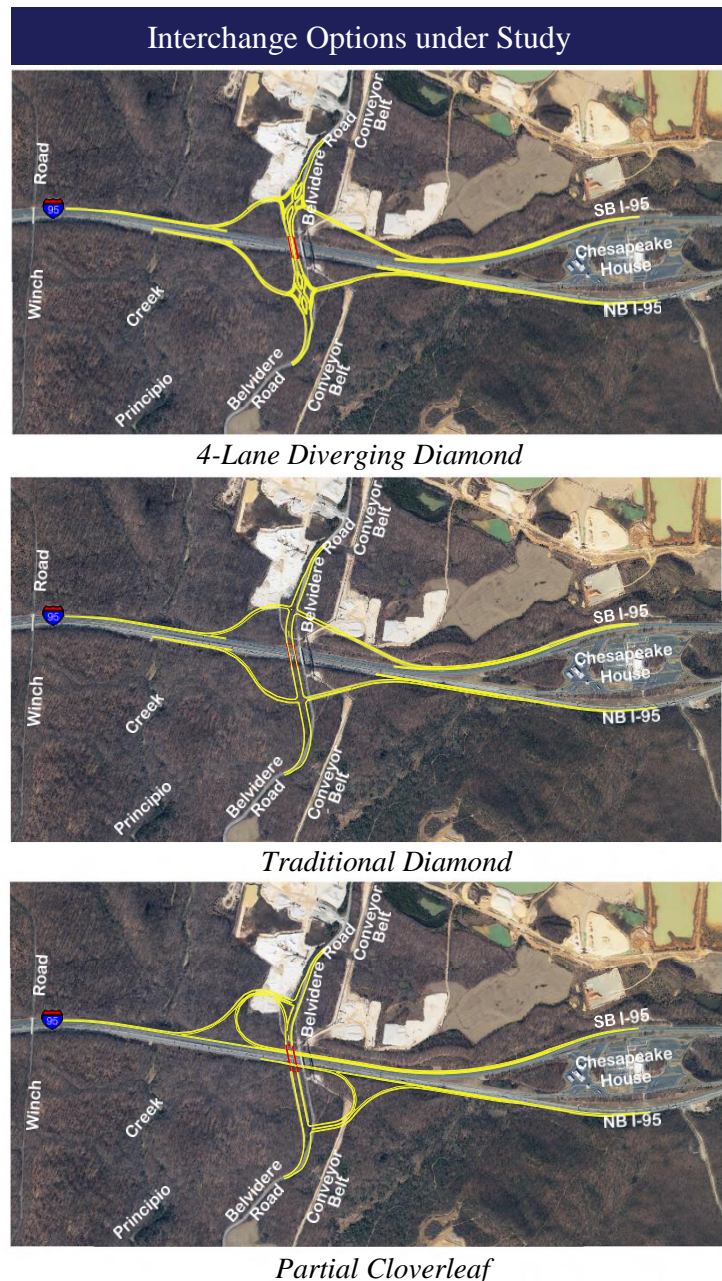


Figure 5: Interchange options that are under study

A high percentage of truck-related intersection crashes occur at several intersections. Truck crashes are more severe and result in more serious injuries than other types of crashes. Crash rates greater than 1.00 are identified as High Crash Locations. Truck-related accidents accounted for a relatively high percentage at [high crash intersection locations](#).

The following is a summary of the Maryland State Police 2015, 2016, and 2017 crash data for high accident locations in the Study Area:

- In 2015, crash rates above 1.00 occurred at the US 40/MD 272, US 40/Belvidere Road/MD 7 and US 40/Red Toad Road intersections with truck related crashes accounting for 20%, 10.5% and 9.1% respectively;

- In 2016, crash rates above 1.00 occurred at the MD 272/Lums Road, US 40/MD 272, MD 222/Bainbridge Road and US 40/Red Toad Road intersections with truck related crashed accounting for 20%, 8%, 29% and 0% respectively; and
- In 2017, crash rates above 1.00 occurred at the MD 272/Lums Road, US 40/MD 272, US 40/E. Principio Parkway. Cold Spring Road and MD 222/Bainbridge Road intersections with truck related crashed accounting for 22%, 6%, 33% and 43% respectively. Crash rates greater than 1.00 are identified as high crash locations. Truck related accidents accounted for a relatively high percentage for several of these intersections

With the addition of the Proposed Interchange, the amount and the type of traffic along the local road network will be reduced. Congestion will be reduced by eliminating failing conditions at intersections. Truck traffic will have direct access to and from I-95, thereby reducing trucks on US 40 by 40%. As described in more detail in the *BCA*, this change in traffic patterns will reduce crashes resulting in significant cost savings.

4.2 State of Good Repair

Several elements of the project will improve the state of good repair by addressing current and projected infrastructure vulnerabilities. These elements include replacing the Belvidere Road bridge over I-95 and reducing the VMT by providing a more direct route for trucks and employees.

Bridge No. CEX960001 is located between mileposts 95.6 and 95.7 and carries Belvidere Road over I-95. The bridge was built in 1963 and was last inspected in 2017. The bridge vertical clearance is 15'- 6" which does not meet MDOT MDTA standard of 16'- 9". In addition, MDOT MDTA's [I-95 Master Plan](#) includes an additional through lane in each direction for this section of I-95 (Section 400). The existing four span bridge has piers at the edge of the shoulders and cannot accommodate the master plan typical section. The current repair recommendations for the structure include:

- Pedestal 4 has 41% loss of bearing and exposed anchor bolts
- Deck underside delaminated concrete in span 3; and,
- Erosion at the west abutment has large areas of failed slope protection.

Typically, structures that are more than 55 years old become more maintenance intensive, requiring significant repairs that can be disruptive to traffic. The new structure will be designed to provide the minimum 16'-9" vertical clearance, together with increased span lengths to accommodate the I-95 Master Plan typical section.

Pavement Maintenance - Constructing a new interchange will reduce the daily trips in and out of the PBP by 1.1 miles in each direction resulting in a total VMT reduction of approximately 7,000 miles daily (As shown in Section 1.4 Project Purpose, Error! Reference source not found.). Wear and tear on local roadways will be significantly less with the reduced 2040 ADT on existing US 40, MD 222 and MD 272 entering and leaving the PBP. The reduction of 40% of heavy truck trips on local roads will significantly reduce the Equivalent Single Axel Load (ESAL) and pavement shoving at signalized intersections. The estimated pavement maintenance reduction cost in the *BCA* is \$1,500,000.

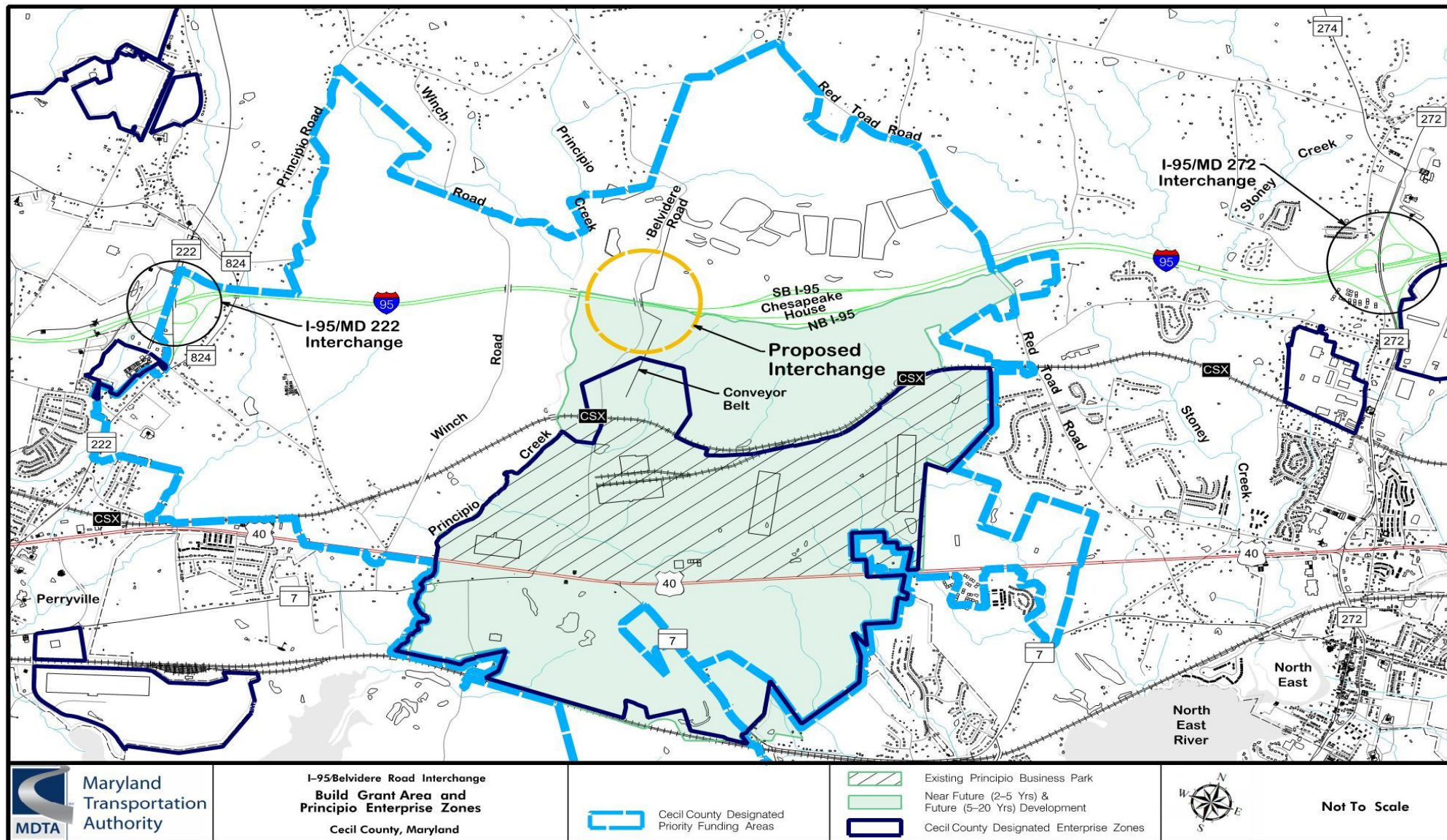


Figure 6: Cecil County Designated Priority Funding Area and CCPEZ source: 2010 Cecil County Comprehensive Plan

4.3 Economic Competiveness

The CCPEZ (See **Figure 6**) was established to leverage Cecil County's location near major metropolitan markets in response to the rapidly growing e-commerce market along I-95. The CCPEZ is strategically situated near and between major metropolitan markets to the north and south including Baltimore, MD (50 miles), Philadelphia PA (60 miles), Harrisburg PA (80), Washington D.C. (85 miles) and New York City (145 miles). See **Figure 1**. The benefits of the CCPEZ include providing tax and infrastructure incentives to businesses locating and maintaining their businesses in the CCPEZ.

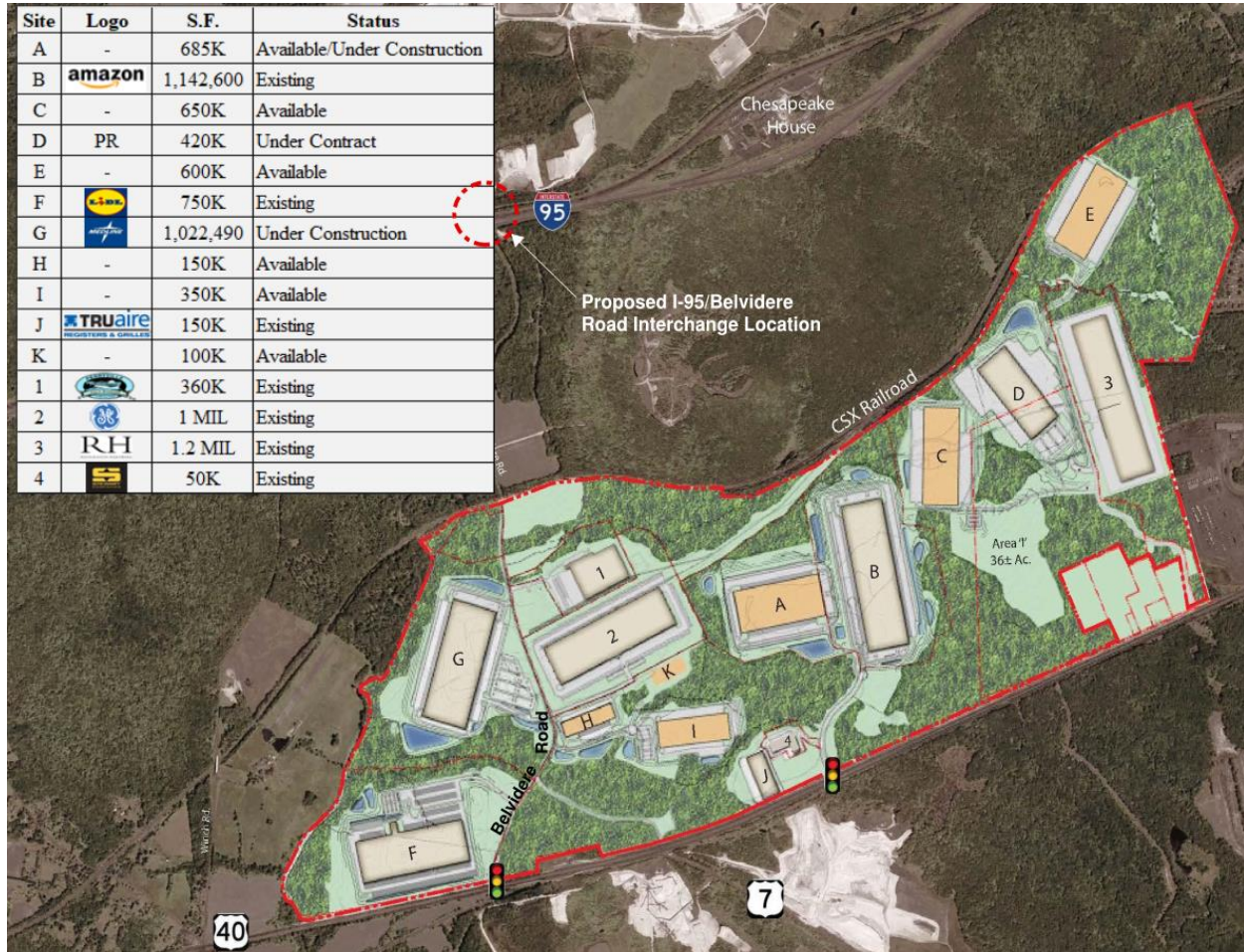


Figure 7: Principio Business Park

The Existing PBP is located within the CCPEZ and is owned and operated by SC. Existing PBP warehousing and distribution businesses include Amazon, Project River, LIDL, MEDLINE, TRUaire, Perryville Cold Storage, General Electric (GE), Restoration Hardware and Principio Tech Park. See **Figure 7**. The decision of these businesses to locate within PBP supports that CCPEZ's tax incentives and the general location of PBP has been, and will continue to be effective in attracting distribution, warehouse and manufacturing businesses.

Cecil County expresses that improved I-95 access to Belvidere Road is critical to keeping existing CCPEZ businesses long term, while attracting new businesses ([March 23, 2018 Letter From Cecil](#)

[County Department of Economic Development to MDOT MDTA](#)) to help realize full build-out of the PBP, CCPEZ and planned adjacent development. Direct I-95 access to Belvidere Road would result in reduced energy and operating costs associated with reduced VMT further increasing the CCPEZ's appeal to new businesses and sustaining existing business long term.

The Proposed Interchange would decrease VMT per each heavy truck trip entering and exiting PBP by 1.1 miles per each truck trip. The Proposed Interchange will also reduce each trip time by:

Non-Principio Traffic:

In 2023 (first year of operation): 2.8 minutes per vehicle (cars and trucks)

In 2042 (last year of analysis): 8.2 minutes per vehicle (cars and trucks)

Simple average across all period: 5.5 minutes per vehicle (cars and trucks)

Principio Traffic:

In 2023 (first year of operation): 4.3 minutes per vehicle (cars and trucks)

In 2042 (last year of analysis): 11.5 minutes per vehicle (cars and trucks)

Simple average across all period: 7.9 minutes per vehicle (cars and trucks)

Existing & Future Employment Revenue – Currently, only 47.1% of employed Cecil County residents physically work in Cecil County ([Maryland Department of Commerce](#)). Cecil County would like to increase this percentage, while also attracting new residents to Cecil County. As shown in **Table 3**, existing PBP businesses and PBP businesses under development are anticipated to generate 2,520 jobs and \$7,592,288 in annual Cecil County tax revenue by 2019 ([Cecil County CCPEZ Economic Development Data](#)). This is tax revenue that can be invested in schools, parks, local infrastructure and other quality of life amenities for Cecil County's residents and expanding work base.

Table 3: Economic Impact of Principio Business Park	
Total Employment by 2019	2,520
Square Footage	6,095,090
Projected Annual Property Taxes	\$ 4,815,121
Projected Annual Income Tax	\$ 2,133,282
Projected Annual Recordation & Transfer Fees	\$ 643,885
Projected Revenues to Cecil County over 20 Years	\$ 151,845,758

Source: Cecil County Department of Economic Development, 2018

The Cecil County Department of Economic Development describes in a [June 22, 2018 letter to MDOT MDTA](#) that over 7,300 warehousing, distribution and manufacturing jobs could be generated with the full build-out of the CCPEZ and planned adjacent development (June 2018 Cecil County Department of Economic Development letter to MDOT MDTA).

Shown on **Figure 8**, is the PBP in relation to areas planned for near-future development (development anticipated within two to five years) and future development (development anticipated within five to 20 years). This development borders the PBP to the north and south and lies between I-95 and the Amtrak line.

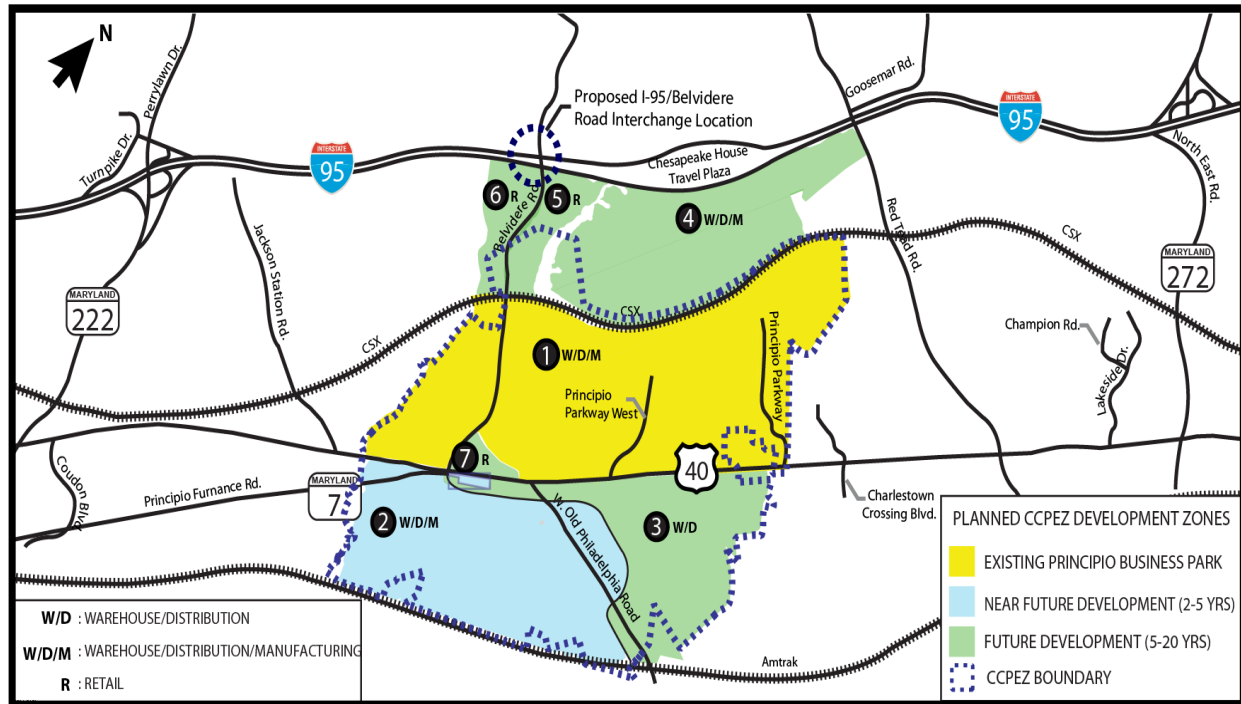


Figure 8: Planned Development in Vicinity of CCPEZ

Shown in **Table 4** (Conservative Method) and **Table 5** (Aggressive Method) are existing and proposed building square footages for warehouse and manufacturing development areas within and adjacent to the CCPEZ, along with the Cecil County Office of Economic Development's number of projected jobs when applying a 0.0004134 jobs per square foot factor extrapolated from Cecil County 2019 economic information for existing PBP businesses and PBP businesses currently under development (e.g. Medline and LIDL Corporations). The 0.0004134 factor was derived by dividing the projected number of 2019 jobs (2,520) by the total building square footage (6,095,090). As shown in **Table 4**, approximately 8,313 jobs would be potentially created with the full build-out of these development areas (numbered 1 through 4 on **Figure 8**). A second method to estimate employment gain derived an average employment /sf factor of 0.000552855 based on [US Department of Energy Industry Averages](#) and 70/30 split between distribution and industrial park businesses respectively. This method generates a total of 10,616 jobs. Therefore the total job increase in the CCPEZ and adjacent development ranges between 8,313 and 10,616.

Projected annual Cecil County property and income tax, recordation and transfer fees were calculated in two different ways. They are explained in the **Table 4** and **Table 5** footnotes. More detail can be found in the [Cecil County CCPEZ Economic Development Data](#). The total projected annual property, income tax, recordation and transfer fees to Cecil County will range from \$26,392,689 to \$28,800,928 per year. Over a 20 year time period this equates to a range from \$527,853,785 to \$576,018,556. This increased revenue to Cecil County will provide funding for quality of life amenities such as schools, improved infrastructure, parks and recreation facilities.

Table 4: Economic Impact from Each Development Area (Conservative)

Develt. Area Map No.	Development Area	Building Space S.F.	Projected Jobs (*)	Projected Annual Property Tax (+)	Projected Annual Income Tax (x,y)	Projected Annual Recordation & Transfer Fee (z)	Projected Total Annual Taxes	Projected Total Taxes Over 20 Years
1	Existing Principio Business Park (PBP) Businesses	6,095,090	2,520	\$4,815,121	\$2,133,282	\$643,885	\$7,592,288	\$151,845,758
1	Future PBP Businesses	3,135,000	1,296	\$2,476,650	\$1,398,210	\$331,181	\$4,206,041	\$84,120,828
2-4	Future Warehouse/Manufacturing Businesses	10,574,000	4,371	\$8,353,460	\$4,716,004	\$1,117,037	\$14,186,501	\$283,730,027
5-7	Future Retail	304,000	126	\$240,160	\$135,584	\$32,115	\$407,859	\$8,157,171
	Total	20,108,090	8,313	\$15,885,391	\$8,383,080	\$2,124,219	\$26,392,689	\$527,853,785

* Used average employment/sf of 0.0004134 based on current Principio Business Park projects

+ Used average property tax/sf of \$0.79 based on current Principio Business Park projects

x Used average income tax/sf based on average Cecil County wages for distribution and manufacturing jobs

y Assumed 80% distribution and 20% manufacturing jobs

z Assumed \$0.05282/sf/yr. Recordation & Transfer Fees and one transfer every 10 years

Table 5: Economic Impact from Each Development Area (Aggressive)

Develt. Area Map No.	Development Area	Building Space S.F.	Projected Jobs (*)	Projected Annual Property Tax (+)	Projected Annual Income Tax (x,y)	Projected Annual Recordation & Transfer Fee (z)	Projected Total Annual Taxes	Projected Total Taxes Over 20 Years
1	Existing Principio Business Park (PBP) Businesses	6,095,090	2,520	\$4,815,121	\$2,133,282	\$643,885	\$7,592,288	\$151,845,758
1	Future PBP Businesses	3,135,000	1,733	\$2,734,262	\$1,548,690	\$413,977	\$4,696,929	\$93,938,582
2-4	Future Warehouse/Manufacturing Businesses	10,574,000	5,846	\$9,222,357	\$5,223,556	\$1,396,297	\$15,842,210	\$316,844,200
5-7	Future Retail	304,000	517	\$265,141	\$203,246	\$40,143	\$508,529	\$10,170,589
	Total	20,108,090	10,616	\$17,036,881	\$9,108,773	\$2,655,273	\$28,800,928	\$576,018,556

* Used average employment/sf of 0.000552855 based on US Department of Energy industry averages and 70/30 split between distribution and industrial park (<https://www.usgbc.org/Docs/Archive/General/Docs4111.pdf>)

+ Used average property tax/sf of \$0.872173 based on 20-year Enterprise Zone impact and current tax rate

x Used average income tax/sf of \$0.35 based on Principio project and assumed \$0.83 for manufacturing jobs

y Assumed 70% distribution and 30% manufacturing jobs

z Assumed \$0.05282/sf/yr. Recordation & Transfer Fees and one transfer every 8 years

4.4 Environmental Protection

4.4.1 Early Agency Coordination

To notify agencies, receive input, and to ultimately expedite informed review, this project has been presented to several agencies early in its project development. On May 16, 2018, the project was presented at an interagency meeting attended by U.S. Fish and Wildlife Service (USFWS), US Army Corps of Engineers (USACE), Environmental Protection Agency (EPA), Maryland Department of Environment (MDE), and Maryland Department of Planning (MDP). If applicable, this project will utilize the MDOT SHA's "Streamlined NEPA/Section 404 Review Process". However, the schedule in **Section 5.3** conservatively shows the Section 404 permit attained following NEPA completion.

The project is being coordinated with FHWA's Maryland Division throughout planning. Formal coordination with the Maryland Historical Trust (the State Historic Preservation Office) has also been initiated. Additionally, coordination has been initiated with USFWS and the Maryland Department of Natural Resources (DNR) to determine the presence of federal or state-listed species in the study area.

4.4.2 Improved Air Quality, Reduced Energy Use and Emissions

The project is located within an EPA 8-hour ozone non-attainment area. Conformity to the State Implementation Plan (SIP) will be needed and determined through a regional air quality analysis performed on the Transportation Improvement Program (TIP) and as part of the State's transportation plan. [WILMAPCO](#) has committed to including the Belvidere Road Interchange project in their Draft 2050 Regional Transportation Plan (RTP). The RTP is set for adoption in March 2019, following an extensive analysis and public outreach process and once air quality conformity modeling and public outreach are complete.

Direct Belvidere Road access to I-95 would also provide energy and air quality benefits through reduced VMT to destinations north and south of I-95. For example, trucks currently exiting the GE distribution center in PBP and heading to northbound I-95 currently travel a 0.5 mile south to US 40, then 4.3 miles east to MD 272, then 1.8 miles north to access the northbound on-ramp at the I-95/MD 272 for a *6.6 mile total trip*. Trucks currently exiting the GE's distribution center and heading to southbound I-95 would travel 0.5 mile south to US 40, then 2.8 miles to MD 222 then 1.7 miles north to access the southbound on-ramp at the I-95/MD 222, for a *total trip of 5.0 miles*.

Should a new I-95 interchange be constructed at Belvidere Road, trucks exiting GE would then travel 1.4 miles north on Belvidere Road to access the interchange at a point 2.5 miles from the MD 222 interchange to the south and 4.1 miles to the MD 272 interchange to the north. This would effectively reduce each northbound and southbound truck trip by a total of 1.1 miles. Additionally, this would reduce VMT on local roads (US 40, MD 222 and MD 272) by 5.2 miles for each northbound trip and 3.6 miles for each southbound trip.

It should also be noted that in addition to this shorter trip length, the efficiency of the trip would be improved by removing the intersection starts and stops that occur along the current routes. The reduced truck VMT would also have safety benefits to the local roadway network.

Shown in **Table 6** are 2017 existing AM /PM traffic volumes and 2040 Design Year (DY) No-Build traffic volumes. The 2040 No-Build volumes assume the full build-out of the PBP along with near future (2-5 years) and future (5-20 years) planned development adjacent to the CCPEZ.

Table 6: 2017 Existing Principio Business Park and 2040 Principio Future Development Traffic Volumes						
2017 Existing PBP Peak Hour and ADT Traffic Volumes						
AM Peak Hour		PM Peak hour		Average Daily Traffic (ADT)		
Cars	Trucks	Cars	Trucks	Cars	Trucks	Total
181	81	174	29	1,780	550	2,330
2040 Peak Hour & ADT Traffic Volumes w/Existing PBP Businesses Only (Background Traffic (1))						
AM Peak Hour		PM Peak hour		Average Daily Traffic (ADT)		
Cars	Trucks	Cars	Trucks	Cars	Trucks	Total
228	103	219	36	2,240	700	2,940
2040 Peak Hour & ADT Traffic Volumes for Remaining CCPEZ Build-Out (2)						
AM Peak Hour		PM Peak hour		Average Daily Traffic (ADT)		
Cars	Trucks	Cars	Trucks	Cars	Trucks	Total
1,617	693	1,833	786	30,678	13,148	43,826
2040 Total Peak Hour & ADT Traffic Volumes (Background Traffic + CCPEZ Build-Out)						
AM Peak Hour		PM Peak hour		Average Daily Traffic (ADT)		
Cars	Trucks	Cars	Trucks	Cars	Trucks	Total
1,845	796	2,052	822	32,918	13,848	46,766
1: Reflects 2017 Existing Traffic + 1% growth over 23 years (Background Traffic)						
2: 2040 Background Traffic plus CCPEZ Build-Out (Includes the remaining Build-Out of PBP along w/Development Areas 2, 3 and 4 shown on Figure 8)						

The 2017 existing peak hour truck volume is 81 AM/29 PM, projected daily truck volume is 550. With 1% annual growth for 23 years at all Business Park access points and truck trips that will be generated by future warehouse, distribution and industrial activities, 796 AM/822 PM truck trips are projected in the DY 2040 AM/PM peak hours and 13,848 daily truck trips are projected in the 2040 Design Year.

As noted, 13,848 total truck trips are projected under the 2040 No-Build scenario. 13,148 trucks are future new trips. It is assumed that 10% of these new trips would remain on US 40 north of the US 40/MD 272 intersection and another 10% would continue south beyond the US 40/MD 222

intersection. 10,518 trucks per day would then be destined for I-95. Assuming a 50% directional split, 5,259 trucks would be headed to northbound I-95 while an additional 5,259 trucks would be headed to southbound I-95. As previously mentioned, and I-95 interchange at Belvidere Road would reduce northbound and southbound I-95 truck trips by 1.1 miles. Therefore, the presence of an I-95 interchange at Belvidere Road would potentially result in design year savings of approximately 11,570 (5,259 trips x 1.1 miles + 5,259 x 1.1 miles) daily truck miles in the study area.

Implementation of the interchange would reduce both VMT and trip delay resulting in reduced energy costs and attracting new businesses to the PBP. The current north/south travel path to/from the PBP contains 12 traffic signals significantly adding delay to the trip and fuel consumption resulting from vehicle stops/starts. This project would reduce VMT and trip time, resulting in reduced fuel consumption and reduced vehicle emissions.

4.4.3 Avoidance of Impacts

No displacements are required for the proposed interchange improvements. All right-of-way will be donated by SC. No right-of-way will be required from any Section 4(f) resources such as publicly owned public parks, recreation areas, wildlife refuges, or historic sites. No Noise Sensitive Areas have been identified in the project area. In accordance with Executive Order 12898, no disproportionately high or adverse effects on minority or low-income populations are anticipated to occur as a result of this project. The project is not inconsistent with the [2010 Cecil County Comprehensive Plan](#).

Preliminary engineering of the grant alternative have included measures to avoid and/or minimize potential impacts where feasible. Typical sections are reduced to minimize the area of impervious surface added, and where possible 2:1 slopes are utilized.

4.4.4 Impacts and Permitting

Based on review of field delineated resources and the proposed limits of disturbance, the proposed DDI, Traditional, and Partial Cloverleaf interchange concepts are anticipated to result in the following approximated impacts to natural resources:

- Waters of the US – 3,400 LF
- Wetlands – 3 Acres
- Forest – 37 Acres
- Specimen trees – 3 removed

Impacts to these resources will require permits from the applicable county, state, and federal agencies, as well as compensatory mitigation permitting/approvals. These impacts vary between interchange concepts and will continue to be minimized and/or avoided as they are refined

4.4.5 Wetlands and Waterways

The Proposed Interchange is located within the Furnace Bay watershed. Principio Creek flows south, beneath I-95 and west of the Proposed Interchange. A number of tributaries to Principio

Creek flow west and southwest through the project area. Wetlands adjoin these tributaries in the vicinity of the Proposed Interchange.

Wetland and waterway resources are regulated and permitted by MDE and USACE. Impacts require submittal of a Joint Federal/State Permit Application (JPA) for the Alteration of any floodplain, waterway, tidal, or nontidal wetland in Maryland to the Regulatory Services Coordination Office of MDE. MDE distributes copies of the JPA to USACE, as well as other state and federal stakeholders.

When total permanent impacts to wetlands and waters of the US exceed one acre for any single and complete project, an Individual Department of the Army Permit is issued by USACE and a separate nontidal wetlands and waterways permit is issued by MDE. Both permits will include a list of general and special conditions and require compensatory mitigation/remediation for impacts. Mitigation is typically required at the following ratios, although these ratios can vary depending on the type of mitigation proposed:

- Emergent wetland impacts 1:1
- Forested wetland impacts 2:1
- Waters of the US 1:1

Options for wetland mitigation include:

- Nontidal wetland creation to establish nontidal wetlands on upland. Generally, the area is graded to or near the groundwater table to establish hydrologic conditions that will support wetland vegetation and development of wetland soils;
- Nontidal wetland restoration that re-establishes wetland conditions on sites where they have been lost due to agriculture or other changes in site conditions; and,
- Nontidal wetland enhancement that improves the functions and values and wetlands, such as converting emergent wetlands to forested wetlands or restoring hydrology to wetlands that have been partially drained.

Mitigation for impacts to waters of the US is generally achieved through restoration of a stream channel, either within the same stream or within the watershed. Restoration activities could stabilize stream banks, reconnect streams with their floodplain, and minimize erosion and nutrient transport.

Based on estimated impacts associated with the Proposed Interchange project, it is possible that up to six acres of wetland mitigation and 3,400 linear feet of stream restoration will be required.

4.4.6 Forests

Forest resources are regulated by DNR and authority is often delegated to the counties. This project is likely to be regulated at a county level and a Forest Conservation Plan (FCP) will be required to determine mitigation needs. The FCP would illustrate existing and proposed conditions and would

include calculations of the forest to be removed and the amount of forest to be replanted as mitigation. Mitigation is generally achieved by replanting and placing the planted area in a perpetual conservation easement, or through payment into a mitigation bank.

Forest mitigation is site specific and is dependent on the size of the parcel, the limits of disturbance, the total amount of forest cleared, and the specific land use. It is estimated that 25 to 30 acres of forest mitigation will be required for the Proposed Interchange project.

4.4.7 Potential Mitigation

The SC properties include small ponds, mostly associated with previous mining activities that are scattered throughout the site indicating shallow groundwater. The SC properties also include large forested tracts and cleared areas that if planted will provide an increase in contiguous forest for wildlife and interior bird habitat. These sites have potential for both wetland and forest mitigation.

Several tributaries to Principio Creek flow west and southwest through the proposed interchange site. There is a potential for stream restoration within these channels in conjunction with construction of the interchange, as the area will already be cleared and construction access established.

As mentioned earlier, SC owns 6,610 acres surrounding the interchange and will make property available towards mitigating unavoidable impact generated by the selected alternative.

4.4.8 Environmental Stewardship

This project may present several opportunities for environmental protection beyond compensating mitigation required by permit stipulations and mitigation requirements. The participation of private partners could enable the restoration, establishment, enhancement, or preservation of wetlands, streams, forests or riparian areas within the project right-of-way. An innovative Design Build approach will include incentives for the Design Builder to reduce environmental impacts.

4.5 Quality of Life

Sustainable, well-paying jobs are needed in rural Cecil County. Residents can endure lengthy commutes primarily because of the rural nature of the County and locations of employment opportunities in other jurisdictions. Although the total labor force is 52,581, fewer than half of Cecil County residents work in Cecil County. Moreover, the County's 2016 unemployment rate was 5.1%. The median household income of Cecil County is just over \$68,000 and 10% of the population lives in poverty.

The construction of the I-95/Belvidere Road interchange would provide a needed infrastructure link to attract more businesses and contribute to a solid local tax base. In this rural area, the attraction of new businesses, the development of employment opportunities, and the provision of access to these jobs can improve the quality of life for Cecil County residents in several ways. An expanded tax base will generate government resources needed to expand emergency services coverage, provide access to health care, improve infrastructure and roadway maintenance, and assist in educational programs. The substantial percentage of employed Cecil County residents working in other jurisdictions almost makes Cecil County a bedroom community with less tax base. Providing the option of a shorter commute is consistent with improving quality of life, minimizing energy utilization and balancing the tax base more evenly between residential and commercial activities. It may also contribute to the retention and development of a skilled and

talented workforce and, reducing both unemployment and underemployment ([The Cecil County Growth Study](#)).

4.6 Innovation

4.6.1 Innovative Technologies

A DDI is one of three interchange options being studied to address the transportation needs of the area. **See Figure 9.** The safety benefits of a DDI are described in detail in the Safety section of this application. As documented in [FHWA's DDI Informational Guide](#) DDIs have proven effective across the country. This innovative interchange would be the first full DDI in Maryland.

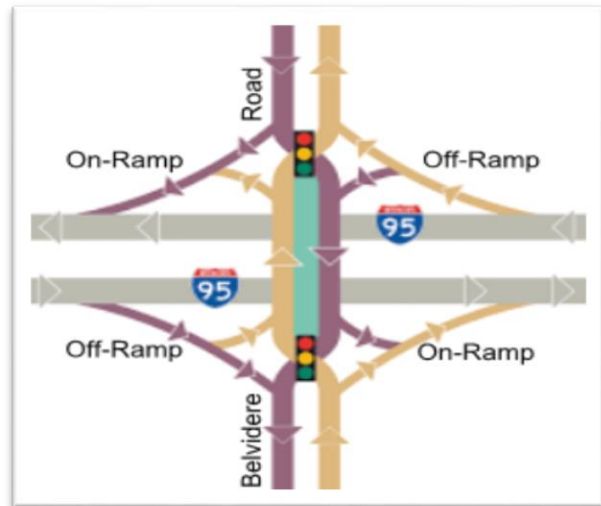


Figure 9: Diagram of a Diverging Diamond Interchange

The DDI is a recognized design concept to improve traffic flow and reduce congestion. The purpose of this design is to accommodate left-turning movements onto arterials and limited-access highways while eliminating the need for left-turn bays and signal phases at the signalized ramp terminals. The highway is connected to the arterial cross street by two on-ramps and two off ramps in a manner similar to a conventional diamond interchange. However, on the cross street, the traffic moves to the left side of the roadway between the ramp terminals. This allows vehicles on the cross street turning left onto the ramps to continue to the on-ramps without conflicting with opposing through traffic. The DDI design provides a safety benefit because it reduces the total number of potential conflict points by eliminating potential crossing conflicts between vehicles turning left onto the freeway and opposing arterial traffic. Traffic signals and other roadway design features such as signs and markings are used to separate conflicts between vehicles. The signals are intended to reduce the probability of driver errors that can result in crashes. Safety performance is generally better when the total number of conflict points is minimized.

4.6.2 Innovative Project Delivery

Design-Build (DB) is a project delivery method where one entity – the design-build team – works under a single contract with the project owner to provide both design and construction services. **See Figure 10.** The DB process provides a one entity, one contract, one unified flow of work from initial concept through completion, thereby re-integrating the roles of designer and constructor. DB is an alternative to the traditional design-bid-build (DBB) project delivery method. Under the DBB approach, design and construction services are split into separate entities, separate contracts and separate work. **See Figure 11.** This DB contract will include incentives to reduce environmental impacts (identified in the concept plans) as an innovative way to reduce impacts.

Environmental impacts can be reduced through the avoidance and/or minimization of wetlands and streams impacted by the interchange. Shifting alignments, adding drainage structures that allow for groundwater connections to be maintained and constructing retaining walls that minimize longer slopes are all methods that will be considered potentially reducing impacts to environmental

resources. Additionally, tree clearing would be minimized to the extent practicable to avoid impacts to forest interior dwelling birds and other sensitive species.

Environmental impacts can be reduced through the avoidance and minimization of wetlands and streams impacted by the interchange. Shifting alignments, adding drainage structures that allow for groundwater connections to be maintained and constructing retaining walls that minimize longer slopes are all methods that will be considered potentially reducing impacts to environmental resources. Additionally, tree clearing would be minimized to the extent practicable to avoid impacts to forest interior dwelling birds and other sensitive species.

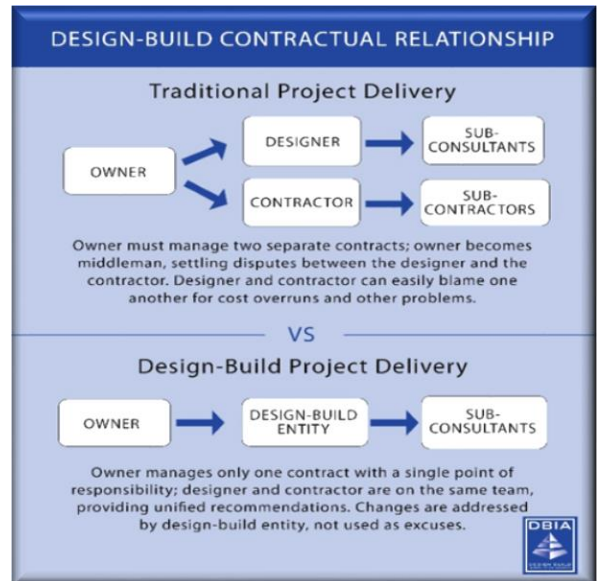
We will consider retaining an expedited permit reviewer from a consulting firm to shorten permit review times. An experienced scientist could work on behalf of the state regulatory entity to review permit applications specific to the project, thereby assisting the state with moving efficiently through the permit process.

4.6.3 Innovative Financing

As described in greater detail in Section 3 of this application MDOT MDTA, Cecil County and/or SC are providing all the planning, design, construction and right-of-way to complete this project. The BUILD Grant is the only federal funding source proposed and potentially used.

4.7 Partnership

The Proposed Interchange project has brought together three committed partners to achieve economic development goals in the rural parts of Cecil County. This is a great example of a primarily local rural county teaming with a state transportation agency and the private sector to deliver a project that will increase job opportunities. Below is a description of each of the project partners:



COMPARISON OF PROJECT DELIVERY METHODS		
METRIC	DESIGN-BUILD VS. DESIGN-BID-BUILD	DESIGN-BUILD vs. CM@R
UNIT COST	6.1% lower	4.5% lower
CONSTRUCTION SPEED	12% faster	7% faster
DELIVERY SPEED	33.5% faster	23.5% faster
COST GROWTH	5.2% less	12.6% less
SCHEDULE GROWTH	11.4% less	2.2% less

Source: Construction Industry Institute (CII)/Penn State research comprising 351 projects ranging from 5,000 to 2.5 million square feet. The study includes varied project types and sectors.

DBIA

Figure 11: Comparison of project delivery methods



Cecil County is the BUILD Grant applicant and has committed \$1,000,000 to the project. The County has a population of just over 100,000 people and is located in northeastern Maryland between Baltimore and Philadelphia. A major goal of the County is to provide economic development in its rural areas. The Proposed Interchange is vital to the PBP and the County's economy as a whole. The Proposed Interchange is Cecil County's top transportation priority and would be transformational for Cecil County's economy.



Maryland
Transportation
Authority

MDOT MDTA is an independent state agency responsible for financing, constructing, operating, and maintaining eight toll facilities, currently consisting of two toll roads, two tunnels, and four bridges in the State of Maryland. The I-95 corridor from Baltimore to the Delaware Line falls within their jurisdiction. MDOT MDTA will be an active and supportive partner and will take the responsibility of administering the BUILD Grant. They will also be a significant financial partner contributing \$22,325,000 to help fund project costs. They are leading the NEPA Study and coordinating with FHWA and other agencies. MDOT MDTA will advertise and administer the project construction and will take over maintenance post construction.



SC is this project's private partner. They have years of experience in the careful planning of land use and development of residential, industrial and commercial properties. They are mining and then developing the land in Cecil County adjacent to the Proposed Interchange area and have been partnering with Cecil County to help economic development in the County. SC owns the necessary right-of-way to build the interchange project. SC is currently paying for the project NEPA Study and IAPA for the Proposed Interchange, in addition to being a major financial partner contributing \$5,675,000 in property, engineering, and construction.

Letters of Support

Cecil County has received broad support for the Proposed Interchange project including variety of elected officials, agencies, private companies, and other organizations. Refer to the Letters of Support Supplementary Documentation of this application for more detail.

4.8 Non-Federal Revenue for Transportation Infrastructure Investment

Several sources of non-federal revenue for transportation infrastructure investment are being generated by the construction of the Proposed Interchange. Projected 2040 ADT generated from the full build-out of the CCPEZ (and adjacent development) is 13,148 trucks and 30,678 cars. **See Table 6.** It is assumed that 40% to 50% of the truck ADT would be heading northbound to CCPEZ and would pay a US 40 or I-95 toll of \$60.00 (2018 dollars) and that 20% to 30% of cars heading northbound to CCPEZ would pay a \$6.00 US 40 or I-95 toll. Daily toll revenues for trucks would range between approximately \$315,540 and \$394,440 while car revenues would range between approximately \$36,816 and \$55,218. Toll pricing would vary based on the true vehicle mix but the total potential ADT gross toll revenues. Based on these assumptions gross toll revenues could potentially range between \$352,356 and \$449,658.

5. PROJECT READINESS

Cecil County is the primary applicant while the MDOT MDTA will administer the procurement and construction of the project elements proposed in this application. MDOT MDTA will work closely with the FHWA, regional and state planning and development entities to support the state and region's economic competitiveness, as well as to improve safety and quality of life. MDOT MDTA has an excellent history of risk management with decades of project and construction experience. The applicant has assessed project scope, schedule, budget risks, mitigation measures, and strategies risks to the project have been analyzed. MDOT MDTA has contractual mechanisms in place that will allow the project to move quickly upon award to begin design, engineering, and construction of the project elements. The applicant understands the need for projects to be obligated by June 30, 2020, and expended by September 30, 2025, to comply with BUILD Grant funding requirements. MDOT MDTA has extensive experience executing projects of similar size and scope.

5.1 Political and Planning

Economic development in this area has also received substantial political support. The recent grand opening of the Amazon fulfillment center in PBP was attended by Governor Larry Hogan, US Representative Andy Harris, MD Commerce Secretary Mike Gill, and Cecil County Executive Alan McCarthy. The Governor said that "the Amazon fulfillment center could bring even more jobs to Cecil County and the I-95 corridor". He also pointed out that the I-95 corridor is a great place for distribution, and other people are going to take notice" ([Baltimore Sun, 3/28/18](#)).

The project is listed in the [Maryland FY 2018-2023 Consolidated Transportation Program](#), the State of Maryland's six-year capital investment program for transportation. Cecil County has listed improvements to I-95 and Belvidere Road as its highest transportation priority, as shown in [2018 Transportation Priority Letter](#). Additionally, improvements in this area are supported in the [2010 Cecil County Comprehensive Plan](#), the [2015 Delmarva Freight Plan](#), and the [2017 Maryland Strategic Goods Movement Plan](#). The location of the planned new I-95/Belvidere Road interchange is classified in the 2010 Cecil County Comprehensive Plan as a future growth area. Specifically the land is within a Mineral Extraction District, which is part of the Designated Growth Area.

The project is in a rural area (a focal point of the BUILD Grant), is Cecil County's top transportation/economic priority and is supported by MDOT. MDOT MDTA has the NEPA studies programmed in their [FY 2018-2023 Consolidated Transportation Program](#) and will program construction following completion of the NEPA process. Refer to the Letters of Support Supplementary Documentation of this application for more detail.

5.2 Technical Feasibility

MDOT MDTA is currently in coordination with FHWA as to whether the project should be classified as a CE or EA/FONSI. In either scenario, the document will be prepared in accordance with the provisions and requirements of Chapter 1, Title 23 Code of Federal Regulations (CFR) Part 771, relating to implementation of the NEPA. Tasks included during NEPA include developing a range of alternatives and identifying environmental constraints. Each alternative will

be evaluated based on impacts and proposed mitigation, operational traffic analysis, proposed construction costs and project risks. The expected benefits include improving regional transportation by providing direct access to I-95 from within the Study Area while reducing traffic congestion on existing roadways, such as US 40. The project will also enhance the economic viability of existing industries, while creating development opportunities for new industries.

Design features closely follow design criteria and policies established by Cecil County, MDOT SHA, American Association of State Highway and Transportation Officials (AASHTO) and FHWA. All traffic barrier design will be in compliance with FHWA's recently implemented Manual for Assessing Safety Hardware (MASH) criteria.

Our constructability team reviewed interchange options and found that using the existing Belvidere Road Bridge to maintain traffic during construction, minimum utility impacts and the donation of right-of-way needed for improvements and potential mitigation eliminated the major schedule risks typically associated with construction.

A DDI is being considered as one of the interchange options. DDI is an innovative and relatively new concept being pursued as an alternative interchange type that provides a significant increase in capacity while reducing bridge size requirements. **See Section 4.6.1** of this application for a more detailed description of the operational benefits of a DDI.

Also as described, the cost estimate and major quantities estimate for the project were developed in accordance with MDOT SHA's 2017 Highway Construction Cost Estimating Manual. Based on this manual, the major quantities estimate was developed to determine the preliminary cost estimate. The manual and MDOT SHA pricing history were used to determine item unit costs. A 30% contingency was applied based on rates provided in the manual to adequately address potential unknowns at this stage of project development.

5.3 Project Schedule

The project schedule is also on FHWA approval of a NEPA EA/FONSI. **See Figure 12**. However, MDOT MDTA is coordinating with FHWA whether the project would qualify as a CE. Should a CE classification be approved, the schedule will be shortened by approximately six months. **Figure 12** illustrates the project schedule from NEPA through construction, and demonstrates how funds will be obligated and expended well before NOFO requirements. A significant schedule float has been provided to account for unforeseen delays.

NEPA will be completed by August, 2019 and the IAPA will be approved shortly thereafter. Design/Build NTP will be granted by September, 2020, and construction will be completed and interchange opened in July, 2023.

5.4 Required Project Approvals

A strategy is in place to obtain all required approvals and permits in a timely manner to meet the project funding obligation and expenditure requirements. The schedule incorporates 6 months of float to meet the desired obligation date of June 30, 2020 with all funds expended more than two years prior to the required September 30, 2025 date. The project is aligned with federal, state, regional and local priorities.

I-95 at Belvidere Road Interchange / 2018 BUILD Transportation Discretionary

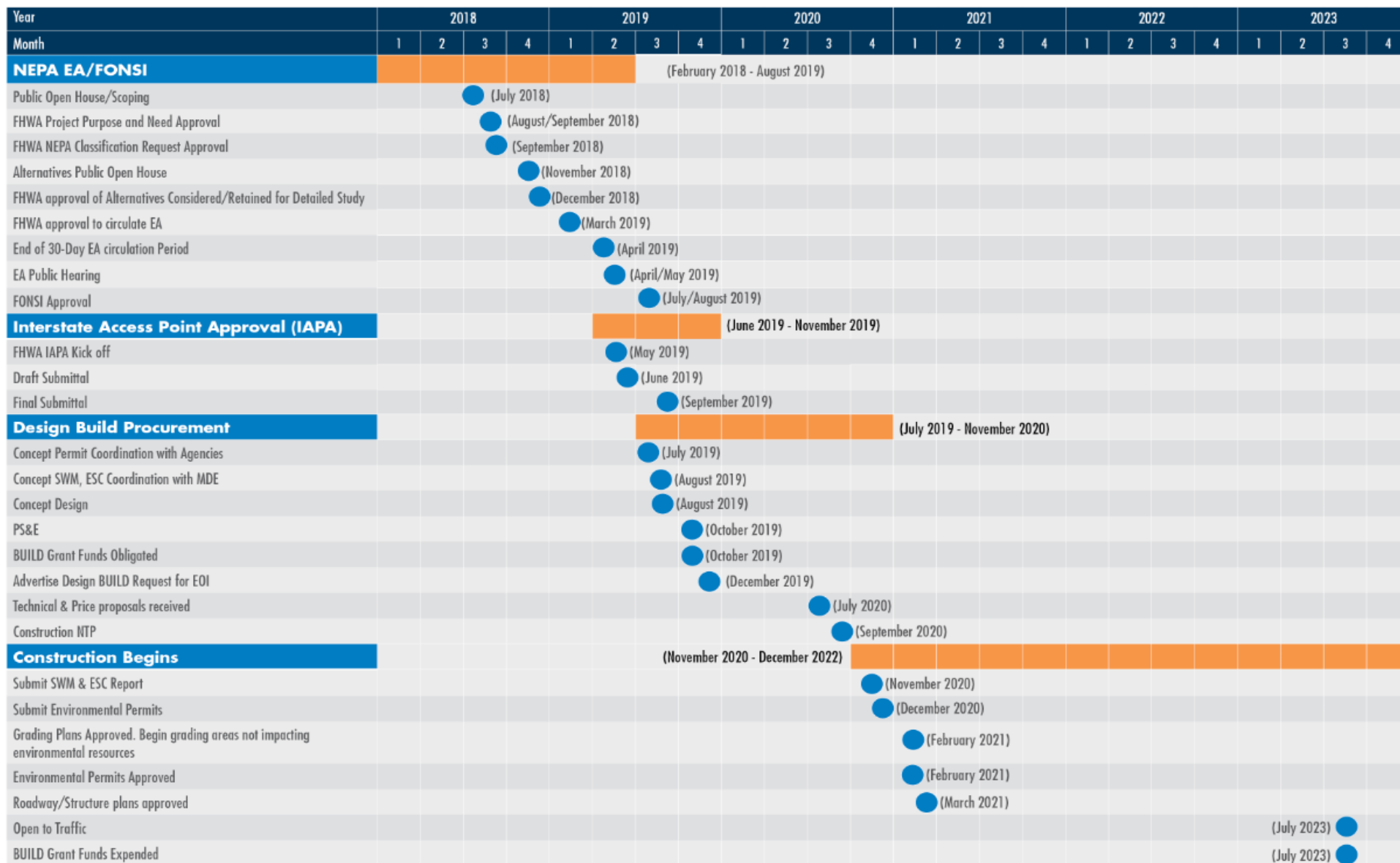


Figure 12: NEPA EA/FONSI Schedule

5.5 Environmental Permit and Reviews

Wetland and waterway, forest and stream impacts and mitigation are discussed in detail in Section 4.4 of this application.

Wetland and waterways are regulated and permitted by MDE and USACE. Impacts require submittal of a Section 404 Joint Permit Application (JPA) to the regulatory services coordination office of MDE.

Forests are regulated by the DNR and authority is often delegated to the counties. This project is likely to be delegated to the County and a Forest Conservation Plan (FCP) will be required to determine mitigation needs.

5.6 Federal Approvals

We have assumed an EA/FONSI NEPA document for purposes of this application. However, MDOT MDTA is coordinating potential CE feasibility with FHWA. The EA/FONSI is scheduled for FHWA approval in August 2019.

This new fully access controlled interchange will require IAPA approval by FHWA. Background traffic data is complete and the IAPA will be based on the selected alternative. The project schedule targets FHWA approval in August, 2019.

5.7 State and Local Approvals

The project is located in an EPA ozone non-attainment area. Conformity to the SIP is determined through a regional air quality analysis performed on the TIP and Transportation Plan. This project is currently not included in the WILMAPCO FY 2018-2022 TIP. [WILMAPCO](#) has committed to including the I-95/Belvidere Road Interchange in its Draft 2050 RTP. The RTP is set for adoption in March 2019, following an extensive analysis and public outreach process TIP once air quality conformity modeling and public outreach are complete.

Stormwater management and erosion and sediment control plans will be submitted to Cecil County and MDE for review and approval prior to any grading. Preliminary plans will be included in the advertisement and the proposed design-builder will be required to acquire final permit approvals. This process reduces the risk of delay and ensures that plans are consistent with the permit and all NEPA commitments.

5.8 Federal Transportation Requirements Affecting State and Local Planning

As described in **Section 5.7**, [WILMAPCO](#) has committed to including the I-95/Belvidere Road Interchange in its Draft 2050 RTP.

5.9 Public Engagement

A public scoping open house is scheduled for July 31, 2018 to receive public and stakeholder input. A second public open house is scheduled for early in the fourth quarter of 2018 with a

public hearing being held early in the second quarter of 2019 pending final FHWA NEPA classification. Additional public and business meetings are being scheduled as requested.

5.10 Assessment of Project Risks and Mitigation Strategies

As described in **Section 4.6.1**, an innovative design-build approach is being proposed for concept design and construction to minimize schedule risk. Permits, utilities and right-of-way often pose the greatest risk. The following strategy is in place to minimize these risks:

- Permits have been carefully considered in the procurement schedule to avoid delays. Permits will be thoroughly coordinated with agencies during NEPA and concept design to develop construction specifications that have been fully vetted by the agencies and provide the design-builder with clear direction and requirements. The design-builder will be required to meet all NEPA commitments and will acquire and comply with the permits for SWM, E&SC, the Maryland Reforestation Law approval, as well as wetland and waterway permits from MDE and USACE. This includes wetland and stream mitigation design approval. MDOT SHA is currently using this approach of having the design-builder acquire final permits on the recent US 219/I-68 interchange design-build construction project to reduce the risk of schedule delays and ensure compliance with the final design.
- All right-of-way for construction and mitigation is privately owned by an affiliate of SC and will be made available for the project.
- Utility research is complete and there are no significant relocations required.

The following are additional areas of potential risk and strategies we have employed to eliminate or mitigate them:

Schedule –The schedule (**See Section 5.3**) allows for six months float to account for any unforeseen conditions to meet the required obligation date while completing construction over two years prior to the required expenditure date. As mentioned, we are using an innovative design-build approach, which is a proven procurement method to reduce completion time via the designer and contractor working collaboratively to reduce construction delays and re-work.

Cost – MDOT SHA’s proven cost estimating procedures are updated annually and based on recently constructed projects. Contingencies are based on project history of similar types of project in a similar location. In addition, our constructability team, comprised of experienced former contractors, evaluate carefully to make sure the project can be constructed as designed/proposed.

Funding – As described, the project is jointly funded by MDOT MDTA, Cecil County, and SC. All three parties have agreed to a funding plan and their individual contributions are shown in their [funding commitment letters](#) (See detailed breakdown of funds in **Section 3**).

6. SUMMARY OF BENEFIT-COST ANALYSIS

The benefit categories associated with the project, and analyzed for their inclusion in the BCA, are mapped into all eight merit criteria set forth by USDOT. To maintain a conservative approach, only those benefit categories for which USDOT provides clear guidance were formally included in the monetization of benefits. **Table 7** and **Table 8** summarize the BCA findings. Annual costs and benefits are computed over the lifecycle of the project (26 years), and benefits accrue during the full operation of the project.

Table 7: Overall Results of the Benefit Cost Analysis, Millions of 2017 Dollars

Project Evaluation Metric	7% Discount Rate	3% Discount Rate
Total Discounted Benefits	\$83.18	\$155.89
Total Discounted Costs	\$44.82	\$49.72
Net Present Value	\$38.35	\$106.18
Benefit / Cost Ratio	1.9	3.1
Internal Rate of Return (%)	12.4%	
Payback Period (years)	7	

With a 7 percent real discount rate, the \$44.8 million capital investment would result in \$83.2 million in total benefits and a Benefit/Cost ratio of about 1.9.

Table 8: Benefit Estimates by Merit Criteria for the Full Build Alternative

Primary Selection Criteria	Benefit Categories	7% Discount Rate	3% Discount Rate
Safety	Accident Cost Reduction	\$6,598,767	\$12,137,549
State of Good Repair	Pavement Maintenance Cost Reduction	\$1,488,893	\$2,742,606
	(-) Increase in O&M Cost	-\$5,402,206	-\$9,178,518
Economic Competitiveness	Travel Time Savings	\$51,884,939	\$97,492,497
	Out-of-Pocket Vehicle Operating Cost Savings	\$27,427,061	\$50,468,799
Environmental Protection	Emission Cost Savings	\$1,177,743	\$2,231,372
Total Benefit Estimates		\$83,175,197	\$155,894,306

In summary, benefits attributed to the project, and monetized in the BCA include:

- **Safety** benefits generated from reduced vehicle accidents resulting from reduced Study Area traffic.
- **State of Good Repair** benefits comprised of pavement maintenance cost savings from reduced traffic on US 40, MD 222, and MD 272, and operating and maintenance costs (as a disbenefit) for the new interchange.

Shorter routes through the interchange and reduced vehicle congestion which generate:

- **Economic Competitiveness** benefits through travel time savings and out-of-pocket vehicle operating cost savings and,
- **Environmental Protection** benefits resulting from reduced emissions cost savings.

Please refer to the BCA Supplementary Documentation of this application for more detail

APPENDIX A
I-95 AT BELVIDERE ROAD INTERCHANGE
BUILD TRANSPORTATION DISCRETIONARY
GRANT APPLICATION
June 19, 2018



I-95 AT BELVIDERE ROAD INTERCHANGE BUILD TRANSPORTATION DISCRETIONARY GRANT APPLICATION



Maryland
Transportation
Authority



July 19, 2018

Cecil County

In partnership with:

MDOT Maryland Department of Transportation
Maryland Transportation Authority
Stewart Companies

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1. PROJECT DESCRIPTION

1.1 Introduction

In rural Cecil County, Maryland there is tremendous potential for improved safety, economic growth and development, and improved transportation and infrastructure through the proposed new I-95/Belvidere Road Interchange (Proposed Interchange), a public-private partnership between Cecil County, the Maryland Department of Transportation Maryland Transportation Authority (MDOT MDTA), and The Stewart Companies of York, Pennsylvania (SC). MDOT MDTA owns and maintains I-95 in Cecil County. An affiliate of SC owns the Principio Business Park (PBP) as well as 6,610 acres in the immediate vicinity of the Proposed Interchange.



A unique element of this rural transportation project is its strategic location along multi-modal freight transportation infrastructure (e.g., I-95 and CSX) and access to major metropolitan markets. PBP is situated approximately 50 miles from Baltimore, MD, 60 miles from Philadelphia, PA, 85 miles from Washington, DC, and 145 miles from New York, NY.

The total economic impact of this Proposed Interchange is significant, potentially yielding between 8,300 and 10,600 direct jobs, (2,520 of which are projected in 2019 from existing businesses and businesses under construction at PBP), that are directly related to existing and planned distribution, warehousing, manufacturing and retail businesses within the Cecil County Principio Enterprise Zone (CCPEZ) and adjacent development. Not considered in these figures are temporary interchange/business construction jobs and new service jobs generated to support CCPEZ employees. Additionally, the impact will generate between \$26,400,000 and \$28,800,000 in annual local revenue from property and income taxes and recordation and transfer fees, of which approximately \$7,600,000 will come from existing businesses and businesses under construction in 2019 at the PBP ([Cecil County CCPEZ Economic Development Data](#)). Cecil County has identified the Proposed Interchange as the key to unlocking the full economic potential of the CCPEZ, and has stated so to the Maryland Department of Transportation (MDOT) highlighting the interchange as Cecil County's top transportation priority in its [2018 Transportation Priority Letter](#).

The Proposed Interchange would immediately support existing PBP large market cap tenants and occupants including Amazon, General Electric (GE), Medline and LIDL, among others. The Proposed Interchange would attract new business and help sustain existing businesses by reducing energy and operating costs that are essential to the warehousing and distribution industry. *The*

SUPPORTS
8,300+
DIRECT JOBS IN
RURAL CECIL
COUNTY

Reduced heavy
truck traffic on
existing roads and
vehicles miles
travelled

total estimated benefits are \$83,200,000 as shown in the Benefit Cost Analysis (BCA). Key benefits/highlights of the Proposed Interchange include:

Safety:

The Proposed Interchange will reduce local heavy truck traffic on US 40, MD 222, and MD 272 by as much as 40%, reducing truck-related accidents at high crash intersection locations. A Diverging Diamond Interchange (DDI) is being considered, as it has significant benefits over traditional interchanges. These benefits are discussed in detail in **Section 4.14.1. An accident cost reduction of \$6,600,000 is detailed in the BCA.**

Vehicle delay would be reduced by 9,300,000 hours for cars & over 2,500,000 hours for trucks over the 2017-2042 analysis period.

State of Good Repair:

Construction of the Proposed Interchange will reduce the daily trips on existing US 40, MD 222 and MD 272 entering and leaving PBP by 1.1 miles in each direction, with an average total vehicles miles traveled (VMT) **reduction of approximately 26,660 miles daily** for cars and trucks between 2023 and 2042 (years of operation) as detailed in the **BCA** model. **A pavement maintenance cost reduction of \$1,500,000 is calculated in the BCA.**

VMT in the CCPEZ would be reduced by 109,000,000 car miles & 45,000,000 truck miles over the 2017- 2042 analysis period.

Economic Competitiveness:

Between 8,300 and 10,600 jobs and between \$26,400,000 and \$28,800,000 in annual revenue could be generated with the full build-out of warehouse, distribution and manufacturing development areas planned for the CCPEZ and adjacent development. ***In addition, the estimated benefit of travel time and out-of-pocket cost savings is \$79,300,000 as estimated in the BCA.***

Environmental Protections:

This project has been presented to numerous federal and state regulatory agencies early in its project development to identify and/or avoid or minimize potential impacts to natural, social, and cultural resources. These agencies have the opportunity to provide input throughout the project development process. Upon construction of the Proposed Interchange, the resultant reduced VMT and congestion delay would reduce vehicle emissions. This is notable as Cecil County is designated as a non-attainment area for 8-hour ozone. ***The estimated cost savings is \$1,200,000.***

The public-private partnership will identify land with capacity to provide compensatory mitigation to any project impacts. Additionally, land may be identified for environmental stewardship and/or future mitigation needs. The footprint of the Proposed Interchange is currently zoned for mineral extraction, which would likely have a greater natural resource impact than the Proposed Interchange.

Quality of Life:

The Proposed Interchange would provide Cecil County residents and businesses with improved access to PBP and additional access to I-95, while reducing congestion at existing intersections. With the new local annual tax revenue, Cecil County can provide additional community amenities and improve existing facilities.

Innovation:

1. A potential interchange alternative being studied is a Divergent Diamond Interchange (DDI). The DDI is a nationally recognized design concept that improves traffic flow and reduces congestion by accommodating left-turning movements onto arterials and limited-access highways while eliminating the need for left-turn bays and signal phases at the signalized ramp terminals.
2. A proposed Design-Build (DB) Delivery method will streamline interchange construction. Proposed financial incentives to the contractor team based on reduction of environmental impacts and adherence to construction performance schedules will accelerate delivery and the timeline for new businesses to open in the existing PBP and future development areas.

Partnership:

Three committed partners have come together on the Proposed Interchange project to achieve goals of economic development and improved mobility in this rural area of western Cecil County, Maryland. This is a tremendous opportunity for a predominantly rural county to team with a state transportation agency using a significant percentage of private non-federal money to deliver a project that will increase job opportunities in an area that has logistically demonstrated its ability to achieve Cecil County's economic goals and vision.

1.2 Project Overview

Cecil County in northeastern Maryland is a mostly rural county with just over 100,000 residents. Fewer than one half of employed Cecil County residents actually work in the county. The remaining employed residents work in neighboring jurisdictions ([Maryland Department of Commerce](#)). Economic development within the Proposed Interchange area would provide residents with employment opportunities in Cecil County that are not currently available.

The largest employment sector in Cecil County is the “trade, transportation and utilities” sector, which includes warehousing and distribution. The distribution industry is rapidly growing along I-95 due to its proximity to major metropolitan areas to both the north and south. **See Figure 1.**

Cecil County has strongly supported the distribution industry principally due to its strategic location to major metropolitan markets. Moreover, the distribution industry has comparatively minor water and wastewater infrastructure requirements. This makes it a viable land use in areas that have had limited public infrastructure ([2010 Cecil County Comprehensive Plan](#)). Additionally, Cecil County has an economic opportunity to increase its industrial and warehouse facilities in support of the robust e-commerce market.

The Proposed Interchange would serve the rapidly growing logistics and distribution industry along this portion of the I-95 corridor by attracting new businesses and employees to planned development in the CCPEZ.



Figure 1: Driving distance from Proposed Interchange to major cities.

While the CCPEZ represents the Cecil County's top employment initiative, it currently does not have direct access to I-95. Existing businesses at PBP are projected to employ over 2,520 people by 2019 and Cecil County estimates that full build-out of the CCPEZ and adjacent development would result in over 8,300 jobs. The Proposed Interchange project would provide direct access for trucks and other vehicles to the newly developed areas.

1.3 Project History

SC owns and maintains several diverse long-standing businesses within Cecil County, including a mining and materials business, a construction business and a real estate development company. Relative to SC's mining and materials division, SC owns and operates three sand and gravel plants in Cecil County under the tradenames Mason-Dixon Materials and York Building Products, as well as the legacy mining/buffer property that SC is proposing to transfer in-kind for the project.

The I-95/Belvidere Road Transportation Improvement Study is funded by SC and overseen by MDOT MDTA in partnership with Cecil County. MDOT MDTA owns, operates, and maintains a 50-mile portion of I-95 in Maryland, from north of Baltimore City to the Delaware state line. The Federal Highway Administration (FHWA) has approval authority over any changes to access points on I-95. Approval of any proposed modification to interstate access constitutes a federal action subject to review under the National Environmental Policy Act (NEPA). A NEPA study began in January 2018 and is fully funded by SC. MDOT MDTA, who is coordinating with the FHWA to determine whether a Categorical Exclusion (CE) or Environmental Assessment/Finding of No Significant Impact (EA/FONSI) will be prepared. In either scenario, the document will be prepared in accordance with the provisions and requirements of Chapter 1, Title 23 Code of Federal Regulations (CFR) Part 771, relating to implementation of the National Environmental Policy Act.

1.4 Project Purpose

The purpose of the Proposed Interchange is to improve safe and efficient vehicular access to I-95 at Belvidere Road, and to facilitate ongoing and planned economic development in Cecil County's CCPEZ Zone by addressing the associated increase in traffic volumes.

The Proposed Interchange will attract new business to CCPEZ and existing PBP which lies within the CCPEZ. The following benefits will be realized by improving Belvidere Road access to I-95:

1. **Jobs** – New businesses will benefit the people in this rural area by providing jobs and saving travel time for the County residents presently commuting out-of-county for work.
2. **Improved Mobility in the Design Year 2040** - Without making any improvements, the I-95/MD 222 interchange, along with seven study area intersections, will operate at undesirable levels-of-service with the projected 2040 full-build-out of the CCPEZ and planned adjacent development.
3. **Reduced trip delay** - The current north/south travel path between I-95 and PBP contains 12 traffic signals, which significantly delay the trip and increases fuel consumption from vehicle stops and starts.
4. **Reduced VMT** - A new I-95 Belvidere Road Interchange would reduce vehicle trips by 1.1 miles in each direction. **See Figure 2.** Reducing VMT will result in reduced energy consumption and costs. *The travel time savings are estimated at \$88,000,000 in the BCA.*

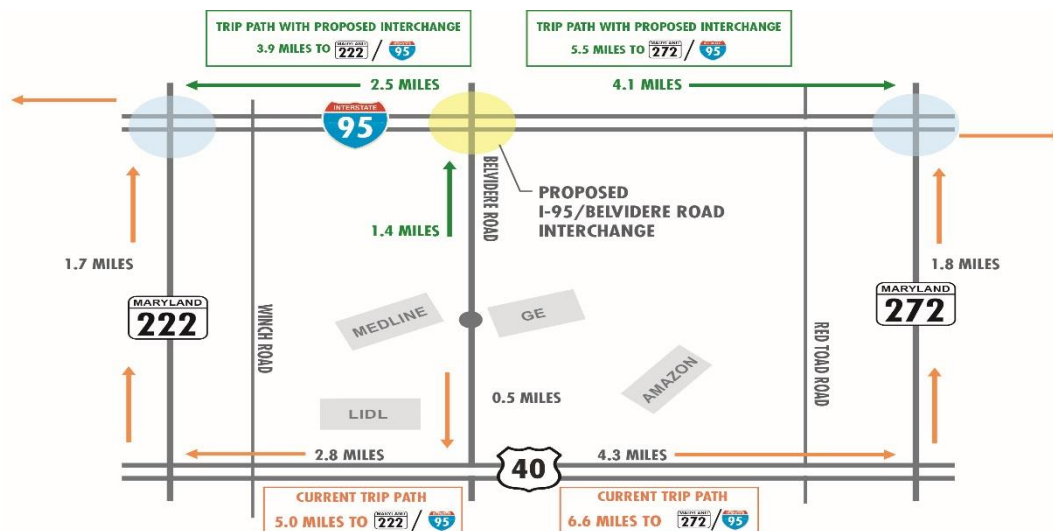


Figure 2: Current and Proposed Trip Path from PBP to I-95

5. **Safety** - A high percentage of truck-related accidents occur at [high crash intersection locations](#). An improved Belvidere Road access to I-95 would significantly remove the number of heavy trucks operating on US 40, MD 222 and MD 272 in the study area.
6. **Air Quality Benefits** - Cecil County is in an EPA designated ozone non-attainment area for 8-hour ozone. Air pollution from emissions would also decrease by reducing VMT.

2. PROJECT LOCATION

I-95 is the foremost north-south roadway in Maryland, providing access to Wilmington, Philadelphia, and points north, and to Baltimore, Washington, D.C. and points south. I-95 also provides direct access to major rail, port, and air facilities along the east coast from Maine to Florida. The project is located in rural western Cecil County, which is traversed by I-95 in an east-west orientation. **See Figure 3.** Belvidere Road crosses over I-95 between the MD 222 interchange to the west and the MD 272 interchange to the east.

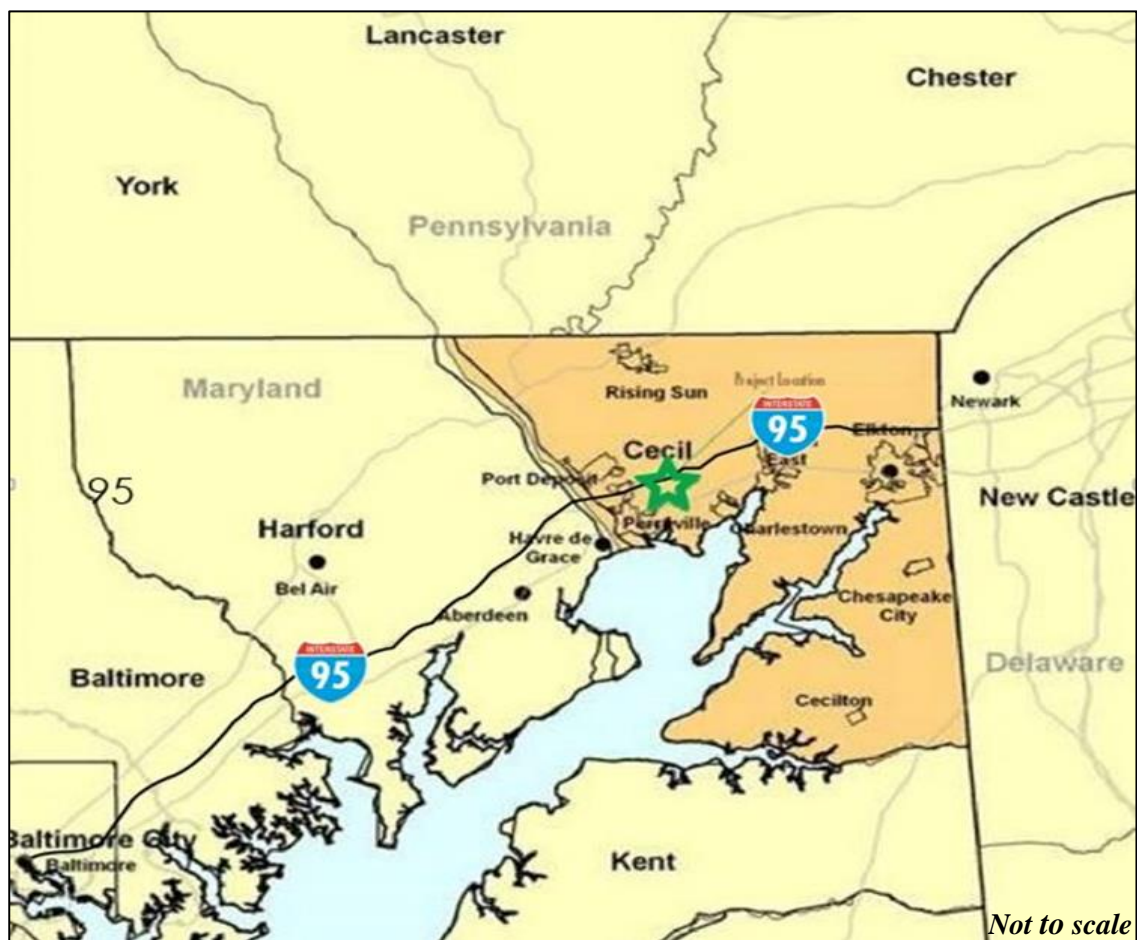


Figure 3: Proposed Interchange location, source: 2010 Cecil County Comprehensive Plan

The MDOT MDTA-owned and privately operated Chesapeake House Travel Plaza (Chesapeake House) is immediately east of the Belvidere Road bridge, between the northbound and southbound lanes of I-95. **See Figure 4.** While Cecil County is predominantly rural, it is a part of the Wilmington Metropolitan Area Planning Council (WILMAPCO) Metropolitan Planning Organization. According to the [US Census Bureau Urbanized Area Reference Map](#), the Proposed Interchange is not in an urban area and therefore considered to be rural.

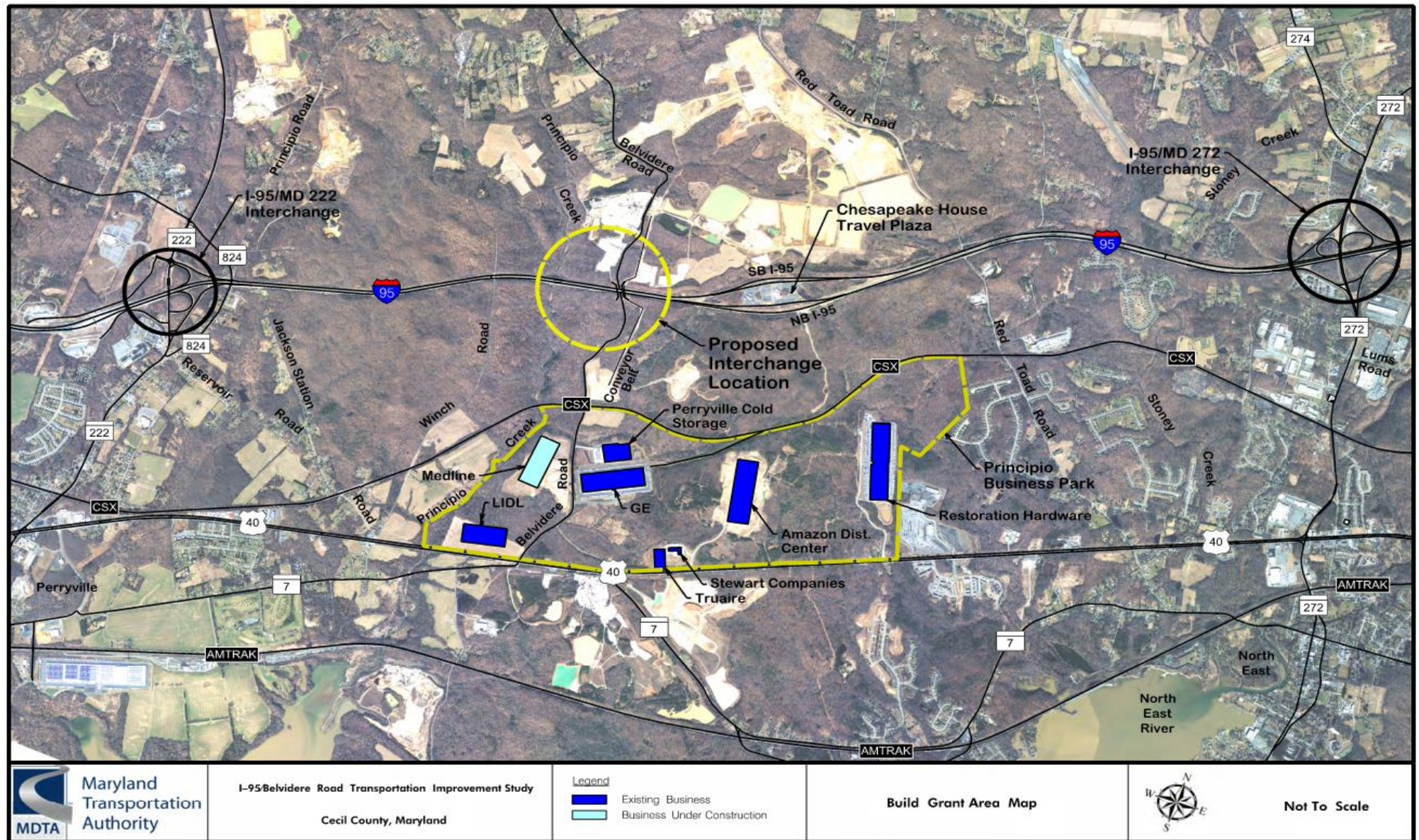


Figure 4: Study Area and I-95/Belvidere Road Interchange location

The green urban demarcation line is shown on the map as approaching the Proposed Interchange from the east. However, that line is simply following nearly two miles of the actual roadway of I-95 which is fully within MDOT MDTA right-of-way. The urban demarcation line also includes the Chesapeake House Travel Plaza which is in the median of I-95 and is also entirely within MDOT MDTA right-of-way. The Census Bureau apparently generated this line solely to classify the commercial and non-residential land use associated with the MDOT MDTA-owned Chesapeake House Travel Plaza and its associated ingress/egress lanes on I-95. The Proposed Interchange is in a rural section of Cecil County.

This section of I-95 is generally six lanes wide (three 12-foot lanes in each direction), with 10-foot inside and outside shoulders and a 25-foot grass median. The location of the Chesapeake House, between northbound I-95 and southbound I-95, requires left exit ramps and left entrance ramps in both directions of the highway. Exit 93 (MD 222) and Exit 100 (MD 272) currently provide indirect access between I-95 and businesses along Belvidere Road. Belvidere Road is a two-lane road, which crosses over I-95 approximately one mile south of the Chesapeake House.

I-95 is part of the National Highway System and is functionally classified as an “Interstate” in the Federal Functional Classification System. It is also included in the State Primary System. US 40, MD 272, MD 222 are all functionally classified as arterials and are owned and maintained by the Maryland Department of Transportation State Highway Administration (MDOT SHA). Belvidere Road and Red Toad Road are functionally classified as Collectors and are owned and maintained by Cecil County. MD 824 is functionally classified as a Collector and is owned and maintained by MDOT SHA. Winch Road is a local road owned and maintained by Cecil County.

Along I-95, there are approximately 6.6 miles between the MD 222 interchange and the MD 272 interchange. The Belvidere Road structure over I-95 is approximately 2.5 miles east of the MD 222 interchange and 4.1 miles west of the MD 272 interchange.

US 40 is generally four lanes wide, two 12-foot lanes in each direction, with 10-foot outside shoulders and two-foot inside shoulders with a variable width grass median. An active CSX railroad line crosses beneath Belvidere Road approximately 0.75 mile south of I-95. A spur from this railroad currently serves the GE Distribution Center and Perryville Cold Storage facility located in the Study Area at the PBP.

3. GRANT FUNDS, SOURCES, AND USES OF ALL PROJECT FUNDING

3.1 Project Costs

The total **estimated cost** of the Proposed Interchange is \$54,000,000. See **Table 1**. This does not include any previously incurred expenses. Project costs were estimated using MDOT SHA’s latest cost estimating manual using the major quantities method. This method quantifies major construction categories including Category 2 (Earthwork), Category 4 (Structures), Category 5 (Pavement) and Category 6 (Shoulders). Categories 1 (Preliminary), 3 (Drainage), 7 (Landscape) and 8 (Utilities) are calculated based on percentages of the major quantities listed above. Traffic items including signing, lighting, marking, and signals are quantified separately. All unit prices are based on bid history for substantially similar size projects in similar markets.

Table 1: I-95/Belvidere Road Interchange Estimate Breakdown	
Phase	Amount
Design-Build Construction	\$40.4M
Preliminary Engineering	\$4.0M
Construction Administration	\$4.0M
Right-of-Way	\$5.6M
Total	\$54.0M

All project funds other than the requested BUILD Grant are non-federal. MDOT MDTA will advertise and administer project construction and understands that BUILD Grant funds will reimburse expenditures.

3.2 Source and Amount of Funds for Eligible Project Costs

Non-federal funds include monies from Cecil County, SC, and MDOT MDTA. NEPA and IAPA approval will be required before commencement of final engineering and appropriate construction permits will be approved prior to commencing construction. **Table 2** shows a summary of the source, funding category, amount of funds, and percentage.

Table 2: I-95/Belvidere Road Interchange Funding Summary			
Source	Funding Category	Amount	Percentage
SC	Non-Federal	\$5.675M	10.5%
Cecil County	Non-Federal	\$1.0M	1.8%
MDOT MDTA	Non-Federal	\$22.325M	41.4%
Build Grant	BUILD	\$25.0M	46.3%
	Total	\$54.0 M	100%

3.3 Documentation of Funding Commitments

Cecil County Maryland, SC and the MDOT MDTA have all submitted [funding commitment letters](#) expressing their financial contribution to the Proposed Interchange project.

3.4 Federal Funds

There is no additional federal funding for this project other than the requested BUILD Grant funds.

3.5 Budget

SC (non-federal) will contribute \$5.675 million (10.5%) including right-of-way donation, engineering, construction and/or in-kind land contributions for wetlands or forest mitigation purposes.

Cecil County (non-federal) will contribute \$1 million (1.8%) towards construction.

MDOT MDTA (non-federal) will contribute \$22.325 million (41.4%) towards construction, utilities and construction administration.

The **BUILD Grant** (federal) funding would provide \$25 million (46.3%) towards construction.

Congress has permitted the US Secretary of Transportation to increase the federal share up to 100 percent for projects in rural areas. The County is requesting a federal share of only 46.3 percent and a non-federal and private share of 53.7 percent.

4. MERIT CRITERIA

4.1 Safety

Three interchange alternatives are being studied. See **Figure 5**. The DDI alternative has gained popularity in the US during the last decade. The Transportation Research Board (TRB) published [Report No. cmr15-006](#) documenting the safety advantages of a DDI. This study concluded that DDIs have significant advantages over traditional diamond interchanges and decreased crash frequency for all severities. The highest crash reduction was observed for fatal and injury crashes – 63.2%, property damage only crashes were reduced by 33.9% and total crash frequency decreased by 41.7%. A collision type analysis revealed that the DDI, as compared to a diamond, reduced the instance of high-severity crashes. While a DDI could eliminate the 34.3% of fatal crashes in a diamond that occurred due to the left turn angle crashes with oncoming traffic.

Design will apply the latest AASHTO and TRB publications including the AASHTO Highway Safety Manual, a predictive method to estimate crash frequency and severity. This method will be used to make informed decisions throughout the project development process including screening potential locations for improvement and choosing alternative roadway designs.

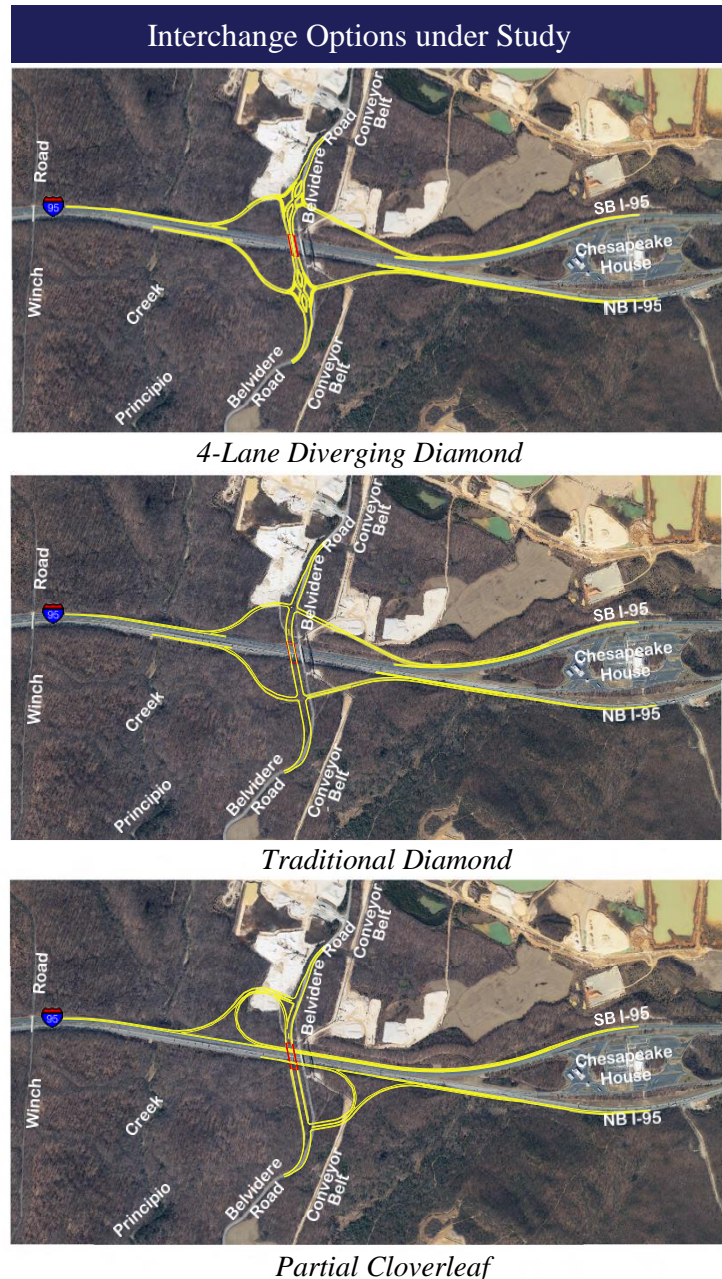


Figure 5: Interchange options that are under study

A high percentage of truck-related intersection crashes occur at several intersections. Truck crashes are more severe and result in more serious injuries than other types of crashes. Crash rates greater than 1.00 are identified as High Crash Locations. Truck-related accidents accounted for a relatively high percentage at [high crash intersection locations](#).

The following is a summary of the Maryland State Police 2015, 2016, and 2017 crash data for high accident locations in the Study Area:

- In 2015, crash rates above 1.00 occurred at the US 40/MD 272, US 40/Belvidere Road/MD 7 and US 40/Red Toad Road intersections with truck related crashes accounting for 20%, 10.5% and 9.1% respectively;

- In 2016, crash rates above 1.00 occurred at the MD 272/Lums Road, US 40/MD 272, MD 222/Bainbridge Road and US 40/Red Toad Road intersections with truck related crashed accounting for 20%, 8%, 29% and 0% respectively; and
- In 2017, crash rates above 1.00 occurred at the MD 272/Lums Road, US 40/MD 272, US 40/E. Principio Parkway. Cold Spring Road and MD 222/Bainbridge Road intersections with truck related crashed accounting for 22%, 6%, 33% and 43% respectively. Crash rates greater than 1.00 are identified as high crash locations. Truck related accidents accounted for a relatively high percentage for several of these intersections

With the addition of the Proposed Interchange, the amount and the type of traffic along the local road network will be reduced. Congestion will be reduced by eliminating failing conditions at intersections. Truck traffic will have direct access to and from I-95, thereby reducing trucks on US 40 by 40%. As described in more detail in the *BCA*, this change in traffic patterns will reduce crashes resulting in significant cost savings.

4.2 State of Good Repair

Several elements of the project will improve the state of good repair by addressing current and projected infrastructure vulnerabilities. These elements include replacing the Belvidere Road bridge over I-95 and reducing the VMT by providing a more direct route for trucks and employees.

Bridge No. CEX960001 is located between mileposts 95.6 and 95.7 and carries Belvidere Road over I-95. The bridge was built in 1963 and was last inspected in 2017. The bridge vertical clearance is 15'- 6" which does not meet MDOT MDTA standard of 16'- 9". In addition, MDOT MDTA's [I-95 Master Plan](#) includes an additional through lane in each direction for this section of I-95 (Section 400). The existing four span bridge has piers at the edge of the shoulders and cannot accommodate the master plan typical section. The current repair recommendations for the structure include:

- Pedestal 4 has 41% loss of bearing and exposed anchor bolts
- Deck underside delaminated concrete in span 3; and,
- Erosion at the west abutment has large areas of failed slope protection.

Typically, structures that are more than 55 years old become more maintenance intensive, requiring significant repairs that can be disruptive to traffic. The new structure will be designed to provide the minimum 16'-9" vertical clearance, together with increased span lengths to accommodate the I-95 Master Plan typical section.

Pavement Maintenance - Constructing a new interchange will reduce the daily trips in and out of the PBP by 1.1 miles in each direction resulting in a total VMT reduction of approximately 7,000 miles daily (As shown in Section 1.4 Project Purpose, Error! Reference source not found.). Wear and tear on local roadways will be significantly less with the reduced 2040 ADT on existing US 40, MD 222 and MD 272 entering and leaving the PBP. The reduction of 40% of heavy truck trips on local roads will significantly reduce the Equivalent Single Axel Load (ESAL) and pavement shoving at signalized intersections. The estimated pavement maintenance reduction cost in the *BCA* is \$1,500,000.

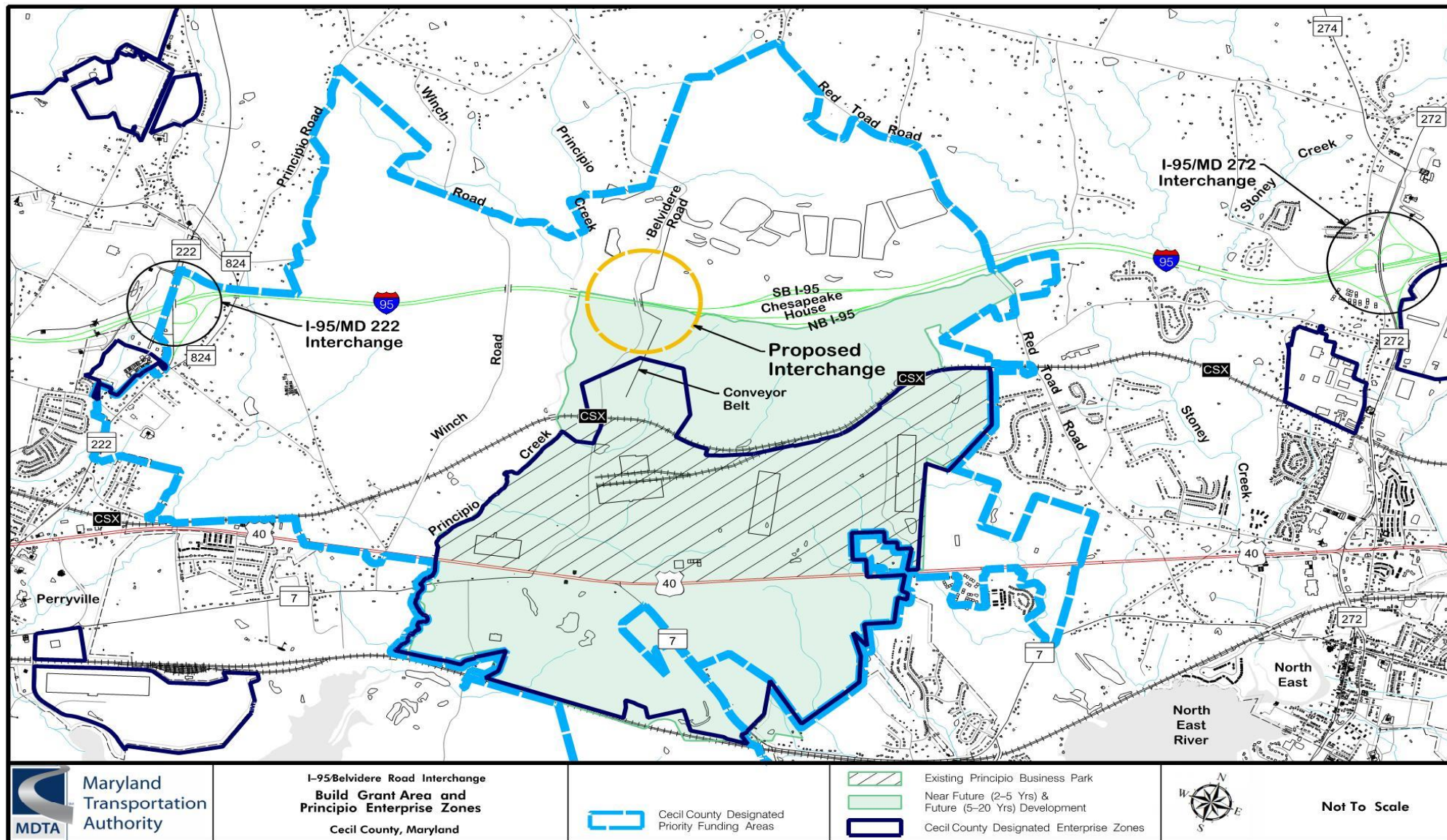


Figure 6: Cecil County Designated Priority Funding Area and CCPEZ source: 2010 Cecil County Comprehensive Plan

4.3 Economic Competiveness

The CCPEZ (See **Figure 6**) was established to leverage Cecil County's location near major metropolitan markets in response to the rapidly growing e-commerce market along I-95. The CCPEZ is strategically situated near and between major metropolitan markets to the north and south including Baltimore, MD (50 miles), Philadelphia PA (60 miles), Harrisburg PA (80), Washington D.C. (85 miles) and New York City (145 miles). See **Figure 1**. The benefits of the CCPEZ include providing tax and infrastructure incentives to businesses locating and maintaining their businesses in the CCPEZ.

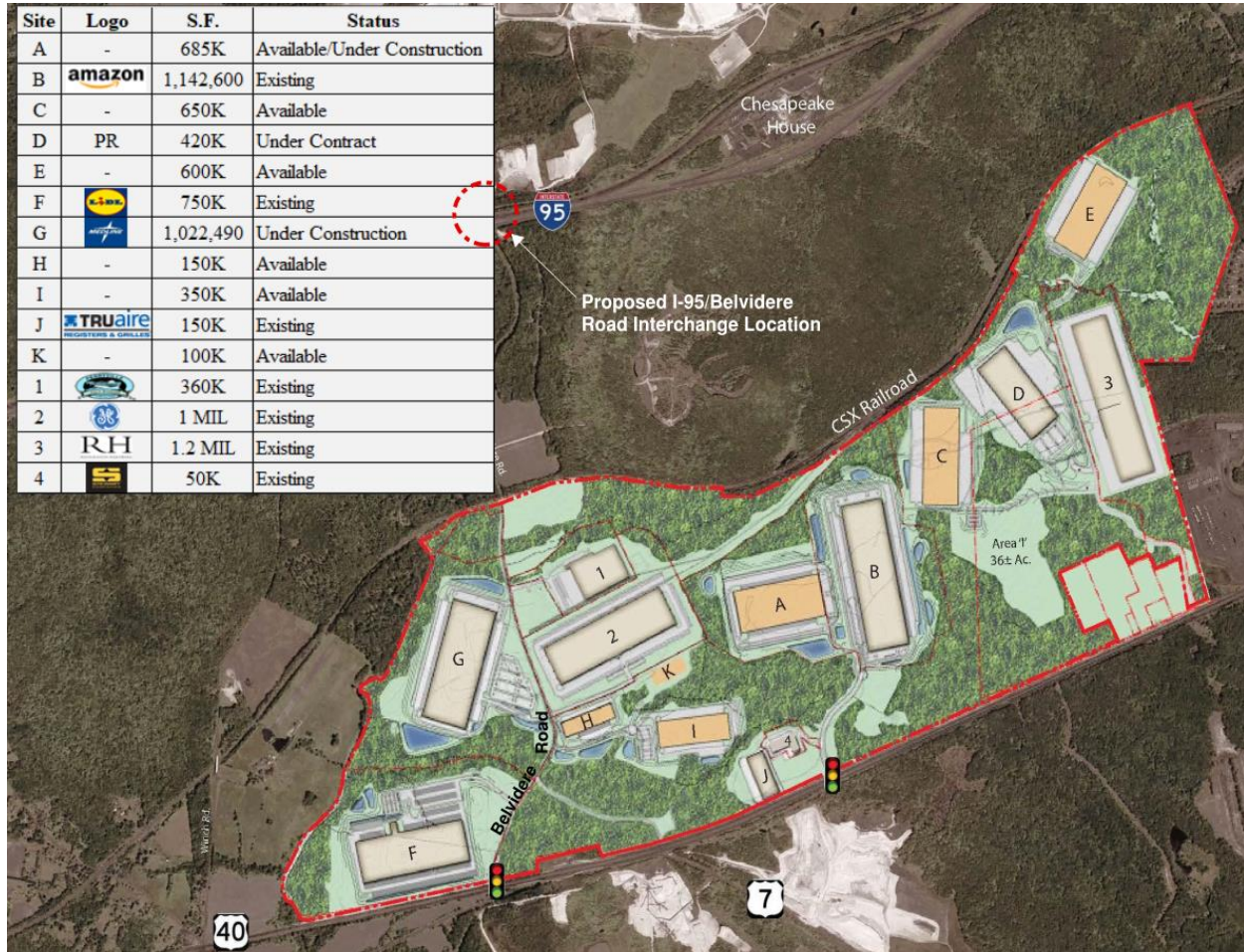


Figure 7: Principio Business Park

The Existing PBP is located within the CCPEZ and is owned and operated by SC. Existing PBP warehousing and distribution businesses include Amazon, Project River, LIDL, MEDLINE, TRUaire, Perryville Cold Storage, General Electric (GE), Restoration Hardware and Principio Tech Park. See **Figure 7**. The decision of these businesses to locate within PBP supports that CCPEZ's tax incentives and the general location of PBP has been, and will continue to be effective in attracting distribution, warehouse and manufacturing businesses.

Cecil County expresses that improved I-95 access to Belvidere Road is critical to keeping existing CCPEZ businesses long term, while attracting new businesses ([March 23, 2018 Letter From Cecil](#)

[County Department of Economic Development to MDOT MDTA](#)) to help realize full build-out of the PBP, CCPEZ and planned adjacent development. Direct I-95 access to Belvidere Road would result in reduced energy and operating costs associated with reduced VMT further increasing the CCPEZ's appeal to new businesses and sustaining existing business long term.

The Proposed Interchange would decrease VMT per each heavy truck trip entering and exiting PBP by 1.1 miles per each truck trip. The Proposed Interchange will also reduce each trip time by:

Non-Principio Traffic:

In 2023 (first year of operation): 2.8 minutes per vehicle (cars and trucks)

In 2042 (last year of analysis): 8.2 minutes per vehicle (cars and trucks)

Simple average across all period: 5.5 minutes per vehicle (cars and trucks)

Principio Traffic:

In 2023 (first year of operation): 4.3 minutes per vehicle (cars and trucks)

In 2042 (last year of analysis): 11.5 minutes per vehicle (cars and trucks)

Simple average across all period: 7.9 minutes per vehicle (cars and trucks)

Existing & Future Employment Revenue – Currently, only 47.1% of employed Cecil County residents physically work in Cecil County ([Maryland Department of Commerce](#)). Cecil County would like to increase this percentage, while also attracting new residents to Cecil County. As shown in **Table 3**, existing PBP businesses and PBP businesses under development are anticipated to generate 2,520 jobs and \$7,592,288 in annual Cecil County tax revenue by 2019 ([Cecil County CCPEZ Economic Development Data](#)). This is tax revenue that can be invested in schools, parks, local infrastructure and other quality of life amenities for Cecil County's residents and expanding work base.

Table 3: Economic Impact of Principio Business Park	
Total Employment by 2019	2,520
Square Footage	6,095,090
Projected Annual Property Taxes	\$ 4,815,121
Projected Annual Income Tax	\$ 2,133,282
Projected Annual Recordation & Transfer Fees	\$ 643,885
Projected Revenues to Cecil County over 20 Years	\$ 151,845,758

Source: Cecil County Department of Economic Development, 2018

The Cecil County Department of Economic Development describes in a [June 22, 2018 letter to MDOT MDTA](#) that over 7,300 warehousing, distribution and manufacturing jobs could be generated with the full build-out of the CCPEZ and planned adjacent development (June 2018 Cecil County Department of Economic Development letter to MDOT MDTA).

Shown on **Figure 8**, is the PBP in relation to areas planned for near-future development (development anticipated within two to five years) and future development (development anticipated within five to 20 years). This development borders the PBP to the north and south and lies between I-95 and the Amtrak line.

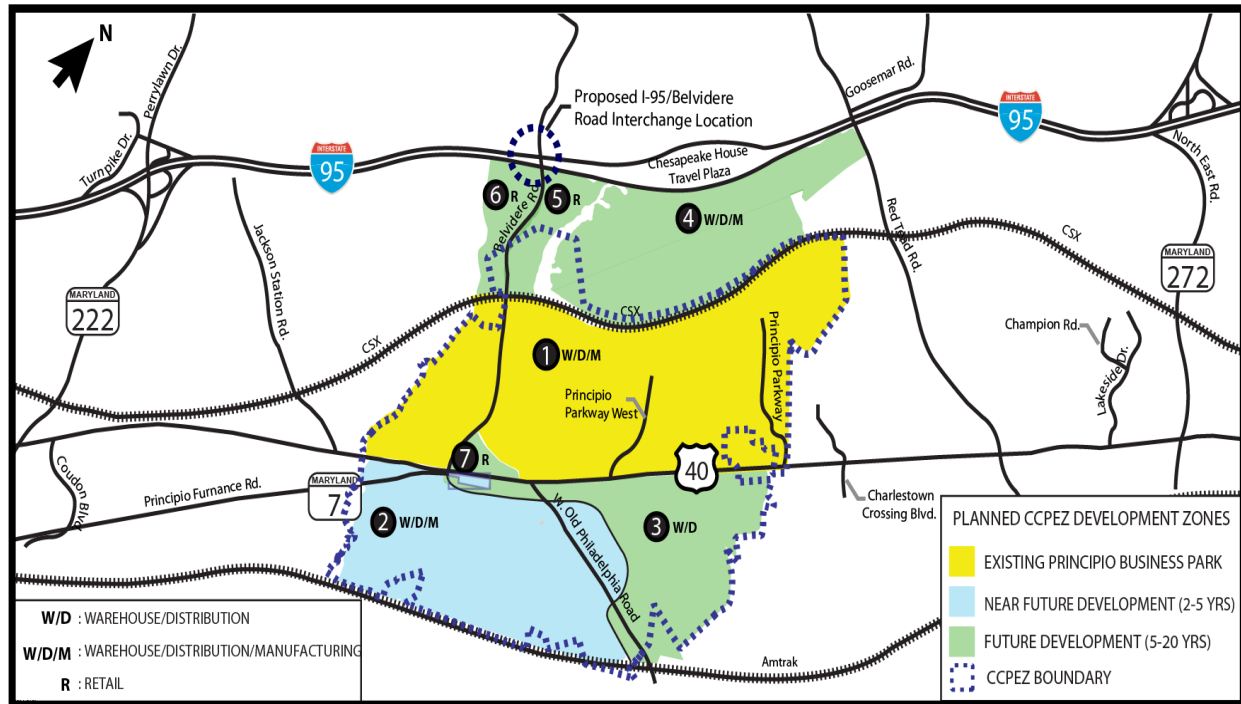


Figure 8: Planned Development in Vicinity of CCPEZ

Shown in **Table 4** (Conservative Method) and **Table 5** (Aggressive Method) are existing and proposed building square footages for warehouse and manufacturing development areas within and adjacent to the CCPEZ, along with the Cecil County Office of Economic Development's number of projected jobs when applying a 0.0004134 jobs per square foot factor extrapolated from Cecil County 2019 economic information for existing PBP businesses and PBP businesses currently under development (e.g. Medline and LIDL Corporations). The 0.0004134 factor was derived by dividing the projected number of 2019 jobs (2,520) by the total building square footage (6,095,090). As shown in **Table 4**, approximately 8,313 jobs would be potentially created with the full build-out of these development areas (numbered 1 through 4 on **Figure 8**). A second method to estimate employment gain derived an average employment /sf factor of 0.000552855 based on [US Department of Energy Industry Averages](#) and 70/30 split between distribution and industrial park businesses respectively. This method generates a total of 10,616 jobs. Therefore the total job increase in the CCPEZ and adjacent development ranges between 8,313 and 10,616.

Projected annual Cecil County property and income tax, recordation and transfer fees were calculated in two different ways. They are explained in the **Table 4** and **Table 5** footnotes. More detail can be found in the [Cecil County CCPEZ Economic Development Data](#). The total projected annual property, income tax, recordation and transfer fees to Cecil County will range from \$26,392,689 to \$28,800,928 per year. Over a 20 year time period this equates to a range from \$527,853,785 to \$576,018,556. This increased revenue to Cecil County will provide funding for quality of life amenities such as schools, improved infrastructure, parks and recreation facilities.

Table 4: Economic Impact from Each Development Area (Conservative)

Develt. Area Map No.	Development Area	Building Space S.F.	Projected Jobs (*)	Projected Annual Property Tax (+)	Projected Annual Income Tax (x,y)	Projected Annual Recordation & Transfer Fee (z)	Projected Total Annual Taxes	Projected Total Taxes Over 20 Years
1	Existing Principio Business Park (PBP) Businesses	6,095,090	2,520	\$4,815,121	\$2,133,282	\$643,885	\$7,592,288	\$151,845,758
1	Future PBP Businesses	3,135,000	1,296	\$2,476,650	\$1,398,210	\$331,181	\$4,206,041	\$84,120,828
2-4	Future Warehouse/Manufacturing Businesses	10,574,000	4,371	\$8,353,460	\$4,716,004	\$1,117,037	\$14,186,501	\$283,730,027
5-7	Future Retail	304,000	126	\$240,160	\$135,584	\$32,115	\$407,859	\$8,157,171
	Total	20,108,090	8,313	\$15,885,391	\$8,383,080	\$2,124,219	\$26,392,689	\$527,853,785

* Used average employment/sf of 0.0004134 based on current Principio Business Park projects

+ Used average property tax/sf of \$0.79 based on current Principio Business Park projects

x Used average income tax/sf based on average Cecil County wages for distribution and manufacturing jobs

y Assumed 80% distribution and 20% manufacturing jobs

z Assumed \$0.05282/sf/yr. Recordation & Transfer Fees and one transfer every 10 years

Table 5: Economic Impact from Each Development Area (Aggressive)

Develt. Area Map No.	Development Area	Building Space S.F.	Projected Jobs (*)	Projected Annual Property Tax (+)	Projected Annual Income Tax (x,y)	Projected Annual Recordation & Transfer Fee (z)	Projected Total Annual Taxes	Projected Total Taxes Over 20 Years
1	Existing Principio Business Park (PBP) Businesses	6,095,090	2,520	\$4,815,121	\$2,133,282	\$643,885	\$7,592,288	\$151,845,758
1	Future PBP Businesses	3,135,000	1,733	\$2,734,262	\$1,548,690	\$413,977	\$4,696,929	\$93,938,582
2-4	Future Warehouse/Manufacturing Businesses	10,574,000	5,846	\$9,222,357	\$5,223,556	\$1,396,297	\$15,842,210	\$316,844,200
5-7	Future Retail	304,000	517	\$265,141	\$203,246	\$40,143	\$508,529	\$10,170,589
	Total	20,108,090	10,616	\$17,036,881	\$9,108,773	\$2,655,273	\$28,800,928	\$576,018,556

* Used average employment/sf of 0.000552855 based on US Department of Energy industry averages and 70/30 split between distribution and industrial park (<https://www.usgbc.org/Docs/Archive/General/Docs4111.pdf>)

+ Used average property tax/sf of \$0.872173 based on 20-year Enterprise Zone impact and current tax rate

x Used average income tax/sf of \$0.35 based on Principio project and assumed \$0.83 for manufacturing jobs

y Assumed 70% distribution and 30% manufacturing jobs

z Assumed \$0.05282/sf/yr. Recordation & Transfer Fees and one transfer every 8 years

4.4 Environmental Protection

4.4.1 Early Agency Coordination

To notify agencies, receive input, and to ultimately expedite informed review, this project has been presented to several agencies early in its project development. On May 16, 2018, the project was presented at an interagency meeting attended by U.S. Fish and Wildlife Service (USFWS), US Army Corps of Engineers (USACE), Environmental Protection Agency (EPA), Maryland Department of Environment (MDE), and Maryland Department of Planning (MDP). If applicable, this project will utilize the MDOT SHA's "Streamlined NEPA/Section 404 Review Process". However, the schedule in **Section 5.3** conservatively shows the Section 404 permit attained following NEPA completion.

The project is being coordinated with FHWA's Maryland Division throughout planning. Formal coordination with the Maryland Historical Trust (the State Historic Preservation Office) has also been initiated. Additionally, coordination has been initiated with USFWS and the Maryland Department of Natural Resources (DNR) to determine the presence of federal or state-listed species in the study area.

4.4.2 Improved Air Quality, Reduced Energy Use and Emissions

The project is located within an EPA 8-hour ozone non-attainment area. Conformity to the State Implementation Plan (SIP) will be needed and determined through a regional air quality analysis performed on the Transportation Improvement Program (TIP) and as part of the State's transportation plan. [WILMAPCO](#) has committed to including the Belvidere Road Interchange project in their Draft 2050 Regional Transportation Plan (RTP). The RTP is set for adoption in March 2019, following an extensive analysis and public outreach process and once air quality conformity modeling and public outreach are complete.

Direct Belvidere Road access to I-95 would also provide energy and air quality benefits through reduced VMT to destinations north and south of I-95. For example, trucks currently exiting the GE distribution center in PBP and heading to northbound I-95 currently travel a 0.5 mile south to US 40, then 4.3 miles east to MD 272, then 1.8 miles north to access the northbound on-ramp at the I-95/MD 272 for a *6.6 mile total trip*. Trucks currently exiting the GE's distribution center and heading to southbound I-95 would travel 0.5 mile south to US 40, then 2.8 miles to MD 222 then 1.7 miles north to access the southbound on-ramp at the I-95/MD 222, for a *total trip of 5.0 miles*.

Should a new I-95 interchange be constructed at Belvidere Road, trucks exiting GE would then travel 1.4 miles north on Belvidere Road to access the interchange at a point 2.5 miles from the MD 222 interchange to the south and 4.1 miles to the MD 272 interchange to the north. This would effectively reduce each northbound and southbound truck trip by a total of 1.1 miles. Additionally, this would reduce VMT on local roads (US 40, MD 222 and MD 272) by 5.2 miles for each northbound trip and 3.6 miles for each southbound trip.

It should also be noted that in addition to this shorter trip length, the efficiency of the trip would be improved by removing the intersection starts and stops that occur along the current routes. The reduced truck VMT would also have safety benefits to the local roadway network.

Shown in **Table 6** are 2017 existing AM /PM traffic volumes and 2040 Design Year (DY) No-Build traffic volumes. The 2040 No-Build volumes assume the full build-out of the PBP along with near future (2-5 years) and future (5-20 years) planned development adjacent to the CCPEZ.

Table 6: 2017 Existing Principio Business Park and 2040 Principio Future Development Traffic Volumes						
2017 Existing PBP Peak Hour and ADT Traffic Volumes						
AM Peak Hour		PM Peak hour		Average Daily Traffic (ADT)		
Cars	Trucks	Cars	Trucks	Cars	Trucks	Total
181	81	174	29	1,780	550	2,330
2040 Peak Hour & ADT Traffic Volumes w/Existing PBP Businesses Only (Background Traffic (1))						
AM Peak Hour		PM Peak hour		Average Daily Traffic (ADT)		
Cars	Trucks	Cars	Trucks	Cars	Trucks	Total
228	103	219	36	2,240	700	2,940
2040 Peak Hour & ADT Traffic Volumes for Remaining CCPEZ Build-Out (2)						
AM Peak Hour		PM Peak hour		Average Daily Traffic (ADT)		
Cars	Trucks	Cars	Trucks	Cars	Trucks	Total
1,617	693	1,833	786	30,678	13,148	43,826
2040 Total Peak Hour & ADT Traffic Volumes (Background Traffic + CCPEZ Build-Out)						
AM Peak Hour		PM Peak hour		Average Daily Traffic (ADT)		
Cars	Trucks	Cars	Trucks	Cars	Trucks	Total
1,845	796	2,052	822	32,918	13,848	46,766
<i>1: Reflects 2017 Existing Traffic + 1% growth over 23 years (Background Traffic)</i>						
<i>2: 2040 Background Traffic plus CCPEZ Build-Out (Includes the remaining Build-Out of PBP along w/Development Areas 2, 3 and 4 shown on Figure 8)</i>						

The 2017 existing peak hour truck volume is 81 AM/29 PM, projected daily truck volume is 550. With 1% annual growth for 23 years at all Business Park access points and truck trips that will be generated by future warehouse, distribution and industrial activities, 796 AM/822 PM truck trips are projected in the DY 2040 AM/PM peak hours and 13,848 daily truck trips are projected in the 2040 Design Year.

As noted, 13,848 total truck trips are projected under the 2040 No-Build scenario. 13,148 trucks are future new trips. It is assumed that 10% of these new trips would remain on US 40 north of the US 40/MD 272 intersection and another 10% would continue south beyond the US 40/MD 222

intersection. 10,518 trucks per day would then be destined for I-95. Assuming a 50% directional split, 5,259 trucks would be headed to northbound I-95 while an additional 5,259 trucks would be headed to southbound I-95. As previously mentioned, and I-95 interchange at Belvidere Road would reduce northbound and southbound I-95 truck trips by 1.1 miles. Therefore, the presence of an I-95 interchange at Belvidere Road would potentially result in design year savings of approximately 11,570 (5,259 trips x 1.1 miles + 5,259 x 1.1 miles) daily truck miles in the study area.

Implementation of the interchange would reduce both VMT and trip delay resulting in reduced energy costs and attracting new businesses to the PBP. The current north/south travel path to/from the PBP contains 12 traffic signals significantly adding delay to the trip and fuel consumption resulting from vehicle stops/starts. This project would reduce VMT and trip time, resulting in reduced fuel consumption and reduced vehicle emissions.

4.4.3 Avoidance of Impacts

No displacements are required for the proposed interchange improvements. All right-of-way will be donated by SC. No right-of-way will be required from any Section 4(f) resources such as publicly owned public parks, recreation areas, wildlife refuges, or historic sites. No Noise Sensitive Areas have been identified in the project area. In accordance with Executive Order 12898, no disproportionately high or adverse effects on minority or low-income populations are anticipated to occur as a result of this project. The project is not inconsistent with the [2010 Cecil County Comprehensive Plan](#).

Preliminary engineering of the grant alternative have included measures to avoid and/or minimize potential impacts where feasible. Typical sections are reduced to minimize the area of impervious surface added, and where possible 2:1 slopes are utilized.

4.4.4 Impacts and Permitting

Based on review of field delineated resources and the proposed limits of disturbance, the proposed DDI, Traditional, and Partial Cloverleaf interchange concepts are anticipated to result in the following approximated impacts to natural resources:

- Waters of the US – 3,400 LF
- Wetlands – 3 Acres
- Forest – 37 Acres
- Specimen trees – 3 removed

Impacts to these resources will require permits from the applicable county, state, and federal agencies, as well as compensatory mitigation permitting/approvals. These impacts vary between interchange concepts and will continue to be minimized and/or avoided as they are refined

4.4.5 Wetlands and Waterways

The Proposed Interchange is located within the Furnace Bay watershed. Principio Creek flows south, beneath I-95 and west of the Proposed Interchange. A number of tributaries to Principio

Creek flow west and southwest through the project area. Wetlands adjoin these tributaries in the vicinity of the Proposed Interchange.

Wetland and waterway resources are regulated and permitted by MDE and USACE. Impacts require submittal of a Joint Federal/State Permit Application (JPA) for the Alteration of any floodplain, waterway, tidal, or nontidal wetland in Maryland to the Regulatory Services Coordination Office of MDE. MDE distributes copies of the JPA to USACE, as well as other state and federal stakeholders.

When total permanent impacts to wetlands and waters of the US exceed one acre for any single and complete project, an Individual Department of the Army Permit is issued by USACE and a separate nontidal wetlands and waterways permit is issued by MDE. Both permits will include a list of general and special conditions and require compensatory mitigation/remediation for impacts. Mitigation is typically required at the following ratios, although these ratios can vary depending on the type of mitigation proposed:

- Emergent wetland impacts 1:1
- Forested wetland impacts 2:1
- Waters of the US 1:1

Options for wetland mitigation include:

- Nontidal wetland creation to establish nontidal wetlands on upland. Generally, the area is graded to or near the groundwater table to establish hydrologic conditions that will support wetland vegetation and development of wetland soils;
- Nontidal wetland restoration that re-establishes wetland conditions on sites where they have been lost due to agriculture or other changes in site conditions; and,
- Nontidal wetland enhancement that improves the functions and values and wetlands, such as converting emergent wetlands to forested wetlands or restoring hydrology to wetlands that have been partially drained.

Mitigation for impacts to waters of the US is generally achieved through restoration of a stream channel, either within the same stream or within the watershed. Restoration activities could stabilize stream banks, reconnect streams with their floodplain, and minimize erosion and nutrient transport.

Based on estimated impacts associated with the Proposed Interchange project, it is possible that up to six acres of wetland mitigation and 3,400 linear feet of stream restoration will be required.

4.4.6 Forests

Forest resources are regulated by DNR and authority is often delegated to the counties. This project is likely to be regulated at a county level and a Forest Conservation Plan (FCP) will be required to determine mitigation needs. The FCP would illustrate existing and proposed conditions and would

include calculations of the forest to be removed and the amount of forest to be replanted as mitigation. Mitigation is generally achieved by replanting and placing the planted area in a perpetual conservation easement, or through payment into a mitigation bank.

Forest mitigation is site specific and is dependent on the size of the parcel, the limits of disturbance, the total amount of forest cleared, and the specific land use. It is estimated that 25 to 30 acres of forest mitigation will be required for the Proposed Interchange project.

4.4.7 Potential Mitigation

The SC properties include small ponds, mostly associated with previous mining activities that are scattered throughout the site indicating shallow groundwater. The SC properties also include large forested tracts and cleared areas that if planted will provide an increase in contiguous forest for wildlife and interior bird habitat. These sites have potential for both wetland and forest mitigation.

Several tributaries to Principio Creek flow west and southwest through the proposed interchange site. There is a potential for stream restoration within these channels in conjunction with construction of the interchange, as the area will already be cleared and construction access established.

As mentioned earlier, SC owns 6,610 acres surrounding the interchange and will make property available towards mitigating unavoidable impact generated by the selected alternative.

4.4.8 Environmental Stewardship

This project may present several opportunities for environmental protection beyond compensating mitigation required by permit stipulations and mitigation requirements. The participation of private partners could enable the restoration, establishment, enhancement, or preservation of wetlands, streams, forests or riparian areas within the project right-of-way. An innovative Design Build approach will include incentives for the Design Builder to reduce environmental impacts.

4.5 Quality of Life

Sustainable, well-paying jobs are needed in rural Cecil County. Residents can endure lengthy commutes primarily because of the rural nature of the County and locations of employment opportunities in other jurisdictions. Although the total labor force is 52,581, fewer than half of Cecil County residents work in Cecil County. Moreover, the County's 2016 unemployment rate was 5.1%. The median household income of Cecil County is just over \$68,000 and 10% of the population lives in poverty.

The construction of the I-95/Belvidere Road interchange would provide a needed infrastructure link to attract more businesses and contribute to a solid local tax base. In this rural area, the attraction of new businesses, the development of employment opportunities, and the provision of access to these jobs can improve the quality of life for Cecil County residents in several ways. An expanded tax base will generate government resources needed to expand emergency services coverage, provide access to health care, improve infrastructure and roadway maintenance, and assist in educational programs. The substantial percentage of employed Cecil County residents working in other jurisdictions almost makes Cecil County a bedroom community with less tax base. Providing the option of a shorter commute is consistent with improving quality of life, minimizing energy utilization and balancing the tax base more evenly between residential and commercial activities. It may also contribute to the retention and development of a skilled and

talented workforce and, reducing both unemployment and underemployment ([The Cecil County Growth Study](#)).

4.6 Innovation

4.6.1 Innovative Technologies

A DDI is one of three interchange options being studied to address the transportation needs of the area. **See Figure 9.** The safety benefits of a DDI are described in detail in the Safety section of this application. As documented in [FHWA's DDI Informational Guide](#) DDIs have proven effective across the country. This innovative interchange would be the first full DDI in Maryland.

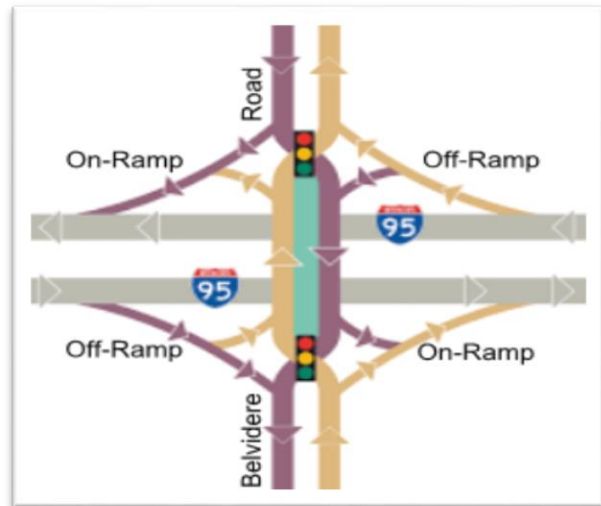


Figure 9: Diagram of a Diverging Diamond Interchange

The DDI is a recognized design concept to improve traffic flow and reduce congestion. The purpose of this design is to accommodate left-turning movements onto arterials and limited-access highways while eliminating the need for left-turn bays and signal phases at the signalized ramp terminals. The highway is connected to the arterial cross street by two on-ramps and two off ramps in a manner similar to a conventional diamond interchange. However, on the cross street, the traffic moves to the left side of the roadway between the ramp terminals. This allows vehicles on the cross street turning left onto the ramps to continue to the on-ramps without conflicting with opposing through traffic. The DDI design provides a safety benefit because it reduces the total number of potential conflict points by eliminating potential crossing conflicts between vehicles turning left onto the freeway and opposing arterial traffic. Traffic signals and other roadway design features such as signs and markings are used to separate conflicts between vehicles. The signals are intended to reduce the probability of driver errors that can result in crashes. Safety performance is generally better when the total number of conflict points is minimized.

4.6.2 Innovative Project Delivery

Design-Build (DB) is a project delivery method where one entity – the design-build team – works under a single contract with the project owner to provide both design and construction services. **See Figure 10.** The DB process provides a one entity, one contract, one unified flow of work from initial concept through completion, thereby re-integrating the roles of designer and constructor. DB is an alternative to the traditional design-bid-build (DBB) project delivery method. Under the DBB approach, design and construction services are split into separate entities, separate contracts and separate work. **See Figure 11.** This DB contract will include incentives to reduce environmental impacts (identified in the concept plans) as an innovative way to reduce impacts.

Environmental impacts can be reduced through the avoidance and/or minimization of wetlands and streams impacted by the interchange. Shifting alignments, adding drainage structures that allow for groundwater connections to be maintained and constructing retaining walls that minimize longer slopes are all methods that will be considered potentially reducing impacts to environmental

resources. Additionally, tree clearing would be minimized to the extent practicable to avoid impacts to forest interior dwelling birds and other sensitive species.

Environmental impacts can be reduced through the avoidance and minimization of wetlands and streams impacted by the interchange. Shifting alignments, adding drainage structures that allow for groundwater connections to be maintained and constructing retaining walls that minimize longer slopes are all methods that will be considered potentially reducing impacts to environmental resources. Additionally, tree clearing would be minimized to the extent practicable to avoid impacts to forest interior dwelling birds and other sensitive species.

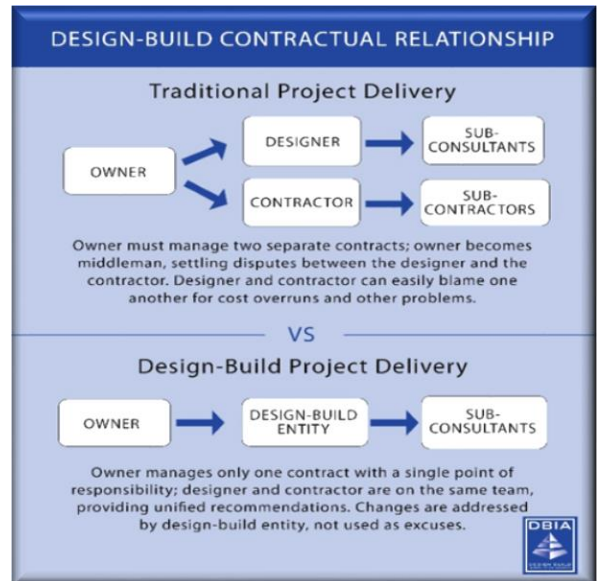
We will consider retaining an expedited permit reviewer from a consulting firm to shorten permit review times. An experienced scientist could work on behalf of the state regulatory entity to review permit applications specific to the project, thereby assisting the state with moving efficiently through the permit process.

4.6.3 Innovative Financing

As described in greater detail in Section 3 of this application MDOT MDTA, Cecil County and/or SC are providing all the planning, design, construction and right-of-way to complete this project. The BUILD Grant is the only federal funding source proposed and potentially used.

4.7 Partnership

The Proposed Interchange project has brought together three committed partners to achieve economic development goals in the rural parts of Cecil County. This is a great example of a primarily local rural county teaming with a state transportation agency and the private sector to deliver a project that will increase job opportunities. Below is a description of each of the project partners:



COMPARISON OF PROJECT DELIVERY METHODS

METRIC	DESIGN-BUILD VS. DESIGN-BID-BUILD	DESIGN-BUILD vs. CM@R
UNIT COST	6.1% lower	4.5% lower
CONSTRUCTION SPEED	12% faster	7% faster
DELIVERY SPEED	33.5% faster	23.5% faster
COST GROWTH	5.2% less	12.6% less
SCHEDULE GROWTH	11.4% less	2.2% less

Source: Construction Industry Institute (CII)/Penn State research comprising 351 projects ranging from 5,000 to 2.5 million square feet. The study includes varied project types and sectors.

DBIA

Figure 11: Comparison of project delivery methods



Cecil County is the BUILD Grant applicant and has committed \$1,000,000 to the project. The County has a population of just over 100,000 people and is located in northeastern Maryland between Baltimore and Philadelphia. A major goal of the County is to provide economic development in its rural areas. The Proposed Interchange is vital to the PBP and the County's economy as a whole. The Proposed Interchange is Cecil County's top transportation priority and would be transformational for Cecil County's economy.



Maryland
Transportation
Authority

MDOT MDTA is an independent state agency responsible for financing, constructing, operating, and maintaining eight toll facilities, currently consisting of two toll roads, two tunnels, and four bridges in the State of Maryland. The I-95 corridor from Baltimore to the Delaware Line falls within their jurisdiction. MDOT MDTA will be an active and supportive partner and will take the responsibility of administering the BUILD Grant. They will also be a significant financial partner contributing \$22,325,000 to help fund project costs. They are leading the NEPA Study and coordinating with FHWA and other agencies. MDOT MDTA will advertise and administer the project construction and will take over maintenance post construction.



SC is this project's private partner. They have years of experience in the careful planning of land use and development of residential, industrial and commercial properties. They are mining and then developing the land in Cecil County adjacent to the Proposed Interchange area and have been partnering with Cecil County to help economic development in the County. SC owns the necessary right-of-way to build the interchange project. SC is currently paying for the project NEPA Study and IAPA for the Proposed Interchange, in addition to being a major financial partner contributing \$5,675,000 in property, engineering, and construction.

Letters of Support

Cecil County has received broad support for the Proposed Interchange project including variety of elected officials, agencies, private companies, and other organizations. Refer to the Letters of Support Supplementary Documentation of this application for more detail.

4.8 Non-Federal Revenue for Transportation Infrastructure Investment

Several sources of non-federal revenue for transportation infrastructure investment are being generated by the construction of the Proposed Interchange. Projected 2040 ADT generated from the full build-out of the CCPEZ (and adjacent development) is 13,148 trucks and 30,678 cars. **See Table 6.** It is assumed that 40% to 50% of the truck ADT would be heading northbound to CCPEZ and would pay a US 40 or I-95 toll of \$60.00 (2018 dollars) and that 20% to 30% of cars heading northbound to CCPEZ would pay a \$6.00 US 40 or I-95 toll. Daily toll revenues for trucks would range between approximately \$315,540 and \$394,440 while car revenues would range between approximately \$36,816 and \$55,218. Toll pricing would vary based on the true vehicle mix but the total potential ADT gross toll revenues. Based on these assumptions gross toll revenues could potentially range between \$352,356 and \$449,658.

5. PROJECT READINESS

Cecil County is the primary applicant while the MDOT MDTA will administer the procurement and construction of the project elements proposed in this application. MDOT MDTA will work closely with the FHWA, regional and state planning and development entities to support the state and region's economic competitiveness, as well as to improve safety and quality of life. MDOT MDTA has an excellent history of risk management with decades of project and construction experience. The applicant has assessed project scope, schedule, budget risks, mitigation measures, and strategies risks to the project have been analyzed. MDOT MDTA has contractual mechanisms in place that will allow the project to move quickly upon award to begin design, engineering, and construction of the project elements. The applicant understands the need for projects to be obligated by June 30, 2020, and expended by September 30, 2025, to comply with BUILD Grant funding requirements. MDOT MDTA has extensive experience executing projects of similar size and scope.

5.1 Political and Planning

Economic development in this area has also received substantial political support. The recent grand opening of the Amazon fulfillment center in PBP was attended by Governor Larry Hogan, US Representative Andy Harris, MD Commerce Secretary Mike Gill, and Cecil County Executive Alan McCarthy. The Governor said that "the Amazon fulfillment center could bring even more jobs to Cecil County and the I-95 corridor". He also pointed out that the I-95 corridor is a great place for distribution, and other people are going to take notice" ([Baltimore Sun, 3/28/18](#)).

The project is listed in the [Maryland FY 2018-2023 Consolidated Transportation Program](#), the State of Maryland's six-year capital investment program for transportation. Cecil County has listed improvements to I-95 and Belvidere Road as its highest transportation priority, as shown in [2018 Transportation Priority Letter](#). Additionally, improvements in this area are supported in the [2010 Cecil County Comprehensive Plan](#), the [2015 Delmarva Freight Plan](#), and the [2017 Maryland Strategic Goods Movement Plan](#). The location of the planned new I-95/Belvidere Road interchange is classified in the 2010 Cecil County Comprehensive Plan as a future growth area. Specifically the land is within a Mineral Extraction District, which is part of the Designated Growth Area.

The project is in a rural area (a focal point of the BUILD Grant), is Cecil County's top transportation/economic priority and is supported by MDOT. MDOT MDTA has the NEPA studies programmed in their [FY 2018-2023 Consolidated Transportation Program](#) and will program construction following completion of the NEPA process. Refer to the Letters of Support Supplementary Documentation of this application for more detail.

5.2 Technical Feasibility

MDOT MDTA is currently in coordination with FHWA as to whether the project should be classified as a CE or EA/FONSI. In either scenario, the document will be prepared in accordance with the provisions and requirements of Chapter 1, Title 23 Code of Federal Regulations (CFR) Part 771, relating to implementation of the NEPA. Tasks included during NEPA include developing a range of alternatives and identifying environmental constraints. Each alternative will

be evaluated based on impacts and proposed mitigation, operational traffic analysis, proposed construction costs and project risks. The expected benefits include improving regional transportation by providing direct access to I-95 from within the Study Area while reducing traffic congestion on existing roadways, such as US 40. The project will also enhance the economic viability of existing industries, while creating development opportunities for new industries.

Design features closely follow design criteria and policies established by Cecil County, MDOT SHA, American Association of State Highway and Transportation Officials (AASHTO) and FHWA. All traffic barrier design will be in compliance with FHWA's recently implemented Manual for Assessing Safety Hardware (MASH) criteria.

Our constructability team reviewed interchange options and found that using the existing Belvidere Road Bridge to maintain traffic during construction, minimum utility impacts and the donation of right-of-way needed for improvements and potential mitigation eliminated the major schedule risks typically associated with construction.

A DDI is being considered as one of the interchange options. DDI is an innovative and relatively new concept being pursued as an alternative interchange type that provides a significant increase in capacity while reducing bridge size requirements. **See Section 4.6.1** of this application for a more detailed description of the operational benefits of a DDI.

Also as described, the cost estimate and major quantities estimate for the project were developed in accordance with MDOT SHA's 2017 Highway Construction Cost Estimating Manual. Based on this manual, the major quantities estimate was developed to determine the preliminary cost estimate. The manual and MDOT SHA pricing history were used to determine item unit costs. A 30% contingency was applied based on rates provided in the manual to adequately address potential unknowns at this stage of project development.

5.3 Project Schedule

The project schedule is also on FHWA approval of a NEPA EA/FONSI. **See Figure 12**. However, MDOT MDTA is coordinating with FHWA whether the project would qualify as a CE. Should a CE classification be approved, the schedule will be shortened by approximately six months. **Figure 12** illustrates the project schedule from NEPA through construction, and demonstrates how funds will be obligated and expended well before NOFO requirements. A significant schedule float has been provided to account for unforeseen delays.

NEPA will be completed by August, 2019 and the IAPA will be approved shortly thereafter. Design/Build NTP will be granted by September, 2020, and construction will be completed and interchange opened in July, 2023.

5.4 Required Project Approvals

A strategy is in place to obtain all required approvals and permits in a timely manner to meet the project funding obligation and expenditure requirements. The schedule incorporates 6 months of float to meet the desired obligation date of June 30, 2020 with all funds expended more than two years prior to the required September 30, 2025 date. The project is aligned with federal, state, regional and local priorities.

I-95 at Belvidere Road Interchange / 2018 BUILD Transportation Discretionary

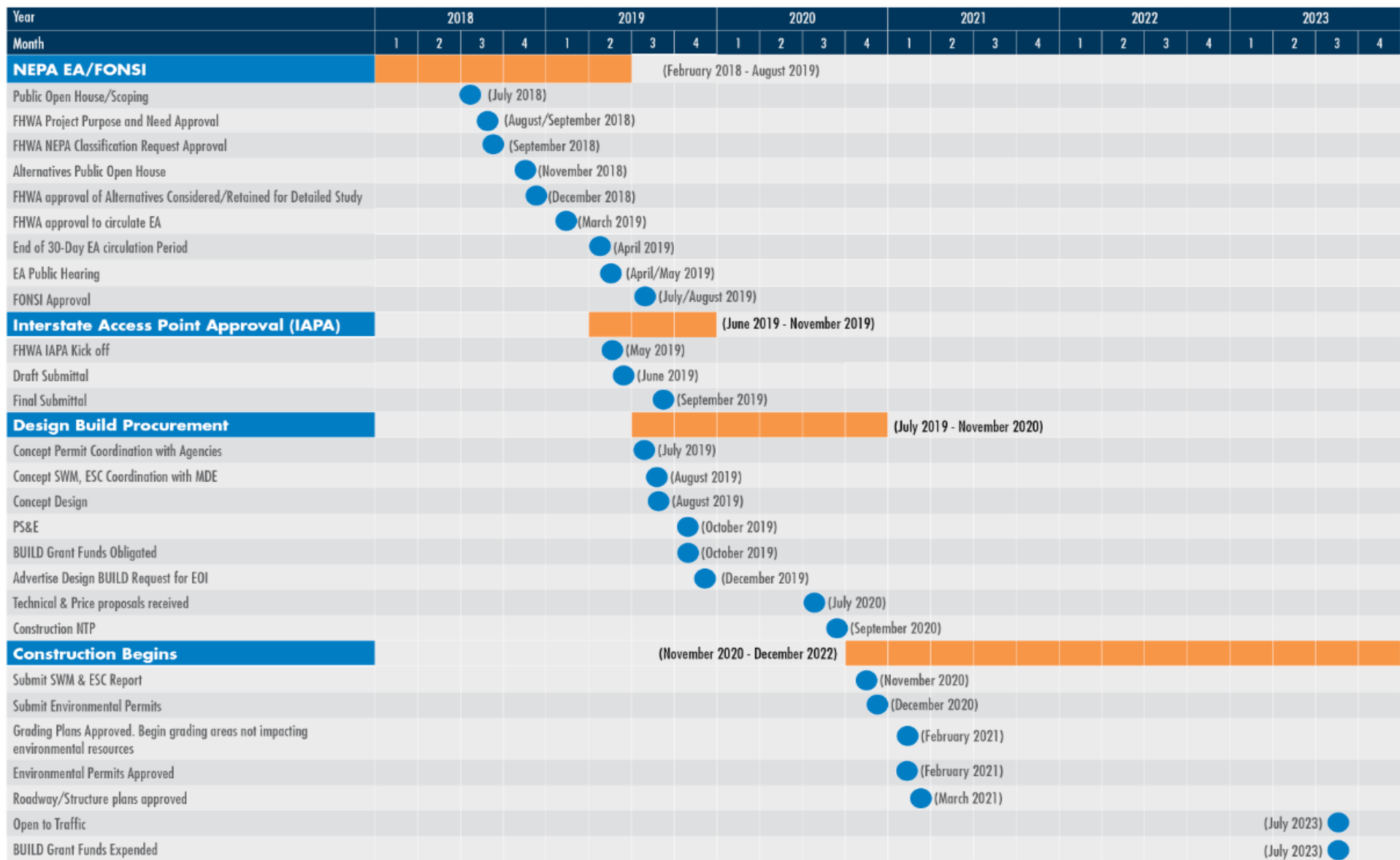


Figure 12: NEPA EA/FONSI Schedule

5.5 Environmental Permit and Reviews

Wetland and waterway, forest and stream impacts and mitigation are discussed in detail in Section 4.4 of this application.

Wetland and waterways are regulated and permitted by MDE and USACE. Impacts require submittal of a Section 404 Joint Permit Application (JPA) to the regulatory services coordination office of MDE.

Forests are regulated by the DNR and authority is often delegated to the counties. This project is likely to be delegated to the County and a Forest Conservation Plan (FCP) will be required to determine mitigation needs.

5.6 Federal Approvals

We have assumed an EA/FONSI NEPA document for purposes of this application. However, MDOT MDTA is coordinating potential CE feasibility with FHWA. The EA/FONSI is scheduled for FHWA approval in August 2019.

This new fully access controlled interchange will require IAPA approval by FHWA. Background traffic data is complete and the IAPA will be based on the selected alternative. The project schedule targets FHWA approval in August, 2019.

5.7 State and Local Approvals

The project is located in an EPA ozone non-attainment area. Conformity to the SIP is determined through a regional air quality analysis performed on the TIP and Transportation Plan. This project is currently not included in the WILMAPCO FY 2018-2022 TIP. [WILMAPCO](#) has committed to including the I-95/Belvidere Road Interchange in its Draft 2050 RTP. The RTP is set for adoption in March 2019, following an extensive analysis and public outreach process TIP once air quality conformity modeling and public outreach are complete.

Stormwater management and erosion and sediment control plans will be submitted to Cecil County and MDE for review and approval prior to any grading. Preliminary plans will be included in the advertisement and the proposed design-builder will be required to acquire final permit approvals. This process reduces the risk of delay and ensures that plans are consistent with the permit and all NEPA commitments.

5.8 Federal Transportation Requirements Affecting State and Local Planning

As described in **Section 5.7**, [WILMAPCO](#) has committed to including the I-95/Belvidere Road Interchange in its Draft 2050 RTP.

5.9 Public Engagement

A public scoping open house is scheduled for July 31, 2018 to receive public and stakeholder input. A second public open house is scheduled for early in the fourth quarter of 2018 with a

public hearing being held early in the second quarter of 2019 pending final FHWA NEPA classification. Additional public and business meetings are being scheduled as requested.

5.10 Assessment of Project Risks and Mitigation Strategies

As described in **Section 4.6.1**, an innovative design-build approach is being proposed for concept design and construction to minimize schedule risk. Permits, utilities and right-of-way often pose the greatest risk. The following strategy is in place to minimize these risks:

- Permits have been carefully considered in the procurement schedule to avoid delays. Permits will be thoroughly coordinated with agencies during NEPA and concept design to develop construction specifications that have been fully vetted by the agencies and provide the design-builder with clear direction and requirements. The design-builder will be required to meet all NEPA commitments and will acquire and comply with the permits for SWM, E&SC, the Maryland Reforestation Law approval, as well as wetland and waterway permits from MDE and USACE. This includes wetland and stream mitigation design approval. MDOT SHA is currently using this approach of having the design-builder acquire final permits on the recent US 219/I-68 interchange design-build construction project to reduce the risk of schedule delays and ensure compliance with the final design.
- All right-of-way for construction and mitigation is privately owned by an affiliate of SC and will be made available for the project.
- Utility research is complete and there are no significant relocations required.

The following are additional areas of potential risk and strategies we have employed to eliminate or mitigate them:

Schedule –The schedule (**See Section 5.3**) allows for six months float to account for any unforeseen conditions to meet the required obligation date while completing construction over two years prior to the required expenditure date. As mentioned, we are using an innovative design-build approach, which is a proven procurement method to reduce completion time via the designer and contractor working collaboratively to reduce construction delays and re-work.

Cost – MDOT SHA’s proven cost estimating procedures are updated annually and based on recently constructed projects. Contingencies are based on project history of similar types of project in a similar location. In addition, our constructability team, comprised of experienced former contractors, evaluate carefully to make sure the project can be constructed as designed/proposed.

Funding – As described, the project is jointly funded by MDOT MDTA, Cecil County, and SC. All three parties have agreed to a funding plan and their individual contributions are shown in their [funding commitment letters](#) (See detailed breakdown of funds in **Section 3**).

6. SUMMARY OF BENEFIT-COST ANALYSIS

The benefit categories associated with the project, and analyzed for their inclusion in the BCA, are mapped into all eight merit criteria set forth by USDOT. To maintain a conservative approach, only those benefit categories for which USDOT provides clear guidance were formally included in the monetization of benefits. **Table 7** and **Table 8** summarize the BCA findings. Annual costs and benefits are computed over the lifecycle of the project (26 years), and benefits accrue during the full operation of the project.

Table 7: Overall Results of the Benefit Cost Analysis, Millions of 2017 Dollars

Project Evaluation Metric	7% Discount Rate	3% Discount Rate
Total Discounted Benefits	\$83.18	\$155.89
Total Discounted Costs	\$44.82	\$49.72
Net Present Value	\$38.35	\$106.18
Benefit / Cost Ratio	1.9	3.1
Internal Rate of Return (%)	12.4%	
Payback Period (years)	7	

With a 7 percent real discount rate, the \$44.8 million capital investment would result in \$83.2 million in total benefits and a Benefit/Cost ratio of about 1.9.

Table 8: Benefit Estimates by Merit Criteria for the Full Build Alternative

Primary Selection Criteria	Benefit Categories	7% Discount Rate	3% Discount Rate
Safety	Accident Cost Reduction	\$6,598,767	\$12,137,549
State of Good Repair	Pavement Maintenance Cost Reduction	\$1,488,893	\$2,742,606
	(-) Increase in O&M Cost	-\$5,402,206	-\$9,178,518
Economic Competitiveness	Travel Time Savings	\$51,884,939	\$97,492,497
	Out-of-Pocket Vehicle Operating Cost Savings	\$27,427,061	\$50,468,799
Environmental Protection	Emission Cost Savings	\$1,177,743	\$2,231,372
Total Benefit Estimates		\$83,175,197	\$155,894,306

In summary, benefits attributed to the project, and monetized in the BCA include:

- **Safety** benefits generated from reduced vehicle accidents resulting from reduced Study Area traffic.
- **State of Good Repair** benefits comprised of pavement maintenance cost savings from reduced traffic on US 40, MD 222, and MD 272, and operating and maintenance costs (as a disbenefit) for the new interchange.

Shorter routes through the interchange and reduced vehicle congestion which generate:

- **Economic Competitiveness** benefits through travel time savings and out-of-pocket vehicle operating cost savings and,
- **Environmental Protection** benefits resulting from reduced emissions cost savings.

Please refer to the BCA Supplementary Documentation of this application for more detail