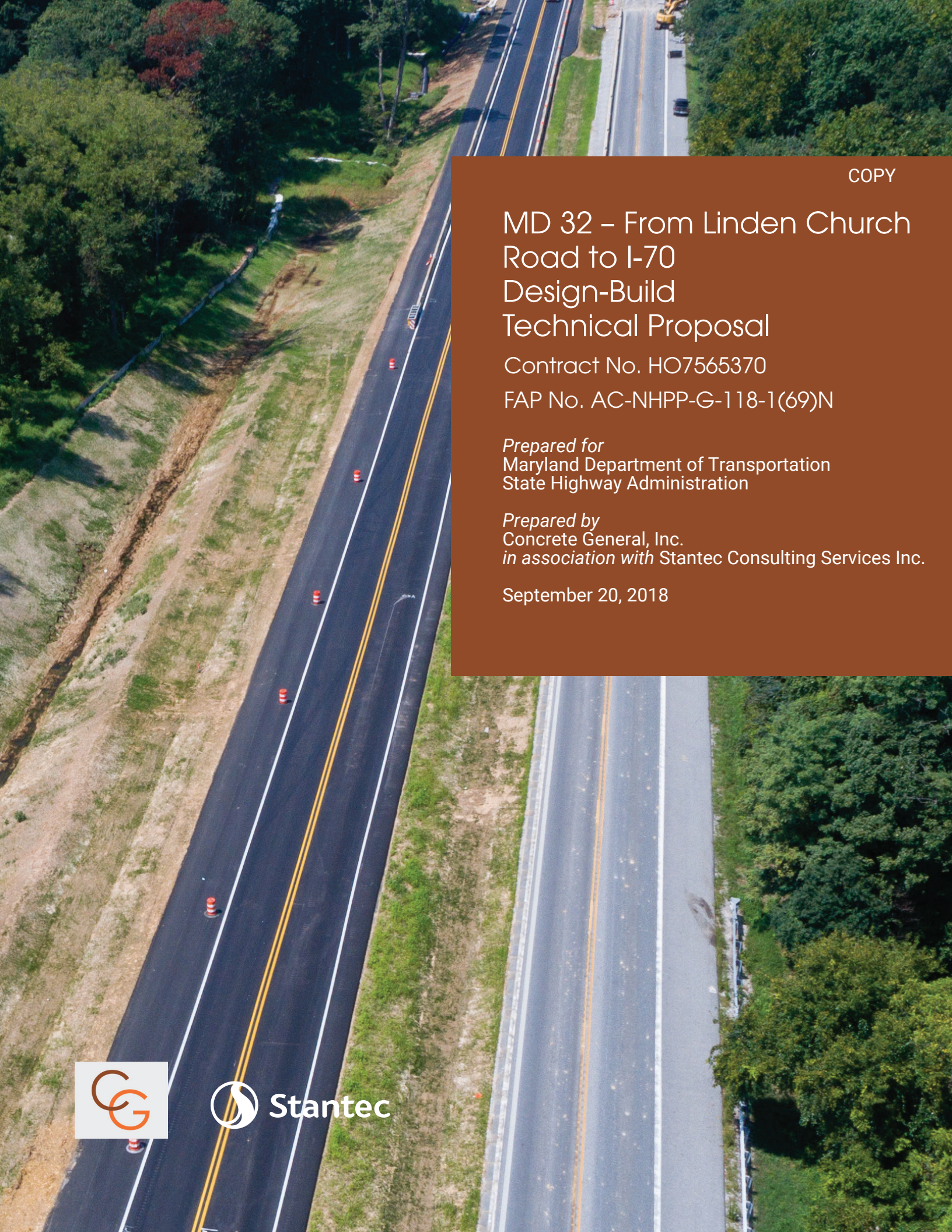

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MD 32 – From Linden Church Road to I-70 Design-Build Technical Proposal

Contract No. HO7565370

FAP No. AC-NHPP-G-118-1(69)N

Prepared for
Maryland Department of Transportation
State Highway Administration

Prepared by
Concrete General, Inc.
in association with Stantec Consulting Services Inc.

September 20, 2018

Stantec

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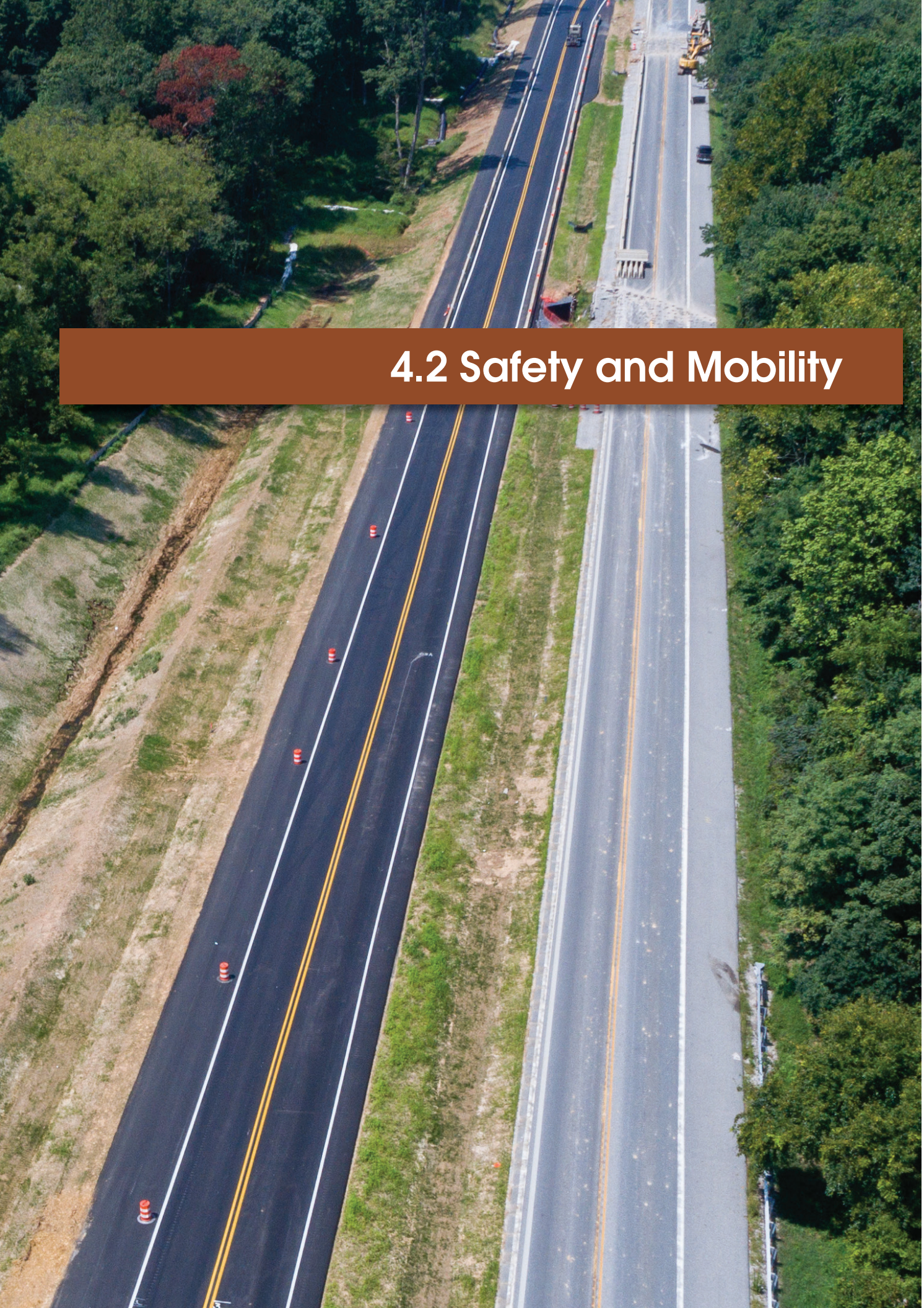


4.2 Safety and Mobility

4.2 Safety and Mobility

The CGI Team will Design and Construct a Continuous Four-Lane Dualized Roadway from the end of the Phase 1 Project to Station 486+10.32 including all the applicable SWM, structures, etc. facilities within these limits (except for Access Road #4) and based on approved changes, ATC's and design. Transition from existing two-lane to the new four-lane roadway will extend southward beginning at the proposed termini limit.

Founded in 1972, **Concrete General, Inc. (CGI)** is a leader in providing Heavy Highway, Road, Bridge, and Utility Construction services to MDOT SHA and the state of Maryland (MD). From their offices in Gaithersburg, **CGI** has delivered numerous projects to MDOT SHA including many using the Design-Build (D/B) method of project delivery. For more than 60 years, **Stantec** has had a significant role in the development of transportation facilities in Maryland, as well as nationally. From their offices in Baltimore, Laurel, and Germantown, in the past 10 years, **Stantec** has served as the Lead Designer or a major design participant on D/B projects in the region totaling more than $1B in construction. The **CGI/Stantec's** (CGI Team) principal objective is to Partner with MDOT SHA to design and build the maximum possible continuous, 4-lane dualized miles of MD 32 starting at the Linden Church interchange and extending north. Working in partnership with MDOT SHA, we will complete the project within our proposed limits meeting or exceeding the goals and objectives of the project.

Meeting Goal #1 to provide a project that maximizes the project elements to improve corridor traffic operations and safety while being compatible with future planned improvements. The CGI Team's focus has been to review the RFP requirements & Concept Design and modify those features that will benefit all stakeholders by maximizing the length of the dualization while minimizing environmental impacts.

The CGI Team will mobilize quickly and provide the management, expertise, and resources necessary to design and construct the project quickly and efficiently and deliver the State with a facility of an excellent quality. CGI is currently constructing the Phase 1 portion of the dualization of MD 32 from MD 108 to the Linden Church Road interchange, is well acquainted with the requirements of this Phase 2 project and is thoroughly familiar with the terrain and existing conditions that will be encountered with the Phase 2 construction. We have both the experience and skills to provide to the State a project of Design Excellence: ***meeting the projects performance requirements, meeting State and AASHTO design criteria, limiting impacts to the environment, meeting our project schedule and minimizing project features that will require added maintenance or reduce the life of the project.***

We are approaching this project with the understanding that the faster we can design and construct this project and open it to the public, the less impacts the project will have to safety during construction and the quicker we will be able to provide the needed additional capacity for volume of vehicles. The CGI Team has developed the design of the project to ensure that the newly constructed roadway will be a safe corridor to travel, align with future interchange construction, and meet the requirements for operations. The existing corridor has a high volume of traffic and no longer meets minimum requirements for capacity, which often leads to safety issues as well. Our team recognizes these roadway issues within the project limits and we have developed a roadway design, including bridges, intersections and access roads, that will alleviate the traffic congestion, provide a safe corridor for vehicle travel, and provide a safe facility that meets requirements set by MDOT SHA and AASHTO regulations. The proposed roadway design and construction will:

- Provide additional travel lanes.
- Reduce conflict points at intersecting roadways.
- Increase safety by providing limited access to MD 32.
- Include bridges that have a 75-year design life and minimal maintenance requirements.
- Replace Triadelphia Road bridge.
- Meet standards for sight distance for intersections, horizontal curves, and vertical curves.
- Provide paved shoulders.
- Meet standards for Clear Zone and Federal Roadside Design standards.
- Include SWM best management practices utilizing ESD to the "MEP".
- Provide both stream and wetland mitigation.
- Improve cross culvert capacity for volume of drainage.

- Align MD 32 to accommodate future interchange design: Dayton Shops, Burntwoods Road changes, and Rosemary Lane.

A. Project Narrative

The successful completion of this project is the CGI Team's primary objective. We define success as a safe, quality, environmentally compliant, and fully functioning, transportation facility delivered on time, within budget, and with minimal impact to surrounding community and environment, while meeting or exceeding MDOT SHA's goals and objectives. We have developed a team comprised of firms and individuals with extensive experience in delivery of (D/B) projects. We need no "learning curve"; we will hit the ground running with an efficient, well-organized team that will work in partnership with MDOT SHA, permitting agencies, the community, and stakeholders to deliver a successful project.

The CGI Team will design and construct the MD 32 Dualization project, within our proposed project limits, to meet the Performance Requirements of the Request for Proposal (RFP) and all Addendums for the project, as well as the design criteria for state, Howard County and federal regulations. T**he CGI Team will design and construct a continuous four-lane dualized roadway from the end of the Phase 1 project to Station 486+10.32 including all related SWM, structures, and facilities within our proposed project limits, *except for Access Road 4 located on the west side of proposed MD 32 at the northern limits*.** Transition from existing two-lane facility to the new four-lane divided roadway will extend southward beginning at the northern limit of the CGI's proposed project limit. (See Appendix Figure 1 for a graphic that indicates the limits of work). Our design and construction staff have extensive and current experience with similar projects in size and complexity. They will use this knowledge, the lessons learned, and challenges faced and overcame, in partnership with MDOT SHA; state, federal, and local agencies; and other stakeholders, to deliver a safe and context sensitive facility to the state while minimizing impacts to the environment, property owners and travelling public. With our extensive experience, and innovative, practical approach to design and construction, we also recognize which roadway geometric features can be modified without sacrificing safety, while still meeting minimum AASHTO requirements or allowable design exceptions. Setting a quality geometric layout of the project is just the start of pulling together a solid roadway design, but we understand that a well-integrated design and construction process includes continuous communication and integration of all project elements (environmental, drainage, SWM, traffic, structures, etc.) from that point forward to develop the most economical, least impactive, environmentally sustainable and safe roadway corridor.

The CGI Team has thoroughly reviewed the RFP and Performance requirements, is very familiar with the site, and understands exactly what the project goals are. Based on this, we have investigated several practical and innovative design and construction options and have developed several Alternative Technical Concepts (ATC) or changes / enhancements - see below. Many of these ATCs or changes propose to modify some project elements from those presented in the Concept Design included in the RFP. We have paid very close attention in evaluating and documenting the changes ensuring that MDOT SHA, federal, and other agency (as needed) standards and requirements are met, the project goals are met, and that we are not increasing environmental impacts. For example, in select cases, we have reviewed the NEPA noise analysis to be certain we will not be required to construct a noise wall to mitigate changes to noise levels. In developing these options, the CGI Team has carefully considered and incorporated the following:

- Maximize length of dualization
- Improve traffic operations
- Reduce conflict points
- Reduce congestion
- Include features to ensure safe roadside design
- Minimize features that require maintenance; bridges, barriers, culverts, drainage structures
- Minimize Impacts – Environmental and Socioeconomic

The CGI Team's proposed design and construction meets the basic requirements of the RFP – construct dualization of MD 32 from a 2-lane arterial to a 4-lane divided rural arterial highway with a design speed of 60 mph, as well as meet the requirements specified for Triadelphia Road Bridge and all other cross streets. The CGI Team's proposed project will be constructed within the existing and proposed right-of-way presented in the RFP and will meet the budgeted cost. Although a significant portion of the project is the dualization of MD 32, we have described below the design of all other roadway segments that affect/ impact the design of MD 32, including Triadelphia Road, at-grade intersections and consolidated access roads.

If chosen to design and build this project, the CGI Team commits to MDOT SHA and the public that we will provide them, the community and all roadway users a project that meets our professional and ethical commitments; that we will hold safety paramount and No. 1 to all other issues; that we will partner with MDOT SHA and all stakeholders in honesty and fairness to provide a facility for all to be proud of.

ATC and Concept Changes

The following tables list the ATC's submitted to MDOT SHA by the CGI Team. The proposed ATC 5, 6, 8 and 18 were deemed to be within the requirements of the RFP by MDOT SHA and not accounted as ATC. They are listed in Table 1 below as changes / enhancements to the RFP Concept Design. ATC 2, 3, 4, 7, 9, 10R, 11, 12, 13, 14R, and 19R were conditionally approved by MDOT SHA and are listed as ATCs in the Table 2. The complete submittal, including the supporting documents, of the all the listed ATCs and changes are included in the Appendix. Description of these ATCs/changes and how they meet or enhance the project goals and objectives are detailed following the tables below.

Table 1 - Enhancements to Concept Design

Change from Concept Design	Description
#5 - Move PGL for Existing NB lanes	The RFP Concept Plans show the existing two-lane roadway will be converted to a two-lane NB roadway and a new two-lane SB roadway will be constructed to create a dualized MD 32. The RFP typical sections depict separate NB and SB profile grade lines (PGL), where the point of rotation (P/R) and point of crown (P/C) are set along the inside edge of traveled way. The CGI Team proposes to relocate the PGL, P/R, and P/C between the travel lanes for both the NB and SB lanes. This will reduce sheet flow run-off distance across the roadway. Specifically, this will allow to utilize the existing pavement section of the NB roadway and reducing wedge-and-level asphalt quantities required.
#6 - Reduce Shoulder Pavement Depth	This change proposes an alternative outside shoulder pavement section along SB MD 32. The section is based on using a reduced Average Daily Truck Traffic of 10 percent of the Design ADTT. This reduction is in conformance with MDOT SHA's Pavement and Geotechnical Design – Revised Shoulder Guidance referenced in the Pavement Performance Specification Section 4.3.1. The new pavement section will consist of 8 inches of hot mix asphalt over 18 inches of graded aggregate base. The total shoulder section will be the same thickness as the mainline pavement section to allow proper drainage.
#8 - Reduce Median Width	The RFP Concept Plans propose a median width of 26ft. This change proposes to reduce the median width, in select sections of the project, to 22ft with 2ft flat bottom ditch; and to 8ft under the Triadelphia Road bridge.
#18 - Reduce Paved Shoulder Width	This change proposes reduce width of paved shoulders from 10ft to 8ft. AASHTO criteria indicates a minimum 8-foot paved shoulder is required for rural arterials with a design speed of 60 mph. The additional 2ft of graded shoulder will be supported with an aggregate layer.

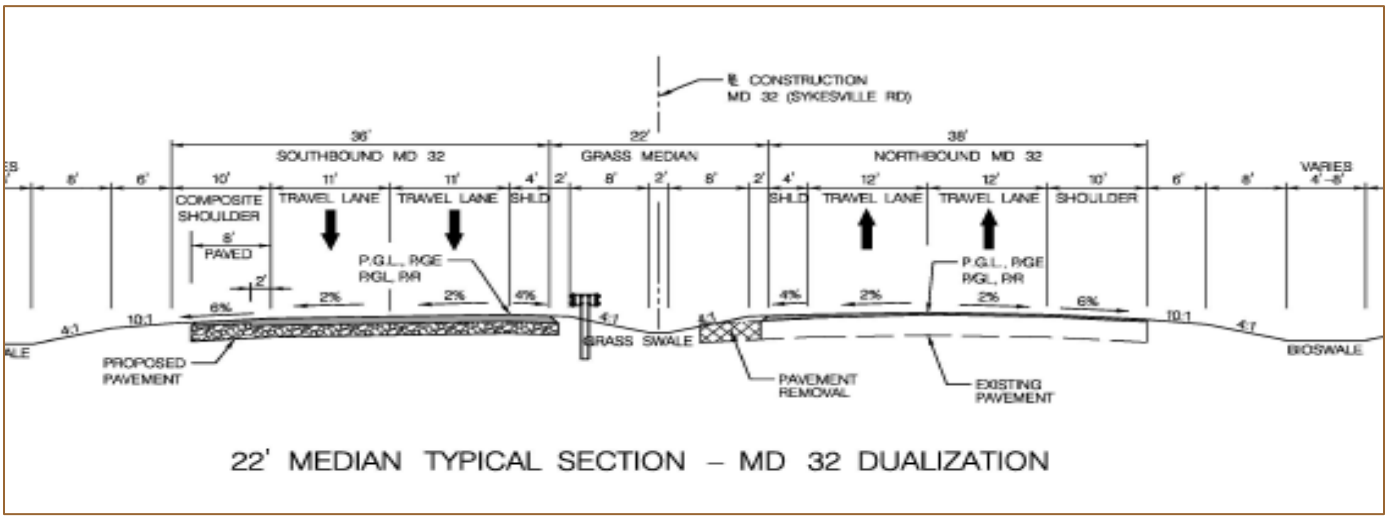
Table 2 - Alternative Technical Concepts

ATC	Description
#2 – ATC to Provide a Single Span Bridge carrying Triadelphia Road over MD 32	This ATC proposes to change RFP Concept Design of Structure S4 (Triadelphia Road over MD 32) from a two-span bridge to a single-span bridge. This is accomplished by modifying the Typical Section of MD 32 by reducing the side slopes and the median width on MD 32. The side slopes are minimized by placing MDOT SHA Std. No. MD 648.54 42-inch F Shape Concrete Traffic Barrier along both outside shoulders of MD 32; and the median is reduced under the bridge from 26ft to 8ft. This proposed MD 32 Typical Section will meet the requirements for the MD 32 roadway section, 2:1 abutment slopes, maximum 3ft of exposed abutment face, and maintaining the 16'-9" under clearance.

#3 – ATC to Provide 6 ft Bridge Shoulder on EB Lane	This ATC proposes to reduce the Concept Design EB shoulder width for Structure S4 (Triadelphia Road over MD 32) from 8ft to 6ft. The minimum sight distance requirements are met for several connecting driveways on Triadelphia Road. This option helps eliminate a girder line and helping reduce future maintenance costs.
#4 – ATC to Bifurcate Alignment	The RFP Concept Design maintains one vertical alignment for both the NB lanes and SB lanes of the proposed MD 32. This ATC proposes to reset the SB PGL with a separate vertical alignment, shifting the profile closer to the existing ground in select segments of the corridor. This will minimize the limits of cut and fill slopes along the SB roadway. The change to the profile will affect the median and will require a flat bottom median ditch that may vary from 2ft to 6ft.
#7 – ATC to Change RCP Drainage Pipe to CPDP Plastic Pipe	This ATC has conditionally approved the use of plastic pipes for sizes 15”- 60”.
#9 – ATC to Change Box Culverts (S1 and S-8) to Reinforced Concrete Pipe (RCP)	This ATC proposes to change the RFP Concept Design of Structures S1 and S8 (MD 32 over Tributary to Clyde’s Branch) from concrete box culverts (CBC) to circular RCP. The CGI Team will use a 102-inch diameter RCP instead of 8ft x 7ft CBC for S1; and an 84-inch diameter RCP instead of the 7ft x 6ft CBC for S8. Both will meet the 50-year design storm requirement.
#10R – ATC to Relocate J-Turn at Fox Chase Road	This ATC proposes to move the location of the J-turn on the SB side of MD 32 at Fox Chase Road. The CGI Team will design and construct the J-turn 200ft to the north of the RFP Concept Design. This shift will avoid building part of the median lane taper on the bridge over the Middle Patuxent River.
#11 – ATC to Change Cast-In-Place Culverts to Precast Culvert	This ATC proposes to change the RFP Concept Design of Structure S5 (MD 32 over Tributary of Middle Patuxent River) from a precast double cell, U-shaped box culvert having a cast-in-place footing, with a precast box culvert. The anticipated length of the precast box sections will be 6ft. The CGI Team will use a mud slab or compacted aggregate base as dictated by the design. Two options will be evaluated: a single cell 20ft × 9ft box; or a double cell 10ft × 9ft box.
#12 – ATC to Change Box Culvert (S-3) to RCP	This ATC proposes to change the RFP Concept Design of Structure S3 (MD 32 over Clyde’s Branch) from a single cast-in-place concrete box culvert to two precast RCP. The CGI Team will use a 90-inch diameter RCP and an 84-inch diameter RCP (this set 3-ft higher than the lower invert) instead of the 12ft x 7ft CBC for S3. The 50-year design storm requirement will be met.
#13 – ATC to Use Temporary Bridge for WB Traffic on Triadelphia Road	Instead of staged construction to reconstruct the Triadelphia Road Bridge, the CGI Team will design and construct a temporary bridge on the south side of the existing bridge to carry the WB traffic during construction of the new bridge. This will provide a safer option than staged construction, shorter construction period for this activity, and hence reduced impacts to public and environment.
#14R – ATC to Provide 11-foot Travel Lanes on SB MD 32	This ATC changes the RFP Concept Design of two 12-foot lanes for the proposed MD 32 SB to two-11-foot lanes. This change provides the opportunity to maximize the MD 32 dualization within the budget while maintaining a safe corridor with equal capacity of traffic to that of 12-foot lanes.
#19R – ATC to Use existing MD 32 Lane Geometry for NB Lanes in vicinity of Parliament Place	The RFP Concept Design shift the NB and SB alignment to the west near Parliament Place requiring reconstruction of all 4 lanes and removal of the exiting pavement. This ATC proposes to build the new alignment for the SB lanes but use the existing lanes for the two NB lanes. The NB and SB lanes will be on differing alignments with a wider median.

Design Elements

MD 32 -Typical Section: The constructed road will have 2 lanes in both directions. Additional lanes are added for center turn lanes and accel/decel lanes for side roads. Lanes will be 12ft wide and in some approved areas reduced to 11ft wide. The outside shoulders will be 10ft and the inside shoulders will be 4ft. The median width will vary by location, however holding the 26ft wide median for a majority of the alignment due to drainage and SWM features located in the median. A section of the alignment between Sta. 291+00 and 358+00 will be reduced to a 22ft median with a 2ft bottom ditch, and a shorter segment will be reduced to a minimum 8ft to reduce the length of the Triadelphia Road bridge overpass. The typical section will have different Profile Grade Lines (PGL) for NB lanes and SB lanes. The existing roadway will become the two NB lanes and will maintain the PGL. at the existing crown of the road, between the 2 lanes of traffic.



22' MEDIAN TYPICAL SECTION – MD 32 DUALIZATION

Placing the PGL between 2 lanes, as long as the breakover does not exceed 4%, is acceptable by AASHTO standards. This will also be the Point of Rotation for superelevating the roadway for the NB lanes. The SB lanes will have the PGL at the edge of the inside lane, as was developed in the RFP Concept Design. This will be the Point of Rotation for superelevating the roadway for the SB lanes. The advantage to this is a reduction in wedge and level paving of the existing lanes. Figure 2 included in the Appendix shows our proposed Typical Sections.

Contribute to Project Goals

- ✓ ***Improve corridor traffic operations:*** *dualizes roadway to provide 2 lanes for traffic in each direction.*
- ✓ ***Improve corridor safety:*** *separates opposing directions as a divided highway; typical section features are being built to AASHTO standards or with approved design exceptions.*
- ✓ ***Compatible with future planned corridor improvements:*** *lanes and shoulders will be compatible with future interchange ramps.*
- ✓ ***Minimize overall impacts:*** *narrowed lanes and median will reduce overall environmental impacts and require reduced SWM requirements.*

MD 32 - Horizontal Alignment: The Baseline of Construction is at the center of the median, and 17ft from the proposed edge of the NB lanes, and has been verified for design standards of a 60-mph design speed. Our design centerline will be verified to ensure it ties in accurately and on tangent to the Baseline of Construction for the Phase 1 portion of dualization. The combination of horizontal curve radii, design speed, and number of lanes is the basic criteria for designing the proposed superelevation through the roadway curves. Our review of the horizontal alignment geometry against AASHTO criteria is shown in a chart in Appendix Figure 3. Three locations where the horizontal alignment does not parallel the existing 2-lane roadway are:

- The alignment for SB lanes shifts to the west, away from the existing lanes between Sta. 410+00 to 450+00. The NB lanes stay on the existing roadway, which is a change from the Concept Design and approved in ATC 19R.

- The median narrows between Sta. 291+00 and 358+00 so the NB lanes remain along the existing two lanes, but the SB lanes are modified to narrow the median. This is a change from the Concept Design and approved in ATC 8.
- The CGI Team has designed a transition for the project limits at the north end to transfer traffic back to the existing 2- lane roadway section. The transition baseline curves meet the 60-mph design speed. Appropriate signing and striping will warn NB drivers of the elimination of 1 lane. We expect to add lighting to this section of roadway, so drivers are more aware of the change of direction in travel.

Contribute to Project Goals

- ✓ ***Improve corridor traffic operations:*** *a geometry that meet AASTHO standards for 60-mph design speed, will promote a road that operates to meet peak capacity.*
- ✓ ***Improve corridor safety:*** *separates opposing directions as a divided highway; designed to AASHTO standards for 60-mph; provided superelevation to AASHTO standards; reduce rear-end collisions.*
- ✓ ***Compatible with future planned corridor improvements:*** *lanes and shoulders will be compatible with future interchange ramps; the areas where the SB and NB lanes are not parallel are not areas where future interchanges are planned.*
- ✓ ***Minimize inconvenience to the community / drivers:*** *the proposed alignment will maintain 2 existing lanes for a majority of the corridor, lending itself to maintain the current 2 lanes during construction.*
- ✓ ***Minimize overall impacts:*** *maintaining the alignment of the existing 2 lanes will reduce overall utility relocations and minimize new impervious surfaces.*

MD 32 – Vertical Alignment: The proposed profile closely follows the existing MD 32 roadway elevations – meets design standards and minimizes wedge and level of existing roadway. The vertical alignment for both NB and SB will be designed so that the shoulder elevations in the median are the same. Our proposed profile also modifies a portion of the SB lanes creating a bifurcated segment from 390+00 to 410+00. (Approved in ATC 4). The purpose of this is to reduce overall cut/fill slope limits, materials needed for construction, and environmental impacts. In addition, from Sta. 475+00 to 486+10.32 the SB lanes are being constructed to the proposed vertical elevations but the NB lanes will remain on the existing alignment. The proposed vertical alignment has been evaluated to ensure it meets and avoids modifications to the geometry of future interchange ramps. Our review of the vertical alignment geometry against AASHTO criteria is included in Figure 4 in the Appendix.

Contribute to Project Goals

- ✓ ***Improve corridor safety:*** *designed to AASHTO standards for 60-mph*
- ✓ ***Compatible with future planned corridor improvements:*** *matching the existing roadway vertical alignment will work well with the design of future ramps and overpasses.*
- ✓ ***Minimize inconvenience to the community / drivers****: avoiding major changes to grades on the existing roadway will allow those lanes to remain open to traffic for a significant period during construction.*
- ✓ ***Minimize overall impacts:*** *maintaining the alignment of the existing 2 lanes will reduce overall utility relocations, minimize the amount of pavement material, and minimize new impervious surfaces.*

MD 32 – Roadside Design: Roadside design can have a big effect on safety of the facility. Beyond the shoulders we are designing side slopes, SWM facilities, drainage ditches, retaining walls, drainage structures and traffic features (signs). Our priority is to remove obstacles, such as overhead sign posts or trees, and provide an easily traversable side slope. However, in some cases this is not possible, or efficient, and roadside or median traffic barriers are required. The roadside design for medians and outside edges of the roadway will follow the State's current Book of Standards and Guidelines for Traffic Barrier Placement and End Treatments. We understand that the Addendum to the MDOT SHA Guidelines requires all new and replaced guardrail will need to meet the latest MASH requirements and approved MDOT Qualified Products. The median will include a median barrier where required due to the width of the median. The side slopes on the outside edges of the road will be designed to minimize impacts to the environment and remain within the proposed right-of-way. Critical to the design is the placement of the SWM bioswales and drainage ditches in reducing quantities, time for construction, and meeting SWM and drainage design criteria. Careful evaluation of the cross sections to define locations of steep slopes, bridge parapets, or possible roadside obstructions has been completed in order to locate proposed roadside traffic barriers based on the MDOT SHA Guidelines for

Traffic Barrier Placement and End Treatment and AASHTO's Roadside Design Guide. A key feature of placing W-beam traffic barrier is to include the appropriate type and location of end treatments and follow the latest MASH requirements. In addition to W-beam barrier, there are four segments of MD 32 that will include F-shaped traffic barrier:

- NB and SB Sta. 333+00 to 337+88 – limiting slopes under Triadelphia Road bridge
- NB 262+49 to 269+50 – reducing slope limits
- NB 294+51 to 298+49 – reducing slope limits

A retaining wall is planned for the SB section of roadway from Sta. 480+50 to 483+50 in the SB lanes. This is required to limit cut slope impacts adjacent to the Milton Shipley house property. Most likely the wall will be a soldier-pile-and-lagging for quick but effective construction.

Contribute to Project Goals

- ✓ ***Improve corridor safety:*** *roadside features minimize obstructions and provide required traffic barriers.*
- ✓ ***Compatible with future planned corridor improvements:*** *meets MASH specifications for all traffic barriers.*
- ✓ ***Minimize inconvenience to the community / drivers:*** *efficient design and minimized quantities will speed construction and open the lanes to traffic faster.*
- ✓ ***Minimize overall impacts:*** *roadside grading has modified the location of the side ditches and outside bio-swales to reduce slope limits and impacts to wetlands and forests.*

MD 32 – Intersections:

Access Control along this corridor is one feature that will have a major impact on the safety of the roadway. The proposed dualization will minimize access points to MD 32 and will limit turning movements at at-grade intersections which will greatly reduce the number of conflict points, and therefore improve safety for all drivers. This project gives an opportunity to limit access points, while ensuring property owners that no property will be land-locked. In the locations in which direct access to MD 32 is maintained, turning movements are restricted. Acceleration lanes and deceleration lanes will be provided for all intersecting roads that have right in and right out control. The proposed design will include center turn lanes and tapers for safe egress from the through lanes for those drivers turning left. Direct access will be maintained at:

- Dayton Shops – This MDOT SHA Maintenance facility requires access to NB and SB lanes of MD 32, exiting and entering the Dayton Shops access drive. The CGI Team's proposed design will match the design provided in the RFP.
- Parliament Place – This access is on the NB side of MD 32 and will be right-in and right-out as well as SB left turns into Parliament Place. Drivers leaving Parliament Place that want to travel SB on MD 32 will be required to drive north to the J-turn near Fox Chase Road. Accel/decel lanes on MD 32 are needed.
- River Valley Chase – This access road will allow only right-in and right-out from SB MD 32. A special median will be constructed to allow for emergency vehicles to access River Valley Chase from the NB lanes, but deter cars from making this turn. The intersection design will include an 8ft paved median shoulder for NB lanes and a raised concrete median to allow for emergency vehicles, but it will not be marked as a left turn lane. Changes to this intersection are shown in ATC 19R.
- Stiles Way – This road serves a neighborhood of homes and will allow only right-in and right-out from the NB lanes. Those seeking to travel SB on MD 32 must travel NB to the J-turn near Fox Chase Road.
- West Side Sta. 443+00 – this is a shared driveway access that will connect just a few houses and properties to MD 32 SB. Drivers can turn right into and right out of this shared driveway and only access SB MD 32. Those that want to travel NB will need to travel SB to the J-turn at Parliament Place.
- Rosemary Lane – this is a Local Road and will be used as the detour during construction of the Triadelphia Road bridge. The final proposed intersection will be right-in and right-out onto NB MD 32, with a SB left turn onto Rosemary Lane. Those leaving Rosemary Lane that want to travel SB will need to travel NB to the J-turn at Fox Chase Road.
- Old MD 32 (approximate Sta. 465+00 right) – This is a shared driveway access that will connect a few houses and properties to MD 32 NB. Drivers can turn right-in or right-out of this access street. A decel

lane for drivers heading NB will be sustained.

- Fox Chase Rd – Since CGI's proposed project dualization will end at station 486+10.32, and Access Road #4 will not be constructed, this intersection will remain as a right-in and right-out to and from SB MD 32. Accommodations will be made for those residents that want to travel on NB MD 32 with a J-turn at Parliament Place.
- Median Openings – Left turns will be allowed at certain points along the MD 32 median to accommodate Emergency Vehicle's to turn around and for travelers that need to change direction of travel on MD 32 and utilize a bulb-out J-turns. These left turns will be checked for adequate sight distance.

Contribute to Project Goals

- ✓ ***Improve corridor traffic operations:*** *limited turning movements and reduced at-grade intersections will improve traffic flow and steady speed limits.*
- ✓ ***Improve corridor safety:*** *limited turning movements will reduce conflict points; added acceleration / deceleration lanes provide safer traffic conditions; center turning lanes will have the length and capacity for turning lane storage.*
- ✓ ***Compatible with future planned corridor improvements:*** *future changes to build interchanges will not be negatively impacted by the proposed intersection designs.*
- ✓ ***Minimize inconvenience to the community/drivers:*** *side roads will have access to both MD 32 SB and NB; however, some of the access will required travel to a J-turn location.*

MD 32 – ITS / CCTV:

Camera Locations

- ✓ *Burntwoods Interchange*
- ✓ *Dayton Shop*
- ✓ *Fox Chase Road*

The ITS components included in this project consist of Closed Circuit Television (CCTV) cameras. CCTVs are used to detect and monitor incidents, and obtain real-time traveler data, including congestion areas, incident locations, or construction sites. CCTVs are proposed at the MDOT SHA Dayton Shop, the Burntwoods Road interchange, and at Fox Chase Road. CCTVs are most beneficial and most often used by CHART for verification of incidents. There are a host of other methods that CHART utilizes for incident detection, such as citizen calls, RITIS VPP, INRIX, and Waze. The key factor is that well-placed CCTVs enable Statewide Operation Center (SOC) staff to quickly verify incidents and plan an appropriate response without deploying a technician or police officer to the site, which is time consuming especially in rural corridors such as MD 32. The key design issues are the Field of View (FOV) and T1 telecommunications service drops. Although CHART is starting to migrate away from T1 services (as is Verizon – the telecom provider for most of CHARTs CCTV infrastructure) towards AT&T FirstNet and Fiber-Optics, this is the current SOP and an RFP requirement. The key to overcoming the legacy T1 telecommunications is working with Verizon to identity service drops early in the process – and we have already started this process! The FOV is based on the Use-Case Scenarios (UCS) which will be confirmed by stakeholders prior to FOV design. The assumed intended uses are:

- FITM Routes/Emergency Evacuation
- Incident Management
- Recurring Congestion Monitoring & Management, and
- Emergency Weather Operations

The UCS will determine the limits of the FOV. The FOV will be tested using desktop surveys and confirmed via bucket-truck surveys to avoid unanticipated occlusions due to structures, poles, foliage, etc. that are not often realized until after the project is complete. A viewshed assessment and site layout report will be prepared for stakeholder agreement prior to the start of detailed design which will provide a recommendation for the location and height of the CCTV pole to meet the UCS and FOV requirements; particularly with respect to horizontal curvature of the roadway (outside of curves typically maximizes FOV), vertical curvature and availability of power and telecommunications.

Contribute to Project Goals: ***Improve corridor traffic operation and safety:*** *use of CCTV will allow emergency responders to respond rapidly and with appropriate equipment to keep the corridor moving.*

MD 32 – Pavement Design: The pavement design and construction will follow the details provided in the RFP. The same depth of pavement section will be used for new lanes and widening of existing pavement for

MD 32. The construction of pavement shoulders will have a thinner asphalt section than the mainline, as was requested and approved by MDOT SHA in ATC 6. The thinner pavement section will meet the requirements for strength and pavement life as specified in the State design criteria. The shoulders, however, will have the same depth of aggregate base as the mainline in order to promote subgrade drainage. Most important to providing a strong pavement section is the subgrade soils. The CGI Team will remove unsuitable soils and replace with select material or strengthen the existing soils with a soil cement mix. The existing lanes of pavement, which will become the proposed MD 32 NB lanes, will require full depth and partial depth patching, as well as mill and overlay to improve the life of the pavement. Areas of patching will be determined once traffic is shifted to the 2 new SB lanes during construction phasing.

MD 32 – Drainage Structures:

Major drainage structures along this corridor include Structure S1 (MD 32 over Tributary to Clyde's Branch), Structure S8 (MD 32 over Tributary to Clyde's Branch) and Structure S3 (MD 32 over Clyde's Branch). (See Figure 1 in the Appendix for the location of each major drainage structure). The CGI Team has determined that RCP culverts as opposed to box culverts as listed in the RFP are superior choices for structures S1, S3 and S8. This is due to the quicker installation time and sound joints. This design change has been reviewed and conditionally approved by in ATC 9 and 12. Using RCP culverts with O rings improves the joint seal over box culverts with a tension based joint system. The use of O rings reduces installation time to seal joints as it is less labor intensive. Furthermore, RCP culverts can be precast as opposed to box culverts which must be cast-in-place where required to meet MD Code 378. Using precast structures reduces construction time and hence minimizes inconvenience to the community and traveling public. The improved joints also reduce the long-term risk of piping / soil loss reducing likelihood of sinkholes and therefore improving long term safety.

For structure S5 at Sta. 450+00, we have an approved ATC 11 to which we believe enhances the RFP Concept Design. Precasting the entire box section will result in a higher quality product when compared to cast-in-place construction. Eliminating the cast-in-place footing shown in the RFP Concept Design will reduce stream impacts during construction considering the time required for excavation, setting forms, placing rebar, and placing and curing concrete. If a large single cell precast box section is moved forward by the CGI Team, maintenance costs would be reduced since debris would not collect against the center wall. Precasting the entire box culvert will reduce the culvert construction time and impact to travelling public. Building the culvert along future SB MD 32 quicker speeds up construction of the SB roadway so that traffic can be switched for construction of NB MD 32 earlier.

Our proposed storm drain design will go hand-in-hand with the major drainage structures and SWM features, draining runoff to these facilities for treatment. The CGI team will construct pipes of 60-inch diameter and less as plastic pipes (CPDP), allowing quicker and easier installation, reducing construction time, long-term maintenance, and retains more funds to construct more of the dualization. This design change has been reviewed and conditionally approved by MDOT SHA through the ATC process. The storm drain system will meet the all the surface drainage Performance requirements and the Highway Drainage Manual as applicable.

Contribute to Project Goals

- ✓ ***Minimize the Overall Impacts:*** *reduced construction time will reduce the potential for large storm events and therefore water quality impacts during constriction.*
- ✓ ***Improve corridor safety:*** *Improved culvert joints and inert storm drain materials will reduce the long-term risk of piping/sinkholes.*
- ✓ ***Compatible with future planned corridor improvements:*** *the extended stream crossings and structure locations will accommodate the future improvements.*
- ✓ ***Minimize inconvenience to the community / drivers:*** *the reduced construction time will minimize the inconvenience during construction.*

MD 32 – Stormwater Management:

The CGI Team has extensive experience working for State projects and has a deep and thorough knowledge of the expectations for PRD/MDE reviews and permit approvals. We understand this project has numerous ESD facilities and SWM ponds:

- Sta. 206+50 to Sta. 440+00: 98 bioswale/grass swales and 16 ponds
- Sta. 440+00 to Sta. 475+00: 7 bioswale/grass swales, 1 pond, and 3 micro-bioretention

These facilities are needed in order to manage the water quality and quantity requirements for the new impervious roadway surface and to treat the reconstructed existing roadway impervious surface. The CGI Team's proposed design will allow a reduced sizing of BMPs and reduced resource impacts since we are reducing the proposed roadway surface: MD 32 SB, 8ft paved shoulders and 22 ft paved thru lanes. Stormwater management facilities will be designed to treat the amount of required runoff to the maximum extent practicable and in accordance with MDE SWM Design Manual including Supplement No. 1 for ESD to the MEP, MDOT SHA Site Development Guidelines and relevant SWM Guidelines from MDE and MDOT SHA. The requirement for ESD is met when post-development hydrology is restored to natural hydrologic conditions assuring that channel stability is maintained, predevelopment groundwater recharge is replicated, and nonpoint source pollution is minimized for the 1-year 24-hour frequency storm event.

Facilities have been placed to maximize quantity and quality treatment of runoff. Modifications to the RFP SWM Concept Design will be proposed to reduce impacts to resources and to provide additional water quality and quantity benefits. An investigation of outfall locations including discharges from proposed facilities and concentrated flows leaving the MDOT SHA right-of-way will be conducted to document conditions and evaluate stability. SWM designs will consider function, existing and proposed site conditions, required treatment, integration of design with ESC and traffic control, resource impacts, MDOT SHA Site Development guidelines, future intersection improvements, safety, facility access and maintenance cost. Non-exempt SWM facilities will be designed in accordance with MD 378. A facility maintenance and inspection schedule will be included. During construction, inspection and as-built certification will be performed including photographs, material testing data, plant and turf establishment checklists, as-built surveys and checklists, and computations as required. Design and as-built information will be provided to facilitate inclusion in the NPDES inspection program.

Contribute to Project Goals

- ✓ ***Improve corridor safety:*** *location and grading of all SWM facilities will meet Roadside Design criteria; SWM ponds will be fenced to limit access.*
- ✓ ***Compatible with future planned corridor improvements:*** *our design locates proposed ponds in locations specified in the RFP Concept Deign to minimize impacts to the future interchange ramps.*
- ✓ ***Minimize overall impacts:*** *ATCs and design modifications have reduced the proposed imperviousness.*

MD 32 – Bridges:

For structures S6 at Sta. 471+00, MD 32 over Middle Patuxent River, the design will be in accordance with the requirements of the RFP and the Structural Design Performance Specification. The configuration of these bridges will generally be similar to the RFP Concept Design. One exception is that we anticipate utilizing pile foundations with two rows of piles and battered piles to resist lateral loads at the abutments and S6 pier. While this matches the structure specific performance requirements in the RFP, the RFP Concept Design show a single row of caissons to support the foundations of S6.

Based on a preliminary analysis, the lateral loads and associated caisson deflections are impractical, and piles provide a more efficient design. This design and construction approach will reduce the overall cost of the bridge and allow our team to maximize the construction limits for the MD 32 dualization. In addition, using a pile foundation will be a quicker construction method since caissons require preaugering, additional inspection, reinforcing, and concrete curing time. This will reduce impacts to drivers by allowing the CGI Team to complete the future SB portions of the bridges and switch traffic for construction for the future NB portion of the bridges more quickly.

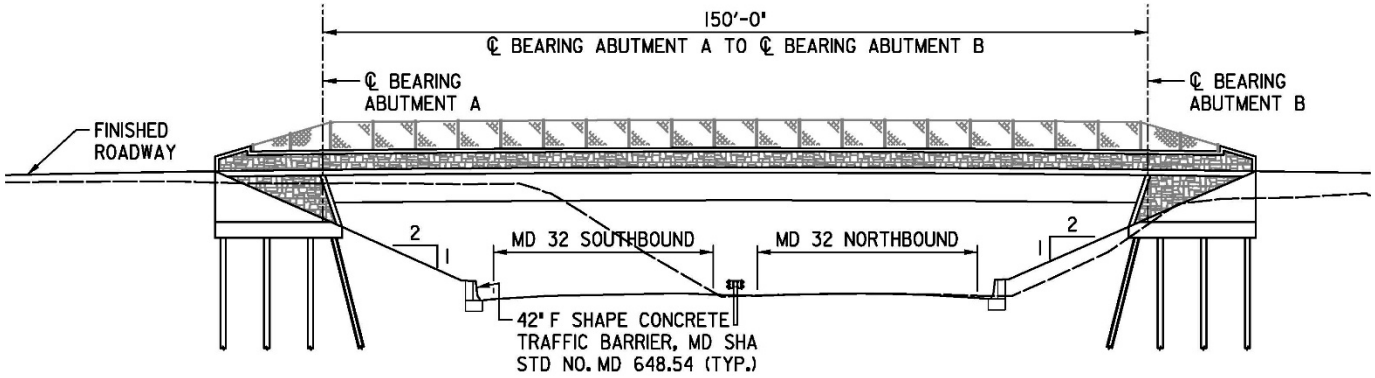
Contribute to Project Goals

- ✓ ***Improve corridor traffic operations & corridor safety:*** *separating northbound and southbound traffic will reduce accidents.*
- ✓ ***Compatible with future planned corridor improvements:*** *the bridge widths will be compatible with MD 32 as a limited access highway.*
- ✓ ***Minimize inconvenience to the community/drivers & overall impacts:*** *the CGI Team will stage construction of S6 to minimize impacts to MD 32 traffic.*

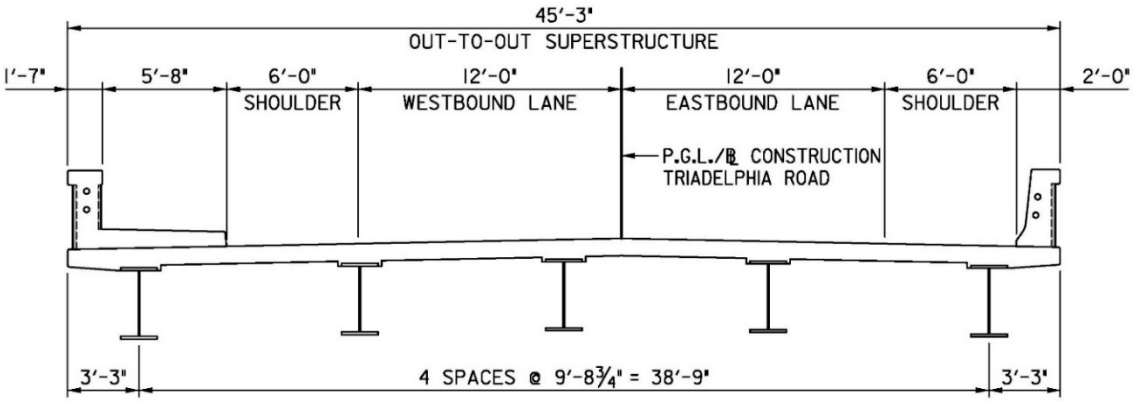
Retaining Walls/ Noise Barriers:

The CGI Team will design and construct the retaining shown in the RFP Concept Design from Sta. 480+24 to Sta. 483+50. We anticipate the retaining wall type will be similar to the soldier pile wall in the RFP. A safety fence will be mounted on top of the retaining wall. The architectural treatment will be an ashlar stone pattern as shown in the Concept Plans. The height and length of the wall will be minimized while considering the adjacent historic property. We anticipate transitioning to MDOT SHA Std. No. MD 648.54 at the limits of the wall. The NEPA study results indicate a Noise Barrier is not required. Although we have modified sections of the alignment, we have reviewed the changes against the noise study report and determined that they do not have a significant change to the results in the NEPA study and noise walls will not be required.

Triadelphia Road and Bridge:



The Triadelphia Road overpass is one of the more challenging aspects of the design and construction of this project since it is an existing bridge that needs to be removed and completely reconstructed along its existing horizontal alignment with access driveways and sight distance concerns at both ends of the bridge. The CGI Team has determined that the bridge can be built as a single span, 150-foot-long structure thereby eliminating the need for a center pier. This will remove a major obstacle in the MD 32 median and will provide to the State a bridge that is shorter and requires less maintenance than if it was a two-span bridge. Future maintenance costs to replace pier bearings will be avoided with a single span bridge. Without a pier, MOT costs for pier inspections and future repair cost for a pier will be saved. To accommodate the single span bridge, the typical section of MD 32 is proposed to be reduced. The median of MD 32 will be 8ft wide and length of the 2:1 slopes will be reduced by using F-shape barriers. This reduced width of MD 32 will meet all AASHTO criteria for safety requirements and will include full width shoulders, consistent with the rest of the MD 32 corridor. A single span bridge was approved through ATC 2. A plan and profile of the bridge are included in the Appendix Figure 5. Below is a brief description of various proposed elements of the bridge.



- Triadelphia – Typical Section: The roadway will be designed as a 2-lane open section Howard County Major Collector roadway with a design speed of 35 mph. The bridge will have 6ft shoulders and will accommodate a 5'-8" sidewalk in the WB direction. An ATC 3 was submitted and conditionally

approved to reduce the RFP required 8ft eastbound shoulder to a 6ft shoulder. The CGI Team will provide a design that does not require temporary underpinning during future deck replacement. The wingwall in the SW corner will be slightly skewed to meet sight distance requirements.

- Triadelphia – Horizontal Alignment: This project will maintain the existing centerline of Triadelphia Road for the proposed bridge and road centerline, although it is understood that the bridge will be wider on one side than the other, since the sidewalk will be constructed only on one side. See Typical Section of the proposed Bridge on previous page.
- Triadelphia – Vertical Alignment: To adequately maintain the minimum clearance of 16'-9" over MD 32, and with a deeper bridge structure because of the single span, the profile of Triadelphia Road was raised from the existing, following the standards for the road with a design speed of 30 mph. The revised profile meets existing grades of Triadelphia Road about 100 feet east of the circular roundabout roadway at Ten Oaks Road.
- Triadelphia – Drainage: Drainage along MD 32 will not require pipes or structures since this is a high point in the profile of MD 32. MD 32 surface runoff will flow along the outside barriers and will outfall to roadside ditches beyond the bridge area. Runoff from the bridge will drain to standard inlet structures at each end of the bridge approaches and will be piped to outfall in the MD 32 side ditches.
- Triadelphia – Sight Distance: A concern with this modification was the intersection sight distance requirements for driveways on the west and east side of the bridge. Both were analyzed and meet the AASHTO standards for sight distance. Although a new development is planned for the west side of Triadelphia Road Bridge, their planned access to Triadelphia Road is in the same location as the existing driveway, and therefore will also meet sight distance requirements.
- Triadelphia – Structure: Eliminating the pier, reducing the overall bridge width, and utilizing a temporary bridge will allow our team to eliminate a girder line and economize the design and construction. This will allow us to push the limits of the MD 32 dualization further north. The temporary bridge allows the proposed bridge to be constructed in a single stage which reduce impacts to drivers and the community. With a single construction stage, the proposed bridge will be open to traffic earlier than if it had been built in two stages as shown in the RFP Concept Design.

Contribute to Project Goals

- ✓ ***Improve corridor safety:*** *new bridge will have shoulders for bike safety and a sidewalk that meets ADA requirements. Without a pier, MD 32 traffic impacts will be reduced during biennial bridge inspections and the aesthetics of the new bridge is significantly improved with an open section as opposed to that with a center pier.*
- ✓ ***Compatible with future planned corridor improvements:*** *the reduced MD 32 section under Triadelphia Road bridge will meet future plans to make MD 32 a limited access highway.*
- ✓ ***Minimize inconvenience to the community / drivers:*** *a temporary bridge will maintain WB traffic on Triadelphia Road; the full closure and reconstruction of the bridge will shorten the construction schedule and open both lanes to traffic faster than if it was done using stage construction; the shorter, single span bridge will also contribute in construction duration reduction minimizing impact to the community.*
- ✓ ***Minimize overall impacts:*** *roadway alignment will maintain existing centerline; vertical alignment will not impede sight distance requirements; reduced future maintenance with a single span bridge.*

Access Roads:

The design and construction of access roads will minimize direct connections to MD 32, provide access for all property owners to some point along MD 32 and work well in the future when all direct access points will be eliminated, and intersections will be reconstructed as interchanges. To be certain these access points are safe, we have reviewed and checked each one for adequate sight distance. Many of the access roads are right-in and right-out and the CGI Team will provide ample signing, striping and will have appropriate street lighting to ensure vehicles don't attempt to travel the wrong direction on MD 32. The State has provided design criteria for these access roads. Depending on the volume of traffic, these roads will follow Howard

County Road Design Standards.

- Local Road – Rosemary lane
- Residential Access Street – River Valley Chase
- Residential Access Place – Parliament Place, Stiles Way, Fox Chase Road, and Vistaview Drive
- Extended Driveways – Sta. 443+00 Left

Contribute to Project Goals

- ✓ ***Improve corridor safety:*** *provides safe design of side roads and access to MD 32.*
- ✓ ***Minimize inconvenience to the community:*** *MOT phasing will provide phasing and continual access for neighborhood streets.*

B. Improvement to Network Traffic Operations and Reduce in Crashes

The CGI Team has been reviewing the RFP documentation to determine how and where we can improve on the Concept Design to provide to the State a corridor that maximizes the traffic capacity while ensuring the MDOT SHA and all roadway users that the facility meets all required safety criteria and has eliminated hazardous conditions. The Appendix Figure 6 includes the Peak Hour and Future Traffic Volumes and Figure 7 includes the Safety Analysis results.

Existing Conditions:

MD 32 is a two-lane road from Linden Church Road to north of Rosemary Lane.

Table 3 – 2015 Existing Peak Hour Traffic Volumes

	MD 32 NB AM (PM)	***MD 32 SB AM (PM)***
South of Linden Church Road	435 (1,680)	1,935 (780)
North of Rosemary Lane	400 (1,620)	1,590 (695)

The Highway Capacity Manual defines the capacity of a two-lane highway under base conditions at 1,700 vehicles/hour. This indicates that MD 32 is operating at capacity during the peak hours.

There are interchanges on MD 32 at Linden Church Road and at Burntwoods Road. There are at-grade intersections at the MDOT SHA/ Howard County Maintenance Shops Entrance, River Valley Chase/Parliament Place, Stiles Way and Rosemary Lane. Stiles Way is a northbound right in and right out intersection and the MDOT SHA/ Howard County Maintenance Shops Entrance has an emergency traffic signal to let vehicles out of MDOT SHA/ Howard County Maintenance Shops Entrance.

The intersection of MD 32 and River Valley Chase/Parliament Place is a full intersection with stop signs on the River Valley Chase and Parliament Place. There are left and right turn lanes for both directions of MD 32 at this intersection. The intersection of MD 32 and Rosemary Lane is stop sign controlled and left and right turns are allowed from Rosemary Lane onto MD 32. There is a northbound right turn lane and a southbound left turn lane on MD 32.

Congestion occurs along MD 32 SB at the Linden Church Road interchange due to volume of traffic during the AM and PM peak hours in one lane of traffic each way and traffic merging into MD 32 from Linden Church Road. This traffic typically backs up to just south of Triadelphia Road overpass and sometimes this congestion will back up into the Burntwoods Road interchange. Traffic has been observed getting off MD 32 at the Burntwoods Road interchange and taking Ten Oaks Road to Linden Church Road and rejoining MD 32 to bypass the congestion.

MD 32 NB typically has a bottleneck at MD 108 where the existing 4-lane roadway reduces down to a 2-lane roadway and then at the intersection of MD 32 and MD 144. This intersection typically backs up traffic to Rosemary Lane. With the completion of Phase 1 of traffic the MD 108 bottle neck will be moved northward to the Linden Church Road interchange.

Crash Analysis: Three years of crash data from 01/01/2013 to 12/31/2015, was analyzed for MD 32 from Linden Church Road to I-70 in Howard County. The overall corridor length is 7.14 miles. The evaluation of

the crash data focused on locations, the probable causes, frequencies, and patterns of crashes.

Overall along the seven-mile segment of MD 32, there were a total of 168 police-reported crashes during the three years of crash data. There were no fatal crashes, 50 of the crashes were injury crashes resulting in injuries to 71 people, and the remaining 118 crashes were property damage only crashes. The crash rate for the corridor was 86.3 crashes per million vehicle miles traveled (VMT), which is lower than the statewide average for similar roadways (93.3 crashes per Million VMT) over the same three-year period.

Rear end crashes were the most common type of crash with 39% of the total crashes and fixed object crashes accounted for 26% of the total crashes. Approximately 53% of the total crashes occurred during the AM and PM peak hours of 8:00 – 11:00 AM and 2:00 – 7:00 PM. There were 89 of the 168 crashes were between Linden Church Road and just north of Rosemary Lane. There were 75 crashes near an interchange or an intersection between Linden Church Road and just north of Rosemary Lane.

There were 27 crashes at the Linden Church Road interchange on MD 32. It should be noted that the Linden Church Road interchange was completed in November 2013. At this location the number of crashes decreased from 16 in 2013 to five in 2014 and six in 2015. There were 16 crashes near the intersection of MD 32 at MDOT SHA/ Howard County Maintenance Shops Entrance, 15 on MD 32 at Burntwoods Road Interchange, five at the intersection of MD 32 at River Valley Chase/Parliament Place, four at the intersection of MD 32 and Stiles Way and eight, at the intersection of MD 32 and Rosemary Lane.

Proposed Conditions:

The CGI Team will develop the design of the project to assure MDOT SHA that this project will provide the State a new facility that is safe and minimizes crashes and maximizes capacity for operations. Our Team will look at the performance of the MD 32 roadway, as well as each section that connects to the existing road network (and future interchange ramps). A safe facility means that all aspects of the design meet State and Federal standards for roadway design. The CGI Team proposes to construct MD 32 to have two lanes in each direction. This additional capacity will reduce the congestion at the Linden Church Road and Burntwoods Road interchange and improve the safety along the MD 32 corridor.

Table 4 – 2040 Peak Hour Traffic Volumes

	MD 32 NB AM (PM)	***MD 32 SB AM (PM)***
South of Linden Church Rd	775 (3,525)	3,355 (1,375)
North of Rosemary Lane	725 (3,150)	2,890 (725)

The Highway Capacity Manual defines the capacity of a four-lane freeway with a free flow speed of 55 mph under base conditions at 2,250 vehicles/hour/lane. This is an increase from existing conditions of 3,400 for both directions of MD 32 to 9,000 after construction. This indicates that MD 32 is operating under capacity during the peak hours.

A Crash Modification Factor (CMF) of 0.712 for all crashes in conversions of two-lane to four-lane divided roadways with AADT ≥ 10,000, was developed based on a 2015 study by Ahmed et. Al. The MDOT SHA has developed Local Calibration Factors (LCF) for Maryland-specific application of the Highway Safety Manual. The study developed an LCF of 0.6956 for rural two-lane roadways, indicating a local CMF of 0.495 for the proposed conditions.

To improve safety along the corridor the number and types of conflict points at driveways and roadways will be reduced and modified to influence the safety of motorists. For example, a crash due to crossing maneuvers (created by motorists crossing the roadway or making left turns) can lead to more severe crashes then merging or diverging conflicts because of the angle and speed differentials between the vehicles. As the angle and speed differentials increase, crash severity can also increase. As part of this project, access roads will be constructed to reduce the number of driveways and roadways with direct access points to MD 32.

The MDOT SHA/ Howard County Maintenance Shops Entrance at MD 32 will be constructed as a Maryland T intersection. This intersection will allow left turns from the MDOT SHA/ Howard County Maintenance Shops Entrance, but the left turn traffic will cross over the northbound traffic and then merge into the southbound traffic utilizing a channelized acceleration lane. A CMF of 0.958 for all crashes in converting a T intersection into a Maryland T intersection, was developed based on 2016 study by Wood and Donnell et. Al.

At the intersection of MD 32 at River Valley Chase/Parliament Place will allow right turns in and out of River Valley Chase and Parliament Place and a left turn from southbound MD 32 into Parliament Place. To make a left turn or to go straight from River Valley Chase traffic must first turn right and then use the Burntwoods interchange to complete the U-turn to go north on MD 32. To make a left turn or to go straight from Parliament Place traffic will turn right and proceed north to a J-turn to go south on MD 32. At the intersection of MD 32 and Stiles Way traffic wanting to go south on MD 32 will turn right onto northbound MD 32 and proceed north to complete a J-turn to go south on MD 32. At the intersection of MD 32 and Rosemary Lane this intersection will be limited to right turns into and out of Rosemary lane and a southbound left turn into Rosemary Lane. Traffic wanting to go south on MD 32 will turn right onto northbound MD 32 and proceed north to a J-turn to go south on MD 32.A CMF of 0.652 for all crashes in installing J-turns, was developed based on a 2013 study by Edara et. Al. In summary, the following tabulation addresses the potential benefits to safety at intersections within the corridor, represented in the reduction of the number of conflicting intersection movements and projected reduction in potential crashes.

Table 5

Intersection of MD 32 and:	***Conflicting Intersection Movements***		***CMF***	***Projected Reduction in Crashes***
	Current	**Proposed**		
Rosemary Lane	6	5	65.2	34.8 % in left turn crashes with J-Turn
Stiles Way	4	4	0	None
Parliament Place/River Fox Valley Chase	12	7	65.2	34.8 % in left turn crashes with J-Turn
Ho. Co. MDOT SHA Maintenance Shops	6	6	0.958	4.2 % reduction in left-turn crashes with Maryland T-Intersection Design

With the improvements of providing a 4-lane divided highway, a Maryland T intersection as well as providing J-turns for left turns from side streets will reduce the potential for crashes along the corridor as well as provide additional capacity for the corridor. This additional capacity will reduce the congestion along the MD 32 and the surrounding roadways, as commuters will not have to bypass the congestion on MD 32. The traffic that was getting off of MD 32 at Burntwoods Road interchange and using Ten Oaks Road to Linden Church Road and Back to MD 32 will be able to stay on MD 32.
The proposed MD 32 corridor design will be designed and constructed to anticipate the future construction of interchanges at the MDOT SHA/ Howard County Maintenance Shops Entrance and Rosemary Lane and will assure that both proposed and future elements will work safely and efficiently together.

Contribute to Project Goals

- ✓ ***Improve corridor Traffic Operations:*** *provides additional capacity to MD 32.*
- ✓ ***Improve corridor safety:*** *potential reduction in crashes due to the proposed widening and intersection treatment.*
- ✓ ***Minimize inconvenience to the community/drivers:*** *by providing additional capacity there will be less delay for traffic on MD 32 and traffic that is using side roads to jump ahead of the traffic congestion will stay on MD 32 reducing the congestion on the side roads.*

C. 10 AASHTO Controlling Criteria

The CGI Team's approach to this project puts the safety of users and the travelling public as the top priority for all aspects of design and construction. Meeting AASHTO design criteria as well as Performance Requirements from the RFP is our framework for reaching this goal and will result in a successful project. We also understand that MDOT SHA is a supporter of Practical Design to achieve the Purpose and Need of a project while minimizing impacts and also follow Context Sensitive design principles. With this in mind, we have reviewed the Concept Design for all segments of the project. To evaluate the Concept Design, we have developed tables to check the geometric attributes to ensure the AASHTO controlling criteria and

Performance Requirements are met and determine where the design needs to be modified. Refer to Figure 3 and Figure 4 in the appendix for the review of the Concept Design. We understand that if any element of design that does not meet the AASHTO controlling criteria, or MDOT BSHA design standards and Policies, will require a Design Waiver or Design Exception. These are defined below:

- *Waiver* – A request for a design waiver will be required for project features that do not conform to MDOT SHA guides and policies such as Accessibility Policy and Bicycle Policy. A request following MDOT SHA standard format will be submitted to the MDOT SHA for their review. Mitigating features and justification will be required for an approval.
- *Exceptions* – A request for a design exception will be required if an element of the design does not meet one of AASHTO's 10 controlling criteria (criteria listed to the right). This type of request will also follow MDOT SHA standard format and needs to strongly justify the reduced standard. Justification may be due to impacts to cultural or historic resources, context sensitivity, right of way costs, or environmental impacts. A clear description of alternatives that were reviewed and analyzed and their costs and impacts will need to be included. Mitigating features will need to be added to the project to offset the reduced standards. In the case of MD 32, MDOT SHA will review and approve this type of exception.

AASHTO's 10 Controlling Criteria
1. **Design Speed**
2. **Lane Widths**
3. **Shoulder Widths**
4. **Horizontal curve Radius**
5. **Superelevation**
6. **Stopping Site Distance**
7. **Maximum Grade**
8. **Cross slope**
9. **Vertical Clearance**
10. **Design Load Structural Capacity**

Prior to submittal to MDOT SHA the roadway design packages, the CGI Team will prepare a spreadsheet of the 10 controlling criteria and review the proposed design to verify that we have either met the AASHTO design criteria or have started preparing or submitted Exception requests for approvals. A discussion of our findings and understanding of the 10 AASHTO controlling criteria for this project is listed below.

Design Waivers: The areas of concern when we review a project for possible waivers are usually related to MDOT SHA Policies on Bike and Pedestrian access. The RFP is allowing bike use of the shoulders of MD 32 north of Burntwoods Road and our design accommodates that requirement. The only area that will include pedestrian activity is Triadelphia Road. We are accommodating pedestrians by including a sidewalk along the structure; however, we have not added pedestrian facilities to the new sections of roadway. Our design team will prepare a Waiver to be submitted MDOT SHA to approve this design, noting that there are no existing sidewalks along Triadelphia Road and no plans to improve or widen the road. If there is a time when the County plans to modify the road to include sidewalks, our proposed design will not preclude that construction from taking place at that time.

Design Exceptions: The results of our review confirm that the RFP Concept Design is generally consistent with AASHTO criteria with two design exceptions as noted in RFP Section 3.6 and will be obtained by the MDOT SHA. Our proposal meets the AASHTO criteria to the maximum extent practicable within the given constraints and goals of the project. Our proposal includes an additional proposed design exception, as approved with ATC 14 (Revision 1) for 11-foot lanes along MD 32 SB but pending final approval by MDOT SHA and FHWA during final design. The following includes a discussion of all three design exceptions and proposed methods for mitigation:

1. **MD 32 from Sta. 436+70 and 444+00 - 6% longitudinal grade (RFP Concept Plans)**: MD 32 has a design speed of 60 mph and is classified as a rural arterial within rolling terrain, with future plans to be upgraded to a freeway. According to AASHTO criteria, the maximum grade for 60 mph in rolling terrain for either a rural arterial or freeway is 4%. However, based on the existing condition and RFP Concept Design, the proposed MD 32 corridor will have a 6% grade between Sta. 436+70 and 444+00. The 6% grade was retained during the Concept Design because modifying the grade would have excessive environmental impacts and create design difficulties where MD 32 intersections with two existing cross roads. MDOT SHA will be acquiring this design exception. To mitigate for this design exception, our proposal includes the following measures:
    - Maximize the traversable slopes and clear zone adjacent to the downgrade (NB lanes).
    - Limit obstacles near roadway.

- Locate the median barrier along the upgrade side of the median (SB lanes) to allow more space for recovery of vehicles that depart from the downgrade side (NB lanes).
- Adjust / increase the superelevation rate along the downgrade (NB lanes) to account for increase in operating speed (AASHTO Green Book, Page 3-33, Effects of Grades).
- Caution signing; enhanced marking.
- Roadway lighting.

2. **MD 32 SB – 11-foot lanes (ATC 14R1):** This proposal includes construction of two, 11-foot lanes for SB MD 32 within our project limits. Lane width is considered an AASHTO controlling criteria; therefore, deviation from 24-foot traveled way (two at 12-foot lanes) will require a design exception. (AASHTO, A Policy on Geometric Design of Highway and Streets: Table 7-3.) The CGI Team's design with the reduced roadway width allows us to maximize the length of the dualized roadway while working within the project budget requirements. To provide added safety to the corridor, the roadway design may include additional advisory signing, marking, and roadside safety treatments as follows:
   - ROAD NARROWS signing.
   - Wide pavement markings.
   - Conventional safety treatments such as:
     - RPMs
     - Rumble strips
     - Post-mounted delineators
     - Breakaway ground-mounted signs and poles

   The CGI Team researched the implications on safety and capacity to justify the use of 11-foot lanes and prepared an ATC 14R for MDOT SHA review. The ATC was Conditionally Approved with the understanding that the final design plans will require a formal application and approval through FHWA.

   While combinations of factors such as reducing shoulder widths, eliminating medians, and reducing lane widths are generally considered to increase crash risk, changing from 12-foot to 11-foot lanes only does not affect an increase crash risk. Studies have shown that for rural two-lane and divided multi-lane roadways, converting lane widths from 12-ft to 11-ft does not have an adverse impact.

   If a design exception were to be approved with standard shoulder widths, then the 11-foot lane width is justified based on our research. The overall width of pavement including shoulders will be 34 ft (4-foot inside shoulder + 22-foot traveled way + 8-foot shoulder).

   Furthermore, the combination of reduced lane widths with roadside safety features such as rumble strips and delineators may even have traffic calming effect. According to the Highway Capacity Manual, the reduction of lane widths to 11-foot results in a 1.9 mph reduction to free flow speed.

   The reduced width will contribute to maximizing the length of continuous four-lane dualized roadway. Maximizing the length of dualized roadway could reduce severe, centerline-crossover crashes typically associated with two-lane roadway facilities. The safety benefits associated with converting from a two-lane roadway to a divided, four-lane roadway are well documented. Based on previous studies, MDOT SHA may be able to anticipate crash reductions ranging from 40 – 60%.

   It has been shown that crashes occur more frequently and more severely along horizontal curves. For example, according to FHWA, a Minnesota study found that 32% of crashes occurred on horizontal curves (composed of less than 10% of the highway system in the region), and 47% of severe roadway departure crashes occurred on horizontal curves. Providing reduced lane widths on tangents but holding 12-foot lanes around curves could preclude increases to crash frequency that could otherwise be attributed to 11-foot travel lanes along the horizontal curves of the proposed dualized MD 32.

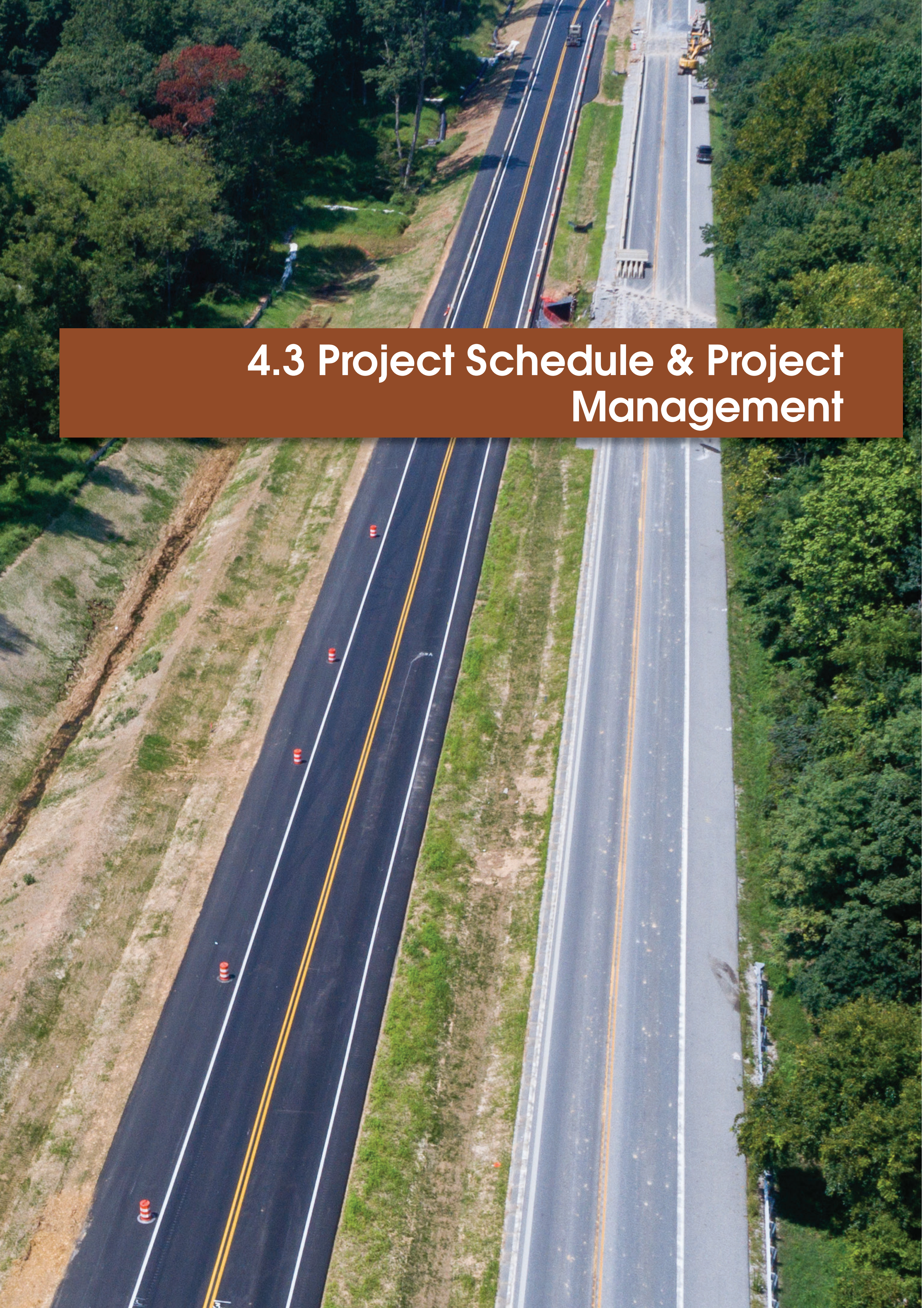
Table 6 below lists our review of the 10 Controlling Criteria against our current roadway design.

Table 6 -Proposed Design Elements Not Meeting AASHTO Controlling Criteria

AASHTO Controlling Criteria	Criterion Value	Proposed Meets AASHTO criteria	Mitigation Measures Proposed
1. Design Speed	60 mph	Yes	N/A
2. Lane Width	12 ft min.	No – design exception needed for 11-ft SB lanes	Curve widening; enhanced signing and marking; RPMs, rumble strips, delineators, break-away posts/poles
3. Shoulder Width	8-ft min.	Yes	N/A
4. Horizontal Curve Radius	See appendix	Yes	N/A
5. Superelevation	See appendix	Yes	N/A
6. Stopping Sight Distance	See appendix	Yes	N/A
7. Maximum Grade	4% max	No – design exception needed for 6% grade	Mitigate with clear zone, traversable slopes, limited obstacles, increase to superelevation, signing & marking, lighting
8. Cross Slope	Travel Lanes – 2% Shoulders – 2% - 6% (8% max rollover)	Yes	N/A
9. Vertical Clearance	16’	Yes	N/A
10. Design Load Structures	AASHTO/ MDOT SHA requirements with HL-93 Live Load	Yes	N/A

Our design will include reconstruction and/or modification of existing roads as part of the project scope. Other than MD 32, all other roads within the project limits will be owned and maintained by Howard County. This includes Triadelphia Road, Rosemary Lane, River Valley Chase, Parliament Place, and Stiles Way. Each road has specified design criteria listed in the RFP under “Performance Requirements Roadway”. While the county road intersections with MD 32 and access to MD 32 will be governed by the State standards, county roads will follow the county’s standards and will be required to go through the county’s review process. Design criteria may vary between the State and local standards but will ultimately be consistent with AASHTO and federal standards. Our design does not change the original horizontal alignment for these roads, though we will have slight modifications to the existing profiles to adequately tie them into the dualized MD 32.

4.3 Project Schedule & Project Management



4.3 Project Schedule & Project Management

Introduction

Meeting Goal #2 to provide a project that minimizes inconvenience to the community and the traveling public. The CGI Team understands MDOT SHA's desire to maximize the number of continuous 4- lanes dualized roadway lane miles on MD 32, while opening the facility to the public as soon as possible. To meet this goal, the CGI Team is committing to a contractual completion date of **November 19, 2021.**

We understand MDOT SHA's desire to minimize inconvenience to the traveling public during construction of this project and, in particular, during the construction of the Triadelphia Road Bridge. This goal can be met by opening a usable facility to the public as soon as possible, and phasing construction with a well-planned, safe, and convenient MOT approach. The CGI Team has prepared a project design and construction schedule to provide this to MDOT SHA, the community and the traveling public.

A well-conceived and coordinated project schedule based on a sequence of construction that is synchronized (and successfully executed) with the progression of design, obtaining required permits/approvals, and other project constraints, is critical to completing the project within the established Total Contract Time, thus meeting and/or exceeding our commitment to the completion date. Primary activities in the project schedule include: design development, including over-the-shoulder reviews by construction personnel and the Independent Design Quality Management (IDQM) team; design reviews and approvals by the IDQM team, and MDOT SHA as applicable; permitting and approvals in a manner to support sequenced construction; utility relocations; lane closure restrictions; and time of year restrictions. The construction phasing was developed to consider not only the effort toward permit approvals but also the requirement to maintain safe travel corridors, continuous access, safe detour routes, school schedules, and minimal traffic delays.

A. Project Schedule

The Design and Construction Summary Schedule (DCSS) utilizes a Critical Path Method with Work Breakdown Structure (WBS) to group activities by Design, Procurement, and Construction. The Design Activities are further broken down into the various design packages. The Construction Activities are broken down into construction phases. The more extensive construction phases are further broken down by area.

Multiple calendars were used while preparing the DCSS. Design and Procurement activities are assigned durations based on calendar days. Construction activities are assigned durations based on working days. Depending on trade and weather sensitivity, the working day calendar was chosen from "General Work Calendar", "Grading", "Stream Restoration", or "Surface Paving & Striping". The general work calendar contains approximately 190 working days per year. The other calendars are based on the general calendar with non-working periods appropriate for the pertinent trade.

The CGI Team has prepared a project schedule that accounts for all design, permitting/approval, and construction activities. Specifically, items on the critical path; ensure that the sequence of construction is synced with design approvals, permitting, work restriction periods, ROW clearances, etc. necessary to initiate timely and uninterrupted construction activities. The CGI Team will continuously monitor and update the schedule and make adjustments as needed. Management and monitoring of the schedule and work progress will be imperative to meeting and/or exceeding the project schedule goal.

Design and Construction Packages

We have identified four (4) areas of the project for both design and construction packages, which will contain both roadway and structure components. The four packages are as follows:

- Triadelphia Road Bridge
- Station 206+50 to Station 299+00
- Station 299+00 to Station 440+00
- Station 440+00 to Station 486+10.32

Roadway design/construction packages will include:

1. Erosion Control/Early Site Grading/Conceptual Stormwater Management
2. MOT/TMP/Construction Phasing
3. Pavement Design/Final Roadway/Stormwater Management Facilities

Structure design/construction packages will include:

1. Temporary Structures for Triadelphia Road and Middle Patuxent River
2. TS&L Foundation Plans
3. 60% Plans
4. Final Plans

Construction of Pavement Markings, Signing, Lighting, Landscaping and Reforestation will be done for the entire project and not each area unless warranted.

Project Sequencing of Work: Upon notification of selection, the CGI team will immediately initiate advanced coordination efforts with SHA and project stakeholders, supplemental data collection activities, and project design activities. These early efforts will include, but are not limited to: attend and facilitate the utility conference and weekly utility coordination meetings between the CGI team, SHA, and utility owners; identify critical path permitting items and attend a pre-permitting meeting; develop and submit our design quality control plan and design certifications; develop and submit the public outreach plan; develop and submit the TMP; perform the tree survey and prepare and submit the tree minimization and avoidance report; develop and submit the geotechnical planning report; perform supplemental field survey, utility test pitting, and soil borings and testing.

Mitigation Strategies to Meet/Exceed Project Schedule

Issues with planning, scheduling, managing, and/or sequencing work activities will have a cascading negative effect in meeting and/or exceeding the Project Schedule Goal. However, we have excellent project leaders in place to manage the contract, proactively avoid delays, and solve problems. Led by our **Design-Build Project Manager, Mike Higgins**, and our **Project Scheduler, Stephen Beckley**, and in collaboration with our **Construction Manager, Shannon Brown**, our **Project Design Manager, Simon Simon, PE**, our **Design/Construction Coordinator, Bob Rosencrance** and our **IDQM Manager, Steve Hawtof**, the CGI team has developed an initial project schedule and sequence of work that includes all design, permitting /approvals, construction, work restriction periods, weather allowances, and other project activities, specifically including activities on the critical path or requiring third party actions. Our schedule and sequence of work will provide a detailed plan for how the project will be designed, permitted/approved, and constructed in the most efficient manner starting from NTP to final clean-up. The CGI management team will proactively monitor and adjust the schedule and sequence of work activities, and allocate project resources, to gain efficiency where possible and recover from unforeseen issues when needed. Impacts to the schedule may include but are not limited to: delays in obtaining permits/approvals, unforeseen site conditions, weather delays, unavailable ROW, or delays from third party utility relocations. Any impacts will be immediately communicated to SHA and project stakeholders for assistance with their resolution.

To maintain our proposed completion date will require the CGI team to develop an approach to get shovels in the ground as soon as possible. To accomplish this, we will design and submit for review and approval phased construction work packages as outlined above. These phased construction work packages will be prepared for each of the anticipated construction phases discussed below. To expedite review and approval of separate design elements of the project, we will develop design submittal packages for the following: 1) S5 - Triadelphia Bridge; 2) Separate packages for S1, S2, S3, S5, S6 and S8; 3) clearing/grubbing/rough grading and initial E&SC implementation for each roadway area; 4) final roadway, drainage, SWM, E&SC, and MOT for each roadway area; 5) traffic signing, marking, intersection/interchange lighting and ITS; and 6) landscaping for roadside, SWM facilities, and reforestation.

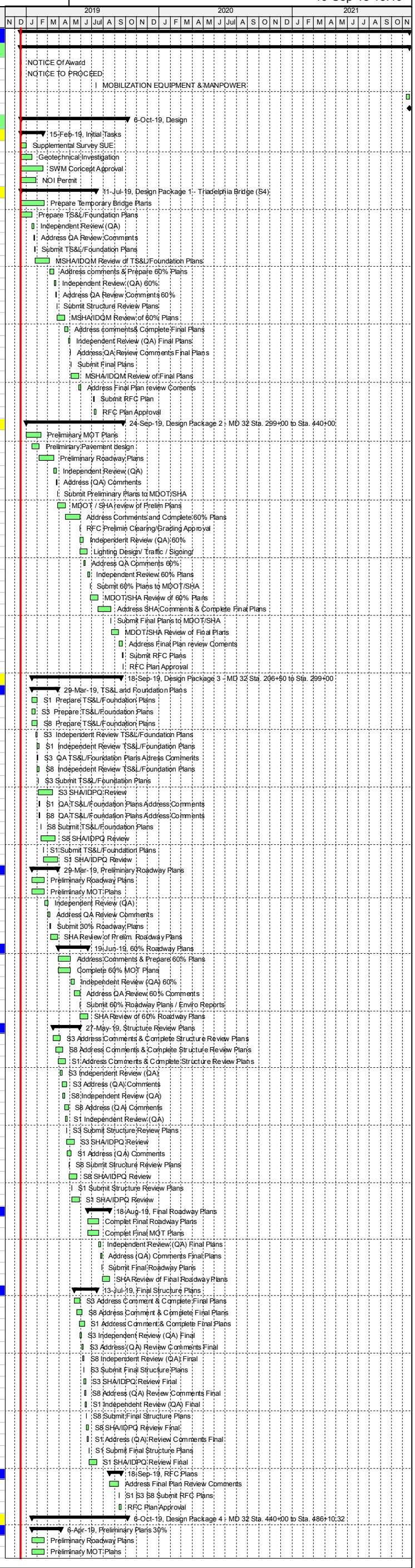
Communication/Partnering: To facilitate interdisciplinary coordination of the design submittal packages and design support efforts for each construction phase, the CGI team, including our subconsultants and subcontractors, will actively communicate and coordinate internally and externally through phone calls, email, and frequent meetings, including video conferences. All design and construction activities will be coordinated to ensure the seamless integration of all design components and the coordinated progression of construction. Staff from construction, quality control, and quality assurance will be engaged throughout the design process and will provide over-the-shoulder reviews to avoid unnecessary delays during compliance reviews/approvals and during construction. Meetings will include weekly team meetings, weekly task force/discipline specific meetings, monthly Partnering meetings, design quality control/quality assurance meetings, constructability review meetings, and other meetings to address specific issues.

Drainage and SWM: The design development and construction of the project's drainage, SWM and E&SC elements will be critical to the project's success. The project will greatly benefit from a well-developed, conceptual scheme for drainage and SWM that minimizes impacts to utility relocations and environmental resources. Previous work completed by MDOT SHA for these disciplines will be utilized to the greatest extent to expedite approvals. To further expedite getting shovels in the ground, we intend to receive approval and commence clearing/grubbing, rough grading, cross-culverts and initial E&SC implementation while the roadway, drainage, SWM, final E&SC, traffic elements, and landscaping are being designed, approved, and permitted. Based on proposed phasing of work as described below, we anticipate final drainage, SWM and E&SC design will be prepared to accommodate and treat runoff during and after construction for each construction phase. Temporary systems will be implemented as necessary to facilitate permit approval. Our engineers have a close relationship with the MDOT SHA and MDE reviewers and will arrange for meetings to review plans, clarify questions, and quickly respond to comments. We have a PRD expeditor on staff to assure PRD that the submittal package is complete and is thoroughly reviewed to meet the design criteria.

Utilities: We understand the utilities present in the project area include overhead and underground utilities including, but not limited to: water, sewer, gas pipelines; electric, communications, fiber optic, utility conduit; wells and septic tanks; poles and house service connections. Our **Utility Coordinator, Al Arnold** will focus his full attention toward coordinating utilities and resolving conflicts throughout design and construction. We understand our responsibility to coordinate with the utility owners on the design, scheduling, and relocation of their facilities, and to help resolve conflicts throughout design and construction. We also understand that available utility information is not always accurate or complete and schedules may change due to unforeseen reasons resulting in unexpected conflict; however, we are prepared to address these challenges through active and ongoing engagement and partnering with MDOT SHA and utility owners.

The following pages include our proposed Design/Construction Schedule. A full version of the schedule is included as part of the Appendix Figure 8.

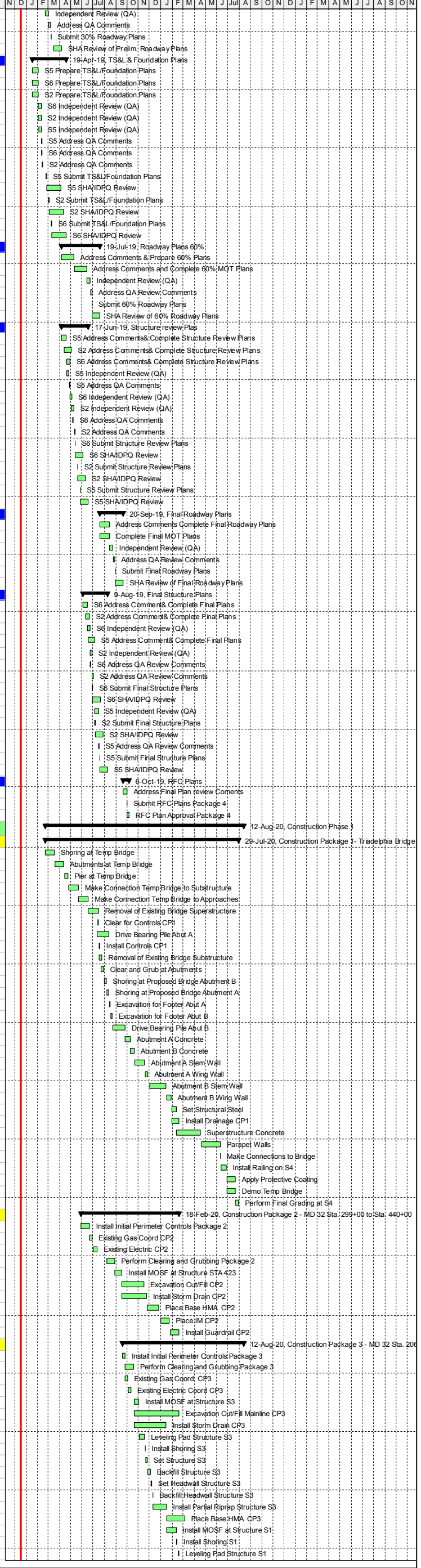
#	Activity ID	Activity Name	Total Float	Original Duration	Start	Finish
1	MD 32 - From Linden Church Road to I-70		0	604	17-Dec-18	19-Nov-21
2	PROJECT MILESTONES		0	604	17-Dec-18	19-Nov-21
3	PM-9015	NOTICE Of Award	1	1	17-Dec-18	17-Dec-18
4	PM-10	NOTICE TO PROCEED	45	1	18-Dec-18	18-Dec-18
5	MOT-100	MOBILIZATION EQUIPMENT & MANPOWER	87	1	12-Jul-19	12-Jul-19
6	PM-9000	DEMOBILIZATION	0	6	11-Nov-21	19-Nov-21
7	PM-9005	PROJECT COMPLETE	0	0		19-Nov-21
8	Design		273	293	18-Dec-18	6-Oct-19
9	Initial Tasks		191	60	18-Dec-18	15-Feb-19
10	DIT -1000	Supplemental Survey SUE	37	15	18-Dec-18	1-Jan-19
11	DIT -1010	Geotechnical Investigation	1	30	18-Dec-18	16-Jan-19
12	DIT -1020	SWM Concept Approval	139	60	18-Dec-18	15-Feb-19
13	DIT -1030	NOI Permit	210	40	19-Dec-18	27-Jan-19
14	Design Package 1 - Triadelphia Bridge (S4)		45	206	18-Dec-18	11-Jul-19
15	DP1 -1180	Prepare Temporary Bridge Plans	54	65	18-Dec-18	20-Feb-19
16	DP1 -1000	Prepare TS&L/Foundation Plans	45	30	19-Dec-18	17-Jan-19
17	DP1 -1120	Independent Review (QA)	45	5	18-Jan-19	22-Jan-19
18	DP1 -1130	Address QA Review Comments	45	2	23-Jan-19	24-Jan-19
19	DP1 -1010	Submit TS&L/Foundation Plans	45	1	25-Jan-19	25-Jan-19
20	DP1 -1020	MSHA/IDQM Review of TS&L/Foundation Plans	45	40	26-Jan-19	6-Mar-19
21	DP1 -1030	Address comments & Prepare 60% Plans	45	12	7-Mar-19	18-Mar-19
22	DP1 -1140	Independent Review (QA) 60%	45	5	19-Mar-19	23-Mar-19
23	DP1 -1150	Address QA Review Comments 60%	45	2	24-Mar-19	25-Mar-19
24	DP1 -1040	Submit Structure Review Plans	45	1	26-Mar-19	26-Mar-19
25	DP1 -1050	MSHA/IDQM Review of 60% Plans	45	21	27-Mar-19	16-Apr-19
26	DP1 -1060	Address comments& Complete Final Plans	45	10	17-Apr-19	26-Apr-19
27	DP1 -1160	Independent Review (QA) Final Plans	45	5	27-Apr-19	1-May-19
28	DP1 -1170	Address QA Review Comments Final Plans	45	2	2-May-19	3-May-19
29	DP1 -1070	Submit Final Plans	45	1	4-May-19	4-May-19
30	DP1 -1080	MSHA/IDQM Review of Final Plans	81	21	5-May-19	25-May-19
31	DP1 -1090	Address Final Plan review Coments	81	5	26-May-19	30-May-19
32	DP1 -1100	Submit RFC Plan	45	1	6-Jul-19	6-Jul-19
33	DP1 -1110	RFC Plan Approval	45	5	7-Jul-19	11-Jul-19
34	Design Package 2 - MD 32 Sta. 299+00 to Sta. 440+00		285	266	2-Jan-19	24-Sep-19
35	DP2 -2020	Preliminary MOT Plans	37	40	2-Jan-19	10-Feb-19
36	DP2 -2000	Preliminary Pavement design	2	20	17-Jan-19	5-Feb-19
37	DP2 -2010	Preliminary Roadway Plans	2	40	6-Feb-19	17-Mar-19
38	DP2 -2190	Independent Review (QA)	2	7	18-Mar-19	24-Mar-19
39	DP2 -2200	Address (QA) Comments	2	3	25-Mar-19	27-Mar-19
40	DP2 -2040	Submit Preliminary Plans to MDOT/SHA	2	1	28-Mar-19	28-Mar-19
41	DP2 -2050	MDOT / SHA review of Prelim Plans	2	21	29-Mar-19	18-Apr-19
42	DP2 -2070	Address Comments and Complete 60% Plans	2	40	19-Apr-19	28-May-19
43	DP2 -2080	RFC Prelimin Clearing/Grading Approval	2	1	29-May-19	29-May-19
44	DP2 -2210	Independent Review (QA) 60%	15	10	29-May-19	7-Jun-19
45	DP2 -2090	Lighting Design/ Traffic / Signing/	2	20	30-May-19	18-Jun-19
46	DP2 -2220	Address QA Comments 60%	15	5	8-Jun-19	12-Jun-19
47	DP2 -2100	Independent Review 60% Plans	2	7	19-Jun-19	25-Jun-19
48	DP2 -2110	Submit 60% Plans to MDOT/SHA	2	1	26-Jun-19	26-Jun-19
49	DP2 -2120	MDOT/SHA Review of 60% Plans	2	21	27-Jun-19	17-Jul-19
50	DP2 -2130	Address SHA Comments & Complete Final Plans	2	35	18-Jul-19	21-Aug-19
51	DP2 -2140	Submit Final Plans to MDOT/SHA	2	1	22-Aug-19	22-Aug-19
52	DP2 -2150	MDOT/SHA Review of Final Plans	2	21	23-Aug-19	12-Sep-19
53	DP2 -2160	Address Final Plan review Coments	2	10	13-Sep-19	22-Sep-19
54	DP2 -2170	Submit RFC Plans	2	1	23-Sep-19	23-Sep-19
55	DP2 -2180	RFC Plan Approval	285	1	24-Sep-19	24-Sep-19
56	Design Package 3 - MD 32 Sta. 206+50 to Sta. 299+00		15	245	17-Jan-19	18-Sep-19
57	TS&L and Foundation Plans		43	72	17-Jan-19	29-Mar-19
58	DP3 - 4070	S1 Prepare TS&L/Foundation Plans	52	15	17-Jan-19	31-Jan-19
59	DP3 - 4590	S3 Prepare TS&L/Foundation Plans	43	10	17-Jan-19	26-Jan-19
60	DP3 - 4640	S8 Prepare TS&L/Foundation Plans	45	15	17-Jan-19	31-Jan-19
61	DP3 - 4620	S3 Independent Review TS&L/Foundation Plans	43	5	27-Jan-19	31-Jan-19
62	DP3 - 4570	S1 Independent Review TS&L/Foundation Plans	52	5	1-Feb-19	5-Feb-19
63	DP3 - 4630	S3 QA TS&L/Foundation Plans Adress Comments	43	2	1-Feb-19	2-Feb-19
64	DP3 - 4650	S8 Independent Review TS&L/Foundation Plans	45	5	1-Feb-19	5-Feb-19
65	DP3 - 4600	S3 Submit TS&L/Foundation Plans	43	1	3-Feb-19	3-Feb-19
66	DP3 - 4610	S3 SHA/IDPQ Review	43	40	4-Feb-19	15-Mar-19
67	DP3 - 4580	S1 QA TS&L/Foundation Plans Address Comments	52	2	6-Feb-19	7-Feb-19
68	DP3 - 4660	S8 QA TS&L/Foundation Plans Address Comments	45	2	6-Feb-19	7-Feb-19
69	DP3 - 4670	S8 Submit TS&L/Foundation Plans	43	1	10-Feb-19	10-Feb-19
70	DP3 - 4680	S8 SHA/IDPQ Review	43	40	11-Feb-19	22-Mar-19
71	DP3 - 4080	S1 Submit TS&L/Foundation Plans	43	1	17-Feb-19	17-Feb-19
72	DP3 - 4090	S1 SHA/IDPQ Review	43	40	18-Feb-19	29-Mar-19
73	Preliminary Roadway Plans		15	72	17-Jan-19	29-Mar-19
74	DP3 - 4000	Preliminary Roadway Plans	1	35	17-Jan-19	20-Feb-19
75	DP3 - 4510	Preliminary MOT Plans	1	35	17-Jan-19	20-Feb-19
76	DP3 - 4520	Independent Review (QA)	1	10	21-Feb-19	2-Mar-19
77	DP3 - 4530	Address QA Review Comments	1	5	3-Mar-19	7-Mar-19
78	DP3 - 4020	Submit 30% Roadway Plans	1	1	8-Mar-19	8-Mar-19
79	DP3 - 4030	SHA Review of Prelim. Roadway Plans	15	21	9-Mar-19	29-Mar-19
80	60% Roadway Plans		15	82	30-Mar-19	19-Jun-19
81	DP3 - 4160	Address Comments & Prepare 60% Plans	15	35	30-Mar-19	3-May-19
82	DP3 - 4540	Complete 60% MOT Plans	15	35	30-Mar-19	3-May-19
83	DP3 - 4550	Independent Review (QA) 60%	15	10	4-May-19	13-May-19
84	DP3 - 4560	Address QA Review 60% Comments	15	15	14-May-19	28-May-19
85	DP3 - 4180	Submit 60% Roadway Plans / Enviro Reports	15	1	29-May-19	29-May-19
86	DP3 - 4200	SHA Review of 60% Roadway Plans	15	21	30-May-19	19-Jun-19
87	Structure Review Plans		49	73	16-Mar-19	27-May-19
88	DP3 - 4710	S3 Address Comments & Complete Structure Review Plans	43	20	16-Mar-19	4-Apr-19
89	DP3 - 4770	S8 Address Comments & Complete Structure Review Plans	43	20	23-Mar-19	11-Apr-19
90	DP3 - 4240	S1 Address Comments & Complete Structure Review Plans	43	20	30-Mar-19	18-Apr-19
91	DP3 - 4720	S3 Independent Review (QA)	43	5	5-Apr-19	9-Apr-19
92	DP3 - 4730	S3 Address (QA) Comments	43	12	10-Apr-19	21-Apr-19
93	DP3 - 4780	S8 Independent Review (QA)	43	5	12-Apr-19	16-Apr-19
94	DP3 - 4790	S8 Address (QA) Comments	43	12	17-Apr-19	28-Apr-19
95	DP3 - 4260	S1 Independent Review (QA)	43	5	19-Apr-19	23-Apr-19
96	DP3 - 4740	S3 Submit Structure Review Plans	43	1	22-Apr-19	22-Apr-19
97	DP3 - 4750	S3 SHA/IDPQ Review	49	21	23-Apr-19	13-May-19
98	DP3 - 4700	S1 Address (QA) Comments	43	12	24-Apr-19	5-May-19
99	DP3 - 4800	S8 Submit Structure Review Plans	43	1	29-Apr-19	29-Apr-19
100	DP3 - 4810	S8 SHA/IDPQ Review	49	21	30-Apr-19	20-May-19
101	DP3 - 4250	S1 Submit Structure Review Plans	43	1	6-May-19	6-May-19
102	DP3 - 4690	S1 SHA/IDPQ Review	49	21	7-May-19	27-May-19
103	Final Roadway Plans		15	60	20-Jun-19	18-Aug-19
104	DP3 - 4330	Complet Final Roadway Plans	15	30	20-Jun-19	19-Jul-19
105	DP3 - 4820	Complet Final MOT Plans	15	30	20-Jun-19	19-Jul-19
106	DP3 - 4830	Independent Review (QA) Final Plans	15	5	20-Jul-19	24-Jul-19
107	DP3 - 4840	Address (QA) Comments Final Plans	15	3	25-Jul-19	27-Jul-19
108	DP3 - 4350	Submit Final Roadway Plans	15	1	28-Jul-19	28-Jul-19
109	DP3 - 4360	SHA Review of Final Roadway Plans	15	21	29-Jul-19	18-Aug-19
110	Final Structure Plans		51	61	14-May-19	13-Jul-19
111	DP3 - 4890	S3 Address Comment & Complete Final Plans	49	15	14-May-19	28-May-19
112	DP3 - 4940	S8 Address Comment & Complete Final Plans	49	15	21-May-19	4-Jun-19
113	DP3 - 4400	S1 Address Comment & Complete Final Plans	49	15	28-May-19	11-Jun-19
114	DP3 - 4900	S3 Independent Review (QA) Final	49	5	29-May-19	2-Jun-19
115	DP3 - 4910	S3 Address (QA) Review Comments Final	49	5	3-Jun-19	7-Jun-19
116	DP3 - 4950	S8 Independent Review (QA) Final	49	5	5-Jun-19	9-Jun-19
117	DP3 - 4920	S3 Submit Final Structure Plans	49	1	8-Jun-19	8-Jun-19
118	DP3 - 4930	S3 SHA/IDPQ Review Final	81	5	9-Jun-19	13-Jun-19
119	DP3 - 4960	S8 Address (QA) Review Comments Final	49	5	10-Jun-19	14-Jun-19
120	DP3 - 4850	S1 Independent Review (QA) Final	49	5	12-Jun-19	16-Jun-19
121	DP3 - 4970	S8 Submit Final Structure Plans	49	1	15-Jun-19	15-Jun-19
122	DP3 - 4980	S8 SHA/IDPQ Review Final	74	5	16-Jun-19	20-Jun-19
123	DP3 - 4860	S1 Address (QA) Review Comments Final	49	5	17-Jun-19	21-Jun-19
124	DP3 - 4870	S1 Submit Final Structure Plans	49	1	22-Jun-19	22-Jun-19
125	DP3 - 4880	S1 SHA/IDPQ Review Final	51	21	23-Jun-19	13-Jul-19
126	RFC Plans		15	31	19-Aug-19	18-Sep-19
127	DP3 - 4490	Address Final Plan Review Comments	15	25	19-Aug-19	12-Sep-19
128	DP3 - 4990	S1 S3 S8 Submit RFC Plans	15	1	13-Sep-19	13-Sep-19
129	DP3 - 5000	RFC Plan Approval	15	5	14-Sep-19	18-Sep-19
130	Design Package 4 - MD 32 Sta. 440+00 to Sta. 486+10.32		1	263	17-Jan-19	6-Oct-19
131	Preliminary Plans 30%		1	80	17-Jan-19	6-Apr-19
132	DP4 - 5000	Preliminary Roadway Plans	2	35	17-Jan-19	20-Feb-19
133	DP4 - 5010	Preliminary MOT Plans	2	35	17-Jan-19	20-Feb-19



Actual Level of Effort | Remaining Work
Actual Work | Critical Remaini...

TASK filter: All Activities

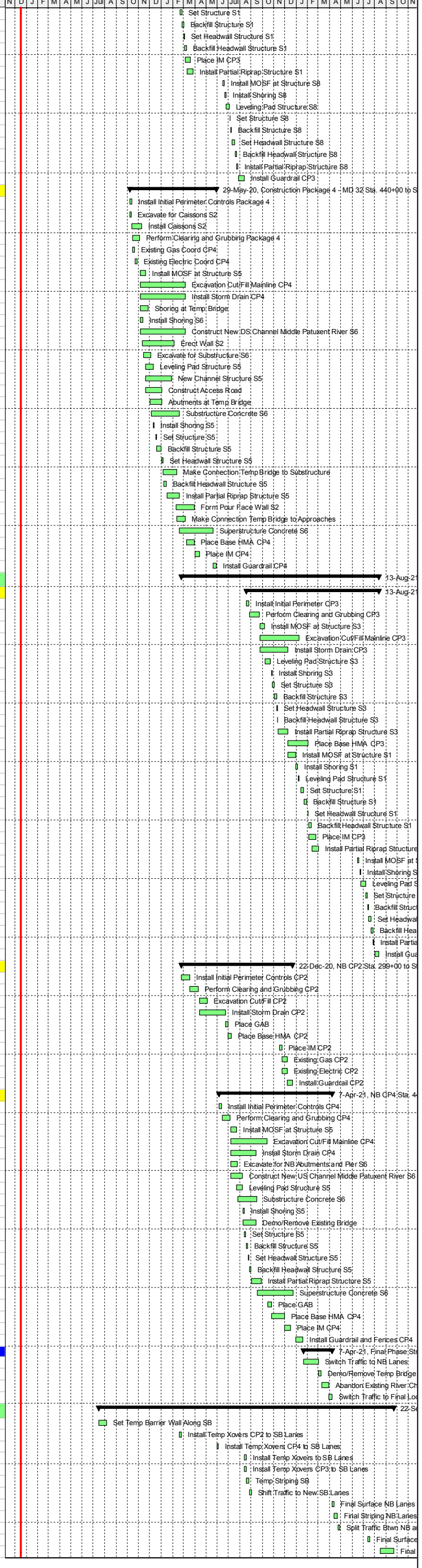
#	Activity ID	Activity Name	Total Float	Original Duration	Start	Finish
134	DP4 - 5510	Independent Review (QA)	2	10	21-Feb-19	2-Mar-19
135	DP4 - 5520	Address QA Comments	2	5	3-Mar-19	7-Mar-19
136	DP4 - 5020	Submit 30% Roadway Plans	1	1	9-Mar-19	9-Mar-19
137	DP4 - 5030	SHA Review of Prelim. Roadway Plans	1	21	17-Mar-19	6-Apr-19
138	**TS&L & Foundation Plans**		56	93	17-Jan-19	19-Apr-19
139	DP4 - 5070	S5 Prepare TS&L/Foundation Plans	57	17	17-Jan-19	2-Feb-19
140	DP4 - 5100	S6 Prepare TS&L/Foundation Plans	71	16	17-Jan-19	1-Feb-19
141	DP4 - 5130	S2 Prepare TS&L/Foundation Plans	63	16	17-Jan-19	1-Feb-19
142	DP4 - 5540	S6 Independent Review (QA)	71	9	2-Feb-19	10-Feb-19
143	DP4 - 5550	S2 Independent Review (QA)	63	10	2-Feb-19	11-Feb-19
144	DP4 - 5530	S5 Independent Review (QA)	57	8	3-Feb-19	10-Feb-19
145	DP4 - 5560	S5 Address QA Comments	57	3	11-Feb-19	13-Feb-19
146	DP4 - 5570	S6 Address QA Comments	71	3	11-Feb-19	13-Feb-19
147	DP4 - 5580	S2 Address QA Comments	63	3	12-Feb-19	14-Feb-19
148	DP4 - 5080	S5 Submit TS&L/Foundation Plans	47	1	24-Feb-19	24-Feb-19
149	DP4 - 5090	S5 SHA/IDPQ Review	70	40	25-Feb-19	5-Apr-19
150	DP4 - 5140	S2 Submit TS&L/Foundation Plans	47	1	3-Mar-19	3-Mar-19
151	DP4 - 5150	S2 SHA/IDPQ Review	49	40	4-Mar-19	12-Apr-19
152	DP4 - 5110	S6 Submit TS&L/Foundation Plans	47	1	10-Mar-19	10-Mar-19
153	DP4 - 5120	S6 SHA/IDPQ Review	47	40	11-Mar-19	19-Apr-19
154	**Roadway Plans 60%**		1	104	7-Apr-19	19-Jul-19
155	DP4 - 5160	Address Comments & Prepare 60% Plans	1	34	7-Apr-19	10-May-19
156	DP4 - 5590	Address Comments and Complete 60% MOT Plans	1	34	11-May-19	13-Jun-19
157	DP4 - 5600	Independent Review (QA)	1	10	14-Jun-19	23-Jun-19
158	DP4 - 5610	Address QA Review Comments	1	4	24-Jun-19	27-Jun-19
159	DP4 - 5180	Submit 60% Roadway Plans	1	1	28-Jun-19	28-Jun-19
160	DP4 - 5190	SHA Review of 60% Roadway Plans	1	21	29-Jun-19	19-Jul-19
161	**Structure review Plas**		46	73	6-Apr-19	17-Jun-19
162	DP4 - 5230	S5 Address Comments& Complete Structure Review Plans	70	14	6-Apr-19	19-Apr-19
163	DP4 - 5290	S2 Address Comments& Complete Structure Review Plans	49	20	13-Apr-19	2-May-19
164	DP4 - 5260	S6 Address Comments& Complete Structure Review Plans	47	10	20-Apr-19	29-Apr-19
165	DP4 - 5620	S5 Independent Review (QA)	70	7	20-Apr-19	26-Apr-19
166	DP4 - 5650	S5 Address QA Comments	70	3	27-Apr-19	29-Apr-19
167	DP4 - 5630	S6 Independent Review (QA)	47	6	30-Apr-19	5-May-19
168	DP4 - 5640	S2 Independent Review (QA)	49	8	3-May-19	10-May-19
169	DP4 - 5660	S6 Address QA Comments	47	3	6-May-19	8-May-19
170	DP4 - 5670	S2 Address QA Comments	49	3	11-May-19	13-May-19
171	DP4 - 5270	S6 Submit Structure Review Plans	43	1	13-May-19	13-May-19
172	DP4 - 5280	S6 SHA/IDPQ Review	52	21	14-May-19	3-Jun-19
173	DP4 - 5300	S2 Submit Structure Review Plans	43	1	20-May-19	20-May-19
174	DP4 - 5310	S2 SHA/IDPQ Review	53	21	21-May-19	10-Jun-19
175	DP4 - 5240	S5 Submit Structure Review Plans	43	1	27-May-19	27-May-19
176	DP4 - 5250	S5 SHA/IDPQ Review	43	21	28-May-19	17-Jun-19
177	**Final Roadway Plans**		1	63	20-Jul-19	20-Sep-19
178	DP4 - 5320	Address Comments Complete Final Roadway Plans	1	26	20-Jul-19	14-Aug-19
179	DP4 - 5330	Complete Final MOT Plans	1	26	20-Jul-19	14-Aug-19
180	DP4 - 5200	Independent Review (QA)	1	10	15-Aug-19	24-Aug-19
181	DP4 - 5380	Address QA Review Comments	1	5	25-Aug-19	29-Aug-19
182	DP4 - 5340	Submit Final Roadway Plans	1	1	30-Aug-19	30-Aug-19
183	DP4 - 5350	SHA Review of Final Roadway Plans	1	21	31-Aug-19	20-Sep-19
184	**Final Structure Plans**		43	67	4-Jun-19	9-Aug-19
185	DP4 - 5420	S6 Address Comment& Complete Final Plans	52	12	4-Jun-19	15-Jun-19
186	DP4 - 5450	S2 Address Comment& Complete Final Plans	53	11	11-Jun-19	21-Jun-19
187	DP4 - 5700	S6 Independent Review (QA)	52	7	16-Jun-19	22-Jun-19
188	DP4 - 5390	S5 Address Comment& Complete Final Plans	43	18	18-Jun-19	5-Jul-19
189	DP4 - 5710	S2 Independent Review (QA)	53	7	22-Jun-19	28-Jun-19
190	DP4 - 5720	S6 Address QA Review Comments	52	3	23-Jun-19	25-Jun-19
191	DP4 - 5730	S2 Address QA Review Comments	53	3	29-Jun-19	1-Jul-19
192	DP4 - 5740	S6 Submit Final Structure Plans	49	1	29-Jun-19	29-Jun-19
193	DP4 - 5440	S6 SHA/IDPQ Review	63	21	30-Jun-19	20-Jul-19
194	DP4 - 5680	S5 Independent Review (QA)	43	10	6-Jul-19	15-Jul-19
195	DP4 - 5750	S2 Submit Final Structure Plans	49	1	6-Jul-19	6-Jul-19
196	DP4 - 5470	S2 SHA/IDPQ Review	56	21	7-Jul-19	27-Jul-19
197	DP4 - 5690	S5 Address QA Review Comments	43	3	16-Jul-19	18-Jul-19
198	DP4 - 5400	S5 Submit Final Structure Plans	43	1	19-Jul-19	19-Jul-19
199	DP4 - 5410	S5 SHA/IDPQ Review	43	21	20-Jul-19	9-Aug-19
200	**RFC Plans**		1	16	21-Sep-19	6-Oct-19
201	DP4 - 5480	Address Final Plan review Coments	1	10	21-Sep-19	30-Sep-19
202	DP4 - 5490	Submit RFC Plans Package 4	1	1	1-Oct-19	1-Oct-19
203	DP4 - 5500	RFC Plan Approval Package 4	1	5	2-Oct-19	6-Oct-19
204	**Construction Phase 1**		266	311	21-Feb-19	12-Aug-20
205	**Construction Package 1- Triadelphia Bridge (S4)**		274	303	21-Feb-19	29-Jul-20
206	CP1 - 1030	Shoring at Temp Bridge	31	15	21-Feb-19	18-Mar-19
207	CP1 - 1040	Abutments at Temp Bridge	31	15	19-Mar-19	11-Apr-19
208	CP1 - 1050	Pier at Temp Bridge	31	7	15-Apr-19	24-Apr-19
209	CP1 - 1060	Make Connection Temp Bridge to Substructure	31	15	25-Apr-19	21-May-19
210	CP1 - 1070	Make Connection Temp Bridge to Approaches	31	15	22-May-19	17-Jun-19
211	CP1 - 1080	Removal of Existing Bridge Superstructure	31	15	18-Jun-19	16-Jul-19
212	CP1 - 1000	Clear for Controls CP1	28	3	12-Jul-19	16-Jul-19
213	CP1 - 1140	Drive Bearing Pile Abut A	35	20	12-Jul-19	12-Aug-19
214	CP1 - 1010	Install Controls CP1	28	3	17-Jul-19	19-Jul-19
215	CP1 - 1090	Removal of Existing Bridge Substructure	31	5	17-Jul-19	24-Jul-19
216	CP1 - 1020	Clear and Grub at Abutments	28	5	23-Jul-19	29-Jul-19
217	CP1 - 1100	Shoring at Proposed Bridge Abutment B	28	5	31-Jul-19	6-Aug-19
218	CP1 - 1110	Shoring at Proposed Bridge Abutment A	28	5	7-Aug-19	13-Aug-19
219	CP1 - 1120	Excavation for Footer Abut A	28	3	14-Aug-19	16-Aug-19
220	CP1 - 1130	Excavation for Footer Abut B	28	3	19-Aug-19	22-Aug-19
221	CP1 - 1150	Drive Bearing Pile Abut B	28	20	23-Aug-19	25-Sep-19
222	CP1 - 1160	Abutment A Concrete	28	8	26-Sep-19	9-Oct-19
223	CP1 - 1170	Abutment B Concrete	28	8	10-Oct-19	21-Oct-19
224	CP1 - 1180	Abutment A Stem Wall	28	19	22-Oct-19	18-Nov-19
225	CP1 - 1190	Abutment A Wing Wall	28	6	19-Nov-19	26-Nov-19
226	CP1 - 1200	Abutment B Stem Wall	28	19	2-Dec-19	14-Jan-20
227	CP1 - 1210	Abutment B Wing Wall	28	6	16-Jan-20	29-Jan-20
228	CP1 - 1220	Set Structural Steel	28	5	30-Jan-20	11-Feb-20
229	CP1 - 1280	Install Drainage CP1	125	8	30-Jan-20	18-Feb-20
230	CP1 - 1230	Superstructure Concrete	28	42	12-Feb-20	17-Apr-20
231	CP1 - 1240	Parapet Walls	28	32	20-Apr-20	10-Jun-20
232	CP1 - 1250	Make Connections to Bridge	28	1	11-Jun-20	11-Jun-20
233	CP1 - 1260	Install Railing on S4	28	10	12-Jun-20	26-Jun-20
234	CP1 - 1270	Apply Protective Coating	280	15	29-Jun-20	21-Jul-20
235	CP1 - 1300	Demo Temp Bridge	28	15	29-Jun-20	21-Jul-20
236	CP1 - 1290	Perform Final Grading at S4	28	6	22-Jul-20	29-Jul-20
237	**Construction Package 2 - MD 32 Sta. 299+00 to Sta. 440+00**		122	145	30-May-19	18-Feb-20
238	CP2 - 1000	Install Initial Perimeter Controls Package 2	112	15	30-May-19	20-Jun-19
239	CP2 - 1080	Existing Gas Coord CP2	232	5	21-Jun-19	28-Jun-19
240	CP2 - 1090	Existing Electric CP2	232	5	1-Jul-19	12-Jul-19
241	CP2 - 1010	Perform Clearing and Grubbing Package 2	87	15	7-Aug-19	28-Aug-19
242	CP2 - 1020	Install MOSF at Structure STA 423	87	10	29-Aug-19	17-Sep-19
243	CP2 - 1030	Excavation Cut/Fill CP2	122	40	18-Sep-19	15-Nov-19
244	CP2 - 1040	Install Storm Drain CP2	122	45	18-Sep-19	22-Nov-19
245	CP2 - 1050	Place Base HMA CP2	122	15	25-Nov-19	27-Dec-19
246	CP2 - 1060	Place IM CP2	122	10	31-Dec-19	24-Jan-20
247	CP2 - 1070	Install Guardrail CP2	122	10	28-Jan-20	18-Feb-20
248	**Construction Package 3 - MD 32 Sta. 206+50 to Sta. 299+00**		11	190	19-Sep-19	12-Aug-20
249	CP3 - 1000	Install Initial Perimeter Controls Package 3	10	5	19-Sep-19	25-Sep-19
250	CP3 - 1010	Perform Clearing and Grubbing Package 3	10	15	26-Sep-19	18-Oct-19
251	CP3 - 1310	Existing Gas Coord CP3	176	5	26-Sep-19	3-Oct-19
252	CP3 - 1320	Existing Electric Coord CP3	176	5	4-Oct-19	11-Oct-19
253	CP3 - 1020	Install MOSF at Structure S3	10	10	21-Oct-19	1-Nov-19
254	CP3 - 1260	Excavation Cut/Fill Mainline CP3	91	60	21-Oct-19	19-Feb-20
255	CP3 - 1270	Install Storm Drain CP3	91	45	21-Oct-19	14-Jan-20
256	CP3 - 1030	Leveling Pad Structure S3	10	10	4-Nov-19	18-Nov-19
257	CP3 - 1040	Install Shoring S3	10	2	19-Nov-19	20-Nov-19
258	CP3 - 1050	Set Structure S3	10	3	21-Nov-19	25-Nov-19
259	CP3 - 1060	Backfill Structure S3	10	4	26-Nov-19	4-Dec-19
260	CP3 - 1070	Set Headwall Structure S3	10	1	6-Dec-19	6-Dec-19
261	CP3 - 1080	Backfill Headwall Structure S3	10	1	10-Dec-19	10-Dec-19
262	CP3 - 1090	Install Partial Riprap Structure S3	10	15	11-Dec-19	16-Jan-20
263	CP3 - 1280	Place Base HMA CP3	91	25	16-Jan-20	5-Mar-20
264	CP3 - 1100	Install MOSF at Structure S1	10	10	17-Jan-20	11-Feb-20
265	CP3 - 1110	Install Shoring S1	61	2	12-Feb-20	14-Feb-20
266	CP3 - 1120	Leveling Pad Structure S1	61	2	18-Feb-20	19-Feb-20



Actual Level of Effort | Remaining Work
Actual Work | Critical Remaini...

TASK filter: All Activities

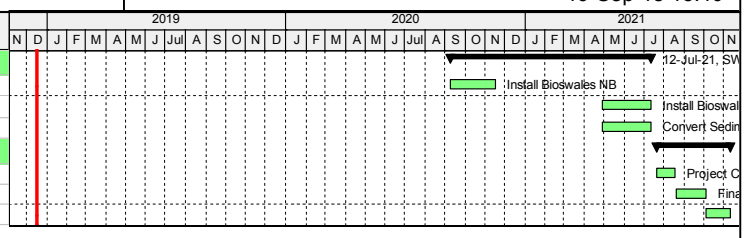
#	Activity ID	Activity Name	Total Float	Original Duration	Start	Finish
267	CP3 - 1130	Set Structure S1	61	4	20-Feb-20	25-Feb-20
268	CP3 - 1140	Backfill Structure S1	61	3	26-Feb-20	2-Mar-20
269	CP3 - 1150	Set Headwall Structure S1	61	2	3-Mar-20	4-Mar-20
270	CP3 - 1160	Backfill Headwall Structure S1	61	4	5-Mar-20	10-Mar-20
271	CP3 - 1290	Place IM CP3	91	10	6-Mar-20	20-Mar-20
272	CP3 - 1170	Install Partial Riprap Structure S1	61	10	12-Mar-20	26-Mar-20
273	CP3 - 1180	Install MOSF at Structure S8	11	3	16-Jun-20	19-Jun-20
274	CP3 - 1190	Install Shoring S8	11	3	22-Jun-20	24-Jun-20
275	CP3 - 1200	Leveling Pad Structure S8	11	7	25-Jun-20	3-Jul-20
276	CP3 - 1210	Set Structure S8	11	1	6-Jul-20	6-Jul-20
277	CP3 - 1220	Backfill Structure S8	11	2	8-Jul-20	9-Jul-20
278	CP3 - 1230	Set Headwall Structure S8	11	5	10-Jul-20	17-Jul-20
279	CP3 - 1240	Backfill Headwall Structure S8	11	3	20-Jul-20	22-Jul-20
280	CP3 - 1250	Install Partial Riprap Structure S8	11	3	23-Jul-20	27-Jul-20
281	CP3 - 1300	Install Guardrail CP3	11	10	28-Jul-20	12-Aug-20
282	**Construction Package 4 - MD 32 Sta. 440+00 to Sta. 486+10.32**		81	132	8-Oct-19	29-May-20
283	CP4 - 1000	Install Initial Perimeter Controls Package 4	0	5	8-Oct-19	14-Oct-19
284	CP4 - 1470	Excavate for Caissons S2	34	4	8-Oct-19	11-Oct-19
285	CP4 - 1480	Install Caissons S2	34	20	14-Oct-19	8-Nov-19
286	CP4 - 1010	Perform Clearing and Grubbing Package 4	0	15	15-Oct-19	4-Nov-19
287	CP4 - 1310	Existing Gas Coord CP4	198	5	15-Oct-19	21-Oct-19
288	CP4 - 1320	Existing Electric Coord CP4	198	5	22-Oct-19	28-Oct-19
289	CP4 - 1020	Install MOSF at Structure S5	15	10	5-Nov-19	19-Nov-19
290	CP4 - 1260	Excavation Cut/Fill Mainline CP4	25	60	5-Nov-19	6-Mar-20
291	CP4 - 1270	Install Storm Drain CP4	25	60	5-Nov-19	6-Mar-20
292	CP1 - 1310	Shoring at Temp Bridge	25	15	5-Nov-19	26-Nov-19
293	CP4 - 1420	Install Shoring S6	0	6	5-Nov-19	13-Nov-19
294	CP4 - 1460	Construct New DS Channel Middle Patuxent River S6	48	60	5-Nov-19	6-Mar-20
295	CP4 - 1490	Erect Wall S2	34	40	11-Nov-19	5-Feb-20
296	CP4 - 1430	Excavate for Substructure S6	0	12	14-Nov-19	4-Dec-19
297	CP4 - 1030	Leveling Pad Structure S5	59	10	20-Nov-19	10-Dec-19
298	CP4 - 1510	New Channel Structure S5	15	30	20-Nov-19	29-Jan-20
299	CP4 - 1520	Construct Access Road	25	20	20-Nov-19	3-Jan-20
300	CP4 - 1380	Abutments at Temp Bridge	25	15	2-Dec-19	3-Jan-20
301	CP4 - 1440	Substructure Concrete S6	0	30	6-Dec-19	18-Feb-20
302	CP4 - 1040	Install Shoring S5	59	2	11-Dec-19	12-Dec-19
303	CP4 - 1050	Set Structure S5	59	3	17-Dec-19	19-Dec-19
304	CP4 - 1060	Backfill Structure S5	59	4	20-Dec-19	31-Dec-19
305	CP4 - 1070	Set Headwall Structure S5	59	2	3-Jan-20	6-Jan-20
306	CP4 - 1400	Make Connection Temp Bridge to Substructure	25	15	6-Jan-20	11-Feb-20
307	CP4 - 1080	Backfill Headwall Structure S5	59	3	8-Jan-20	14-Jan-20
308	CP4 - 1090	Install Partial Riprap Structure S5	59	15	16-Jan-20	19-Feb-20
309	CP4 - 1500	Form Pour Face Wall S2	34	30	11-Feb-20	30-Mar-20
310	CP4 - 1410	Make Connection Temp Bridge to Approaches	25	15	12-Feb-20	6-Mar-20
311	CP4 - 1450	Superstructure Concrete S6	0	60	19-Feb-20	20-May-20
312	CP4 - 1280	Place Base HMA CP4	25	15	9-Mar-20	31-Mar-20
313	CP4 - 1290	Place IM CP4	25	8	1-Apr-20	13-Apr-20
314	CP4 - 1300	Install Guardrail CP4	0	4	21-May-20	29-May-20
315	**Construction Phase 2**		32	315	25-Feb-20	13-Aug-21
316	**NB CP3 Sta. 206+50 to Sta. 299+00**		32	204	19-Aug-20	13-Aug-21
317	NB CP3 - 1340	Install Initial Perimeter CP3	30	5	19-Aug-20	25-Aug-20
318	NB CP3 - 1350	Perform Clearing and Grubbing CP3	30	15	27-Aug-20	23-Sep-20
319	NB CP3 - 1360	Install MOSF at Structure S3	30	10	24-Sep-20	7-Oct-20
320	NB CP3 - 1600	Excavation Cut/Fill Mainline CP3	126	60	24-Sep-20	7-Jan-21
321	NB CP3 - 1610	Install Storm Drain CP3	126	45	24-Sep-20	8-Dec-20
322	NB CP3 - 1370	Leveling Pad Structure S3	30	10	9-Oct-20	23-Oct-20
323	NB CP3 - 1380	Install Shoring S3	30	2	26-Oct-20	27-Oct-20
324	NB CP3 - 1390	Set Structure S3	30	3	28-Oct-20	2-Nov-20
325	NB CP3 - 1400	Backfill Structure S3	30	4	3-Nov-20	9-Nov-20
326	NB CP3 - 1410	Set Headwall Structure S3	30	1	10-Nov-20	10-Nov-20
327	NB CP3 - 1420	Backfill Headwall Structure S3	30	1	11-Nov-20	11-Nov-20
328	NB CP3 - 1430	Install Partial Riprap Structure S3	30	15	12-Nov-20	9-Dec-20
329	NB CP3 - 1620	Place Base HMA CP3	126	25	9-Dec-20	2-Feb-21
330	NB CP3 - 1440	Install MOSF at Structure S1	30	10	10-Dec-20	30-Dec-20
331	NB CP3 - 1450	Install Shoring S1	94	3	31-Dec-20	5-Jan-21
332	NB CP3 - 1460	Leveling Pad Structure S1	94	2	7-Jan-21	8-Jan-21
333	NB CP3 - 1470	Set Structure S1	94	4	13-Jan-21	21-Jan-21
334	NB CP3 - 1480	Backfill Structure S1	94	3	22-Jan-21	29-Jan-21
335	NB CP3 - 1490	Set Headwall Structure S1	94	2	1-Feb-21	2-Feb-21
336	NB CP3 - 1500	Backfill Headwall Structure S1	94	4	4-Feb-21	10-Feb-21
337	NB CP3 - 1630	Place IM CP3	126	10	4-Feb-21	22-Feb-21
338	NB CP3 - 1510	Install Partial Riprap Structure S1	94	10	12-Feb-21	2-Mar-21
339	NB CP3 - 1520	Install MOSF at Structure S8	32	3	16-Jun-21	18-Jun-21
340	NB CP3 - 1530	Install Shoring S8	32	3	22-Jun-21	24-Jun-21
341	NB CP3 - 1540	Leveling Pad Structure S8	32	7	25-Jun-21	8-Jul-21
342	NB CP3 - 1550	Set Structure S8	32	2	9-Jul-21	12-Jul-21
343	NB CP3 - 1560	Backfill Structure S8	32	2	14-Jul-21	15-Jul-21
344	NB CP3 - 1570	Set Headwall Structure S8	32	5	16-Jul-21	22-Jul-21
345	NB CP3 - 1580	Backfill Headwall Structure S8	32	3	23-Jul-21	27-Jul-21
346	NB CP3 - 1590	Install Partial Riprap Structure S8	32	3	28-Jul-21	30-Jul-21
347	NB CP3 - 1640	Install Guardrail CP3	32	10	2-Aug-21	13-Aug-21
348	**NB CP2 Sta. 299+00 to Sta. 440+00**		53	185	25-Feb-20	22-Dec-20
349	NB CP2 - 1120	Install Initial Perimeter Controls CP2	133	15	25-Feb-20	18-Mar-20
350	NB CP2 - 1130	Perform Clearing and Grubbing CP2	133	15	19-Mar-20	10-Apr-20
351	NB CP2 - 1150	Excavation Cut/Fill CP2	133	15	13-Apr-20	4-May-20
352	NB CP2 - 1160	Install Storm Drain CP2	133	45	13-Apr-20	23-Jun-20
353	NB CP2 - 1220	Place GAB	133	5	24-Jun-20	30-Jun-20
354	NB CP2 - 1170	Place Base HMA CP2	133	5	1-Jul-20	8-Jul-20
355	NB CP2 - 1180	Place IM CP2	53	5	17-Nov-20	23-Nov-20
356	NB CP2 - 1200	Existing Gas CP2	53	5	24-Nov-20	7-Dec-20
357	NB CP2 - 1210	Existing Electric CP2	53	5	24-Nov-20	7-Dec-20
358	NB CP2 - 1190	Install Guardrail CP2	53	10	8-Dec-20	22-Dec-20
359	**NB CP4 Sta. 440+00 to Sta. 486+10.32**		0	170	5-Jun-20	7-Apr-21
360	NB CP4 - 1340	Install Initial Perimeter Controls CP4	0	5	5-Jun-20	12-Jun-20
361	NB CP4 - 1350	Perform Clearing and Grubbing CP4	0	15	15-Jun-20	6-Jul-20
362	NB CP4 - 1360	Install MOSF at Structure S5	52	10	8-Jul-20	22-Jul-20
363	NB CP4 - 1600	Excavation Cut/Fill Mainline CP4	4	60	8-Jul-20	14-Oct-20
364	NB CP4 - 1610	Install Storm Drain CP4	24	40	8-Jul-20	14-Sep-20
365	NB CP4 - 1670	Excavate for NB Abutments and Pier S6	0	12	8-Jul-20	24-Jul-20
366	NB CP4 - 1700	Construct New US Channel Middle Patuxent River S6	24	20	8-Jul-20	7-Aug-20
367	NB CP4 - 1370	Leveling Pad Structure S5	52	10	23-Jul-20	7-Aug-20
368	NB CP4 - 1680	Substructure Concrete S6	0	30	27-Jul-20	16-Sep-20
369	NB CP4 - 1380	Install Shoring S5	52	3	10-Aug-20	12-Aug-20
370	NB CP4 - 5010	Demo/Remove Existing Bridge	24	20	10-Aug-20	14-Sep-20
371	NB CP4 - 1390	Set Structure S5	52	3	13-Aug-20	17-Aug-20
372	NB CP4 - 1400	Backfill Structure S5	52	4	18-Aug-20	21-Aug-20
373	NB CP4 - 1410	Set Headwall Structure S5	52	2	24-Aug-20	25-Aug-20
374	NB CP4 - 1420	Backfill Headwall Structure S5	52	3	27-Aug-20	31-Aug-20
375	NB CP4 - 1430	Install Partial Riprap Structure S5	52	15	2-Sep-20	28-Sep-20
376	NB CP4 - 1690	Superstructure Concrete S6	0	60	17-Sep-20	23-Dec-20
377	NB CP4 - 1650	Place GAB	4	8	15-Oct-20	26-Oct-20
378	NB CP4 - 1620	Place Base HMA CP4	4	20	27-Oct-20	30-Nov-20
379	NB CP4 - 1630	Place IM CP4	4	10	1-Dec-20	16-Dec-20
380	NB CP4 - 1640	Install Guardrail and Fences CP4	0	8	30-Dec-20	18-Jan-21
381	**Final Phase Structure S6**		0	40	20-Jan-21	7-Apr-21
382	NB CP4 - 5000	Switch Traffic to NB Lanes	0	20	20-Jan-21	1-Mar-21
383	NB CP4 - 5020	Demo/Remove Temp Bridge in SB Lanes	0	5	2-Mar-21	9-Mar-21
384	NB CP4 - 5040	Abandon Existing River Channel	0	10	10-Mar-21	29-Mar-21
385	NB CP4 - 5030	Switch Traffic to Final Location	0	5	30-Mar-21	7-Apr-21
386	**MOT**		32	459	15-Jul-19	22-Sep-21
387	MOT - 1000	Set Temp Barrier Wall Along SB	87	15	15-Jul-19	6-Aug-19
388	MOT - 1090	Install Temp Xovers CP2 to SB Lanes	133	4	19-Feb-20	24-Feb-20
389	MOT - 1100	Install Temp Xovers CP4 to SB Lanes	0	4	1-Jun-20	4-Jun-20
390	MOT - 1010	Install Temp Xovers to SB Lanes	11	4	13-Aug-20	18-Aug-20
391	MOT - 1110	Install Temp Xovers CP3 to SB Lanes	30	4	13-Aug-20	18-Aug-20
392	MOT - 1020	Temp Striping SB	11	5	19-Aug-20	25-Aug-20
393	MOT - 1030	Shift Traffic to New SB Lanes	11	4	27-Aug-20	2-Sep-20
394	MOT - 1080	Final Surface NB Lanes	0	4	8-Apr-21	13-Apr-21
395	MOT - 1040	Final Striping NB Lanes	0	5	14-Apr-21	21-Apr-21
396	MOT - 1060	Split Traffic Btwn NB and SB Lanes	0	4	23-Apr-21	28-Apr-21
397	MOT - 1070	Final Surface SB Lanes	0	4	14-Jul-21	19-Jul-21
398	MOT - 1050	Final Striping SB Lanes	32	20	16-Aug-21	22-Sep-21



Actual Level of Effort | Remaining Work
Actual Work | Critical Remaini...

TASK filter: All Activities

#	Activity ID	Activity Name	Total Float	Original Duration	Start	Finish
399	**SWM**		0	172	8-Sep-20	12-Jul-21
400	SWM - 1000	Install Bioswales NB	11	45	8-Sep-20	16-Nov-20
401	SWM - 1010	Install Bioswales SB	0	45	29-Apr-21	12-Jul-21
402	SWM - 1020	Convert Sediment Basins SB	0	45	29-Apr-21	12-Jul-21
403	**Landscaping**		0	71	20-Jul-21	10-Nov-21
404	SWM - 1050	Project Clean up / PunchList	0	21	20-Jul-21	17-Aug-21
405	SWM - 1030	Final Landscaping SB	0	25	19-Aug-21	4-Oct-21
406	SWM - 1040	Final Landscaping NB	0	25	5-Oct-21	10-Nov-21



Actual Level of Effort
Actual Work
Remaining Work
Critical Remaini...

TASK filter: All Activities

B. Phasing and MOT Approach

The CGI Team's overarching approach to construction phasing is to minimize construction duration through a comprehensive understanding of needs and constraints; proactive monitoring of critical path items, being proactive in developing contingency plans in advance to mitigate high risk items; continuous communication with stakeholders, including the public via outreach, MDOT SHA, our internal design team; our field staff (often problems were first known as risks by field staff before they became a problem), subcontractors, and the utility companies.

Key performance metrics for the construction phasing of this project include: ensuring safety of workers and travelers; maintaining traffic flow and stream flow; maintaining access to properties and bus stops; providing adequate traveler mobility in terms of traffic delays and Level of Service (LOS); minimizing impacts to stakeholders such as the community, and the school bus routes; and phasing the work to provide the required lead-time for utility relocations, Storm Water Management and Erosion & Sediment Control approvals/ permits; expected seasonal/ weather issues with respect to concrete pouring and stream work restrictions, and design schedule approvals. We believe a short construction duration accomplishes MDOT SHA's goal of minimizing inconvenience to the community and the traveling public. Our Maintenance of Traffic plan flows out of the construction phasing needs and requirements. A summary of the key construction phasing constraints are as follows:

- Triadelphia Road bridge reconstruction must be completed such that the detour only impacts 2019-2020 school season between summer 2019 and summer 2020
- Rosemary Lane at MD 32 left turn prohibition and MD 32 SB storage length improvements must be completed prior to the Triadelphia Road bridge detour
- Utility Construction Phases
- Stormwater Management / Erosion & Sediment Control permits
- Stream work restrictions from March 31st to May 31st
- Construction within the same watershed
- Timeline to obtain permits

Design / Construction Phasing

Our project schedule reflects four design/construction packages. We plan to construct by building the SB lanes first (Phase 1) and then the NB lanes (Phase 2). Phase 1 includes new roadway, bridges and culvert structures within the SB footprint. Phase 2 includes new bridge structures and extending culverts within the existing MD 32 lanes. Upon completion of this Phase 1 work, tie-ins will be constructed at both southern and northern termini to switch all traffic onto newly constructed SB lanes. Additional cross-overs may be constructed to accelerate construction, minimize inconvenience for drivers, and maximize safety. At all times, cross streets will have access to the MD 32 corridor. Once traffic is fully operational in its final configuration, final work elements will be completed such as surface paving course, permanent pavement markings, and final roadside features. The four design/construction packages are as follows.

1. ***Triadelphia Road bridge replacement***: This phase is the first priority to minimize impact to school bus routes. There is also no SWM permits required. All utilities are expected to be out of the way of the construction activities. The only critical path item is structural and TMP and design approval. Construction work in this phase is expected to begin in June 2019 and be completed by the end of the school year. The sequence is:
    a. Construct a temporary bridge and connecting road for westbound traffic on Triadelphia Road.
    b. Construct Rosemary Lane at MD 32 left turn restriction and storage length improvements. We understand there are concerns by the residents along Rosemary Lane because of the added traffic along their road, and we will work with them to determine what safety features may be added to slow traffic and maintain safety.
    c. Implement the eastbound Triadelphia Road detour and WB travel on the Temporary Bridge starting in June 2019, after the last day of school.
2. ***Sta. 299+00 to Sta. 440+00:*** The key dependencies to the start of work on this phase are design and SWM permit approvals, both of which are expected in a relatively short timeframe. It is possible that this phase may begin during the Triadelphia Road bridge. However, it is expected to be completed

after these phases are finished. The sequence is:
   a. Construct the new southbound roadway
   b. Construct crossovers, from existing (future NB) roadway to the new southbound roadway.
   c. Reconstruct the existing roadway (which will be the new northbound roadway).
3. ***Sta. 206+50 to Sta. 299+00***: The key dependencies are the same in this segment as in Phase 4. However, there are several large and deep culverts, and median retaining walls that require a longer design and permit approval time. This phase may start prior to the finish of the previous Phase. The sequence of work is similar to the "Sta. 299+00 to Sta/ 440+00" Phase. The maintenance of stream flow for the culverts will be accomplished by pumping the stream into temporary pipe. The sequence of work is similar to the previous phase: southbound road, and then northbound road.
4. ***Sta. 440+00 to Sta. 486+10.32:*** This section of the project requires the longest lead time due to utility relocations, stream relocations, and the temporary bridges. The sequence of work is as follows:
   a. Construct a southbound roadway, temporary bridge over the existing Middle Patuxent River, and the southbound road permanent bridge over the same stream.
   b. Construct crossovers and relocate traffic to the southbound road.
   c. Construct the northbound road permanent bridge over the proposed Middle Patuxent River alignment.
   d. Relocate the stream to the new alignment and remove existing NB bridge and complete construction of NB lanes.
   e. Shift traffic back to existing lanes, remove temporary SB bridge, and complete construction of the southbound roadway

Traffic Management Plan

The TMP will identify stakeholders, public outreach activities and stakeholder team-building strategies; traffic control management; alternative and preferred maintenance of traffic (MOT) plans and sequence of construction; MOT Red Flag summary; detour options and impact assessment; location of construction entrances and access to construction vehicles and equipment; access to emergency service providers; incident management plans; coordination liaisons with various MDOT SHA offices (TEDD, CHART, TDSD, MCD and others), Howard County Police, local Fire Departments, and local schools; and monitoring and evaluation of mobility and safety measures during construction. Our ***Public Outreach Liaison, Odessa Phillip*** will play a major role in meeting this goal to keep all stakeholders informed, especially when traffic patterns and access control to intersections will change from full movement access to controlled movement access.

The Traffic Control Manager also will play a key role in performing safety audits of the implementation of the MOT plans in work zones, checking all traffic control devices for correct size, proper placement, and proper visibility per the requirements of the MD MUTCD, and ensuring adequate sight distances for all movements at intersections. The TMP plan will be updated periodically to maintain accurate record of all field changes to the traffic control plans, sequence of construction, and assessment of impacts on safety and mobility, stakeholder involvement, and public outreach. The TMP will include Traffic Control Plans, Transportation Operations, and Public Information and Outreach strategies.

As part of this community outreach the CGI Team will address community concerns, such as the travel time of school buses. More details relating to the construction phasing and detour for Triadelphia Road can be found in Section C.

C. Triadelphia Road Bridge Phasing Construction Timeline

The Triadelphia Road bridge replacement impacts the timely completion of the overall project and the closure will create significant inconvenience to the community, schools, and traveling public. It is critical this bridge replacement occurs during the time periods specified in CGI Team's schedule to ensure the impacts are minimized and the project is a success. For these reasons, the CGI Team is providing a detailed construction timeline, including design, to indicate how we will meet this critical challenge. **Our proposed approach to the replacement of this bridge will meet all the requirements of the RFP and will allow us to close and build the bridge in one phase of construction**.

The CGI Team has come up with a construction phasing plan for the Triadelphia Road bridge that will allow the team to construct the new bridge in one phase by using a temporary bridge to provide the WB Triadelphia Road travel lane. The use of a temporary bridge was presented to MDOT SHA as ATC 13 and approved. A plan of the temporary bridge and connecting roadway can be found in the Appendix Figure 10. EB drivers on Triadelphia Road will take the detour as shown in the RFP. Our proposed schedule for design and construction, including the temporary bridge is in the following chart.

Triadelphia Road Bridge Design/Construction Phase	Start Date	End Date
Design Temporary Bridge	Dec. 2018	Feb. 2019
Design Permanent Bridge	Dec. 2018	July 2019
Construct Temporary Bridge	Feb. 2019	June 2019
Implement Detour	June 2019	
Removal of Existing Bridge	June 2019	July 2019
Construct New Triadelphia Road Bridge	July 2019	July 2020
Demolition of Temporary Bridge	July 2020	Aug. 2020
Open New Triadelphia Road Bridge	July 2020	

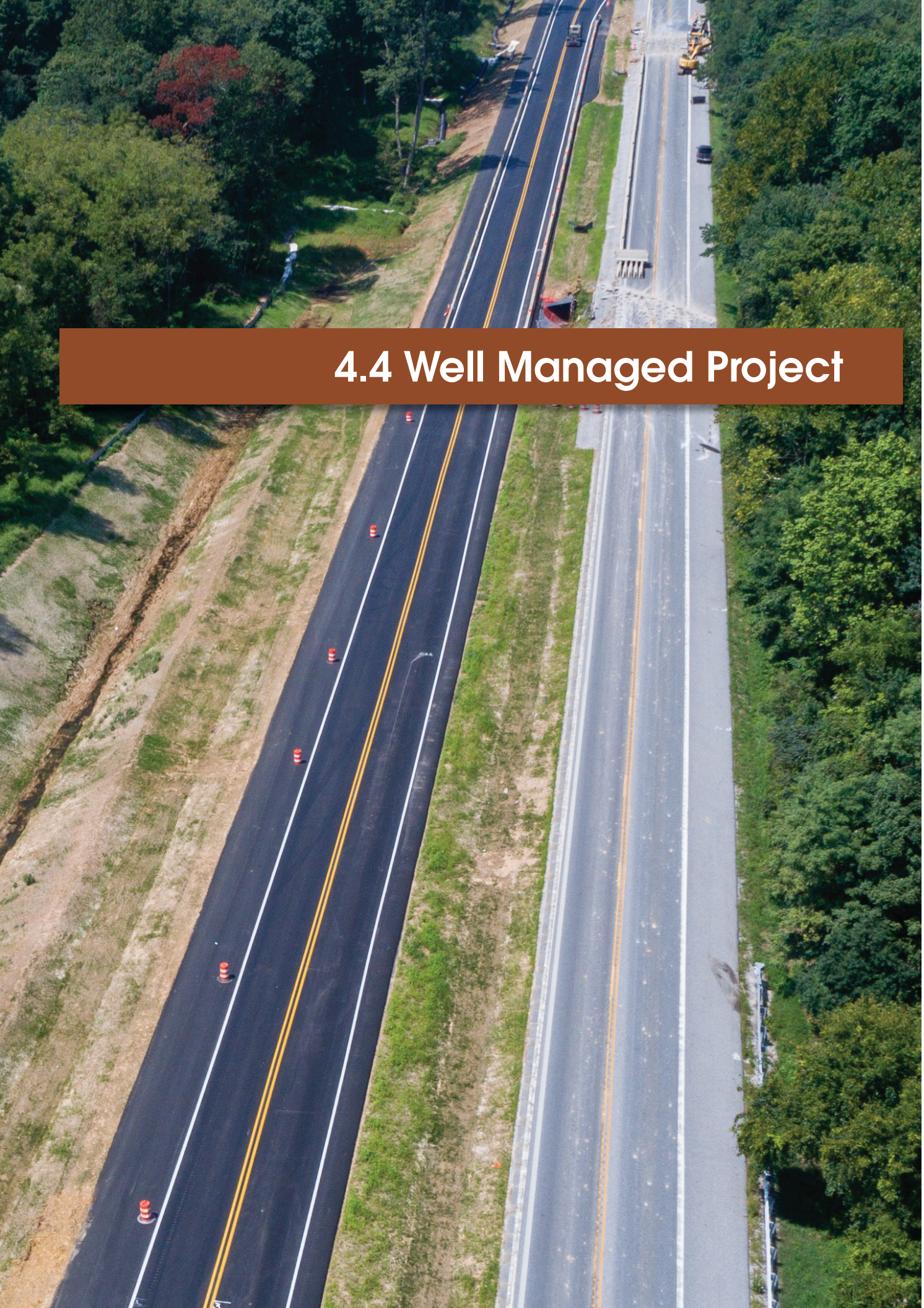
Design and Construction of Temporary Bridge: The CGI team will be designing and constructing a safe route to bypass the existing Triadelphia Road bridge. The road alignment will require reverse curves for a smooth transition from the existing road to the temporary road aligned with the bridge. The bridge will be located on the south side of the existing bridge and in an area that should be clear of utilities prior to the beginning of construction. The temporary bridge will clear the proposed gas and fiber relocations, but there may need to be some utility adjustments along the temporary roadway. We will begin this coordination as soon as there is a notice of award or selection**.** The design of the Temporary bridge will follow the same steps as that of the proposed road bridge and will be reviewed and approved through MDOT SHA.

Improve EB Detour Route: The Triadelphia Road EB traffic will be detoured on the 4.5-mile route as proposed in the RFP which is expected to take approximately eight minutes from the roundabout at Triadelphia Road and Ten Oaks Road to the intersection of Triadelphia Road and Folly Quarter Road. A design will be completed to eliminate the left turn movements from Rosemary Lane onto MD 32 due to sight distance concerns and increased volume of traffic on NB MD32 due to the detour. A traffic analysis and design will be completed to ensure there is adequate southbound MD 32 left turn storage at Rosemary Lane.

The local community is opposed to the eastbound detour route on claims of safety due to the roadway geometry, school bus stops, delays, and speeds. The CGI Team will prepare a Transportation Management Plan to evaluate options to mitigate their concerns. The TMP will evaluate and may implement improvements to address safety concerns, such as:

- pull off areas for buses to provide for the safety of school children
- resurface the roadway
- improve existing signing and marking to improve traffic operations
- develop an alternative detour route that may be used in case of an emergency

Public Outreach: The TMP will identify stakeholders and public outreach activities. The CGI Team will coordinate with liaisons from various MDOT SHA offices (TEDD, CHART, TDSD, MCD and others), Howard County Police, local Fire Departments, and local schools; and monitoring and evaluation of mobility and safety measures during construction. Our ***Public Outreach Liaison, Odessa Phillip*** will play a major role in meeting this goal to keep all stakeholder informed, especially when the detour is in place for the Triadelphia Road bridge replacement. As part of community outreach, the CGI Team will address the community concern such as the travel time of school buses.



4.4 Well Managed Project

4.4 Well Managed Project

Meeting Goal #3 to provide a project that minimizes overall impacts and provides proactive coordination: The CGI Team understands the importance of preparing a thorough, well documented, and clear plan before moving forward with this project. This process will allow the CGI Team to always face issues proactively, so problems and delays can be avoided or quickly resolved.

Management Team and Philosophy - The successful completion of this project is ***Concrete General, Inc. / Stantec's*** (CGI Team) primary objective. We define success in such a project as a safe, quality, environmentally compliant, and fully functioning, transportation facility delivered on time, within budget, and with minimal impact to surrounding community and environment, while meeting or exceeding MDOT SHA's goals and objectives. We have developed an organization that will deliver a successful project to MDOT SHA comprised of firms and individuals with extensive experience in delivery of design-build (D/B) projects. We need no "learning curve"; we will hit the ground running with an efficient, well-organized team that will work in partnership with MDOT SHA, permitting agencies, the community, and stakeholders to deliver a successful project. Through our recent experience, we have found that for a D/B project of the size and complexity as MD 32, proactive engagement, communication, and coordination of work by the management team - from executive level to discipline leads – are the key factors in the successful execution of the design and construction of the project. Leading the CGI Team will be ***Mike Higgins, PE*** of CGI serving as the ***Design-Build Project Manager***. Mike has 32 years of relevant experience and is currently leading the D/B Team for the MD 32 Phase 1 dualization project. He will be responsible for the overall management of this D/B project overseeing the design and construction activities as well as environmental compliance, safety, and public relations teams. ***Simon Simon, PE*** of Stantec will serve as ***Design Manager***. Simon has 39 years of relevant experience and has managed major transportation projects including those involving D/B method of delivery. He will be the individual in charge of all design activities and will be responsible for design and financial management, monitoring and control of design activities, interfacing with and coordinating with environmental compliance, QC and construction teams, and design subconsultants' management.

Working Under "One Roof" - The CGI Team will mobilize immediately upon Notice of Award. We will mobilize key managers and discipline leads as soon as possible to facilitate project start-up and begin early communications and interaction between the CGI Team and MDOT SHA. The CGI Team will use Stantec's Laurel Office, located 24 miles from MDOT SHA's headquarters, and 15 miles from the project site, as the project's hub office for design and coordination activities. Our proposed key and design staff, including ***Simon, Kathy Walsh, PE*** (Lead Highway Eng.), ***Elizabeth Kanner, PE*** (Lead Water Resources Eng.), ***Al Arnold, PE*** (Utility Coordinator), ***Mike Chamberland, PE*** (Structural Eng.), ***Bimal Patel, PE*** (Design QC Manager), and other key design and production staff are already located in the Laurel office. The CGI Team has already been working under one roof in the Laurel office, and has developed communication, coordination, document control, protocols during design development, ATC's, quantities for this Proposal.

Safety - Safety of the traveling public and project employees is the No. 1 Priority in all of CGI's operations and continues to be an important and integral aspect of CGI culture. ***Brian Colson*** of CGI will lead the Safety Team serving as the ***Safety Manager.*** He will work directly with ***Mike Higgins*** and have direct line of communication with the ***Executive Committee*** comprised of principals from CGI and Stantec. Brian will direct and administer our safety program for the entire project. He will visit the project site to verify that the safety program is properly addressing the hazards that are generated during construction. He will audit the construction activities to verify that properly planned safety procedures, during particularly hazardous stages of the project such as excavations or steel erection, are adhered to. He will work in concert with the ***Mike*** as well as our ***Construction Manager***, ***Shannon Brown***, to ensure that proper documentation, reporting, and training requirements for the project are met. ***Mike*** will enforce implementation of CGI's Safety Plan and ensure that the project is constructed and maintained safely. The ***Executive Committee*** will ensure that all necessary resources are available for ***Brian*** to support, monitor and enforce the CGI's Safety Plan.

Management Plan - Based on the CGI Team's decades of experience working for MDOT SHA, other MDOT Busines Units, and local jurisdictions, on projects of a similar scope and size, we have a thorough understanding of the issues and impacts that may arise on this MD 32 Dualization project. Our approach from the beginnning will be to plan for potential impacts and proactively confront them to find the right solutions

to minimize their effect. Our Team will develop a detailed Project Plan that will be our guide to successfully completing this project and will be modelled off previously prepared successful plans. This Plan will include:

- *Safety Plan* – This will ensure that safety procedures are documented and provided to all project team members, including subcontractors and MDOT SHA personnel. CGI's Corporate Safety Plan will be used as the basis with additional information and guidance provided for any site specific items not covered.
- *Quality Control Plan* – The CGI Team believes that quality is the cornerstone of excellence. Our commitment to producing quality work is taken very seriously on all aspects of our daily functions – from design to construction. To achieve such excellence on this project, our quality management will be driven by the several factors beginning with the development of a Quality Plan (QP) The QP will incorporate key elements critical to project success addressing the critical aspects of utility coordination, environmental compliance, design and construction QC, and design management. The plan will ensure that all work is checked and back checked thoroughly, and construction is performed accordingly so that when the project is completed, we have provided a facility that meets all the contract requirements. This process will relate to all documents that are submitted for review, approvals or permits including reports, computations, plans and estimates. The CGI Team includes the firm of ***Gannett Fleming, Inc.*** (GF) as our ***Independent Reviewer*** who will be the last set of eyes on the documents prior to any submittal. ***GF*** will not be involved in the design and plan development at all and will be under contract with CGI and ***report directly*** to ***Mike Higgins***. Partnering with MDOT SHA and other stakeholders in all stages of the design and construction will also be a key factor to delivering a seamless and quality project to MDOT SHA and the community.
- *Public Outreach Plan* – An important piece to this project's success is our Public Outreach process. This Plan will be developed soon after NTP and will be carried through design and into construction. This process is a shared responsibililty of MDOT SHA and the CGI Team. Our experience working on the adjacent MD 32 dualization and our understanding of the critical issues and community concerns, drivers, and other stakeholders will enable us to be proactive in preparing a Public Outreach Plan that is comprehensive and includes tools and provisions to reach those most concerned and affected by this project during construction. ***Odessa Phillip***, Assedo Consulting, will serve as ***Public Outreach Coordinator.***
- *Risk Management Plan* – We understand the project risks and will analyze and evaluate them to ensure we can be proactive in eliminating or minimizing their impacts to the schedule and goals of the project.
- *Transportation Management Plan (TMP)* – To ensure safe and efficient travel through the Work Zone, the TMP will include changes to traffic patterns and lane closures, a Public Outreach process, emergency closure procedures, an analysis of traffic capacity, and work zone management to keep travel lanes open.
- *Communication Plan* - The lines of communication, key staff and frequency of meetings and flow of information will be documented in this plan. The Plan will have a Decision Tree to direct our engineers and construction crew to the proper channel of communication to work through unexpected issues, to resolve them efficiently and to MDOT SHA's satisfaction.

Some potential issues involve third-parties such as utility relocation and environmental permitting and are not in our direct control. We will be handle these proactively by engaging the third-party entities early in the process during our planning and design processes. The CGI Team is not be responsible for the design or relocation of utilities though we understand they are on the critical path toward completing our work. There are a few significant environmental impacts that have been noted in the NEPA documents, based on the dualization of the full corridor from MD 108 to I-70. This project will address those impacts related to the project limits and include numerous permits, some obtained by MDOT SHA and the remainder obtained by the CGI Team. It is our goal to eliminate or reduce impacts that were determined in the RFP Concept Plans.

A. Approach to Coordinating Design & Construction with Potential Utility Relocations

One of the highest risks to a construction project is the utility coordination – avoidance and relocation. The CGI Team has considerable experience in the utility coordination role for highway projects throughout the region, including the current MD 32 Phase 1 project, and understands the steps needed to minimize risks due relocation of 3rd party utilities. While every project has its own set of utility coordination issues, they all require a proactive and disciplined approach to identification of the existing utilities, coordinating the design to avoid and minimize utility impacts, and to coordinate and facilitate the utility relocations that are needed. CGI is currently working on Phase 1 of the MD 32 Dualization and is familiar with these utility companies, their personnel, and priorities. ***Al Arnold, PE***, of Stantec will serve as CGI Team's Utility Coordinator; he

has been working with utility companies in Maryland for more 30 years and is aware of the challenges every construction project faces when working with the 3rd Party utilities to keep them on track with the construction schedule. From the start of a project, preparing the design schedule, through to the completion of the project open to traffic, the design stage and construction stage will require a well-thought-out Utility Coordination Plan. We will have a proactive approach to avoiding issues with utilities to maintain the project schedule, and ***most importantly, maintaining utility service to the customers at all times.*** Utility design, relocation and avoidance of impacts will require a combined effort of MDOT SHA and the CGI Team, and support by the utility owners. We anticipate the following roles:

The following utilities, both underground and aerial, fall within the footprint of this project. The CGI Team will have proactive and continuous contact and coordination with these companies and agencies.

BGE Electric; BGE Gas; Columbia Gas; Comcast; Howard County Communications; Howard County Well & Septic; Verizon

MDOT SHA – provided a utility designation file; contract with utility owners for their design/ relocation of utilities; schedule relocations for area around the Triadelphia Road bridge; obtained ROW for utility relocation; provide test hole data and a utility conflict matrix; and issue access permits for utility relocations.

CGI Team – will verify utility data that was provided; perform supplemental utility test pits; support the Partnering process; provide utility relocation design services, if needed; develop strategies to avoid utility conflicts; revise utility matrix as information is obtained.

Utility Coordinator - ***Al Arnold, PE,*** Utility Coordinator, will be in continuous contact with the designers and construction key personnel to ensure the utility relocation design and construction are on schedule, and the avoidance and protection of existing utilities is maintained throughout the project. He will ascertain this from NTP through to completion of construction. He will ensure MDOT SHA that all aspects of the Performance Specifications are met. Al's duties will include:

- Review the utility designation and locations with information from the utility companies. Request utility test pits and review the data to verify depths of facilities at possible conflict points.
- Ensure that the proper permits have been obtained from MDOT SHA by 3rd party utility companies working in the project site.
- Ensure that utility service is continuous and make certain that temporary service is provided, if needed.
- Update/ revise/ review utility conflict matrix to ensure it is current. This matrix will be used as one of the tools to track all the needed utility relocations and ensure they are understood by all utility stakeholders.
- Coordinate/ provide input to design and construction team to have adequate time for utility relocations.
- Review design plans to ensure proper clearances are kept between proposed features and existing utilities.
- Design for utility service connections for traffic control devices.
- Prepare for the Utility coordination portion of the Partnering meetings.
- Reach out to Columbia Gas for coordinating that there will be no impacts to the large 30" transmission line.
- Monitor utility companies to assess their design of relocations is on schedule.

Utility Coordination Meetings - The CGI Team will establish and facilitate regular utility design and construction coordination meetings, usually during Partnering meetings, to include all utility owners, designers, construction personnel and MDOT SHA. The first meeting will be scheduled within 30 days following notice to proceed for the contract. These meetings will continue routinely throughout the project design and construction period until all the required utility relocations are completed. **We will be proactive in setting and facilitating utility coordination meetings throughout design and construction.** It is imperative that we get cooperation and attendance by the agencies and 3rd party utility companies to maintain our proposed schedule. If necessary, we will contact individuals at each company to encourage attendance and cooperation. Those that need to be in attendance include: the CGI Team's Design/Construction Coordinator, ***Bob Rosencrance***, Construction Manager, ***Shannon Brown,*** and Utility Coordinator***, Al Arnold,*** MDOT SHA Design Project Engineer and Construction Project Engineer, District 7 Utility Engineer, and District 7 Area Engineer; Utility Owners and Engineers; and Howard Co. representatives including Daniel Davis, Chief of Utility Design.

The CGI Team will be prepared for the meetings with an agenda and graphics required to have a complete

and detailed discussion of the current schedule and issues. The CGI Team will prepare roll map(s) to be used during the utility coordination meetings. The maps will show all existing utilities within the proposed ROW and reflect proposed project design. The agenda for each meeting to include: ♦ Status/ schedules for the CGI Team project design – with focus on items of relevance to utility impact avoidance and relocations design ♦ Review any updates to the Utility Conflict Matrix ♦ Status/ schedule for design and construction activities, including clearing for utility relocations ♦ Status/ schedules of utility relocation design and construction activities, including the construction of temporary connections for continuous service ♦ Constructability review for avoidance and approvals from utility companies ♦ Resolution of Utility issues ♦ Action item list.

Utility Relocation Packages - Utility relocations have been determined based on the Concept Design plans, but it is understood that these are not the only utilities that will be required to be moved in order to complete this project. Coordination and relocation plans were started during the Planning stages of this project and have been separated by segments of the project corridor: ♦ ***UCP 1*** – is the package of relocation in and around the Triadelphia Road Bridge ♦ ***UCP 2*** – is the package of relocations along MD 32.

The ***UCP 1*** package has been designed and the relocations are anticipated to start before the NTP for this project. The relocations are expected to be concurrent with some of the CGI Team's design and construction activities, so their progress will be closely monitored. ***UCP 2*** is for the relocation of utility poles and underground conduit. These will be scheduled concurrent with the construction of the roadway.

The CGI Team understands that the coordination and scheduling of the relocations is a risk borne by us and, we are expecting, with our experience in this corridor and with these same utility owners, we will be able to manage the work without delays in the construction schedule. We will facilitate relocations for utility owners by providing for them access roads for utility relocation for any impacted areas per the IFB requirements.

We understand the importance of working with utility owners on design, scheduling, and relocation of their facilities. We also understand the available utility information is not always accurate or complete and schedules may change due to unforeseen reasons resulting in unexpected conflicts. The CGI Team is prepared to address these challenges through active and ongoing engagement and partnering with MDOT SHA and utility owners. We will leverage the combined experience of our Team to develop creative and innovative solutions to avoid or address conflicts and accelerate construction activities when possible.

Critical Utilities - The below utilities have been highlighted as critical utilities for this project.

1. ***Gas Transmission lines*** - These are large gas mains that will not be directly impacted by any proposed design feature but will require special attention during construction to protect them from damage. The CGI Team will maintain a minimum of 3 feet of cover over the gas mains and encasements. Vibrator rollers will not be used within the vicinity of the transmission lines. The CGI Team will proactively coordinate with the utility companies by arranging pre-construction meetings, giving 72-hour notices before work begins, and submitting plans for review to make sure we meet their requirements. The plans will include specifications for any equipment that will be utilized near the transmission gas lines. CGI is currently proactively coordinating work with Columbia Gas on MD 32 Phase 1 and will continue the relationship.
2. ***Howard County Fiber Optic*** – there are a few locations along the corridor where Fiber Optic conduit will need to be relocated. Since these are critical feeder lines for emergency responders and County government, their downtime is limited to 4 hours. The Utility Coordinator, Construction Manager, and Design/Construction Coordinator will make certain the CGI Team understands and make appropriate provisions for this serious utility concern.

Approach to Specific Utilities

Design Package 1 - *Triadelphia Bridge (Structure S4):* This early utility relocation is critical to the overall project schedule. To be proactive and avoid impacts the utility relocation schedule, the CGI Team's design includes a one lane temporary bridge located to the side of the existing structure. The relocation construction of the BGE Electric (underground and overhead), BGE Gas, and Howard County Fiber will not be impacted or delayed by the CGI Team's activities.

Design Package 2 - *MD 32 Sta. 299+00 to Sta. 440+00:* The CGI Team will accelerate the roadway design elements and make this an early focus of the coordination efforts with the utility owners in this area. The utility owners which appear to have impacts include: BGE electric, Comcast Cable, Howard County FO, BGE Gas, Verizon Fiber and MDOT SHA electric. Several of these are at the River Valley Chase

intersection. Drainage design in this area will be an early priority to reduce impacts and to provide the utility companies with plans to begin their relocations designs. This is also an area that the construction sequencing will be coordinated with the utility relocation construction.

Design Package 3 - *MD 32 Sta. 206+50 to Sta. 299+00:* The CGI Team will avoid impacting the BGE Gas facilities in this area and will adhere to all applicable BGE Gas construction requirements. We will seek to avoid impacts to Howard County Fiber. If impacts prove unavoidable, the CGI Team will accelerate the design process and sequence construction to coordinate with the Fiber service relocation.

Design Package 4 - *MD 32 Sta. 440+00 to Sta. 486+00:* The utility owners which appear to have impacts include: BGE electric and Verizon Fiber. If impacts prove unavoidable, the CGI Team will accelerate the design process and sequence construction to coordinate with the relocation. This is also an area that the construction sequencing will be coordinated with the utility relocation construction.

B. Avoid and Minimize Impacts to the Environmental Resources

The CGI Team will achieve total compliance with the project's environmental commitments and continue to avoid and minimize impacts throughout the life of the project through a rigorous compliance program, complete with multiple reviews, checks, and formal approvals. Leading the development and implementation of our Environmental Compliance Program (ECP) will be our ***Environmental Compliance Manager (EM)***, ***Roger Windschitl***. The environmental approach to avoiding and minimizing impacts, and maintaining environmental compliance presented herein is the result of a careful review of the RFP, and our extensive and continuous experience with environmental permitting and compliance for MDOT SHA as it relates to highway development and construction processes.

Environmental Compliance Program - Early and continuous coordination with the regulatory agencies is critical to secure environmental permits and to achieve continuous compliance throughout the design-build process. The EM will develop a complete protocol for Team Processes, Structure, Organization, Chain-of-Command, and Communication. The ECP will include the Environmental Compliance Team's (ECT) individual roles and responsibilities. The EM will be the point of contact for MDOT SHA's Environmental Programs Division (EPD), the Regulatory Agencies, and the Independent Environmental Monitor (IEM).

Environmental Compliance Team - The primary goals of the ECP are strict adherence to COE and MDE permit conditions; continuous compliance with the FEIS, ROD, and other commitments throughout design, construction, and post construction; evaluation of avoidance, minimization, and mitigation efforts throughout the project; and complete tracking and documentation of compliance and impacts. Our ***permitting specialist***, ***Harry Canfield***, will develop an Avoidance, Minimization and Mitigation Plan (AMMR) detailing reductions of impacts to wetlands, buffers, waterways, and floodplains below the corridor permit impacts. We will prepare AMMR memos with each ESC/SWM submittal to demonstrate continued minimization of impacts.

The ECT will have five primary functions: design reviews; avoidance, minimization, and mitigation design and construction; environmental construction monitoring; post-construction assessments; and compliance documentation. The ECT will coordinate with the Design Team and will use our collective experience to identify, develop, and implement Best Management Practices (BMPs) within the project design to reduce environmental impacts. During design we will perform field inspections to confirm and demarcate the environmental resources and will ensure installation and continuous maintenance of protective fencing adjacent to wetlands, forest conservation areas, and other sensitive features.

Forest resources, including FIDs habitat, will be impacted by the project. Tree preservation measures will be incorporated into the ESC plans and shown on the Landscape plates to reduce forest clearing to the extent possible. Tree clearing will not occur during the FIDs nesting season (April - August). The ROW will be reforested to the extent possible to maximize on-site forest mitigation.

Resource Impacts - The CGI Team propose to reduce the median near the Triadelphia Road bridge to reduce impacts to forest and WUS. To further reduce impacts, we are including F barrier or other small structures where there are significant cuts (over 15 ft vertical) to reduce cut slopes and therefore tree impacts. We are also proposing a shift in the proposed PGL for the northbound lanes to optimize the pavement draining to the median BMPs. In addition, we have received MDOT SHA approval of an ATC to reduce the lane widths of MD 32 SB to 11 ft and to reduce asphalt paved shoulder widths from 10 ft to 8 ft. These measures will allow

us to reduce the width of the BMPs along MD 32 NB, reduce the limits of grading/paving, and reduce the overall impacts to wetlands, streams and forest.

Compliance and Commitment - As a value-added measure, the ECT will monitor construction activities to ensure that commitments are fulfilled, BMPs are implemented correctly and properly maintained, are functioning at high levels, and are providing the intended benefits. The ECT will meet on-site weekly during construction to review the construction progress, ensure avoidance/minimization of resources, coordinate with the IEM, REC, and construction team to address questions and concerns, assess impact reduction measures, and ensure compliance. Dedicated ESC crews will ensure prompt stabilization and will identify and correct deficiencies to avoid and minimize environmental impacts. The EM will have the authority to direct the construction personnel to tighten site controls and is authorized to suspend operations until deficiencies are resolved. All stream diversion and relocation/restoration work will be constructed in strict compliance with the approved maintenance of stream flow plans. For the protection of aquatic life, instream work will not occur during the closure period for Use IV streams (March 1 through May 31 of any year, inclusive) in order to avoid impacts to aquatic habitat spawning periods. Fish will be relocated from the work area during establishment of diversions on perennial streams. During construction, our EM will prepare a quarterly Environmental Compliance Report which tracks compliance with each environmental commitment. This report will be submitted to MDOT SHA within one week of the quarter end and include charts comparing permitted, designed, and constructed impacts to ensure minimization efforts are successful.

The continual tracking of commitments throughout the design and construction phases will ensure that construction close-out is smooth and efficient. We will prepare the post-construction reports, which will provide MDOT SHA with a comprehensive document of the project commitments, including final impact quantities, mitigation quantities, and agency approvals and modifications.

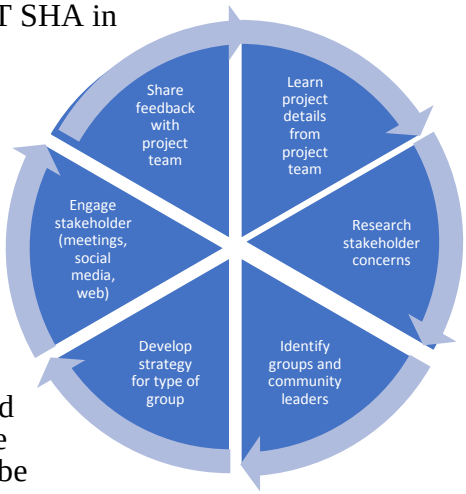
We recognize that the relocation of the Middle Patuxent River, the restoration of the Rosemary Lane tributary, compensatory wetland mitigation design and construction, along with minor relocations of other stream crossings, are significant and vital components to the overall success of the project. Our **stream and *wetland mitigation specialists***, led by ***Rich Pfingsten*** and ***Graham Boardman***, have reviewed the preliminary stream morphology study and hydraulics report, and are prepared to conduct detailed geomorphic assessments immediately following NTP and prepare full restoration/ mitigation design packages concurrently with the bridge/culvert/roadway/ESC designs. They will prepare a pre-construction stream condition report detailing the existing condition of streams and wetlands that will be impacted by the project for comparison with the post-construction conditions. Natural channel design and use of log vanes, rootwads, and natural stream bed material salvaged from site will be used to the extent possible for relocations and mitigation reaches. Stream crossings will be sized/ sited to minimize roadway overtopping and upstream ponding. Stream restorations/ relocations will be designed to mitigate any increases in tractive forces and ensure long term stability.

Once construction is complete, we will prepare and submit a revised Joint Permit package that details the final project impacts to wetlands, buffers, floodplains, and waters of the US. The package will include revised impact plates and summary tables showing the permitted impacts and the actual impacts for each resource, a final AMMR report, compensatory mitigation as-builts, and other required information to assist SHA with compliance tracking. We will also perform a post-construction assessment of the impacted resources to ensure that temporarily impacted resources are returned to pre-construction conditions.

C. Customer Outreach Plan

MDOT SHA implemented a public outreach program to educate and engage communities about the MD 32 corridor starting early in the planning process. The CGI Team understands and respects the extensive effort that MDOT SHA has undertaken to build and maintain the trust of project stakeholders. This trust is the result of a proactive approach to coordinating with potentially impacted communities, leaders, stakeholders and the traveling public for the earlier phases of the work. We understand how essential it is to continue this relationship for the completion of the dualization project. The CGI Team is excited to offer MDOT SHA the services of our team to lead the agency toward the goal of Customer Satisfaction and reduced inconvenience.

Project Team - CGI has a long history of assisting and supporting MDOT SHA in providing public outreach on community sensitive projects, from the planning/design phase through project completion. The success of any outreach program begins with bringing the right people and right approach. The CGI Team includes the expertise of ***Odessa Phillip***, Assedo Consulting, to provide community and stakeholder outreach services. CGI has worked with Assedo on other projects and will bring that working relationship and strategic partnership to proactively address the needs of stakeholders along MD 32.



Project Background - MD 32 is heavily traveled and can experience a variety of crashes that can snarl the region's transportation network for extended periods of time. To protect both the contractors and those travelling on the roadway, the outreach effort will need to be proactive and engaging and allow parties to appropriately convey their concerns. We are committed to sharing information early so the alternatives developed can be comprehensive and as acceptable to all parties as possible.

Outreach Approach - Assedo Consulting specializes in providing grassroots construction outreach for highway and environmental projects. We use our technical experience and knowledge of construction processes to help both designers/contractors and the public work together to develop solutions that are mutually agreeable and don't hinder project progress. Our approach is simple – understand the design and permitting constraints, learn about adjacent communities and their most prominent concerns, and look for opportunities to implement unique solutions that don't negatively affect project schedule or stakeholders.

Outreach Toolbox - There are numerous tools that can be used to share information and solicit feedback from stakeholders. There are different types of stakeholders on every project. For those that have expressed an interest in the project we will use social media alerts, email information, a web-based project calendar and notifications of updates to the project website to reach each out to them. For those parties who don't expressly engage the project team but still want and need project information, we use GIS to develop a project mailing list and share information such as ♦ Project Kick-off letter ♦ Project fact sheet ♦ Public friendly maps/displays ♦ Newspaper articles ♦ Press releases ♦ Project newsletters ♦ Construction notifications.

The CGI Team also recognizes the value of actively touching the community by attending homeowners and business chamber meetings and hosting a series of meetings to introduce the construction team and provide points of contact for the community. At these meetings, our team will use materials that share key information about project construction activities and the schedule as tools to build positive relationships. These materials may include, but are not limited to: Project display boards, PowerPoint presentations, and Project fact sheets. We will be strategic with the rollout of our community meeting series so that we can balance both meetings organized by our team and those already on community calendars. This can be an extremely effective tool in maximizing participation in the process by the public.

Project Kick-off - In the early stages of the project, the outreach team will work with the MDOT SHA District Community Liaison to identify the strategies that have been most recently successful in communicating project activities to the public. This information will inform the team as we develop an outreach strategy and plan that combines the most successful strategies. We will submit this plan within 60 days of project notice to proceed and our team will work to get up-to-speed as quickly as possible to minimize any delay in information sharing with the public. Additionally, we will create a briefing book to identify and group stakeholder groups in a logical fashion. This research helps the team learn about the human element associated with the project. For each stakeholder/group, the book will identify the pressing issues/ concerns, elected official representation, jurisdiction and many other pertinent and relevant details.

Stakeholder Outreach Understanding - Since the 2005 NEPA study, MDOT SHA has worked consistently with the communities along the corridor to develop a project plan that would have the least impact on the traveling public. Stakeholders in this area proved to be vocal and interested in the proposed changes and worked with MDOT SHA to develop additional alternatives lessening impacts to their communities.

The CGI Team has developed an alternative technical concept (ATC) to help reduce the overall construction duration, most notably shortening the time of the westbound detour for the project. Our team will develop a

public-friendly benefits analysis of this concept and share it with elected officials and community leaders to help build support for the innovation. While this ATC may raise challenges from elected officials and the community, the outreach team will reiterate the MDOT SHA goal of limiting disruption to the traveling public and other stakeholders. We will develop educational materials to help explain the potential benefits of the approach and seek feedback on strategies to lessen the inconvenience.

Outreach and Communication Protocols - Maintaining a proactive outreach effort requires continuous coordination between the CGI team and MDOT SHA. To ensure that a consistent message is delivered to project stakeholders, we will work closely with our assigned District Outreach Liaison and the Office of Communications. Our public outreach plan will clearly outline the roles and responsibilities of the project team, the strategies we plan to employ and a general overview of how we will manage outreach for the project. This document will be updated over the course of the project as needs change. A preliminary list of the roles and responsibilities is shown below but it not considered all encompassing.

♦ Schedule elected official briefings – MDOT SHA ♦ Schedule/attend community meetings – CGI/ MDOT SHA ♦ Develop and disseminate project notifications – CGI ♦Deliver outage notices – CGI ♦ Develop outreach schedule - CGI ♦Draft press releases – CGI ♦ Issue press releases and traffic alerts – MDOT SHA ♦Develop briefing memos and advertising copy – CGI/MDOT SHA ♦ Gather construction updates/schedule – CGI ♦ Manage project email account – CGI/MDOT SHA ♦ Draft responses to correspondence – CGI/MDOT SHA (elected official) ♦ Gather media clips – CGI ♦ Develop web and social media content – CGI ♦ Respond to media inquiries/media relations – MDOT SHA ♦ Develop project graphics – CGI ♦ Coordinate site visits/special events – CGI ♦ Develop copy/graphics for marketing materials - CGI

Document Templates - Since there are often project activities that are repetitive in nature (i.e. developing traffic alerts and detour messaging, coordinating community meetings, providing briefings to elected officials and stakeholders), our team will create templates of commonly used documents. The notification templates for traffic alerts, lane closures, utility shut-offs, that are highlighted in the Public Outreach Performance Specification will be coordinated with the MDOT SHA Project Management team to ensure that they meet the needs of the project and are consistent with similar notifications issued by MDOT SHA.

Traffic Advisories - As construction of the project commences, we will need to keep the travelling public informed about changes to travel patterns. Maintenance of traffic is a key component construction and the methods for communicating changes – minor to significant – can be an essential part of creating and maintaining public trust. As part of the weekly project updates, we will proactively share potential impacts to traffic with the public. Traffic alert information will be placed into the appropriate template and then sent out to the team for review, comment and dissemination in advance of traffic impacts.

Emergency Preparedness - It is important to be as prepared as possible for the unexpected and undesired events that can occur during the construction of any project. To that end, the outreach team will proactively consider the types of occurrences that can arise and develop contingency plans for addressing potentially foreseeable challenges. As part of this planning, emergency contact mechanisms such as phone and email trees will be developed and produced for use in case of emergencies.

Phone and Email Trees - Phone trees look at the project leadership both within the CGI Team and MDOT SHA to identify the most efficient and effective way to share urgent information with the project decision-makers. The phone tree will include notes that identify who information will be shared with, how decisions will be made, who the final decision-makers will be and the expected timing of these activities. We will update these documents regularly to ensure that contact information is accurate. Similarly, email trees can be used to help track the decisions that are made during crisis communication situations and protect both MDOT SHA and the CGI Team from miscommunication during potential periods of crisis and high concern.

Project Correspondence - Over the lifetime of a project, the public uses various methods to communicate with the project team. The CGI Team will develop and maintain a project database to capture and track constituent concerns, document our responses, and issue reports to MDOT SHA on correspondence.

Monitor and Refine Outreach Strategies -This combination of strategies has proven successful on several projects. Using this tailored approach will help project stakeholders stay informed and allow them to appropriately plan for potential project impacts creates lasting and positive relationships. We will continuously monitor our outreach efforts to verify their efficacy and may modify them, as needed.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