MD 404

TECHNICAL PROPOSAL

US 50 to East of Holly Road | Contract No. AW8965170 | F.A.P No. AC-NHPP-300-1(53)N | March 2, 2016

Kiewit PARSONS

MD404

US 50 to East of Holly Road

Contract No. AW8965170 | F.A.P No. AC-NHPP-300-1(53)N

TECHNICAL PROPOSAL

March 2, 2016

Kiewit PARSONS

COPY

TABLE OF CONTENTS

2.09.02: Schedule

VALUE STATEMENT:

It is of the highest importance to the Administration that the project reaches the substantial completion milestone by November 21, 2017. The Design-Builder will demonstrate how it will achieve this schedule and minimize or eliminate risk to achieving the schedule.

2.09.02 SCHEDULE

GOAL: Fully open four lanes to traffic and substantially complete construction by Thanksgiving 2017.

A. PROPOSED APPROACH

Our achievable schedule uses realistic design, review, and construction durations based on our extensive design-build experience. This schedule was developed to meet the following objectives:

- Complete the entire project in the shortest timeframe possible–without sacrificing project quality or safety
- Minimize disruptions to the traveling public and other project stakeholders
- Meet all of the critical environmental requirements including storm water management sequencing and time-of-year restrictions
- Schedule the project to accommodate key activities such as utility relocations and ROW procurement
- Safety and mobility consideration during construction through logical construction sequences to minimize impacts on traffic

Our team spent significant time developing our schedule and phasing plan by brainstorming multiple scenarios including different segment options, resource levels, phasing plans, allocation of personnel and by incorporating our design team's resources to produce a design schedule that matches the construction sequence. Our final project schedule will achieve project substantial completion by November 21, 2017.

Scheduling Approach

Our scheduling approach focused on maintaining current accurate quantities and durations based on critical past production rates. We performed independent quantity takeoffs and compared them internally to ensure accuracy. If there was a discrepancy, the team would discuss the difference, relook at the design and assumptions made, and adjust as needed. We also used historic production rates on similar items of work to determine our schedule durations.

The past productions benchmark this project against other past projects to determine the most accurate production rates and resources needed for this project. For example, on our paving operations, we compared our estimated productions against different projects based on total area, paving widths, pavement sections, location, weather, and ground conditions. This analysis gives our team confidence that all schedule durations are achievable and highly productive, therefore resulting in schedule certainty.

Along with traditional bar chart and P6 scheduling techniques, our team also used a linear schedule to develop the overall project approach. By using this technique, we were able to focus on the optimization of project resources, identify conflicts with utility relocations and time-of-year restrictions, and optimize the sequence for efficiency. The linear schedule and P6 schedule has been included in the Appendix in Section D.

While the primary work element consists of new roadway construction, we have incorporated several other distinct work elements into the project schedule, including:

- Utility relocation
- Permitting/approvals
- Erosion & sedimentation (E&S) controls
- Stormwater management construction
- ROW procurement
- Excavation/embankment
- Aggregates/paving
- Milling/resurfacing
- Bridge construction
- Noise wall construction
- In-stream and flood plain time-of-year restrictions

Project Schedule

While we are confident that this plan will successfully deliver the project ahead of the required milestone, we recognize that unforeseen activities and impacts can occur on this type of fast-paced project. We have strategically divided the project into multiple packages, and have scheduled the initial activities in a non-linear fashion. This approach gives us the flexibility to move fluidly to another package if an impact occurs to the current plan. We will continue working to find alternatives throughout design and construction to keep the overall schedule progressing, regardless of encountered issues.

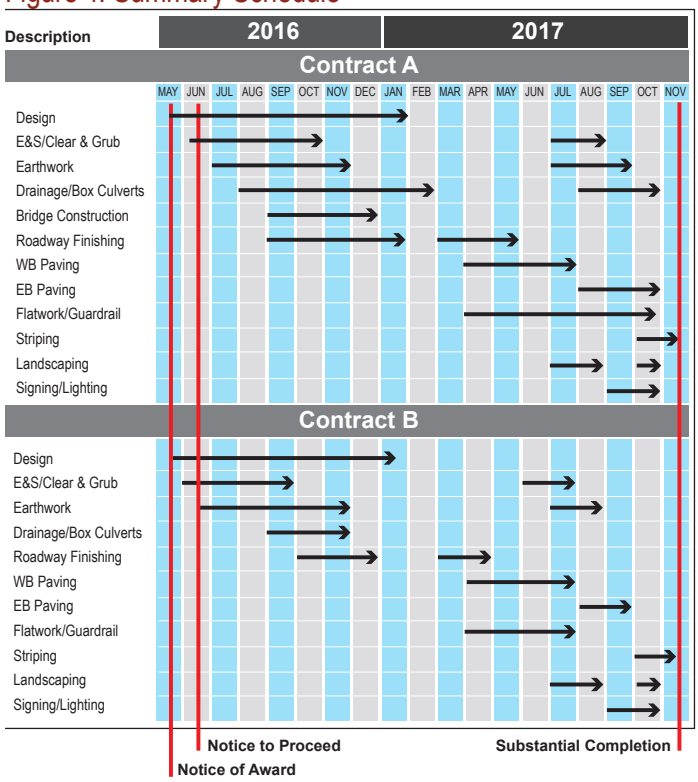
As shown in Figure 1 on the next page, an important factor in our scheduling is leveraging the depth and strength of our design partner, Parsons. Their experience and resources allow them to complete the majority of design for storm water, bridge, and multiple roadway locations by November 2016.

Design

In order to accomplish our plan, we have divided the project into two separate segments and nine design/construction packages as shown in Figure 2 below.

By dividing the project this way, we capitalize on our ability to begin designing different packages simultaneously. Each

Figure 1: Summary Schedule



package averages approximately one mile in length, which gives enough area for productive construction operations and allows the design to be completed in the time shown on our schedule. We will start developing the design immediately upon notification as the best value proposer to ensure construction can begin shortly after NTP.

The design starts with Design Packages 1A, 2A and 2B, which were strategically created to provide the construction team with approximately four miles of available work, and because:

- Package 1A includes a nearly balanced earthwork section. By starting this package early, we can start our first earthwork crews, which will primarily consist of short haul equipment including tractors with scraper pans. This package will not impact the utility relocation work, and will start right after the June time-of-year restriction for the Class I water work.
- Package 2A and 3A requires material to meet the design profiles. These sister packages were an ideal place to begin balancing the material with our longer-haul equipment including excavators and haul trucks. These areas also include areas that will not conflict with the utility relocation work. We will also import material to complete the grading of these packages.

For these first three packages, we will submit the rough grading packages to the Plan Review Division (PRD) within one week of NTP, with an anticipated three-week turnaround for approval. This schedule facilitates the start of the Erosion & Sediment Control and clearing operations to support excavation and embankment work. We anticipate starting this work on July 11, 2016, approximately four weeks after NTP.

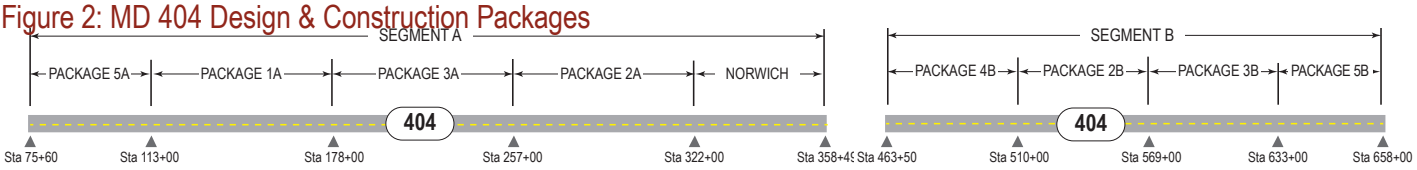
Concurrently with rough grading, we will also begin working on the storm water design to facilitate the critical pipe work that will be completed during 2016. These designs will be submitted three weeks after the rough grading packages, with six weeks of PRD/MDE approvals to ensure sufficient time for comment resolution.

Storm water and rough grading design will be performed in the first few months of the project to ensure construction can start strong in 2016. For E&S design, we will use the current design provided in the RFP to eliminate the need for additional PRD/MDE review, and if required, any modifications to the current design will be minor in nature. The design will be developed in conjunction with our independent quality firm, KCI, to expedite approvals.

Shortly after the first three packages are started, we will begin work on subsequent packages, anticipating one rough grading and pipe package to be submitted every week for approval. By following this schedule, all rough grading and storm water design will be complete by October 17, 2016, which supports the overall grading and pipe construction schedule. The sequence for design packages will be:

1. **Packages 1A, 2A and 2B:** Allows for four miles of construction, with two grading crews
2. **Norwich Creek:** Must be completed prior to the restriction window
3. **Packages 3A and 3B:** Simultaneous design and construction; supports dirt flow and sequencing
4. **Package 4B:** Last major roadway package requiring material.
5. Packages 5A and 5B: Final tie in to existing roadway

Figure 2: MD 404 Design & Construction Packages



For final roadway design that allows for grading and paving of the roadway surface, we will complete the design in the following order:

- Packages 1A, 2A and 2B: September 2016
- Packages Norwich, 3A and 3B: November 2016
- Packages 4B, 5A and 5B: February 2017

After completion of the final grading and stormwater design, we will seek stormwater management approval by November 2016 to allow for final paving on the entire project.

As an overall note, we have the ability to flex our design schedule to meet changing circumstances throughout the project. For example, if a permit or ROW area gets delayed, or we experience a utility relocation issue, we can adjust our priorities to allow for design and construction in an area that is available.

Construction

Utility Relocations

Based on the RFP documents and information from the one-on-one meetings, we understand that there are utility relocations for Delmarva Power, Choptank Electric, Verizon, Maryland Broadband and Comcast. While the majority of utility relocations occur on the eastbound side of the roadway, there are also multiple locations of relocations on the westbound side.

In order to expedite the design for the E&S in an effort to perform clearing and grubbing for the utilities, we will use the advanced clearing and grubbing plans already developed by SHA to begin this work. We will follow the sequence of construction shown on the plans to ensure no additional design and approval efforts are required.

We will also use multiple crews to expedite the installation of the E&S controls required for the clearing and grubbing. By staying ahead of the utility crews throughout construction, we can ensure the utility companies are able to maintain their schedule.

For Contract A, the utility companies are currently performing relocations from Sta 75+00 to 115+00. We anticipate that this work will be completed by November 2016, which is another reason for constructing this package later in the construction schedule. For Sta 115+00 to 365+00, the utilities will be relocated from east to west, and will be completed by January 2017. For relocations on the westbound roadway, our earthwork and pipe crews will work concurrently with the utilities early in the project schedule. We will ensure utility companies are given full access to their work, and we will sequence our operations to avoid any conflicts.

For Contract B, the utility companies will perform relocations from Sta 460+00 to 670+00. We anticipate that this work will start in June 2016 and be completed by February 2017. The utilities will be relocated from west to east. Our construction operations will outpace all utility relocations in the contract, which will ensure the utility companies do not conflict with construction operations.

Since the majority of the relocations are performed on the eastbound roadway, we have scheduled all eastbound work after all utility relocations are complete, in the 2017 season.

E&S and Stormwater Management

Another key reason for strategically dividing the project into nine packages is to ensure compliance with the maximum allowed disturbance of 20 acres in adjacent areas.

All segments will begin by installing the required E&S controls, stripping the topsoil, clearing and grubbing the area, and constructing the stormwater management. We will construct the temporary stormwater management in the same location as the permanent, therefore reducing the overall schedule and project cost. This allows the excavation and embankment crews to install all ditches, berms, and ponds in the permanent configuration early in the project schedule. In order to meet the aggressive schedule for this project, we are starting off the E&S and clearing operations with four crews, which support the subsequent earthwork and piping operations.

Earthwork

Immediately after the E&S and clearing is completed in a usable area (approximately 2,000'), we will begin major earthwork operations on new westbound lanes of the project, which is supported by the completed rough grading design packages.

In Package 1A, tractors and scraper pans are used to complete the major earthmoving operations and to spread in other areas allowing for in-station balancing, such as in Packages 2A, 3A, 4B, 5A and 5B.

For areas that have a major surplus or deficit of material, we use an excavator and haul truck operation to move the material throughout the project. Legal haul trucks are employed so that existing roadways can be used to haul the material to the needed locations. Each location will have designated haul routes to ensure the safety and mobility of the travelling public.

As the major material is removed or embanked in each location, the same crews use dozers and motor graders to fine grade the storm water ditches, berms and roadway sections in 2,000' stretches. Once complete, each area is stabilized to ensure the project is within 20 acres of the installation of the storm drainage piping. We will use daily stabilization where required to ensure compliance with the 20-acre limit.

The majority of earthwork operations for the new westbound lanes will be completed in November/December 2016, ahead of the frozen weather season. Once weather improves in March/April 2017, crews can begin the earthwork and grading operations on the eastbound roadway, working in a linear fashion from west to east, in the same direction as traffic. With design complete, we will work linearly, allowing highly productive operations.

Drainage

Shortly after earthwork operations begin, our design schedule allows for the start of the major storm drain operations. There will be two approaches to storm drain installation, depending on the location and the flow direction of each particular pipe.

- The first approach will be to install the first section of pipe under the new westbound roadway, and temporarily connect the new pipe to the existing pipe with a temporary collar. Once the westbound paving is complete and all traffic is temporarily switched to the new lanes, we can then complete the installation across the existing lanes and remove the temporary connection and existing pipe. The pipe installation across the eastbound lanes will take place during the spring/summer of 2017. In this situation, there will be no impacts to existing traffic and minimal MOT required.
- In areas where the first approach is not feasible, the second approach will be to construct the piping under the existing roadway first, in an effort to construct the system from the downstream to the upstream side. We will construct this work by adjusting the lane configuration down to 11' lanes and use the shoulders for a temporary shoefly detour. We will first construct the southernmost section of pipe, backfill with flowfill and concrete, cover with street plates and then shift traffic. Then we complete the northernmost section. Once our crews are out of the existing roadway footprint, they will continue the pipe run until complete.

Our plan is to construct the project with four full-time crews to complete all westbound pipe work in 2016, prior to winter weather and ahead of the 2017 time-of-year restriction. After traffic is temporarily switched to the westbound lanes in July 2017, we will complete the remaining eastbound pipe work along with any remaining parallel runs. These sections will be completed concurrently with the eastbound earthwork construction.

There are also several box culverts that are either new or being extended from their existing location. We will use two structures crews for the entire box culvert construction period, due the number and duration of the construction.

They will first install the necessary stream diversions prior to construction, utilizing the same MOT sequence as the rest of the storm drain installation, always working from the downstream side to the upstream side. All box culvert construction will be completed by November 2016, before the time-of-year restriction.

Stream Diversion

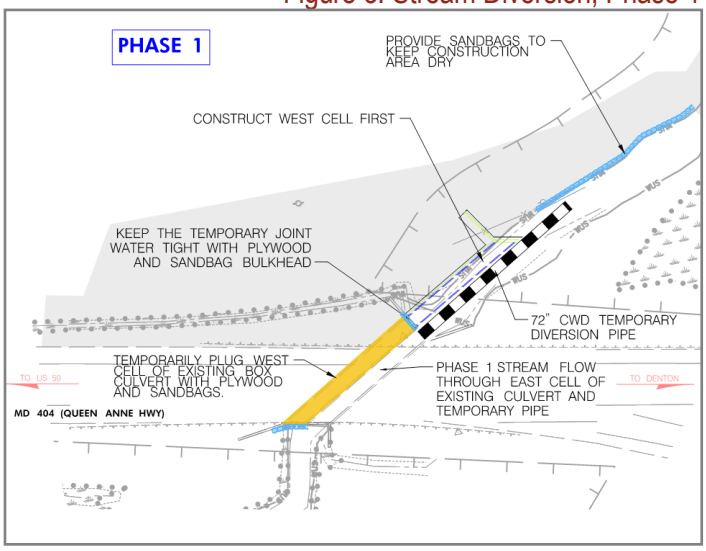
Our team strives to bring Practical Design solutions on a complex construction situation. For example, on the culvert extension at Norwich Creek (RFP plan Sta. 321+75) we developed other construction sequences that are more practical and easy to construct without any impact to the existing stream. The following sequences have some advantages over the sequences provided in the RFP plans:

- No need to perform extensive excavation to install 72" pipe in under existing roadway, which could have significant impacts on traffic and safety.
- No impacts on traffic except shoulder closure.
- Improved safety.
- Improved schedule and reduced cost.

Phase 1

1. Extend existing east cell using 72" temporary pipe.
2. Install sand bag diversion on downstream side to keep construction area dry and install west cell per the proposed box culvert.
3. Block west cell of existing culvert at inlet using sand bags.
4. Construct proposed west cell extension, wing wall and headwall in dry area.

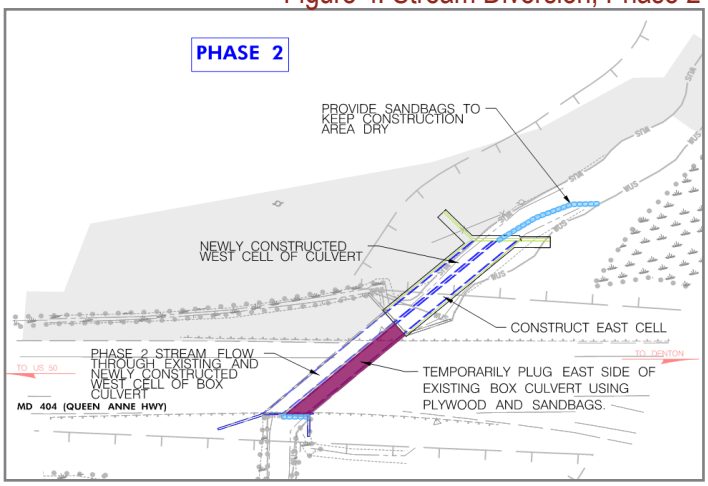
Figure 3: Stream Diversion, Phase 1



Phase 2

1. Install sand bag diversion to keep construction area dry and install east cell of proposed box culvert.
2. Block east cell of existing culvert at inlet using sandbags.
3. Divert the water in newly constructed west cell.
4. Complete construction of east cell of proposed box & headwall.
5. Stabilize area and stream.

Figure 4: Stream Diversion, Phase 2



Norwich Creek

The Norwich Creek bridge work will begin early in the project to ensure the bridge is completed prior to the November flood plain restriction window. This area also requires a significant amount of embankment, and by completing the substructure work in the fall of 2016, we can maximize dirt flow.

After the Norwich Creek design package is completed, we will immediately procure girders for the new bridge. Standard sized girders are used, which can be quickly fabricated and delivered to the jobsite.

One of our two structures crews will transition the bridge work by installing the foundations for the bridge abutments, first. Then, they can form, install rebar, and pour the abutments on the east and west side. After stripping and curing is complete, our grading crews will backfill the abutments up to the final grade, which will allow good access for future bridge operations. Next, we will install the bridge girders across the creek, followed by the installation of the bridge deck and barrier. All of this work will be completed by November 2016, several weeks ahead of the environmental restriction window.

Roadway

After the earthwork is complete, our finishing crews will begin prepping the surface for the future pavement. By using motor graders and small scrapers and rollers, we will fine grade and compact the subgrade to the specified tolerances and perform any soil remediation as required. All of the grading work will be constructed per a 3D model, and our grading crews and equipment will use GPS-controlled equipment to increase productivity and quality. Once the surface has passed compaction tests and proof rolling, we can place the aggregate base course.

The majority of the aggregate base will be installed in all roadway packages in 2016. Our plan is to rough grade and compact the aggregate base in 2016 in order to maximize schedule and stabilize the roadway areas. Once the favorable weather returns in March/April 2017, crews will fine grade the aggregated bottom of pavement elevation, also achieving the required compaction.

Paving

Due to favorable paving temperatures, our concrete paving crews will begin the preparation for paving operations, including setting up the grade control and required reinforcement in March/April 2017. Similar to the grading work, we will use wireless paving technology through the use of the 3D model. On the SR 101 project, we acheived productivity increases of nearly 30 percent with the smoother riding surface compared to other projects. superb quality using this technology.

Our crews will then begin concrete paving from the west of the project moving to the east. All of the major concrete work will be completed in a linear fashion, to provide usable sections for the future detour to support milling and overlay of the existing section. As paving crews are progressing, our grading crews will complete the remaining earthwork operations in Packages 5A and 5B, to allow for the future tie-ins at the east and west end of the project.

Eastbound Work

Once the concrete paving is complete, we will switch traffic to the newly constructed lanes in June/July 2017. This traffic switch provides full access to the eastbound work, including the grading, storm drainage, intersections, paved concrete median landscaping, soundwall, guardrail, and mill/overlay work. Crews will construct the eastbound work in a linear fashion, working from west to east, since the design will be complete, and the amount of earthwork balancing is less than the westbound roadway.

As the grading work progresses, we will stabilize completed work and maintain the 20-acre limitation. All of the intersections will be tied into the eastbound roadway, and the miscellaneous concrete (barrier/curb) will be completed at this time, since the intersections will no longer be needed for haul truck crossings. Once the asphalt work is complete, we will finish the roadway by installing the new striping, and preparing for the final traffic switch.

Resources to be Provided

Labor

To meet the critical completion milestone, we have scheduled the resources shown in Figure 5.

Figure 5: Self-performed Labor Resources

Contract A		Contract B	
Discipline	# of Crews	Discipline	# of Crews
E&S	3	E&S	3
Roadway excavation/ embankment	4	Roadway excavation/ embankment	3
Drainage	2	Drainage	2
Structures	2	Structures	1
Roadway finishing	2	Roadway finishing	1
Concrete paving	1	Concrete paving	1
Total	**14**	**Total**	**11**

With over $4B worth of construction projects within one hour of the MD 404 project, we are uniquely capable of mobilizing the necessary craft resources. We have strategically added Michael Graham—who is currently working with 500 employees on our Cove Point project in Lusby, Maryland—as our Construction Manager. Michael's team works with the local Baltimore and D.C. metropolitan area unions, and are well suited to construct the MD 404. As our other local projects begin ramping down, the timing to transfer employees to MD 404 will be seamless.

Parsons also has several local offices and access to hundreds of professional engineers, which will ensure design milestones are met. This team includes key staff from the ICC-B project who are familiar with SHA standards, the design review process, and all of the best practices needed to make this project a success.

Equipment

In addition to our knowledgeable employees, we have an extensive equipment fleet located in the Mid-Atlantic area. Many of our local projects include roadway and grading construction, which use similar pieces of equipment required for the MD 404 project.

While many of the pieces needed are located here locally, the sheer amount of equipment resources needed to support the number of crews will require resources from outside of the region. To meet the demands of large, fast-paced, and technically challenging projects, Kiewit has a centralized department called Kiewit Equipment Services, that controls all equipment throughout North America.

KES is able to coordinate and mobilize equipment virtually anywhere to meet any project's needs. If a particular piece is unavailable, our national agreements with the largest equipment suppliers enables us to use outside rented resources as well.

Our team has already located and scheduled two concrete pavers, four motor graders, excavators, dozers, rollers, 8 tractors with 16 scraper pans, and a 100-ton crane.

Subcontractors

We have a large database of subcontractors and suppliers that we have used on past successful projects. As we select subcontractors, we not only look at price, but evaluate past performance as a gauge to ensure they can meet the demands of the project. We will ensure that all subcontractors on the project understand the goals, clearly understand the project schedule prior to bid, and will execute at a high level.

One of the critical suppliers on the project is for concrete. We have reached out to a local supplier who has provided over 200,000 CY on other local projects. They have permitted sites near the MD 404 project, and have multiple batch plants available to meet the demands on this project.

Since we plan to pave both contracts simultaneously, it is critical that concrete supply meets the demands on the project, and we have full confidence in the local supplier.

We take pride in our collective history of disadvantaged business utilization as well as our ability to balance DBE participation with self-performed work—all while meeting SHA's expectations for cost, schedule and quality of work. While the benefits associated with self-performed work are numerous, we have also diligently and successfully sought out work and procurement packages to be set aside for DBE participation.

Meeting Substantial Completion

ATCs

As detailed in our ATC submittal #5, we will use an optimized PCC pavement section. The pavement section that we have chosen uses a soil modulus of 230psi, which does not require additional testing during construtions in contrast with any optimized asphalt section. This ATC significantly reduces aggregate base and pavement quantities, and enables our finishing and paving crews to cover more area per shift. By reducing these quantities, we are also reducing pressure on our material suppliers to meet the production demands. The quantity reduction improves the overall schedule, and helps us to better ensure that the substantial completion dates are met and should resolve in life-cycle cost production.

Utilities

In an effort to support the utility relocation schedule and reduce schedule risk, we will use the Advanced Clearing and Grubbing plans already created by SHA to support clearing and grubbing and E&S control operations. This approach eliminates the need for additional design time, and allows work to begin immediately after NTP.

In our project schedule, we use six E&S crews to support the utility schedule, and we have strategically broken the project down into nine packages which are sequenced to support utility relocations. While there are several critical activities immediately after NTP, our approach gradually creates float between construction operations and utility relocations, which provides flexibility should an issue arise.

Right-of-Way

We anticipate that all ROW acquisitions will be completed by June 20, 2016; however, if an issue should arise, we have the flexibility to adjust our design and construction schedules to accommodate any delays. If an issue arises, we can immediately shift resources to a package that has all ROW cleared in an effort to keep the overall schedule on track. We have also included Norwich Creek as an early package, since the ROW will be cleared to facilitate advanced utility relocations, and because this area includes bridge and box culvert construction, which have longer durations.

Permit Review/Approval

In order to start construction shortly after NTP, and to ensure no reevaluations will be required, we will complete all work in compliance with the current permits that SHA has already obtained. Our design will ensure all limits of construction and no additional LOD will be required, and we will minimize impacts wherever possible. We will follow the current Stormwater Concept, and ensure that all improvements to the design do not trigger a new concept report. Lastly, we have strategically included GPI as an exclusive environmental consultant on our team. GPI has a long-standing history with SHA and the State of Maryland, and was a key team member in the success of ICC-B. GPI will be responsible for all permit management and compliance.

In Stream/Floodplain Work

When we developed our schedule, we paid special attention to the time-of-year restrictions and created float in our schedule to enable flexibility in the event an issue occurs on the project. Our plan is to complete all of the Norwich Creek embankment from August to September 2016 and the box culverts from September through November 2016, which is well ahead of the floodplain restriction, and provides schedule float.

By having multiple structures crews onsite, we can dedicate additional resources to this area as needed. All of the remaining work at Norwich Creek will be outside of the floodplain and will not be impacted by the restriction.

For storm drain and box culvert operations, we are completing the 2016 season of work two months ahead of the time-of-year restrictions. In the 2017 season, this work does not resume until July, nearly a month after the restriction ends. This approach provides two months of schedule float before the March in stream restriction and provides a month of float prior to starting the operations again in 2017.

Geotechnical

We have reviewed the current geotechnical information and performed additional testing during the bid phase of the project. We will use the RFP subgrade modulus and pavement section that will not require additional testing during construction, which eliminates significant schedule risk due to failing tests and rework throughout the project roadway.

During our investigation, we identified materials that are over optimum moisture throughout the corridor. In order to mitigate the risk of failing density and moisture tests, we have included subgrade remediation in our project schedule and estimate. This approach ensures that remediation is a planned activity and does not increase schedule criticality once pumping subgrades are discovered.

Weather

Our project schedule was created to minimize schedule risks due to weather. Our overall summer/spring/fall schedule assumed five-day work weeks, with Saturday as a makeup day if needed. Any makeup work on the weekends will not impact the traveling public and will be in full compliance with the RFP regarding traffic restrictions. In our project schedule, we have adjusted the winter work schedule to four days per week.

Our plan is to accelerate the design and complete the majority of westbound work (except for paving) by November 2016. By completing this work in November, we can ensure that favorable temperatures will eliminate the risk of frozen subgrade, snow accumulation and will allow for productive operations.

The project resumes major operations in March 2017, including aggregate base finishing, with paving operations starting in April 2017, when favorable temperatures return. While not ideal, the winter months provide schedule contingency to the team should issues arise on the project, providing nearly two months of schedule flexibility.

Accelerated and Innovative Construction Techniques

Finishing the Design Early

Once notified as the best value contractor, our team will immediately begin design activities and construction planning from April to June 2016 to support the start of construction activities shortly after NTP. This design approach accelerates design completion and creates space in our overall project schedule.

While the early design package schedules are extremely critical to begin construction operations, we gradually create space between our design completion and start of construction in subsequent packages. As the design team begins working on the final design packages, we have developed approximately two months of schedule float.

Finishing and Paving Machine Control

As discussed earlier, we will use GPS-controlled technology on our grading and paving equipment. Once the design team completes the 3D model, it is programmed into our equipment, allowing for automated line and grade control.

This technology also allows our pavers to operate wirelessly, providing tremendous benefits to the project including:

- Greater flexibility to mobilize to different locations on the project when issues or conflicts arise in a particular area.
- Allows for consecutive paving passes that would not have been possible using a traditional wire, which accelerates the schedule.
- Reduces the human error in setting/maintaining wire line.
- Reduces the man-hours spent setting wire, which reduces overall project cost and improves worker safety.
- Flexibility in planning access for your trucks and placer, since trucks do not have to find a break in the wire, but can unload in front of the paver in any location.
- Improves material yield, productivity, and final quality, which improves the overall project schedule.

B. CONCEPTUAL GRADING UNIT AREA PLAN

2016 Grading Season Approach

Erosion & Sedimentation Control

Our approach is to begin with the Erosion & Sedimentation (E&S) Control Plans provided by SHA for utility installation and advanced clearing and grubbing plans Package 2. We will design and gain approval for an E&S control package for rough grading. This plan will avoid waterways and wetlands that will be crossed by temporary bridges or culverts and allow our team to begin grading in June 2016. In the meantime, our designers will complete a series of individual plans for the 21 designated drainage areas. These plans will show the individual steps required to install those culverts.

The general approach for the fieldwork in each area will be for the E&S installation crews to construct SHA's E&S plans for utility installation and advanced clearing and grubbing plans Package 2 as shown, starting from the BMP items at the treated water discharge locations and installing them in sequence up stream to the limit of that particular drainage.

A subcontractor will install the silt fence, super silt fence and diversion fences, also as shown in the plans. Another crew will also perform daily ground stabilization with seed and mulch on all completed disturbed areas. The E&S crews will concentrate on the westbound area north of the existing roadway, and will only disturb areas south of the eastbound roadway if it is necessary to make the system functional.

The detailed approach for Contract A will be for the E&S to begin with the installation of the super silt fence at Sta 108+75 and proceed with the installation of the BMPs toward the east in sequence. Daily stabilization will be performed on the disturbed area.

At Sta 128+00, which is the limit of the initial drainage area, this E&S crew will skip to the outfall locations at approximate Sta 141+00 and 143+00 to install the BMPs and work back to the drainage divide at 128+00.

Next, they will skip to Sta 159+00 and work back to Sta 143+00. The Waters of the US drainage at Sta 158+75 will be crossed with a temporary bridge until a detailed plan is produced and approved that addresses this culvert.

Other temporary bridges will be used at Stas 171+50, 188+50, and 287+50. A second E&S crew will begin simultaneously with the first crew, but starting at Sta 320+00 and working to the west to meet with the first crew, who will be performing their work in the same sequence as described above.

Grading

Following the E&S crews will be two grading crews. They will approach each sub-unit in the same sequence working from the north LOD, constructing the final berms, soils, ditches, and roadway to the south until it intersects the existing eastbound roadway. Temporary culverts and bridges as described above are planned for crossings at the water culverts.

The grading crew that starts at Sta 108+75 will be a scraper crew constructing the clean water diversion ditch, separation berm, roadway runoff ditch, and the roadway itself. This crew is expected to fully complete an average of 550 LF of grading per day. A daily seed and mulch stabilization will cover the completed work area outside of the new roadway shoulder.

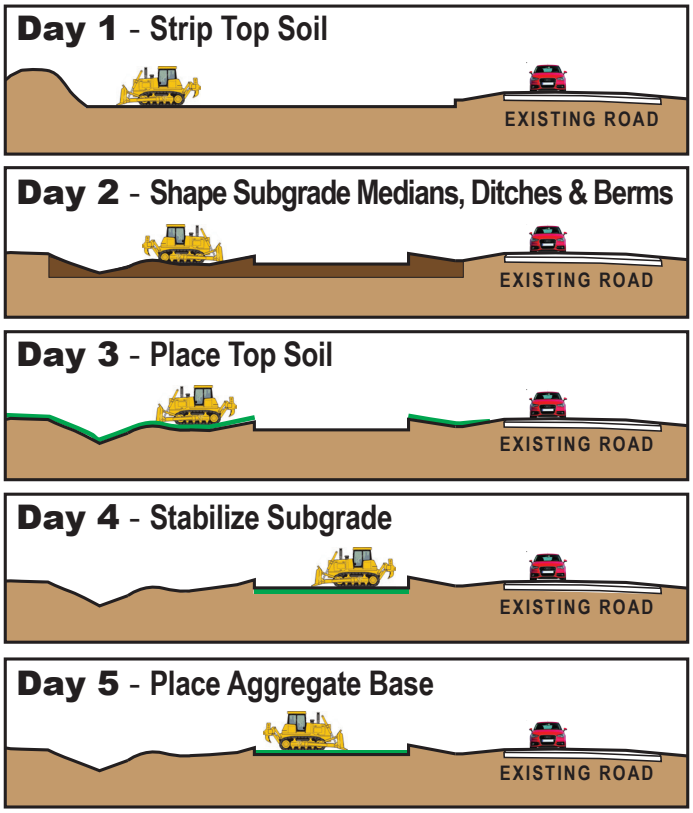
The second crew will start at Sta 320+00 Lt and will consist of an excavator and legal truck crew excavating the westbound roadway with support from a bulldozer to shape the parallel ditches and berms. This crew will work toward the west, at the average rate of about 50 LF per shift. This material will be hauled to Contract B where it will be placed as embankment.

Contract B will have a third E&S crew, starting at the same time as the first two crews, but at Sta 510+50 Lt. They will

work to the east, skipping a Station at 518+00, to protect this WUS area. Another area skipped will be Sta 534+00 Lt to 544+00 Lt. This E&S crew will work east to the end of the project. Their primary goal is to prepare areas for the fill being imported from Contract A.

All three E&S crews will have the added responsibility of adding the BMPs required to protect each area as the grading progresses, so that continuous silt treatment is always in place.

Figure 6: Grading Sequence



Drainage

The next set of crews working will be the drainage crews installing the temporary and permanent piping necessary for the E&S and the permanent drainage for the project.

There will be two crews for each Contract. Where the drainage flow is from the north to the south, the crew will work within a traffic control zone to install the pipe across the existing lanes. Where the drainage flow is in the opposite direction, the second crew will install the culvert outside of the area influenced by traffic. This second crew will work both ahead of the first crew for the diversions and temporary piping, and behind for the permanent piping. The water diversions will conform to the Maryland Standards as specified for each of the 21 permitted locations.

Roadway

The next step in the sequence of construction operations will be to stabilize the roadway subgrade. This stabilization will be either soil cement or lime treated subgrade, depending on the soil composition at that location.

A separate set of finishing crews will be finishing the subgrade on the westbound lanes along with the under drain construction. As soon as a section is completed and approved, Graded Aggregate Base will be placed and compacted, which stabilizes the section for E&S purposes.

We will use SHA's E&S drawings, the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control and will ensure that each non-contiguous work area has less than 20 acres disturbed any one time.

By the end of the 2016 grading season, the westbound lanes will be complete up through the GAB, and all disturbed areas to the north (except the new westbound shoulders) of the existing roadway will be fully stabilized.

The advantage of this approach is that it limits the amount of disturbed land at any one time. This is accomplished by not disturbing any of the grading areas south of the existing roadway, by constant daily stabilization, and by having multiple crews with automated blade controls to rapidly shape the ditches, berms, ponds, excavations and embankments to their final shapes and allow the stabilization to take hold and grow. The placement of the GAB layer further reduces the amount of disturbed land. This allows the project to be stabilized for the winter season.

2017 Grading Season Approach

In 2017, the focus will shift to the eastbound lanes and areas south of them. The general approach will be the same as the 2016 northern areas, with the E&S crews protecting an area. They will be followed by the grading crews constructing the finished ditched and berms. A separate set of crews will later replace the eastbound inside shoulder where it is required for the Maryland "J" and "T" turns, and the outside shoulder for the turnout widenings, acceleration and deceleration lanes. These crews will work in the same direction as the traffic adjacent to them. Meanwhile, the paving of the westbound lanes will occur.

C. ENVIRONMENTAL COMPLIANCE

Minimizing Schedule Risks

Key elements to successfully minimizing schedule risk include:

- Use of an experienced environmental compliance team (ECT) during the design phase to perform early compliance reviews, constructability reviews, provide recommendation for avoidance and minimization and coordination with SHA and regulatory agencies to streamline permitting.
- Use of experienced ECT during the construction phase to assist with technical issues when performing culvert construction, working near wetlands and waterways, floodplains, trees, cultural resources and facilitate the preparation and approvals of OOC062 Plan Modifications through OED Toolkit and minimize the potential for Non-Compliances and Stop Work Orders.

Permit/Approval Acquisition & Modifications

To reach the environmental goals and to exceed the expectations of the design and construction schedule, the selected design-builder must possess the experience to efficiently and effectively coordinate, collaborate, and deliver the documented environmental commitments. We have the experience in the federal, state and local environmental regulations regarding environmental impacts and as well as SHA requirements to streamline the permitting approval process.

Our comprehensive approach to environmental compliance incorporates the clear understanding of SHA design specifications, specifications for construction protocols, accurate assessment of natural resources, permitting processes, MDE, USACOE, MD DNR, and USFWS regulatory agency special conditions, commitments and construction guideline documents. Our ECT has ongoing working relationships with SHA personnel and are well respected with the Regulatory Agencies. These relationships allows us the ability to resolve issues quickly to obtain permits/approvals in a timely manner to streamline design and construction.

Our environmental compliance approach also incorporates environmental personnel throughout the preliminary design, final design, construction and post-construction phases to develop solutions that avoid and minimize impacts and reduce permits/approval time. Our staff will obtain permit approvals and/or modifications, environmental reevaluations, E&S Control Plan modifications through the OOC062 Minor or Major Plan Modification processes to maintain construction progress at all times to minimize risk to the schedule. These plan modifications will be processed though OED Toolkit that facilitates communication and streamlines the approval process. Figure 7 on the following page indicates the typical permits and regulatory review authority that may be required for the MD 404 project.

Environmental Reevaluation

SHA is currently completing a 2016 Environmental Reevaluation Consultation comparing the design and environmental impacts of the selected alternate, and has determined that the current design for MD 404 (in comparison with the FONSI / Section 4(f) Evaluation for the MD 404 Planning Study, approved by the FHWA on November 15, 1991 and previous reevaluations) will have greater impacts to residential and commercial displacements, ROW, streams, wetlands, forests, and prime farmland soils. This increase in impacts is due to changes in the design, including: revisions to the design of service roads; upgrades in stormwater design to meet current regulatory standards (COMAR 26.17.02); modifications to the design of median crossovers; and grading in accordance with current SHA design criteria.

Though impacts of the current design are greater than those identified in the 1991 FONSI, SHA has provided appropriate mitigation for all impacts such as continued coordination of relocations/properties; continued cultural resources evaluations in accordance with the stipulations of the MD 404 MOA; performed mitigation of stream, wetlands and forests in accordance with USACE and MDE permit conditions at the Smith Farm Mitigation Site; increased the Norwich bridge structure to span the stream channel; implemented the strictest E&S control methods to minimize impacts to the RTE Dwarf Wedge Mussel; and coordinated noise mitigation options for residents in the vicinity of Dulin Road.

In accordance with the RFP documentation, SHA believes that the FONSI will remain valid and that no supplemental documentation will be required. It is anticipated that the current RFP design will not result in any additional significant environmental impacts therefore Environmental Reevaluation will not be necessary. Following the Award of the Contract and Notice to Proceed, we will continue to review the design plans, evaluate commitments and identify any design issues far enough in advance so issues can be managed without risk to the schedule. If a condition exists where an environmental reevaluation may be required, the ECT will coordinate with the design-build team to develop innovative solutions to avoid environmental reevaluation to minimize schedule risk. If an environmental reevaluation is unavoidable, the ECT will assist SHA with preparing environmental reevaluation consultation documentation for submittal to FHWA.

Figure 7: Environmental Permits

Permit	Review Authority	Status	Work Required	Duration
USACOE	SHA EPD/PRD/HHD & USACOE	Corridor Permit Obtained / Design Package Authorization Needed	Preparation of Design Plans, Avoidance and Minimization Memos for each design package.	2 to 3 weeks
MDE Nontidal Wetlands & Waterways	SHA EPD/PRD/HHD & MDE	Corridor Permit Obtained / Design Package Authorization Needed	Preparation of Design Plans, Avoidance and Minimization Memos for each design package.	2 to 3 weeks
Water Quality Certification	SHA EPD/PRD/HHD & MDE	Obtained	Incidential to MDE NTWW Permit	-
Reforestation Site Review	SHA LAD/LOD & MD DNR	Obtained	Preparation of Tree Avoidance and Minimization Memo for each design package.	1 to 2 weeks
Roadside Tree	SHA LAD/LOD & MD DNR	May need to be obtained for Roadway Crossings on Public ROW other than SHA.	Preparation of plans and application identifing tree impacts.	1 to 2 weeks
Erosion and Sediment Control	SHA PRD/HHD	Authorization needs to be obtained for every design package.	Preparation of design plans.	2 to 3 weeks
Stormwater Management	SHA PRD/HHD	Authorization needs to be obtained for every design package.	Preparation of design plans.	2 to 3 weeks
Tier II Watershed Requirements	SHA PRD /HHD, MDE	Additional requirements associated with each E&S Control/SWM Design Package referred to as Enhanced Best Management Practices.	Preparation of Corridor Management Plans and design plans.	2 to 3 weeks
Groundwater Appropriate	SHA EPD & MDE	Obtained	None	-
Surface Water Appropriation	SHA EPD & MDE	Needs to be obtained if extracting water from streams for construction use.	Mapping and Application.	2 weeks
Scientific Collection (Fish Relocation)	SHA EPD & MD DNR Fisheries	Needs to be obtained to relocate fish/aquatic species at all culvert construction areas	Development of mapping, protocol and application.	1 to 2 weeks
NPDES Permit	SHA OED & MDE	Obtained	Maintain environmental compliance during construction.	-
Environmental Re-evaluations	SHA EPD, FHWA, USACOE & MDE	2016 Environmental Reevaluation being performed my SHA. If no design changes occur as the result of the ATC process then no Reevaluation will be necessary to start construction.	Development of supporting documentation to submit to SHA for the Environemental Reevaluation	4 weeks or more
Local Grading and Access Permits	Queen Anne's and Caroline Counties	Needs to be obtained for work outside of SHA LOD	Development of plans for Off-site soil material waste sites.	4 to 6 weeks
Minor E&S Control Plan Modification (OOC062)	SHA PRD/HHD, SHA E&S Quality Assurance	Minor changes to approved plans during construction that require approval.	Development of design plans and OOC062 Form	1 to 3 days
Major E&S Control Plan Modification (OOC062)	SHA PRD/HHD, SHA EPD, MDE	Major changes to approved plans during construction that require approval.	Development of design plans and OOC062 Form	1 to 3 weeks
Other Commitments				
USFWS Biological Opinion	SHA EPD, USFWS, USACOE & MDE	Requirements and commitments need to be incorporated into the design plans of Norwich Creek.	Commitments to be included in to the design plans.	-
FHWA, MDSHPO, SHA MOA Cultural and Archaeological Resources	SHA	SHA is obtaining clearance prior to the NTP.	Only necessary if work extends outside of Existing ROW.	4 to 6 months
Local Public Outreach Commitments	SHA	Contract documents and SHA.	Coordination with Public	Unknown

Avoidance and Minimization of Impacts to Natural Resources

Our approach to minimizing risk to the construction schedule is to proactively evaluate and document avoidance and minimization opportunities and perform early coordination with the regulatory agencies to obtain their input. Their early input in the design phase will streamline the permitting process. By proposing innovative construction techniques and/or methods, participating in regulatory agency coordination and task force meetings and demonstrating successful avoidance and minimization has been performed to the maximum extent practical, these are all key steps in the process of maintaining environmental compliance, streamlining the permit/approval process, as well as, minimizing risk to the schedule. The following outlines some of environmental features that will need to be evaluated for avoidance and minimization opportunities.

Sensitive Environmental Areas

MD 404 impacts several sensitive environmental areas, including waterways (Wye River Watershed including Mill Creek Tributary and Choptank River Watershed including Tuckahoe Creek with tributaries of Meetinghouse Branch and Norwich Creek) which are Use I waterways with an instream time-of-year restriction of March 1 to June 15. The unnamed tributaries to the Choptank River are Use 1 (Yellow Perch) with an instream time-of-year restriction from February 1 to June 15.

Within Norwich Creek is the federally and state listed endangered Alasmidonta Heterodon (Dwarf Wedge Mussel) habitat. We understand the USFWS Biological Opinion and the MDE and USACOE Special Conditions, Tier II Watershed requirements and recognize the importance for the avoidance and minimization efforts, time-of-year restrictions and additional E&S control requirements that will be required for the Norwich Creek bridge construction area.

There are also forest tracts (supporting Forest Interior Dwelling Species such as migratory song birds) and other plant and animal species habitats. Many tributaries, wetland complexes, groundwater seeps, high groundwater table, 100-year floodplains, specimen trees, high quality upland, farmland areas and cultural resources will be directly or indirectly impacted. All of these resources will need to be evaluated for avoidance and minimization.

The proposed culvert designs will need to incorporate fish or aquatic passage that may require some additional channel modifications to comply with the commitment. Also, there is a potential for hazardous material associated with building demolition and ancillary site features as well as soil and water contamination that may need to be remediated.

Environmental Compliance Approach

The following outlines our environmental compliance approach which supports our key elements to successfully minimizing risk to the schedule.

Preliminary Design Compliance Process

Based on our review and recent site visits, impacts to natural resources associated with the utility relocation construction are ongoing. A preliminary field investigation will be performed to verify all environmental resources have been conveyed from the documents to the project constraints mapping and to confirm the impact status of the resources.

It will be important to identify and evaluate ongoing utility company impacts before roadway design commences, so not to propose avoidance and minimization efforts on previously impacted natural resources. Determining what has been impacted to date will streamline the design and permitting to only focus on avoidance and minimization of resources not previously impacted. Environmental Compliance and Awareness Training (ECAT) will be provided so construction personnel have a clear understanding of the resources within the work areas.

Final Design Compliance Process

Environmental personnel will be deployed throughout the design phase to perform pre-, interim, and final design coordination to ensure environmental commitments and performance specifications and special and standard provisions are being implemented in a streamlined approach. We will evaluate avoidance and minimization opportunities to wetlands and waterways and the effectiveness of using measures such as retaining walls, steeper fill slopes, increased headwall heights, reduced roadway sections and any other feasible minimization efforts.

The environmental team will attend weekly task force meetings, such as roadway, utility, drainage and environmental task forces, to provide recommendations for avoidance and minimization of impacts to natural, cultural and socioeconomic resources. Actions items will be developed from these meetings with prioritization and deadlines to resolve issues. With SHA's goal of reducing impacts by 25%, task force meetings and quick resolution of issues will be critical in maintaining the schedule.

The environmental team will prepare mapping, resource delineation, avoidance and minimization studies, and proposed design drawings for the SHA EPD's submittal for acceptance and regulatory agency approval. Design compliance reviews will be approved by the EM and will accompany the design submittal. The environmental team will coordinate with SHA EPD to resolve non-conformance findings and will meet with the SHA EPD as needed to resolve issues, provide information and assist in

coordination with regulatory and/or environmental agencies and public outreach efforts.

If, during the final design, a proposed LOD exceeds the FONSI documented LOD, we will exhaust all avoidance opportunities to not impact areas outside the permitted LOD. If additional impacts are unavoidable, we will coordinate with the SHA EPD to develop the Environmental Reevaluation Consultation and, if required, prepare supplemental documentation to obtain FHWA's NEPA post-ROD refinement approval of the change. Documentation may include avoidance and minimization efforts, environmental assessment, mapping, changes in impacts to natural, cultural or socioeconomic impacts and proposed remediation to compensate for any additional losses.

A Forest Compliance Plan will be implemented in accordance with regulations and permits required as applicable to Maryland Roadside Tree Law, Reforestation Law and Maryland Forest Conservation Act. We have developed techniques and a process to investigate and document avoidance and minimization of forested habitats throughout the design process. Final design plans will be used to identify significant trees located adjacent to the LOD to be investigated by an ISA-certified arborist and Maryland licensed tree expert to determine the impact of proposed construction and the need for protection or removal.

Construction Compliance Process

Environmental specialists will be deployed throughout the construction phase to ensure compliance with the approved plan, environmental commitments and performance specifications, special provisions, and standard provisions are being implemented. The environmental personnel serve as a technical resource to the contractors by providing recommendations or plan interpretations in the field when questions arise. This is a key element in successfully minimizing risk to the schedule because of the instantaneous resolution of a potential issue.

Compliance during the construction phase starts with surveying the environmental resources for protection and avoidance such as verifying the survey crews accurately demarcating and labeling with appropriate flagging ROW, SHA wetlands, LOD, 100-year floodplains, significant trees, Norwich Creek 10-year floodplain limits, Norwich Creek 25-foot stream channel buffer for mechanized equipment, 30-foot stream channel vegetative buffer, protective habits and cultural resources.

Once the surveys have been completed, our environmental specialist will review the stakeout for accuracy and provide recommendations to the construction manager for additional avoidance and minimization opportunities, if they exist. The specialist will coordinate with the CM so orange protection safety fence can be installed along the ROW and critical sensitive habitats.

During construction, members of the environmental compliance team will be assigned to the project to monitor daily environmental compliance. Some of the typical monitoring responsibilities include:

- Monitor and document compliance, corrective actions and impacts on a daily basis
- Provide technical environmental assistance and proactive recommendations for deficiencies or improvements that are present
- Implement a pre-activity meeting and/or for specific activities such as de-watering operations in compliance with COMAR to discuss environmental resources, construction sequence, construction challenges, compliance construction restraints, construction schedule, E&S control and culvert maintenance of stream flow
- Perform joint field inspections with E&S Control Manager, SHA inspection staff, independent environmental monitor, SHA, and if available, SHA E&S QA inspector, MDE compliance inspector, and USACE representative
- Assist the ESCM in preparing OOC 062 Form Request for Revision of E&S Control Measures to modify the approved plan though the OED Toolkit in order facilitate construction operation
- When major E&S plan modifications are required, notify management immediately to coordinate and facilitate major plan design modifications and submit to SHA PRD, SHA EPD, MDE and USACE for approval
- Perform water quality monitoring for dewatering activities associated with construction using hand held water quality monitors
- Provide recommendations for treatment to the construction staff should water quality parameters be exceeded. The recommendations may include, but not be limited to additional E&S devices in a series or automated flocculant using devices

Post Construction Compliance Process

Once construction has been completed, temporary wetland and waters of the US impact restoration will be inspected to ensure impacted areas have been restored satisfactorily. Then, environmental impact tables will be finalized and submitted for review and approval to SHA EPD, MDE, and USACOE to obtain the final permit modification for impacts. Forest impact plates and reforestation plans will be submitted to SHA EPD and MD DNR for final approval. The remnant E&S control measures and temporary sediment trap removal and site restorations, reforestation planting and stream restoration that may have been constructed will be monitored for compliance.

D. QUALITY CONTROL MANAGEMENT

Through our long relationship, Kiewit/Parsons has established a best practices manual based on our policies and procedures that maximizes results in our design-build projects. Quality is at the forefront of these best practices. We value doing projects "right the first time." The key to achieving this is team-based quality control, in which each and every member, including SHA, has a role.

Project Team – Design Quality Management

Design-Build Project Manager

The design-build project manager is responsible for the project and ensures the team develops a comprehensive list of requirements, follows quality procedures, and assigns adequate resources and time to these activities. He empowers the design manager and design quality manager to adequately staff the project while also establishing project-specific policies and procedures. And, he holds them accountable for processes, training, meeting requirements and audits throughout the project.

Design Manager

The design manager ensures project requirements are properly defined–both in terms of work product inputs and deliverable outputs–based on quality expectations set forth in the RFP and our best practices. The DM works directly with SHA on properly aligning these expectations, proactively seeking additional information to establish our shared vision for the highest level of quality for the project.

To aid in this effort at start of this project, the DM will work with you on approving a carefully prepared Project Management Plan that clarifies expectations for quality deliverables and the information necessary to produce them, including any special requirements. Meetings will be held with SHA individuals to reach agreement on, and document, the requirements.

Design Quality Manager

The design quality manager assists the DM in developing a project-specific design quality control plan that includes the overall policies and procedures, quality control procedures, and frequency of internal and external audits. The DQM ensures that the team follows or meets all corporate policies and requirements and prepares reports documenting reviews and overall status of the quality program. As needed, this person also establishes training programs.

Project Engineer

The project engineers have a subset of responsibilities similar to those of a DM with regard to ensuring work is done right the first time. They must validate that design criteria are complete with selected options discussed and agreed upon with the SHA before any drawing is started. SHA's expectations regarding drawing presentation detail and quality with respect to the requirements of the reviewing and approving agencies must be determined during contract negotiations. All drawings will be prepared using SHA CAD standards including CADD cell and resources libraries. Samples of the drawings to be produced will be provided to SHA for their concurrence. Reports and other deliverables will be managed in a similar fashion.

Independent Design Quality Review Services

KCI will provide the Independent Design Quality review services for the MD 404 project for compliance with the project scope and contract documents, design consistency and coordination between disciplines and big picture constructability reviews for this fast paced and complex project. KCI will review the plans for compliance with SHA policy and procedures, proper application of incidental structures and standards, PRD and MDE requirements, and the project's contract specifications. KCI will also review each submission for compliance and provide comments on items that are not conformance with the requirements. KCI is familiar with Parsons Quality control requirements for Design Build projects and has worked with the design team on the ICC-B project.

Constructability Review

Constructability review included review of effectiveness of design during construction. Our review will include constructability issues related to MOT and the interaction of the public with the project. We will work with the Public Information staff to check the proposed work along the route and see if there are conflicts with traffic shifts in adjoining sections, access to residential and business properties, farmers access to their fields with large planting and harvesting equipment, and the movement of construction equipment along the route has been addressed. The process help assisting and monitoring how effective the proposed design are working for the use of pumps, diversion and sand bag pipes, and phasing to see if there are faster and less disruptive methods to build these crossings once the project gets started.

Design Quality System

Project Management Plans

The PMP establishes agreement by the client, the project manager, DM, senior project staff, and special consultants on quality requirements before substantial resources are committed to performing work. These specify the expertise, level of effort, equipment and facilities necessary to provide products and/or services for this project. The PMP will be a dynamic working document regularly updated to document changes throughout the project such as staff, communication, requirements, commitments and lessons learned.

Quality Control Plan

A major element of the overall PMP, the design quality control plan is based on Kiewit and Parsons' best practices and certified processes documented in the ISO 9001: 2008 Parsons Quality Manual; Parsons Quality, Engineering/ Design and other related procedures; and Parsons PACE Quality Manual.

ISO 9001: 2008

Since 1999, Parsons Transportation Group has held this international standard (ISO) certification, indicating we are a committed and qualified world-class leader in quality management. Documented quality procedures provide standards for our project-specific plans and how staff performs quality control activities. A major goal of all of this is to provide a basis for optimizing construction staff success and eliminating rework.

Defining Requirements

Quality is defined as "conformance to requirements." Therefore, to best evaluate quality, project requirements must be clearly defined, communicated, understood, and agreed to by all parties before, not after, work starts. Doing so will establish shared expectations by both SHA and the D-B team about the staff, information and tools needed to perform work right the first time and avoid excessive expenditures for audits, checking, and rework. Based on the RFP, federal and state standards and general practice, the overall initial list of requirements was developed during the bid phase (pre-award), and serves as the basis of the workplan and technical proposal.

Our team has developed a risk-based requirements management system called PAR-PRO™ (previously known to Maryland DOT as Q-Most). This database-driven application organizes requirements of the contract and the RFP based on risk, then links them to the document control system and project schedule. This enables all team members to review progress on submittals, including QA/ QC records, and fully understand project needs before, during and after task completion.

When the entire team understands and agrees to the requirements, the expectations can be set and met. We must strive to work as a team in order to define, communicate, and fulfill requirements the first time - every time.

Solution Development

Once requirements are defined and agreed to, work begins towards solution development. The following techniques will be used to meet the project requirements:

- Task forces and over-the-shoulder (OTS) reviews
- Formal interdisciplinary reviews including environmental and constructability
- Formal quality control
- Quality assurance and audits

Engineering Development

From the initial release of the RFP, we began developing enhancements and approaches to meet the project requirements including schedule. This will continue until project completion and involve all members of the team from SHA, quality control, environmental, design, safety and construction.

Task Forces and OTS Reviews

Our established development task forces will continue to address the multiple facets of the project, quickly solve challenges, optimize solutions and speed reviews. These task forces will build on our team's successes on the ICC-B project — winner of the 2013 MdQI Silver Partnering Award — developing open and honest atmospheres where all ideas or concerns can be voiced and addressed. This approach allows for quick resolution of challenges at the appropriate level, eliminating unnecessary delays and disagreements. OTS reviews as part of these tasks forces foster discussion of progress, issues and addressing comments on the spot that ultimately speeds approvals, permitting and other reviews. This also optimizes incorporation of environmental, constructability and community elements early in the development of solutions when they can most easily be accommodated into project design and schedule.

Formal Interdisciplinary Reviews

In addition to the task force and OTS reviews and discussions, interdisciplinary reviews of environmental, constructability and other plans will be formally conducted prior to submittals going to SHA, PRD or other approval or permitting entities.

Formal Quality Control

Our team has developed standard quality control procedures which include the following.

Design Quality Control Checking Policies and Procedures

The DM or project engineers for specific disciplines appoint experienced engineers who check work product such as design analyses, drawings, specifications, cost estimates,

other contract documents, and reports before its submission to our clients. Checkers perform their reviews independent of engineers who prepared the design and have experience equal to or greater than them. All check prints (or reviews in the case of reports and other documents) have stamps, requiring the "checker," "backchecker," "corrector" (person who makes the corrections), and "verifier" (person who verifies that corrections have been made) to sign a line when their stage of the process is completed.

Subconsultant Quality Control

We require our subconsultants to perform services with the same level of diligence and care that we expect of ourselves. Each is required to submit a quality program plan for the DM's approval or commit to strictly follow the Quality Management System (QMS).

Software Quality Control

All commercially available or locally developed software for design or calculations must be validated before it is used on the project. Complete documentation of the validation including fully-checked calculations, input and printout, and a brief description of the process is to be placed in the project files and available for audit.

Quality Audits

Internal Quality Audits

Periodically, quality assurance staff will perform audits of planning and design-related functions to determine compliance by project managers, project staff and support personnel with the QMS. Such reviews enable us to identify opportunities to improve and also modify work practices to ensure continual improvement. Audit findings are entered into the online Audit Finding system. Responses and recommended corrective actions are documented and are to be completed in a timely fashion. All staff members are expected to be familiar with the quality audit procedures.

Our management team also reviews QA, audit results and client assessments to ensure the continuing suitability, adequacy, and effectiveness of the QMS.

ISO 9001 Certification and Surveillance Audits

The QMS is audited on an annual basis by an external ISO 9001 Registrar. A select number of project offices and projects are audited for compliance with the ISO 9001 requirements in the Quality Manual. The audited locations are selected on a rotational basis and/or if the particular location was not previously included in an external ISO audit.

The QMS undergoes a recertification audit every three years and a surveillance audit in the interim years. The number of days at a particular audit location (permanent project office) is based on the number of personnel working in that office.

Administration Involvement

As mentioned earlier, quality is a team effort and that includes the Administration. Full partnering starts with early communication and coordination that are essential to building working relationships and trust needed for project success. This must continue throughout project design, construction, and close out. The five major areas of administration involvement:

- **Agreeing to requirements.** SHA will be asked to review the tracking database and applicable standards contained within the PAR-PRO™ through completion. This helps everyone understand needs and sets expectations early in the project. Just as important, this helps speed reviews, approvals, permitting and close outs since everyone knows what is needed to satisfy each of these elements.
- **Involvement in task force meetings and OTS reviews.** We will ask SHA to participate in task force meetings and OTS progress reviews. These tools help to build trust and understanding of design intent. They also result in an open and honest atmosphere for raising challenges early when they are most easily handled and project solutions can be optimized to account for safety, environmental, community, design and construction aspects. In addition, these tools help speed the review and approval process to ensure schedules are met.
- **Reviewing validation documentation which includes software selection and assumptions.** Through task force and over the shoulder meetings, as well as formal submittals, the Administration will be asked to review calculations and software use. This will include assumptions as well as software selection. Some software design packages are more suited for specific applications than others and proper selection and assumption development are keys to successful design and construction. Early review and comment by the Administration will help us avoiding schedule delays or other design issues.
- **Reviewing/Audit quality control documentation.** Our team will keep design, as well as construction, quality control information accessible in online records. This will include review reports and quality audits. The Administration will be given the opportunity to review these records as often as desired.
- **Final Acceptance.** SHA will assist with MDE final review and acceptance of as-builts but also perform its own review prior to acceptance. This is very similar to what SHA performed on the Intercounty Connector. ICC B, designed and built by Kiewit and Parsons was the first of the segments to receive acceptance by MDE and was the first fully accepted section.

VALUE STATEMENT:

Providing a safe roadway while minimizing delay both during and after construction is needed for the multiple users of the MD 404 roadway. The Design-Builder will demonstrate how it will achieve these goals.

2.09.03 SAFETY AND MOBILITY

GOAL: Safety – Safe roadway with zero fatalities and serious injuries during and after construction.

GOAL: Mobility – Minimize delay during and after construction.

A. SAFE TRAFFIC MAINTENANCE

The design-build team performs Maintenance of Traffic (MOT) work in accordance with the project requirements and the guidelines provided by SHA for a safe and efficient movement of all road users and construction workers with minimum delays to the traffic. MOT will follow the Temporary Traffic Control Typical Applications (TTCTA) as follows:

- Shoulder work will be set up in accordance with standard MD-104.02-01
- Lane shifts will be set up in accordance with standard MD-104.02-03
- Lane shifts for complete travel way blockages, where necessary, will be set up in accordance with standard MD-104.02-07
- Bypass detours, where necessary for bridge or culvert construction, will be set up in accordance with standard MD-104.02-11
- Maintenance of traffic for the pavement edge drop-off greater than 5" with an adjacent lane closure will be setup in accordance with MD-104-06-18 in combination with the above signs
- Detour Signing will be set up in accordance with standard MD-104.06-05

MOT plans will be prepared for construction phasing and staging and proper traffic control based on the existing traffic patterns. Before preparing MOT plans, we conduct field visits to observe traffic patterns and review the following traffic related information provided by the RFP:

- 24-hour vehicle classification data for average weekdays and weekends at various locations along MD 404
- Peak hour turning movement counts at major signalized intersections on MD 404. Roadway geometry data, including lane and shoulder widths at various locations along MD 404 and alternate routes
- Speed limits

In addition, existing signal timing data and crash information will be obtained from SHA for traffic and safety operation analysis.

The 24-hour volume provided in the RFQ on MD 404 will be plotted to determine hours for lane closures. Work zone capacity analyses will be conducted using Synchro and QuickZone software to determine the impacts of lane closures, lane width reduction and speed reduction, if required. Crash data provided will be used to evaluate the safety conditions and to plan the detour routes.

Access and Mobility Plan

Based on the input from traffic and safety analyses, MOT plans will be prepared for each specific construction activity. The MOT strategies will be prepared to minimize traffic delays and maintain safety during peak and off-peak hours.

The traffic control plan is designed to impact the traffic to the minimal extent possible, while providing for both the safety of the traveling public and the safety of the construction team. Figure 8 shows that the vast majority of construction operations will have little or no impact to the traffic.

Figure 8: Traffic control strategies and estimated durations

Construction Operation	Shoulder closure	Shoulder shoefly detour[1]	Truck entrance/exit	Flagmen single lane detour[2]	Traffic switch to westbound	Traffic switch to permanent
Expected impact to traffic	Minimal impact				15 minute impact	
Grading westbound 2016			70			
Grading eastbound 2017			20			
Graded aggregate base			45			
Drainage in EB lanes		80				
Drainage in WB median/lanes	20					
Paving westbound	45		45		1	
Shoulder removal & replacement				25		
Repairs to eastbound	25			45		
Asphalt milling				15		
Asphalt overlay				35		
New asphalt pavement	15	10		10		
Median barrier	30					
Pavement markings				10		1
SWM finalization	10		10	10		
Job Totals	145	90	190	150	1	1

Note: All quantities are in estimated work days.

[1]Temporary traffic alignment | [2]Single lane on new WB & old EB

In addition, based on the results of the safety analysis, temporarily auxiliary lanes will be constructed and special signal timing plans will be prepared to mitigate congestion and avoid rear-end and angle crashes during construction at the intersections of US 50, MD 309 and MD 480.

In the case of long-term shoulder use (periods greater than two days), we will investigate the load bearing capacity of the shoulder. Where the investigation indicates that the shoulders are not suitable for traffic, the shoulders will be strengthened. We will use traffic control devices per MD-104.02-01 for all shoulder closures, and protect all drop offs to keep the travelling public safe.

The MOT plans will include hours of operation and important contact information. In addition, sequence of construction plans will be prepared with proper signing and pavement markings based on the standards given in the SHA Book of Standards for Highway and Incidental Structures.

Lastly, the majority of MOT will occur from June to December 2016, and from April to November 2017. The majority of activities in the 2016-2017 winter season will require minimal MOT. Below are the access and mobility plans for the specific operations on the project.

Excavation and Embankment

One of the first early activities is the excavation and embankment of onsite material for storm water and roadway construction. While some of the material will be moved in station, the majority of the material must be hauled from one project area to another. We are using legal haul dump trucks on the existing MD 404 roadway to transport the material throughout the jobsite. While there are some exceptions, the majority of the material is being moved from Contract A to Contract B. In this scenario, the haul trucks are loaded, head east on MD 404, and return empty traveling west on MD 404. Based on this sequence, each haul truck enters the roadway by crossing the westbound lane and accelerating on the eastbound lane, and exits the roadway by decelerating on the eastbound lane, and crossing the westbound lane.

Once empty, the truck only utilizes the westbound roadway to return to the loading site. In order to accomplish this work safely and with minimal impact to travelers, we will include full time flagmen and MOT devices at each access point throughout the jobsite. These locations will be setup at planned defined intervals, so that truck traffic is not entering at random points. Currently, we plan to use several of the farm roads and other existing roads as access points along the corridor. We will also space these access points at reasonable intervals to minimize the total number, and only have one entrance and exit point at any given time throughout the operation.

All trucks and flagmen will be equipped with radio communication, and once a truck needs to exit or enter the roadway, the flagmen will slow or stop traffic, flag the truck onto the roadway, and return traffic to the normal pattern. Due to the overall volume of trucking on the project, our plan ensures that the traveling public is kept safe, and reduces impact to their travel time.

Box Culvert/Pipe Crossing Construction

Another early activity includes the storm drain and box culvert construction. For pipe construction, the pipe must be installed across the entire roadway, including the existing lanes, and cross under the new lanes. To meet the storm water compliance rules and ensure a fully functioning system, it is most beneficial to install all of the pipe from the downstream side working towards the upstream side. In most cases, this sequence requires construction from south to north.

For the majority of storm drain construction, our plan is to start the pipe construction that crosses the eastbound roadway in two phases. First, two-way traffic would be shifted to the north into a two 11' lane scenario. Traffic would ride on the existing shoulder of the westbound lane. Once traffic is shifted, our pipe crews will install the first piece of storm drain as close to the traffic shift as safely possible. When the pipe is backfilled and the riding surface is replaced, two-way traffic would be shifted to the south, also in a two 11' lane scenario, riding on the existing shoulder and eastbound lane. This shift provides enough access to locate the new pipe that was just installed, and continue the pipe run to the north.

Once the pipe is installed outside of the existing lane footprint, the roadway will be returned to its original configuration. The remaining pipe that ties into the new roadway system can be completed with no remaining traffic control. Traffic shifts will only occur within the time windows allowed per Section 104.01 of the Special Provisions. Our plan is to complete several adjacent pipe locations into one traffic shift, to minimize the amount of MOT required, improve productivity, and reduce impacts to the traveling public. By completing all of the pipe work in one sequence, we will have the majority of it completed in the fall of 2016 season, with little remaining work in 2017. This sequence ensures that beach traffic is not impacted in 2017, and that all work is completed outside of the environmental restriction windows that occur in Spring 2017.

Bridge Construction

Once all of the embankment is placed in the Norwich Creek area, we will begin abutment construction for the future bridge. When the abutments are cured, we will backfill the abutment to final grade, allowing for good access for the bridge material deliveries including the precast girders and

deck concrete. The concrete girders will be delivered to the project on MD 404, and then off of Partnership Farm Lane. Once the transport is near the abutment, the cranes will erect the girder over Norwich Creek.

Concrete Paving

Similar to excavation, our concrete paving operations will require on-road legal haul trucks to place the concrete. They will have similar traffic patterns to the excavation operations, and will also include MOT and flaggers at each location to protect the traveling public and assist in the efficient delivery of material. For the access/exit points, we will use the future J-Turn and T intersections as our primary points of access and exit for the trucks. At each of these locations, the grade will already be constructed to support the future intersection concrete, and these areas provide a level surface for truck access in and out of the jobsite. For each concrete pour, the trucks will be provided with a haul plan that ensures every driver knows how to safely deliver the concrete. Each truck will follow a cyclical haul pattern so all drivers follow the same path to prevent traffic incidents or delays to travelers.

Eastbound Reconstruction

Once the westbound roadway is completed in summer of 2017, we will shift all of the MD 404 traffic in a two-way configuration on the newly constructed westbound lanes. After the shift, our crews will be able to complete the remaining grading, storm drain, and landscaping work on the eastbound lanes. Lastly, our team will complete all of the roadway repairs, along with the mill and overlay construction on the existing eastbound lanes. Our approach of completely moving traffic away from the existing lanes will eliminate the need for major closures and restrictions on the existing lanes, especially during the mill and overlay operations. Additionally, side roads are available for travelers in the event of an incident and flagmen will allow emergency vehicles through to avoid detours. Overall, this plan improves safety, productivity, and keeps the traveling public moving through the corridor minimal impacts to travel time.

Detour Plans

Our team has identified potential alternate routes and prepared preliminary detour plans for incident management during construction. These detour plans can also be used as standalone plans in the absence of incidents to re-route traffic for lane closures, structure replacement, and construction at major intersections to safely and effectively maintain flow of traffic during construction. Separate plans will be prepared for segments of MD 404 in the eastbound and westbound directions. Plans will be prepared in coordination and consultation with SHA engineers and submitted for approval before implementation.

During detour conditions, appropriate traffic control devices and personnel–including traffic signs, traffic cones, portable message boards, and police officers–will be deployed to prohibit travelers from entering a closure zone and direct them to the designated routes. Information materials, such as traffic alerts and press releases with helpful maps or graphics will be supplied as specified in advance of any planned detours for approval and distribution to local and regional media, as well as police, fire/EMS and other important stakeholders. Media such as radio, television, websites, and social media will be used to provide the public with the latest information regarding the closure and detour.

In the examples shown below, there are potential detour setups for incidents within a roadway segment. However, this same detour could be deployed with proper notification for work zone scenarios that require total road closures. While identifying detours, local traffic access and truck traffic access will be taken into consideration. Our goal would be to divert the traffic to an efficient distance that would not increase the trip time or distance traveled by local traffic or truck traffic.

Phase IIA (one segment)

Routes 480 and 312 can be used as a detour route, for both west and eastbound directions. The travel distance would increase by 1.6 miles, and the travel time would increase by approximately three minutes. Additional delays will be caused by this detour that require detailed traffic analysis.

Phase IIB (one segment)

Old Queen Anne Highway, Cordova Road and Route 303 can be used as a detour route, for both west and eastbound directions. The travel distance would increase by 0.3 miles, and the travel time would increase by approximately two minutes. Additional delays will be caused by this detour that require detailed traffic analysis.

Phase III (one segment)

Holly Road, Central Avenue, School Road and Route 480 can be used as a detour route for both west and eastbound directions. The travel distance would increase by 2.5 miles, and the travel time would increase by approximately six minutes. Additional delays will be caused by this detour that require detailed traffic analysis.

Phase IV (two segments)

Segment 1 (between Route 50 and Church Lane):
Route 50, Route 213, Grange Hall Road, Charles Boyle Road and Fox Meadow Road can be used as a detour route for both west and eastbound directions. The travel distance would increase by 6.2 miles, and the travel time would increase by approximately 14 minutes. Additional delays will be caused by this detour that require detailed traffic analysis.

Segment 2 (between Church Lane and Old Queen Anne Highway): Fox Meadow Road and Route 309 can be used as a detour route, for both west and eastbound directions. The travel distance would increase by 4.1 miles, and the travel time would increase by approximately six minutes. Additional delays will be caused by this detour that require detailed traffic analysis.

B. INCIDENT MANAGEMENT PLAN

The safe and efficient flow of traffic within work zones is a major concern and priority for this project. Incidents within a work zone lead to traffic congestion that cause traveler delays, as well as delaying progress to the construction project. Additionally, incidents within a work zone pose a risk of secondary accidents as traffic slows or stops unexpectedly. According to the Maryland Work Zone Accidents Comparison 1994-2003 report published by SHA in May 2005, there were a total of 26,720 statewide work zone related crashes within the ten-year period (from 1994 to 2003), 119 (0.4%) of which involved fatalities.

Crash information obtained for MD 404 from 2005 to 2014 indicates that on average, 40 crashes per year occurred along this road during the 10-year period, including 12 fatalities. Since MD 404 is a high speed, heavily travelled corridor, we will employ incident management strategies to maintain efficient traffic flow and motorist's safety after an incident occurs. These strategies are developed based on SHA Transportation Management Plan (TMP) guidelines for incident management during construction.

Communication Plan

We prepare a comprehensive incident plan for a better coordination between different agencies and personnel in case of an incident during construction. The MD 404 Incident Management Plan includes a list of key personnel including names and contact information, Design-Build team members, MD 404 maintenance staff, SHA safety patrol, and emergency responders including the fire department, EMT and highway police. A contact protocol is prepared to notify and respond immediately to an incident within the work zone.

Prior to project construction, our team meets with critical parties including emergency responders and SHA Safety Patrol to discuss the project details and the phasing plan of construction. During this meeting, we tour the jobsite with the critical parties to show them access/egress areas, the shortest route of response, and discuss other key points to manage any incidents. These meetings continue as the phasing changes, to ensure all emergency personnel can respond in a safe and timely manner.

Emergency Pull-outs

Emergency pull-out areas will be provided at different locations along the work zone to pull-off disabled vehicles without obstructing the flow of traffic. These pull-out areas provide locations for crash investigations, providing safe locations for travelers, increasing mobility after an accident, and minimizing impact to construction operations.

Incident Notification to Travelers

As soon as an incident is detected and notified to the SHA safety patrol and state/local police, we take following actions while waiting for the arrival of the safety patrol and police:

- At least one vehicle with a flasher is dispatched to the incident site to maintain flow of traffic and safety for the travelers
- Assistance is offered to the vehicle owner(s) to move to the nearest emergency pull-out area from the travel lane
- If there is a potential for congestion and queueing before the arrival of emergency services, a vehicle with a flasher is stationed at the end of the queue to warn approaching drivers
- Implement lane closures with onsite flaggers

Standby Towing Service

An on-call towing service is provided at different locations along MD 404 work zones to increase response time and to remove vehicles involved in a crash or breakdown. Prior to construction, we meet all local towing services within the corridor to determine the companies that can respond in the quickest manner, and to identify backup firm if the primary firm is unable to provide services.

Planned Detour Routes

Specific eastbound and westbound detour plans are prepared to re-route traffic in case of an incident that requires closure of a section of MD 404 during construction. These plans are prepared in coordination and consultation with SHA engineers and are submitted for approval prior to implementation.

The detour plans indicate major intersections or exits along the detour routes, truck restrictions on detour routes, if any, and detour signage. The plans consist of maps prepared using ArcMap and detour narrative. If possible, more than one detour routes is identified for each roadway segment. This allows for rapid deployment of a detour when needed to minimize impacts to the traveling public.

Incident Management Plan Traffic Control Devices

Traffic control devices, including variable message signs (VMS), arrow boards, work zone signs, drums, cones, barricades are set aside are stored at the field construction office. These devices are available for incident management

within the construction zone. The location of the construction office may change based on the work zone location to provide timely response to the incident. Personnel responsible for storing and using these devices are trained to respond to incidents during construction. A complete list of the location and number of the devices, and contact information of the responsible personnel are prepared and distributed to the D-B team.

Use of ITS for Incident Management

The incident management plan includes the use of ITS devices, such as VMS and traffic monitoring video devices, and highway advisory radios. These ITS devices support detection and provide timely response to the incidents and detour traffic to alternative routes.

Full-Time Traffic Manager

A full-time traffic manager is assigned to the jobsite for every shift of construction. Their responsibility is to supervise all activities related to MOT, monitor the work zones, support incident management throughout the life of the project. This manager ensures our work zones are safe for motorists, impacts to traffic are kept to a minimum, and ensures all activities meet the laws and regulations.

First-Aid Training

Our team provides first-aid training to all project staff and craft foreman on the entire project, which allows our trained project leaders to provide the necessary first aid services to the travelling public prior to the arrival of emergency response teams. This training provides key life saving techniques to the travelling public and construction team.

C. SAFE ACCESS TO AND FROM ALL PROPERTIES

Widening MD 404 will be accomplished by staged construction. In the first phase, the additional road width will be constructed off-line to the north of MD 404. In addition, curb and median will be installed where possible for the ultimate condition in this phase. Properties on the north side of MD 404 will be provided access through these work zones that will be tailored to the type of vehicle required. Driveway extensions must be wider for properties that involve ingress and egress of farm equipment or heavy vehicles. Figure 9 shows how access will be extended through the work zone.

Where several driveways are consolidated, temporary access roads will be constructed to direct these properties onto an adjacent side street. This eliminates private access through a work zone and reduces the number of access points per mile along MD 404 during construction. Figure 10 on the following page, shows how one temporary road can eliminate four individual personal property access points.

In the second phase, all traffic will be shifted to the newly created westbound lanes in order to widen and improve the eastbound lanes and shoulder. In this case, properties on the south side of MD 404 will require access through work zones or a temporary road will be constructed to consolidate driveways and direct them to an adjacent side street. In addition, temporary pavement will be constructed through the grass median segment areas at intervals to provide designated left-turn and U-turn areas to cross drivers over from the new westbound lanes to property driveways off the old, eastbound lanes.

Finally, one lane of traffic will be maintained in each direction on their respective new westbound or improved eastbound lanes while the median is constructed. In this phase, driveways to properties on both sides of MD 404 will be temporarily designated as right in-right out access only, with designated U-turn areas will be provided at intervals to allow drivers to turn in the opposite direction.

There are no signalized intersections within the project limits, so no temporary signal plans will be prepared. However, there are approximately 16 unsignalized intersections within the project limits, along with over 30 driveways. Six of these driveways are named farm roads that are expected to involve large farm equipment and multiple trips per day that will require uninterrupted access.

Both unsignalized intersections and driveways require temporary access during construction that may require temporary pavement during some phases. Right-in/ right-out access will be employed at low-volume ingress/ egress points to consolidate all left-turns to designated U-turn locations. The U-turn areas will be designed to accommodate truck traffic and farm equipment. Heavy

Figure 9: Extended farm equipment access

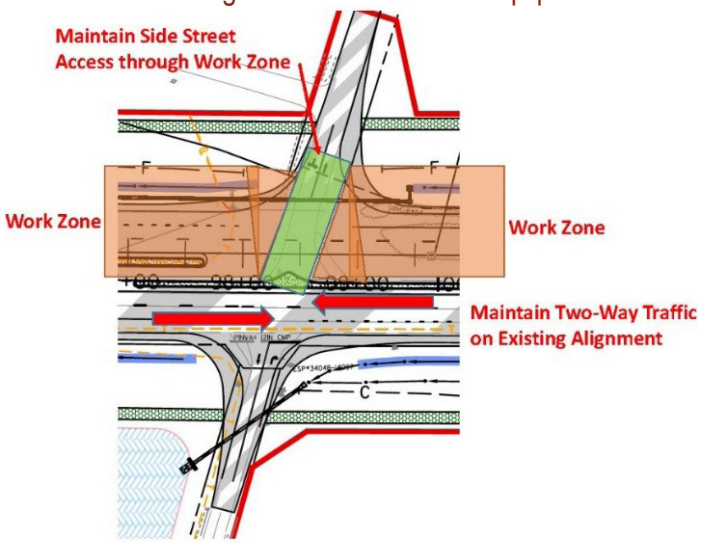
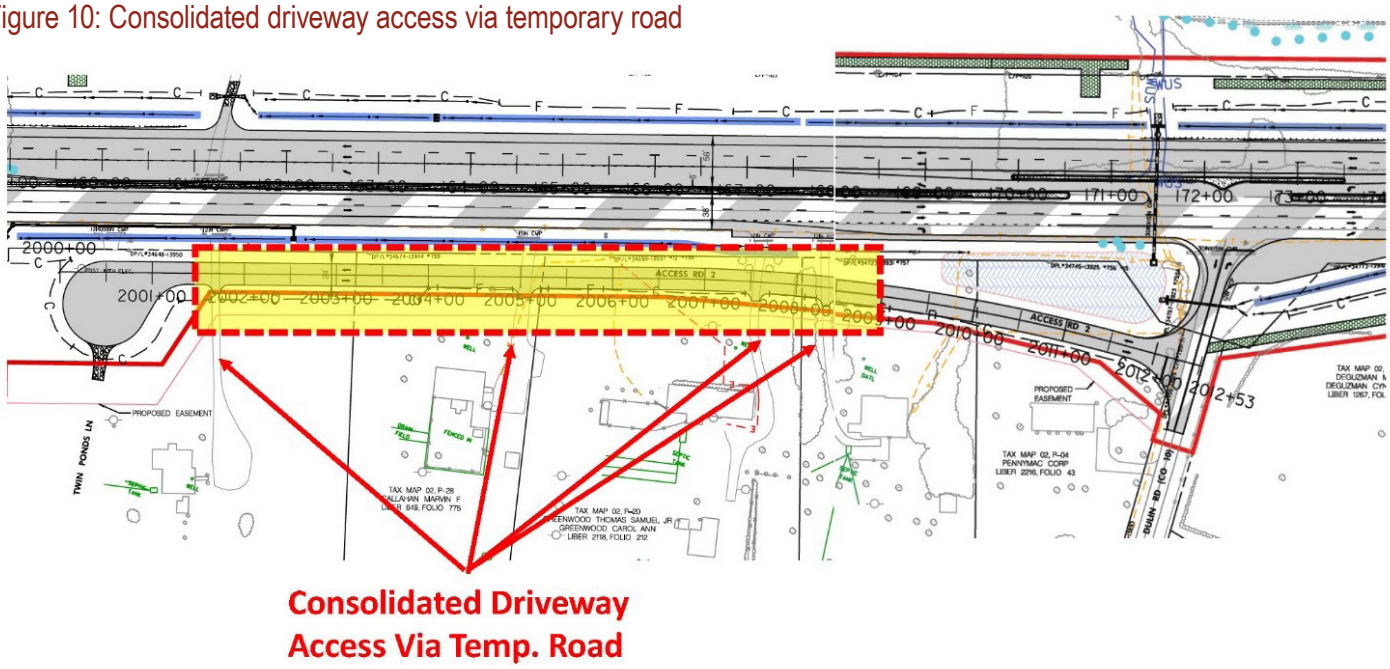


Figure 10: Consolidated driveway access via temporary road



vehicles are longer and require a larger turning radius. Farm equipment is typically wider, so while the turning radius required is often not as great as for tractor trailers, it must be designed for a wider entry and exit path.

After construction, all temporary access roads will be eliminated. The fully dualized section of MD 404 will provide additional shoulder width for large farm equipment to be able to use one lane and the shoulder, while allowing following vehicles to pass easily. Limiting left turns along MD 404 to designated T-left and J-turn junctions is expected to significantly reduce or eliminate angle crashes by consolidating these movements at specific locations that are median-protected from both read-end and on-coming traffic, and where long sight distances allow drivers to choose acceptable gaps in the oncoming traffic stream. The extra pavement width at the J-turn locations allows drivers to either make wide turns if their vehicle requires the extra turning radius, or it allows a driver to cross both oncoming lanes of traffic, wait in this paved area, and re-enter and merge into the lane when traffic has cleared again. This allows even smaller gaps in traffic to be utilized safety with essentially a two-stage crossing.

After construction, the additional lane in each direction will significantly reduce rear-end crashes by removing turning traffic from the through traffic stream. Currently, almost half of all crashes on the two-lane segment of MD 404 are rear ends. The additional lane in each direction also eliminates head-on crashes, since drivers will now have a passing lane. Head-on crashes are particularly severe in terms of injuries and fatalities.

D. MINIMIZING DELAY WHILE MAXIMIZING SAFETY

The project involves constructing two 12’ lanes in each direction, with 4’ inside and 12’ outside shoulder widths. The project also involves implementing access management along the study corridor by eliminating left turns from side streets, driveways, and access roads and consolidating them with J-turns at specific locations.

The average daily traffic on MD 404 is about 18,000 vehicles per day (vpd), including 16 percent heavy vehicles. The light traffic (Classes 1 to 3) includes 14 percent light truck traffic. During the summer, the daily traffic volumes on MD 404 increase to 23,000 vpd, reflecting the influence of recreational travel to and from beach areas.

According to Highway Capacity Manual (HCM 2010), a two-lane, high speed roadway operates at LOS D or better for the daily traffic threshold between 16,500 vpd to 31,199 vpd and 10 percent truck traffic. This threshold includes up to 10 access points per mile. Although the daily traffic volume on MD 404 is within the HCM threshold for this type of facility, the heavy vehicle volumes are significantly higher and contribute to traffic congestion. In addition, delay occurs along the corridor due to the two-lane section, as vehicles platoon behind slower moving vehicles, heavy vehicles, and farm equipment, where they must wait for a passing section and an opportunity to pass when there is no oncoming traffic in range. Vehicles entering and exiting the highway intermittently with several driveways and side streets along the corridor also is another major cause for platooning and reduced operations along the arterial.

For a four-lane rural highway, the daily service volume threshold is between 63,100 to 73,800 vpd, which means that in the build condition, the capacity of a four-lane highway is two to three times higher than the daily traffic volume traveling on MD 404. It is expected that the widening of MD 404 from a two- to a four-lane highway will alleviate traffic congestion on MD 404 for build out year and for traffic conditions well into the future.

Corridor crash data for the past 10 years (2005-2014) was evaluated. Historical crash data reveals that the corridor had several crashes involving fatalities along the corridor. The safety benefits of this project in the build condition are immense. A total of 402 crashes occurred along this segment during a ten-year period from 2005 to 2014, which averages to about 40 crashes per year. Twelve of those crashes involved fatalities. Figure 11 illustrates the number of crashes each year on MD 404.

Almost half of the 402 total crashes were rear-end crashes. MD 404 is a high-speed roadway posted at 55 mph, and with long, straight and level roads, drivers tend to exceed the speed limit. Vehicles that are slowing or stopped to turn left onto a side street or driveway are directly in the path of following vehicles, because most intersections lack auxiliary lanes for turning traffic.

Rear-end crashes are all too common when following drivers do not see in time that they need to stop. These crashes tend to be severe due to the speed differential involved. Highest number of fatal crashes occurred along the corridor due to rear end collisions and due to angle collisions. There were two fatal crashes involving pedestrians also along this corridor in the last 10 years.

The purpose of the project as documented in the FONSI is to alleviate traffic congestion and improve safety throughout the study area. Particularly, during peak traffic volume periods and weekends during summer when the tourist traffic is high.

In the build condition, these crashes are expected to be significantly reduced by adding a through lane in each direction, as well as by providing median-protected turning lanes for left- and U-turn movements. According to FHWA Toolbox for Countermeasures and Effectiveness for Roadway Departure Crashes, increasing the number of lanes reduces rear-end crashes by 52 percent. The dedicated turning lanes improve this number even greater by removing these vehicles completely from the through traffic stream. According to FHWA toolbox, construction of acceleration/deceleration turn lanes reduces the possibility of rear-end crashes by 79 percent.

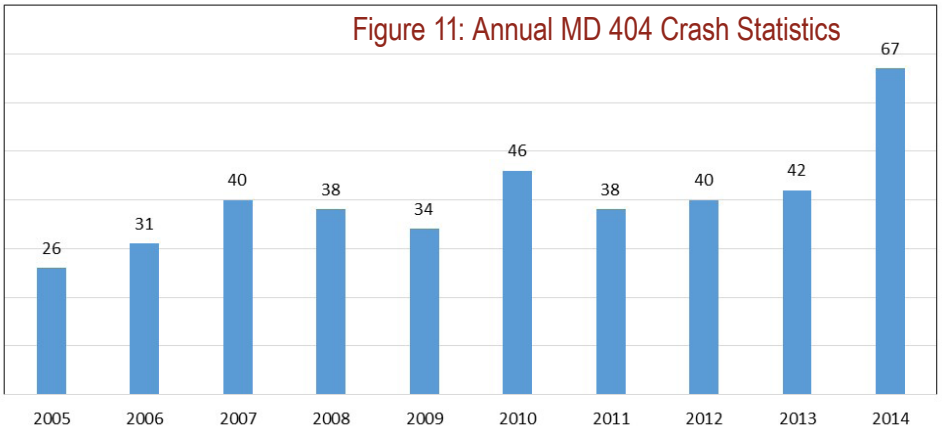
By providing four lanes and a 10-wide shoulder in each direction, the farming vehicles in this area can utilize both the right lane and the shoulder as they travel from field to field. This keeps the passing lane open for faster moving vehicles, improving safety for both.

The corridor currently has about 46 unsignalized access points, or about 5 access points per mile. There are no signalized intersections within the project limits, although the west end of the project terminates at the signalized intersection of US Route 50 and MD 404. A combination of speed and traffic congestion lead to a high frequency of angle crashes, as drivers from the side streets attempt to cross the main line, or when drivers on MD 404 attempt to turn left into a driveway in front of oncoming traffic rather than stop in the through lane.

In the build condition, the proposed improvements along MD 404 include access management strategies by constructing a median that eliminates left turns from most driveways and side streets. Where left turn access must be maintained, construction of Maryland T-intersections allows these left turns to cross into a median-protected area to allow vehicles to make a two-stage crossing of one direction and then wait for the other direction to clear. This configuration reduces conflict points and allows driver greater comfort in roadway crossing. Figure 12 on the next page shows an illustration of a Maryland T-intersection treatment.

Since most private driveways and smaller/less traveled side streets will be converted to right in-right out only access in the build condition, either partial or full J-Turns are constructed at specific locations to allow for U-turn movements to access the opposite direction from the mainline. If a J-turn is constructed at an unsignalized intersection, this configuration also allows left turning traffic. The J-turns allow direct left turns from the mainline using

Figure 11: Annual MD 404 Crash Statistics



physical barriers but restrict all left turns from side streets. Utilization of these U-turn locations does not reduce the overall number of access points per mile, but it restricts the number of access points on each side of MD 404. Figure 13 shows an example J-turn.

The additional pavement on the shoulder opposite the J-turn is to allow heavy vehicles that have a longer wheelbase, as well as farm equipment that typically have both a longer and wider wheelbase, to complete U-turns within the pavement section but out of the through traffic lanes. This is especially important for farm equipment in this rural area, since these vehicle types tend to be much slower than the posted 55 mph speed limit. With the shoulder "J" pavement, a farm vehicle can cross both lanes of oncoming traffic and then take additional time to complete the movement outside of the travel lanes before then finding the next gap to merge into the right lane.

This design would remove conflict points at unsignalized intersection reducing crashes and also improving vehicle through put. "Conflict points" are the points were two vehicle paths cross, which means the point where there is a potential for a crash. Typically, a three legged intersection presents nine conflict points and a four legged intersection has 42 conflict points. However, using the J-turn intersection or a Maryland T- intersection would reduce the number of conflict points to two points or even zero. This design would improve the overall corridor safety tremendously.

The crash history on MD 404 indicates a total of 67 angle and left turn crashes during the 10-year period, or an average of almost 7 crashes of this type per year. Channelizing the mainline left turns and eliminating left turns from the side streets is expected to significantly reduce angle and left turn collisions at major intersections, as well as at access points along MD 404.

The construction of these improvements are expected to negate any need for additional signalized intersections for the near future. Signalized intersections can increase rear end crashes, since they introduce full stops on MD 404 that the project improvements are intended to reduce.

Figure 12: Maryland T-Intersection

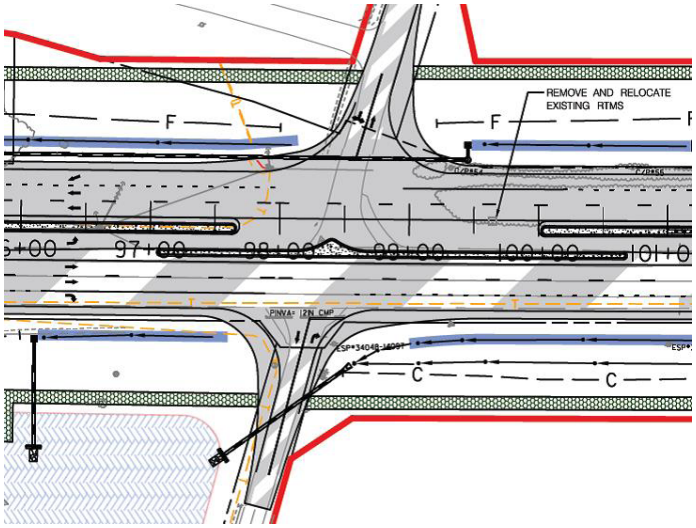
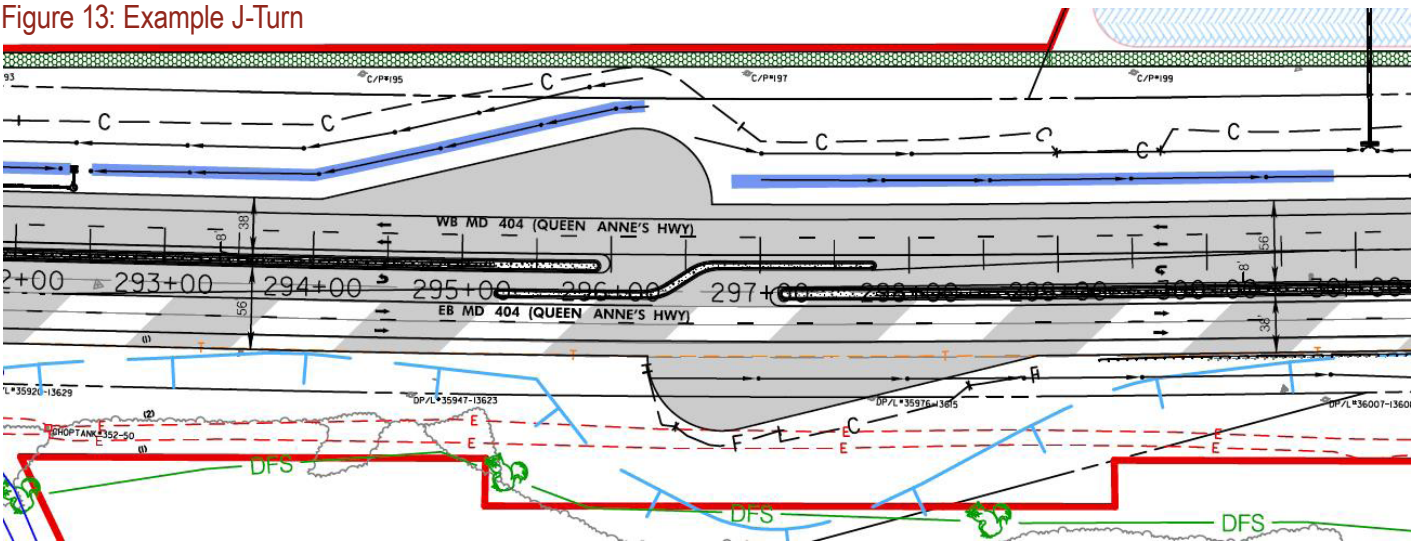


Figure 13: Example J-Turn



2.09.04: Customer Satisfaction

VALUE STATEMENT:

Communication and partnering with stakeholders that fosters problem-solving and a collaborative relationship with all stakeholders will be needed to achieve a successful project. The Design-Builder will demonstrate how it will achieve this goal.

2.09.04 CUSTOMER SATISFACTION

GOAL: Customer Satisfaction – Ensure satisfaction of the project stakeholders.

Our team truly recognizes the high-profile nature, sensitivities and critical importance of this historic project to local residents and businesses, who travel MD 404 on a daily basis to reach schools, jobs, medical care and recreational centers; to regional and interstate travelers, who use the highway for tourism and commerce; and to law enforcement, emergency service providers, elected officials and SHA, among others, who serve the aforementioned users.

While we read the news clips and reports about the roadway's more than 400 accidents and 12 fatalities since 2005, we also know local residents who lost friends or loved-ones in some of them. Moreover, we experienced first-hand its congestion during emergency situations or when crowded by motorist traveling to or from beaches and annual high-attendance events like NASCAR races at Dover Downs. And, one of our team members worked and maintains relationships with local media that has covered it all.

Similarly, we are well-aware that visions for a dualized MD 404 date back to improvements and right-of-way acquisition in the 1950s, but project development activities have been phased over decades due to funding constraints. All the while, cumulative accidents and seasonal traffic congestion, led to this highway's widening being an annual transportation priority for area residents and successions of local, county and state elected officials.

Local organizations, such as the Citizens for Transportation Emergency Action for Maryland (C-Team) representing Caroline, Queen Anne and Talbot Counties have tirelessly worked to garner and maintain public support for SHA to plan, design, and construct dualized portions of the MD 404 included in this project, and have not given up on remaining portions between Denton and the Delaware State line in the future.

Throughout it all, SHA–in conjunction with successive offices of Maryland transportation secretaries and governors–has strived to make the roadway operate as safely and efficiently as possible. Nevertheless, frequency of congestion has continued to increase along with nearby populations and use of the roadway by travelers from elsewhere in Maryland, Virginia, Washington, D.C. and other parts of the country. With each new accident or period of traffic delays, perceptions of the roadway being dangerous and public pressure to dualize the roadway sooner rather than later continued to grow. As a result this, project is generally broadly supported and much anticipated.

Yet, now with the project poised to start and despite earlier SHA outreach efforts, local stakeholders have raised a variety of questions and issues. As evident from the project's November 2015 public meeting and subsequent media coverage, their concerns include:

- Roadway access changes and new safety measures, such J-turns and Maryland-T intersections
- Possible construction traffic impacts and mitigation
- Best use and placement of stormwater management facilities on adjacent properties
- Additional right of way to build the project
- Participation in the design-build process

Among the keys to project success will be effectively addressing these concerns while building relationships with stakeholders based on trust and partnership. To do so, we must clearly identify opportunities for local stakeholders to provide input and report back to them how we used that information throughout the project. To many of them, participating in design-build project is a foreign concept.

More broadly, for all stakeholders, we must raise awareness about planned work while setting realistic expectations that minimize surprise about potential construction impacts. A critical aspect of this is identifying the best methods and messages for proactively sharing advance information and the best times for motorists to travel through our work area to avoid delays. This is true not just for local and regional motorists but also those from outside of the area who may travel the roadway only a few times or even just once during the project. Moreover, we must adroitly work with SHA and other partners to widely share information and manage response during emergency situations.

We offer SHA the best team to achieve 100% customer satisfaction for this project. Our extensive understanding of the breadth of audiences and issues involved with the project combined with our proven communications and outreach experience will allow us to working hand-in-hand with agency staff, to fine tune and execute a comprehensive strategic communications and outreach plan tailored to meet the unique needs of the project, its location and various stakeholders.

We will use the latest, most cost-effective communication strategies and tactics, carefully monitoring and adjusting each as needed to maximize our effectiveness in educating and informing the public about the project. As deemed necessary, we also will motivate them to best take control of their travel to minimize delay.

A. PUBLIC OUTREACH PLAN

Our team has a varied but long history of working with or supporting the SHA in providing public outreach on high-profile, politically sensitive projects like this one. Recognizing how important communications and outreach are to this project's success, we offer a powerhouse duo of Bryon Johnston and Odessa Phillip, of Assedo Consulting.

Bryon Johnston

A Mid-Eastern Shore resident since 1996 who regularly travels MD 404 along with friends and family, Bryon has 20 years experience managing and supporting proactive strategic communications and outreach work from both the owners' and contractors' perspectives. He has worked with SHA's Office of Communications, community liaisons and other staff in a variety of capacities–early on as a reporter for the Star Democrat, later as colleague while a Communications Director for Maryland's Lieutenant Governor and Maryland Transportation Authority, and since as a communications and community relations consultant for URS and public relations firm Stratacomm.

His resume includes work on high-profile, politically sensitive infrastructure projects with transportation agencies in Maryland, Virginia, and Washington D.C. Among these projects have been Maryland's rehabilitation of Chesapeake Bay Bridge, Baltimore Harbor Crossings and other toll facilities, construction of the Woodrow Wilson Bridge Project and four related Interstate interchanges in all three jurisdictions, design-build-to budget construction of the 11th Street Bridge Project and various stages of other projects in the larger Anacostia Waterfront Initiative Transportation Program in Washington.

Bryon specializes in building strong relationships with key stakeholders and local opinion leaders while fostering partnerships with the public that help make the project better for everyone. This often leads to staff-level issue resolution and perceptions of true project success. Within the first year on the 11th Street Bridge Project, Bryon was credited by staff and stakeholders, including one whose organization originally sued to stop the project, with providing the "gold standard" for how DDOT should do project communications and outreach. He knows from experience, "No Surprises" for stakeholders and responsiveness to their questions, concerns and complaints are critical to overall success of projects like this one.

Finally, based on his professional work and years as an Eastern Shore resident, Bryon knows and has worked with key local opinion leaders such as Marie Freeman and George Jackson; local, county and state elected officials, such as Delegate John Mautz and Senators Addie Eckard and Steve Hershey; and reporters and editors with the Star Democrat and its weekly newspapers along with print and broadcast media in Salisbury, Baltimore and Washington DC. Even though SHA will handle directly media and elected official interactions, his knowledge and relationships will prove strategically helpful to SHA in planning and executing messaging and outreach throughout this project.

Odessa Phillip, Assedo Consulting

In more than 15 years working with SHA on public outreach initiatives, Odessa has worked on planning, design, and construction projects with unique experience providing outreach strategies on design-build projects across the state such as MD 200 (Montgomery/Prince George's counties), US 40 at MD 715 (Harford County) and MD 210 at Kerby Hill/Livingston Road (Prince George's County). Each of these projects had unique stakeholders, commitments and challenges that needed to be addressed with specific and tailored outreach strategies to meet the needs of SHA and the traveling public. Ms. Phillip is very familiar with SHA's approach and outreach tools (newsletter and mailings, community and individual meetings, project website, etc.) and processes (Community Liaisons, Media coordination through Office of Communications) and will further help provide superior service to SHA.

Our Public Outreach Plan

Our goal is to have 100 percent customer satisfaction and widespread stakeholder appreciation for this project and our efforts, such that they maximize success of the project and might be models for similar future projects.

The Objectives

- Raise project awareness/appreciation by local daily, periodic regional and even one-time motorists passing through from other states; educate them on tools available to help them best travel through the project, and persuade them, when necessary, to alter their times or routes to avoid delay.
- Help SHA maximize messaging and targeted outreach strategies for media covering the project and motorist travel during construction, also featuring human interest stories when possible.
- Proactively build relationships and partnership with local residents, farmers, businesses, community organizations, law enforcement, emergency providers, schools, government officials and others that make traffic configurations and access, J-turns and Maryland-T intersections, storm water management facilities, potential construction impacts and mitigation strategies work as best they can for everyone.

- Provide timely responses to feedback, questions, concerns or complaints that demonstrate appreciation, thoughtful consideration and, when possible, changes or solutions.
- Measure effectiveness and adjust as needed our strategies and tactics throughout the project to maximize our success.

Our Strategies

Project Kick-off. After NTP, we will start work with District 1 and 2 Community Liaison Bob Rager and other SHA staff to coordinate, refine and schedule execution of our public outreach plan with detailed tactics. An important first step will be reviewing success of communications strategies and tactics used for design-build or other transportation projects locally and statewide. As appropriate, we will incorporate these into our proposed strategic communications and outreach plan that will be tailored to best meet the needs of this project and the breadth of local, regional and other stakeholders who rely on this roadway. This plan will be submitted for approval within 60 days of NTP.

Our experience will allow us to hit the ground running with SHA, minimizing any delays in information sharing with the public. We also will create a detailed briefing book further identifying and grouping the breadth of stakeholders them so as to help SHA and the team best recognize the human elements associated with the project. We will denote issues/concerns, elected officials, jurisdictions and other pertinent details that will allow us to be good neighbors throughout design and construction.

Special Events. Given the prominence and importance of this project to local stakeholders and motorists both elsewhere in Maryland and other states, we propose holding a special event at the start and end of the construction, such as a ground breaking and ribbon cutting. Doing so will promote the project with local and state stakeholders while also providing news hooks that will yield more extensive local and regional print and broadcast media coverage about the project and what motorists traveling through its area should expect.

We are very experienced at all aspects of planning and executing events like these in coordination with clients, such as SHA, and know from experience that they result in more prominent coverage about projects like this than any press release or subsequent traffic advisories alone ever could. This type of coverage often is critical to helping us reach the greatest number of motorists and stakeholders with messages about the project in general, changes to their travel, tools available to follow our progress and plan their trips and how they can reach us with questions or concerns. All of this is invaluable in both short and long-term stakeholder relationship building and perceptions of project success.

Effective Informational Materials. Maximizing effectiveness of our messages about the project and the methods or materials by which we disseminate them throughout our work will be key to our success. Based on our stakeholder information gathering and in close coordination with our team's technical staff and SHA, we will develop and update throughout the project printed and digital informational materials that include a project brochure/fact sheet, Frequently Asked Questions, one-page project update sheets, PowerPoint presentations, display boards, graphics, website and social media content, proposed draft press releases, traffic advisories or alerts, progress photographs and low-cost videos; and, as needed, mailings or door hangers. All of these will be developed to ensure they are consistent with SHA's branding and needs for this project and as denoted in the larger RFP or other agency Public Outreach Performance Specifications.

We recognize each project and the informational needs and opportunities related to it are unique and sometimes subject to change due to events outside of our control. Therefore, we will be creative, flexible and adroit in our use of messaging and materials throughout this project, continuously monitoring their effectiveness and altering them as appropriate.

Public Forums or Meetings. We recommend holding a public forum or meeting at the start of this project. This will allow SHA and our project team to collectively follow up on any issues and concerns outstanding from the November 2015 public meeting while also further creating a shared larger public understanding of the project moving forward. The meeting will be structured to help us share the latest design and construction details and schedule, solicit feedback, further introduce how we will work with stakeholders during the design-build process and set expectations for traffic configurations and project work.

As deemed helpful or needed, another public meeting will be proposed to broadly update stakeholders on project progress and changes to traffic configurations about which we need them to be aware. Both meetings will provide another hook for more prominent media coverage. As we have done for countless other transportation project, our experienced team will support SHA by managing meeting logistics and facilitation; providing informational graphics, presentations, displays, handouts for approval and use; capturing and reporting feedback; and preparing any need follow-up responses. We also will work with SHA staff on the best mix of traditional and digital media outreach and advertising to publicize the meetings and share their outcomes.

One-on-One and Organizational Meetings. We recognize that in coordination with SHA throughout design and construction proactive meetings and updates will have to be held with individual residents, farmers, businesses, schools bus officials, law enforcement, emergency service providers and stakeholder organizations. Doing so is yet one more way to build relationships, a spirit of partnership and overall customer satisfaction. Again, our experienced team has worked with individuals and organizations have similarly performed this function for sensitive transportation projects that include the Bay Bridge reconstruction and the construction of the 11th Street Bridge and the Woodrow Wilson Bridge Project, among others.

We will work closely with SHA to be responsive to issues raised during these meetings, flag those that could be problematic, and generally create an environment that allows the community to be heard and achieve satisfaction from our methods. For the most part, these meetings will be held with pre-planning off-site at stakeholder homes or offices, but we do anticipate that some may occur based on walk-ins at the Project office. In all instances, these interactions will be logged and tracked.

Community Communications Committee. Based on our experience with high-profile, politically sensitive design-build projects with both local and regional stakeholders, we propose forming a standing Community Communications Committee. This committee will meet quarterly and consist of seven to 10 people approved by SHA and representing the array of MD 404 project stakeholders, including residents, farmers, businesses, law enforcement, emergency service providers, community organizations and tourism officials. In addition to further helping us build relationships with local opinion leaders, the committee gives us a structured way to get advance feedback about our messaging, methods and pending aspects of project work from stakeholders with potentially conflicting interests. With Odessa's assistance and as he has done successfully with similar committees for the Bay Bridge and 11th Street Bridge Project, Bryon will work with SHA on forming and staffing the committee; developing meeting presentations and materials; and preparing follow up items for advance approval by the project team and SHA.

In addition to further building relationships with local opinion leaders, the committee gives us another structured way for generating advance feedback on effectiveness of our outreach messaging and methods and pending aspects of project work affecting stakeholders with potential conflicting interests. As he has done successfully with such committees for the Bay Bridge and 11th Street Bridge Project and with Odessa's assistance, Bryon will work with SHA on forming and staffing the committee, developing meeting presentations and materials and follow up items for advance approval by the project team and SHA.

Project Office, Phone Number, Email Address and Other Correspondence. We know that our effectiveness responding to stakeholders that contact us, SHA or other local and state officials will be just as important to customer satisfaction as how well we reach out to them. To help facilitate direct interaction with us, we will have both regular walk-in and by appointment staffing hours at the project office so stakeholders can pick-up information, ask questions or share concerns in-person. In addition, we will publicize a branded email account and toll-free phone hotline to which we will promptly respond. The hotline will have recorded information about the project while allowing callers to leave messages. Sensitive complaints will be flagged immediately for SHA.

Our team is very experienced in handling stakeholder walk-ins, calls and traditional and electronic correspondence from both the owner and contractors perspectives. As communications director for the Maryland Transportation

Authority, Bryon managed responses to thousands of inquires directly to that agency or forwarded by Maryland's offices of the Transportation Secretary and Governor. He provided similar services for the Woodrow Wilson Bridge and Anacostia Waterfront Initiative projects. He and Odessa will work closely with our entire team and SHA on responding effectively.

Public Contact Records. As required by the RFP, by the first of each month, our team will provide an electronic copy of all public contact records made prior to the 25th of the previous month. These will include all communications with the public conducted in-person, by phone or via correspondence. Each of our public contacts will be captured in a project database that includes the person's personal information (name, address, phone number, email, preferred method of response), information about the contact (date, time and reason for the call) and resolution information (who answered, provided the response, the response, and time of the response). Again, information about pressing issues or complaints will be shared with SHA more immediately, as required under the contract with the agency. We also will use each of these interactions to request that the contact subscribe or allow us to add them to our project email distribution list for future updates and information about the project.

Traffic Advisories, Construction Schedule/MOT and Access. Proactively prior to the start of and throughout construction, we will educate motorists about changes to lane configurations and access to/from side roads, as well as potential resulting traffic impacts. As part of the weekly project updates, construction and public outreach staff will identify potential immediate or upcoming traffic impacts and mitigation strategies. These will be shared with SHA as part of the construction scheduling reports and a weekly matrix.

Traffic advisory information also will be placed into the appropriate template, sent out to our larger team and SHA for review, approval, and dissemination in advance of any configuration, access or traffic impacts and in accordance with notification requirements in the RFP and project contract.

The periodic mix of large volumes of tourist and commercial traffic with daily local and regional traffic throughout the corridor pose important challenges, requiring multiple levels and methods of outreach and education. As such, comprehensive and robust tactics will be needed to ensure motorists know about the project and tools available to help them make informed travel decisions throughout construction.

Media and Government Official Information Strategies. While we recognize that SHA will perform outreach with media and various government officials directly, we know making sure it is coordinated with our other outreach efforts will key to success of overall outreach about the project. Therefore, based on our experience and project needs, we will work with key SHA staff to identify opportunities for strategic outreach to specific reporters, news outlets and government officials along with the most appropriate messaging and informational materials to share with them.

Signs. Our communications staff will work directly with our technical staff and SHA to ensure signs are prepared and installed throughout and the project office with messaging identifying the Administration by its SHA official logo, the name of the project, the hotline number, website and other information required by SHA and in accordance with MUTCD size guidelines.

Emergency Preparedness. In coordination with SHA and building on existing protocols, our team will proactively work with local, county and state law enforcement and emergency response agencies to identify situations that could arise and develop contingency plans for most effectively working together to address and mitigate them. Emergency contact mechanisms such as phone and email trees will be established for use in emergencies. In addition, we will establish with SHA templates to be used for providing information it needs to communicate to motorists via traditional media and its social media, traffic information systems or other tools such as CHART and MD511.

- **Phone Trees.** Phone trees look at the project leadership both within the D-B team and SHA to identify the most efficient and effective way to share urgent information with the decision-makers for the project. Our phone tree will include notes identifying who information will

be shared with, how decisions will be made, who final decision-makers will be and expected timing of each activity. This are related documents will be regularly updated to ensure accurate contact information.

- **Email Trees.** Similarly, email trees can be used to help track the decisions made during crisis communication situations and protect both SHA and our team from miscommunication during potential periods of crisis and high concern. This information will also be available on ProjectWise with access to high level parties who may be involved in the process.

Construction Progress Photos. At least monthly but also any time a significant activity commences, we will provide at least 10 new high resolution construction photos suitable for use on the internet and other informational materials. Distinct from project documentation photographs that capture key technical aspects of construction progress, these will show vantages that more broadly enhance the public's ability to view and understand the advancement and achievement of various project elements and milestones.

B. COORDINATION WITH PROPERTY OWNERS, EMERGENCY SERVICES & SCHOOLS

As mentioned earlier, a wide variety of motorists travel the MD 404 corridor throughout the year, from residents, farmers and school buses to commercial trucks and beach goers. Many of them live locally or regionally; however, on any given day thousands of them may be from other parts of Maryland or even other states. Accordingly, we will work with SHA to comprehensively coordinate proactive and effective communication with them all. Each supporting outreach tactic will be tailored to best educate and inform all of these motorists both before and during their travel. This will minimize surprises and help them make informed decisions on how and when to travel through our project area to avoid delay, particularly during peak travel months and weekends.

For the most part, key messages and information for motorists living both near and far from the project area will be similar – a brief overview of the project, its benefits and planned duration; the updates on traffic configurations and work schedule; pending configuration changes and potential impacts; and the tools available to them to follow our progress and plan their trips. What will be different, mostly due to their proximity to and frequency using MD 404, is the greater potential for impacting local/regional compared to non-local motorists on a daily basis. We will offset this by capitalizing on the increased methods and opportunities available to us for communicating with local/regional motorists, as well as the frequency with which we do so.

In this regard, local/regional motorists certainly will be more apt than non-local motorists to subscribe to our contact lists, attend project public meetings, and be exposed to more frequent local news coverage about the latest work and traffic configurations, and also remember and use tools available to help them plan their travel. They can be more easily specifically segmented and targeted for outreach through mailings and periodic one-on-one or small group meetings for stakeholders such as residents, businesses, communities, third party organizations, elected officials, and local media.

Even further segmented and targeted local stakeholders will include adjacent farmers and other property owners; representatives of the three county school systems providing bus service; local, county and state law enforcement agencies; and the dozen or so local/regional fire and emergency service departments that must travel the corridor to collectively serve areas in and around the project area. Upon starting this project, our team will work with SHA to reach out to these stakeholders about the project, update them on details of specific interest to them and solicit their input to help us fine tune our design and construction plans to best address their specific access needs. In particular, we want to ensure schools, farmers and fire departments can best maneuver large equipment and maintain access important to them within the project area. We will build relationships with these stakeholders and more directly communicate with them throughout the project about aspects of our work and traffic configurations that could impact their mobility and access.

Acknowledging that some project stakeholders are concerned about more than just traffic, we will similarly communicate, work and build relationships with residents, farmers and businesses whose properties could be impacted by project design and construction. Such impacts may include utility interruptions or relocations, placement of storm water management facilities and various other construction-related activities.

To maximize our effectiveness from start to finish, our outreach staff will actively participate in meetings with the design and construction teams to best understand project plans and proactively help identify aspects requiring special attention and communication with stakeholders.

We also will establish with SHA an approved, comprehensive notification package of static signs and variable message boards to provide advanced notice of project work, potential travel delays, detour routes and, as possible, emergency information.