MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

INTERSTATE 695

PHASE ONE -

STATEMENT OF QUALIFICATIONS

DESIGN-BUILD

IS-695 from IS-70 to MD 43 Transportation Systems Management and Operations

Baltimore County, MD

Contract No. BA0065172

F.A.P. No. Pending

ALLAN MYERS + Bruce & Merrilees + WALLACE MONTGOMERY + Kimley»Horn

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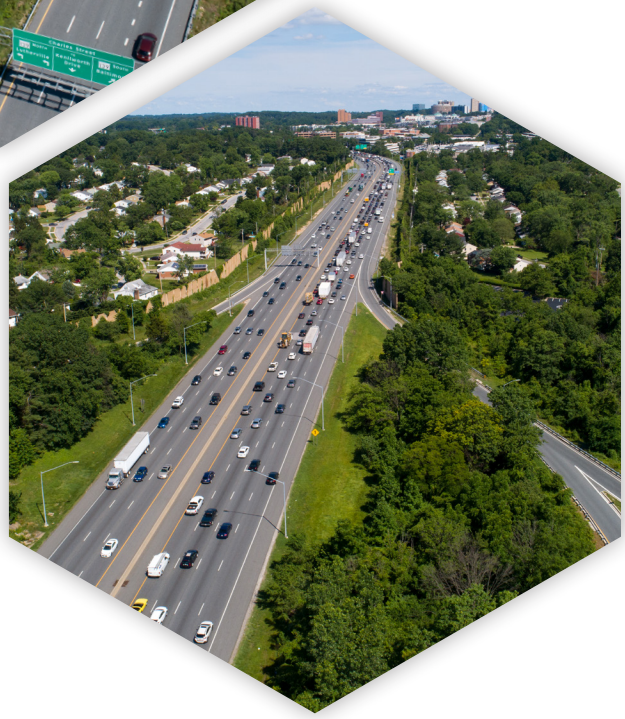
DESIGN-BUILDER CAPABILITY



ALLAN MYERS + BM Bruce & Merrilees + WALLACE MONTGOMERY + Kimley»Horn

FIRM: ALLAN MYERS

EXPERIENCE: 33 Years

EDUCATION:
M.S. / 1995 / Civil Engineering;
B.S. / 1986 / Civil Engineering

TRAINING/CERTIFICATIONS:
VA Registered PE #19597
Design-Build Institute of America (DBIA) #D-2293

Tom Heil, PE, DBIA – Design-Build Project Manager

As DBPM, Tom will be responsible for all design, construction, management, and coordination of the I-695 TSMO Project. Tom's experience includes more than 12 years on 15 Design-Build, PPTA, and P3 transportation projects. He manages design efforts with a focus on coordination with designers and construction personnel to accelerate delivery, reduce project impacts, and prevent delays. He has held the role of DM for more than 60 projects which provides unique design coordination expertise. His experience serving as a DBPM, DB Integrator, and Responsible Charge Engineer on similar projects will benefit the I-695 TSMO Project by enabling the design and construction teams to maximize its value, maintain safety/mobility throughout construction, and ensure design compatibility with future improvements.

VDOT – DESIGN-BUILD I-66 ACTIVE TRAFFIC MANAGEMENT ($38.6M) Prince William, Fairfax, and Arlington Counties, VA – As the Design Manager, Tom worked closely with VDOT and his design team, including Mark Dunzo (KHA), to deploy ATM, including part-time active running shoulders along a 32-mile corridor. As will be needed for the I-695 TSMO Project, he and his team developed conceptual ITS DB plans which included defining operational requirements and communications with the existing system, field hardware configurations, communication network, and acceptance criteria. The I-66 ATM system DB project was completed on-time and within budget and was successfully integrated into VDOT's NOVA traffic management system.

VDOT – P3 TRANSFORM I-66 OUTSIDE THE BELTWAY ($2.4B) Fairfax and Prince William Counties, VA – As Design Manager for the DBJV, Tom serves as the project's DB Integrator and Deputy DM with the specific focus of working closely with VDOT, the Concessionaire, and the design-build's design and construction management teams to secure approval of phased design plans. This interstate congestion relief project includes 22 miles of roadway reconstruction and widening to include two express lanes and three general purpose lanes in each direction; eight interchanges with direct EL and GP lane access; 35 bridges; and a fully integrated ITS management system compatible with VDOT's current ITS system and toll operator requirements. As will be needed on the I-695 TSMO Project, Tom manages the design and construction team daily to ensure the optimized design is compatible with anticipated construction means and methods.

VDOT – DESIGN-BUILD I-64 SEGMENT II CAPACITY IMPROVEMENTS ($141M) Newport News, VA – As Responsible Charge Engineer, Tom was fully integrated into both the design and construction teams, as he will be for the I-695 TSMO Project. He served as the primary VDOT liaison during design and controlled all engineering decisions and/or design modifications during construction. The project consisted of 7.5 miles of six-lane roadway widening to support regional growth and traffic demands for beaches and port access and included widening and rehabilitation of nine existing structures, 19 ramps, three interchanges, box culvert extensions, integrated ITS, retaining walls, and SWM features. The project was completed on-budget and opened to traffic six weeks early.

MDOT SHA – DESIGN-BUILD MD 404 DUALIZATION ($105M) Talbot County, MD – As DB Integrator, Tom oversaw the design for the JV construction team to ensure the advanced design RFC plan packages were clear, concise, and constructible. This project widened 9.2 miles of MD 404 from a two-lane to a four-lane divided highway. For this project, the Governor mandated an 18-month schedule to address the corridor's seasonal congestion and high accident/fatalities rates. Due to the critical schedule, this project was performed by a three-part design JV (including Wallace Montgomery) and a three-part construction JV. Throughout concurrent construction efforts, night work was often utilized to ensure the schedule. Paving solutions and clarification of SWM swale requirements for effective traffic barrier protection without compromising safety resulted in a savings of $11M and substantial construction time.

FIRM: WALLACE MONTGOMERY

EXPERIENCE: 29 Years

EDUCATION:
B.S. / 1990 / Civil Engineering

TRAINING/CERTIFICATIONS:
MD Registered PE #25404
Design-Build Institute of America (DBIA) #D-2370

Eric Sender, PE, DBIA – Design Manager

Eric offers extensive experience in designing and managing MDOT SHA projects including interstate-expressway realignments, capacity-safety improvements, and interchange modifications. Eric is skilled at developing studies/concepts, designs, and construction documents. He is very familiar with MDOT SHA, AASHTO and MUTCD standards, policies, and criteria. His areas of expertise include road geometrics and drainage design, construction staging/MOT development, and traffic engineering. He has applied working knowledge of structural, pavement, SWM and ESC designs; H&H and noise analysis; and environmental permitting. Eric has an extensive background in supporting NEPA reevaluations and IMR/IAPA development. For the I-695 TSMO Project, Eric will use vast background in managing multi-disciplined Baltimore-Washington Interstate projects to deliver designs focused on meeting the project goals and critical paths; avoiding design pitfalls; and maintaining a continual flow of construction.

MDOT SHA – I-95/I-495 MD 5 BRANCH AVENUE METRO ACCESS ($68M) Prince George's County, MD – Project Manager responsible for the multi-discipline engineering analysis/design efforts (highways, geotechnical-pavement, structures, water resources, traffic, noise) of this Capital Beltway capacity and operations improvements with an interchange modification. Led the road geometrics, H&H, MOT designs with maintaining existing traffic operations throughout construction. As will be needed on I-695 TSMO, Eric facilitated stakeholder outreach and detailed traffic analysis with innovative geometric refinements to ensure safe, efficient Beltway operations, which we documented through the IMR/IAPA. Eric orchestrated avoiding impacts to an existing Beltway noise barrier by securing a design exception for a reduced shoulder width at the dual lane exit from the Inner Loop. Also, facilitated NEPA reevaluation/categorical exclusion support.

MDOT SHA – I-95/I-495 GREENBELT METRO ACCESS IMPROVEMENTS ($91M) Prince George's County, MD – Project Manager responsible for the multi-discipline engineering analysis/design efforts for the Capital Beltway traffic capacity-operations improvements between the US 1 and the BW Parkway with interchange access-capacity modifications with the Greenbelt Metro Station and MD 201. Analysis/design efforts included highway, noise abatement, structural bridge-culverts-retaining walls, H&H/SWM, ESC, TMP/MOT, traffic (ITS-lighting-signing/marking), construction plans, securing permits and stakeholder outreach. Eric orchestrated roadway geometrics and IMR/IAPA development, and NEPA reevaluations.

MDOT SHA – DESIGN-BUILD MD 404 DUALIZATION ($105M) Caroline, Queen Anne's and Talbot Counties, MD – Design Manager overseeing the design efforts for this safety and capacity project to construct two new lanes along nine miles of the existing MD 404 for a four-lane divided road. Design efforts included highway, structural bridge-culverts-noise/screen walls, H&H/SWM, ESC, TMP/ MOT, pavement-geotech, traffic (lighting-ITS-signing-marking), construction plans development, and securing permits. As will be needed on I-695 TSMO, Eric facilitated extensive design coordination with the IDQM, CHART, SHA (PAGD, TEDD, PRD, etc.) along with regular public, utilities, environmental agencies outreach.

MDOT SHA – DESIGN-BUILD I-95 AT CONTEE ROAD INTERCHANGE ($34M) Prince George's County, MD – Design Manager responsible for the full design efforts of Contee Road, a divided urban arterial road, and its partial cloverleaf interchange connection with I-95. Design efforts included: highway, structures, H&H/SWM, ESC, TMP/MOT, geotech-pavement, traffic (ITS-signals-lighting-signing-marking); construction plans development; utilities coordination/designs securing permits; environmental compliance; and NEPA reevaluation support. Eric facilitated two cost-effective ATCs that allowed for maximizing the project scope while minimizing MOT impacts.

MDOT SHA – SURVEY AND ENGINEERING DISTRICT 4, BCS 2009-12F ($4M Fee) Baltimore County, MD – Highway Engineer/ Primary Liaison for this design On-Call Contract of transportation improvements including the I-695 from MD 140 to MD 25 Safety and Resurfacing.

FIRM: ALLAN MYERS

EXPERIENCE: 24 Years

EDUCATION:
B.A. / 1993 / Finance

TRAINING/CERTIFICATIONS:
OSHA 10-hour; OSHA 30-hour

Eric Eastin – Construction Manager

On the I-695 TSMO Project, Eric will be responsible for ensuring that the construction is completed in accordance with the project requirements. Eric has over 24 years of experience in heavy civil construction and project management. His experience includes managing the construction of complex, fast-tracked interstate congestion and safety improvements as well as design-build transportation projects. He ensured that project goals, objectives, and requirements were accomplished within scheduled timeframes and established budgets, while maintaining safety and environmental compliance throughout the duration of construction. Eric's focus on incident and injury-free construction led to his project's acknowledgement with the 2018 ENR Mid-Atlantic Best Projects Safety Award. Eric will plan operations to minimize construction impacts, expedite delivery, and communicate progress updates with MDOT SHA and stakeholders.

MDTA – I-95 EXPRESS TOLL LANES, MD 43 TO JOPPA RD ($42M) Baltimore County, MD – As Construction Manager, Eric was responsible for managing all construction activities. He was accountable for meeting the project goals, schedule, and safety program; and ensuring environmental compliance and coordination with adjacent projects. The congestion relief project expanded 1.5 miles of I-95 to eight general purpose lanes and four express toll lanes. It successfully created more efficient mobility and vehicle throughput for this fully urban interstate corridor. The project included full depth paving, resurfacing, drainage-SWM, concrete barriers, retaining walls, complex MOT, and ITS. The project was completed on schedule and within budget. Eric helped mitigate a global sliding failure issues with a value engineering solution for a caisson wall. Eric's team conducted comprehensive MOT planning to ensure the existing traffic flow was uninterrupted, similar to the approach our Team will utilize on the I-695 TSMO project.

MDTA – I-95/I-695 INTERCHANGE ($57M) Baltimore County, MD – Construction Manager for reconstruction of I-695 at I-95 for 1.5 miles. Eric oversaw the overall construction process including coordination of field personnel, equipment, materials, subcontractors and all construction activities to ensure contract compliance and schedule milestones were meet. The project reconstructed/ realigned the existing six-lane divided highway. Major work items included full depth paving, milling and resurfacing, stormwater management, noise and retaining walls, culverts, a new bridge overpass, stream re-alignment, MOT, drainage retrofits, SWM, and ESC. This project was completed with no safety issues or recordables.

MDOT SHA – DESIGN-BUILD US 113 DUALIZATION PHASE 4 ($51M) Worcester County, MD – As Construction Manager, Eric was responsible for managing all construction activities in accordance with project requirements. The project includes the design and construction of US 113 to a four-lane divided highway with new service roads and modified Maryland T and J-turn intersections from North of MD 365 to North of Five Mile Branch. Improvements included new full-depth paving, existing pavement rehabilitation, drainage, SWM, ESC, lighting, signalization, and signing/marking. Eric facilitated project partnering meetings as well as supporting public outreach and communicating MOT conditions throughout construction. This project is currently expected to be completed on time and on budget.

MDOT SHA – DESIGN-BUILD US 113 DUALIZATION PHASE 3 ($32M) Worcester County, MD – Construction Manager for the design and construction of two additional lanes along US 113 to create a dualized divided highway. Eric was responsible for managing all construction activities in accordance with project requirements. The project improvements included new pavement construction, existing pavement rehabilitation, drainage, SWM, erosion & sediment control, signing and marking, and lighting/ signalization. Eric worked closely with Wallace Montgomery (WM) to ensure proper constructability/sequencing of the project's grading, drainage, road cross culverts, paving and traffic features. He worked with WM engineers on phased construction, MOT and ESC designs to create the most cost-effective solutions for the project. The project was completed on time and within budget with no safety incidents.

FIRM: WALLACE MONTGOMERY

EXPERIENCE: 19 Years

EDUCATION:
B.S. / 2000 / Civil Engineering

TRAINING/CERTIFICATIONS:
MD Registered PE #44063
Design-Build Institute of America (DBIA) #174762

Will Fiorillo, PE, DBIA – Highway Engineer

Will is a MD registered PE offering over 19 years of experience in designing and managing MDOT transportation projects including interchanges and expressway realignments, safety and capacity improvements. Will's experience also encompasses preparation of alternative designs, MOT schemes, and stakeholder coordination. Will provides expertise and a deep understanding in designing transportation projects with a similar scope and complexity, as required for the I-695 TSMO project. He is vastly familiar with MDOT SHA CADD standards and design programs (Microstation, InRoads/OpenRoads, AutoTurn) to develop concepts, final layouts, and plans; and ProjectWise for transmitting project data/submittals. He has extensive experience in the selection and application of design criteria, including AASHTO and MDOT SHA polices, guidelines, standards; and coordinating within multi-disciplinary teams. As will be needed on I-695 TSMO, Will offers tremendous knowledge to apply unique combinations of design requirements that are often conflicting and developing a solution for the design challenge and constraints.

MDOT SHA – DESIGN-BUILD I-95 AT CONTEE ROAD INTERCHANGE ($34M) Prince George's County, MD – Highway Engineer on this project to construct Contee Road, a divided 4-lane urban arterial road, and its grade separated partial cloverleaf interchange connection with I-95. Will was responsible for Contee Road, its three signalized intersection connections, and interchange geometrics per AASHTO; overall project layout and grading (rough & final), staging/MOT; and interim/ final construction plans preparation. As will be needed on I-695 TSMO, Will developed cost-effective geometric refinements that allowed for construction with the minimum number of stages, provided smooth transitions with existing, and minimized traffic disruption. He assisted with stakeholder outreach and NEPA reevaluations. Facilitated construction support services such as RFI responses, redline revisions, As-Builts, etc.

MDOT SHA – DESIGN-BUILD US 113 PHASE 3 ($32M) Worcester County, MD – Highway Engineer on this safety and traffic operations project to convert four miles of US 113 from the existing 2-lane highway to a 4-lane divided median highway. Will was responsible for the dualized US 113, nine consolidating access roads, and the two "Maryland-T" and five "J-Turn" intersections geometric designs per AASHTO; overall project layout and grading, and staging-MOT development; and preparation of rolling interim and final construction plans submittals. He was responsible for assuring integration of designs between road geometrics, H&H/SWM, structures, and traffic (signals-lighting-signing-marking). Facilitated stakeholder coordination including with the MD-DE Railroad and utilities for their concurrent relocations. Developed five cost-effective ATCs that maximized the corridor's safety and mobility.

MDOT SHA – DESIGN-BUILD US 113 PHASE 4 ($51M) Worcester County, MD – Design Manager responsible for overseeing the full design efforts for this safety and operations project to convert approximately 4½ miles of US 113 from a 2-lane to a 4-lane divided median highway. Design efforts included road geometrics; H&H/ SWM; ESC; TMP/MOT; structures; pavement-geotech; traffic (signals-lighting-signing-marking); construction plans development; and securing permits. Developed seven innovative ATCs that provided over $8M in savings and maximized the corridor's safety and mobility. Facilitated design "kick-off" and over-the-shoulder coordination with the SHA including PRD, and regular coordination for utility relocations and environmental agencies.

MDOT SHA – I-695 FROM MD 140 TO MD 25 SAFETY AND RESURFACING ($12M) Baltimore County, MD – Extensive recent I-695 TSMO corridor knowledge along four miles of I-695 from MD 140 to MD 25 (Northwest Section) serving as the Highway Engineer on this District 4 project for pavement rehabilitation and median-roadside safety and drainage upgrades. Will orchestrated full design efforts and prepared contract documents (plans and specifications) for pavement patching, milling, resurfacing; roadside regrading improvements; traffic barrier (MASH 2016) replacements; and concrete barrier and drainage structure replacements/repairs.

Matt Allen, PE, PTOE, CCM – Traffic Engineer

FIRM: WALLACE MONTGOMERY

EXPERIENCE: 25 Years

EDUCATION:
M.B.A. / 1994 / Business Admin.;
M.S. / 1996 / Civil Engineering;
B.S. / 2002 / Civil Engineering

TRAINING/CERTIFICATIONS:
MD Registered PE #200487
Registered PTOE #712
MDOT TTC Traffic Manager

Matt Allen has 25 years of experience in all facets of traffic engineering, including traffic engineering design, studies, analyses, and ITS. He oversees the design of traffic control, signing, marking, signal, roadway lighting, and ITS plans. He oversees the development of analyses for corridor and freeway operations and safety; TMPs; congestion relief; traffic simulation/ optimization modeling; capacity; speed; O/D; signal warrant/timing; travel-demand; traffic impact; crash; regulatory; sight distance evaluations; and geometric improvements. Matt is responsible for ensuring that all traffic analyses and design meet requirements and utilize good judgement. Matt also ensures all deliverables meet MDOT SHA standards and specifications. Matt has worked in the Baltimore area his entire professional career and has worked on projects along the Baltimore Beltway and on nearly every interchange throughout the limits of the I-695 TSMO Project.

MDOT SHA – I-95/I-495 MD 5 BRANCH AVENUE METRO ACCESS ($68M) Prince George's County, MD – Lead Traffic Engineer for this Capital Beltway capacity/operations project. As will be needed on I-695 TSMO, Matt's work efforts included data collection, travel forecasting, operational analyses of existing and various proposed alternatives, coordination with FHWA, and IAPA (IMR) documentation. Analyses required HCM and CORSIM analyses to determine lane-by-lane speed and density differentials. He orchestrated the development of the Beltway and interchange modification MOT and ITS-CCTV design plans.

MDOT SHA – I-95/I-495 GREENBELT METRO INTERCHANGE IMPROVEMENTS ($91M) Prince George's County, MD – Chief Traffic Engineer for three miles of I-95/I-495 Capital Beltway traffic operation and interchange access improvements with the Greenbelt Metro Station. Oversaw the traffic analysis/design for the project's ITS (DMS and CCTV sites), lighting, and signing/marking features as well as the final development of the project's IMR/IAPA. As will be needed on I-695 TSMO, Matt was responsible for developing the project's TMP and associated MOTAA operational analyses, and the MOT plans. The MOTAA required analyses of interstate ramp junctions under various concept scenarios.

MDOT SHA – DESIGN-BUILD I-95 INTERCHANGE AT CONTEE ROAD ($34M) Prince George's County, MD – Chief Traffic Engineer responsible for signals, ITS (DMS), lighting, signing, pavement marking, and MOT designs and plans preparation. and developing a project-wide TMP for the reconstruction of an I-95 overpass into a full-access interchange. Managed data collection and analyses of design alternatives and temporary traffic control strategies for each construction phase. The roadway lighting included partial interchange and intersection lighting.

VDOT – DESIGN-BUILD I-95 AT TEMPLE AVENUE IMPROVEMENTS ($15M) Colonial Heights, VA – Chief Traffic Engineer for the design of interchange modifications and construction of a new 3-lane roundabout (first of its kind in Virginia) at the ramp terminus. Matt was responsible for developing the TMP, MOT plans and lighting plans. Analyzed temporary traffic control options for each phase of construction. Matt orchestrated the development of a construction/MOT sequencing scheme that reduced the number of stages and maximized the contractor's work area. The developed staged construction scheme maintained traffic along an existing bridge that was replaced by the roundabout and minimized I-95 ramp impacts.

MDOT SHA – DESIGN-BUILD MD 404 DUALIZATION ($105M) Caroline, Queen Anne's, and Talbot Counties, MD – Traffic Design Manager charged with overseeing traffic engineering services on a dualization project to upgrade a 2-lane roadway to a 4-lane divided highway. Traffic design efforts included roadway lighting, MOT, ITS (DMS and CCTV sites), signing and pavement marking, signals, and the development of a comprehensive TMP. Matt worked with MDOT SHA OOTS and CHART to expedite designs, reviews and approvals; address accessibility/maintainability; and developed field revisions to mitigate ITS cabinet/light pole impacts.

FIRM: Kimley»Horn

EXPERIENCE: 26 Years

EDUCATION:
M.C.R.P. / 1995 / City & Regional Planning
M.S. / 1993 / Civil Engineering;
B.S. / 1991 / Civil Engineering

TRAINING/CERTIFICATIONS:
MI Registered PE #6201054031
MD Registered PE – Pending

Mark Dunzo, PE – ITS Specialist

Mark has 26 years of experience in ITS plans, specifications and estimates (PS&E) development; provision of construction phase services for ITS projects; development of ITS systems engineering, ITS architecture, and ITS strategic deployment plans; and development of regional ITS communications plans. This experience combined with Mark's understanding of and planning for highway corridor and managed lanes projects makes him exceptionally qualified to lead the ITS planning, design, stakeholder coordination, and construction coordination for the I-695 TSMO Project. His recent projects involve developing specifications for connected vehicle projects; evaluation, procurement, and implementation of advanced traffic management system (ATMS) software packages; and ITS and operations program assessments. He also is a member of the Transportation Research Board, ITE ITS Council, IBTTA, and ITS America.

VDOT – DESIGN-BUILD I-66 ACTIVE TRAFFIC MANAGEMENT ($38.6M) Prince William, Fairfax, and Arlington Counties, VA – Deputy Project Manager responsible for preparing bridging documents for a design-build program to deploy an ATM system on a 32-mile segment of the I-66 corridor serving the D.C./ northern VA metropolitan area. Mark's team produced system engineering bridging documents; defined operational requirements; and developed 30% plans for field hardware configuration, communication network, and acceptance testing requirements. Mark orchestrated the resources needed to complete this fast-paced critical path project to meet a federal funding deadline. Similar to his role on the I-695 TSMO Project, Mark oversaw all systems engineering and design efforts.

VDOT – P3 TRANSFORM I-66 OUTSIDE THE BELTWAY ($2.4B) Fairfax and Prince William Counties, VA – Senior Technical Advisor for ITS elements and Travel Demand Modeling responsible for coordinating with VDOT, the Virginia DRPT, the VAP3 office, and the FHWA, to develop a multimodal transportation improvement project in the I-66 corridor for approximately 25 miles from US 15 to I-495. The project is in accordance with the Tier 1 EIS ROD to advance through a Tier 2 EA. As will be needed for the I-695 TSMO Project, Mark's team developed a solution that improved mobility in a congested and ROW-constrained urban corridor; tailored solutions for recurring/non-recurring congestion; and invested in technology to accompany infrastructure reconfigurations.

NCDOT – DESIGN-BUILD I-85 ITS EXPANSION ($59.2M) Rowan County, NC – Project Manager and ITS Specialist for the design and construction of the widening of I-85 through Rowan County, including the expansion and enhancement of the region's ITS freeway management system. The freeway management system expansion covered 10 miles; upgraded the corridor's video surveillance system; added DMS units; and added a network of vehicle detectors. Mark's team also designed a fiber-optic, Ethernet IP-based digital communications network for the corridor. This systems knowledge and expertise will be an asset to the I-695 TSMO Project. In addition to design, Mark's team provided utility coordination services for the ITS portion of the project; provided product cut-sheets; and provided installation, implementation, and coordination assistance.

MICHIGAN DOT – US-23 ATM ($124M) Ann Arbor, MI – ITS Specialist responsible for providing preliminary engineering services for an ATM system using ITS technology along US-23 from M14 to M36 in Washtenaw and Livingston Counties, Michigan. Mark oversaw design activities that included a review of best practices in the U.S. and in England, preliminary conceptual layout and Concept of Operations; system requirements and High-Level design; and a cost estimate for construction. This project implemented the PTSL goal of the I-695 TSMO Project. This design solution, which is now in operation, allows the median shoulder to be used as a travel lane during peak periods higher congestion, special events, and non-recurring incidents.

FIRM: KCI

EXPERIENCE: 41 Years

EDUCATION:
B.S. / 1978 / Civil Engineering

TRAINING/CERTIFICATIONS:
MD Registered PE #13248

Stephen Drumm, PE – IDQM Manager

Stephen offers extensive experience in designing, managing, and performing independent design reviews of both MDOT SHA and design-build interstate projects including interstate-expressway realignments, capacity-safety improvements, and interchange modifications. Prior to joining KCI, Stephen served as Chief of Highway Design for the MDOT SHA for three years. He is vastly familiar with MDOT SHA, AASHTO and MUTCD standards, policies, and criteria. His diverse experience includes interstate mainlines and interchange designs; geometric improvements; drainage; utilities; right-of-way; and preparation of quantities, specifications, and cost estimates. For the I-695 TSMO Project, he will lead a multi-disciplined Independent Design Quality Management team in reviewing the proposed designs and plans; ensuring they meet the contract requirements; are coordinated between disciplines; adhere to geometric and traffic control criteria; minimize impacts to the traveling public; and maintains environmental commitments, permitting provisions, and limits of disturbance.

INDEPENDENT QUALITY FIRM SERVICES FOR DESIGN-BUILD CUY-90-14.90 CLEVELAND INNERBELT CCG 2, EASTBOUND BRIDGE ($273M) Cleveland, OH – Lead Design Manager responsible for providing independent quality review services for the non-structural design elements for replacement of the I-90, and a 3,883'-long eastbound viaduct over the Cuyahoga River in Cleveland, Ohio. He served as the Independent Highway Lead (Design) for the review and approval of the project plans prior to release for construction. He worked in a project office with the Contractor, Designer, and Owner during the design phase. In a similar quality review role as will be needed on I-695 TSMO, Stephen supervised highway and multi-staged traffic control designs plans reviews for reconstructing six miles of I-90 and four interchanges with traffic capacity and operations improvements.

MDOT SHA – DESIGN-BUILD INTERCOUNTY CONNECTOR (ICC), SECTION B ($550M) Montgomery County, MD – Roadway Design Manager responsible for the environmentally-sensitive roadway design of Section B, a $500 million, seven-mile section of a new controlled access, six-lane tolled highway with two interchanges (MD 182, MD 650). The project included 10 bridges that carried the ICC over waterways and local roads the ICC; a temporary connection at MD 28; a single-point urban interchange at MD 650; two bike paths; 21 noise walls and 10 retaining walls; and an access roadway to SWM facilities and utilities. Steve managed design work that included setting horizontal and vertical alignment; coordinated the design with all disciplines; reviewed utility relocation plans; prepared early stage temporary access haul roads; coordinated the clearing, rough grading and final design packages with the structures, drainage, and traffic control plans; managed the widening and alignment of the cross road connections and interchanges; and assured ADA compliance for bike paths and sidewalks.

MDOT SHA – I-95/I-495 AND MD 210 INTERCHANGE RECONSTRUCTION ($150M) Oxon Hill, MD – Project Manager responsible for the reconstruction of the MD 210 interchange as part of approach roadway improvements for the replacement of the Woodrow Wilson Bridge. The I-495/I-95 widening/ reconstruction include design for HOV, express, and local traffic lanes; ramp reconfigurations; and construction of a flyover ramp for express traffic connection to I-495. Services included highway, structural, geotechnical, traffic, drainage, and SWM designs; surveys; ROW plats preparation; noise abatement analysis; environmental permits; and landscaping. Design included development of three construction contracts MB 1-3, to phase the work into smaller contracts starting with mainline I-95/I-495 widening and interchange improvements for MD 210; a new grade separated interchange of MD 210/Oxon Hill Road; and a fly-over ramp to I-295. Phasing of the contracts required complex storm drain and SWM features coordination; and the staging of noise and retaining walls construction; signing and pavement markings installation; and pavement reconstruction, patching and resurfacing.

TEAM MEMBERS INVOLVED

ALLAN MYERS Kimley»Horn

OWNER CONTACT
VA Department of Transportation
Kamal Suliman, 703-259-2231
Kamal.suliman@vdot.virginia.gov

CONTRACT/PROJECT NO.
NRO-27084

DELIVERY METHOD
Design-Build

CONSTRUCTION COST
Contract Value (Initial / Final):
$35,000,000 / $38,600,000
Reason for Difference:
Specifications changed based on equipment choice and additional detection was required.

SCHEDULE PERFORMANCE
Completion Date (Initial / Final):
March 2016 / March 2016
ATM System became active in September 2015.

SIMILARITIES TO I-695 TSMO

Part-Time Shoulder Use
- ✓ Leveraged PT Shoulder Use

Mobility
- ✓ Increased Travel Time Reliability
- ✓ Maximized Vehicle Throughput

Safety
- ✓ Tailored Solutions for Recurring and Non-Recurring Congestion
- ✓ Decreased Incident-Related Delay

Operate/Maintain/Adapt
- ✓ Accommodates Future Technology and Innovations

PROPOSED STAFF INVOLVED
- Tom Heil, PE, DBIA*
- Mark Dunzo, PE*
- Alan Toppen, PE
- Kevin Smith, PE

* Proposed Key Staff

I-66 Active Traffic Management Design-Build, Northern VA

KHA developed 30% design plans for a design-build procurement package for ATM strategies on 34 miles of I-66 outside Washington, DC for VDOT. With the objective of alleviating congestion in the corridor, VDOT initiated this project to allow more flexible use of a hard shoulder and HOV lanes that were limited to time-of-day operation. The project included full-span gantries every ½ mile with lane-by-lane DMS used for lane control or variable speed limits, depending on location and prevailing conditions. KHA designed a shoulder lane monitoring system using dedicated fixed cameras and video analytics to alert operators to stalled vehicles that would impede safety on the hard shoulder. DMS over the HOV lane was installed to allow the lane to be opened or closed to general purpose traffic from the TOC. Ramp meters were upgraded from fixed time-of-day to traffic adaptive, with the necessary ramp and mainline detector upgrades.

The project cost $35M, and due to federal funding constraints, the project had a short deadline. In the end, KHA and its consulting partners completed the design-build package for VDOT in under six months. At the time, the I-66 ATM was preceded in the United States only by systems in Washington, Minneapolis, and California. These and similar systems in Europe were referenced for best practices in the design. This task included the development of systems engineering documents and updating the regional ITS architecture to accommodate the project.

As we propose for the I-695 TSMO Project, Mark Dunzo, PE, served as ITS Specialist on this project. He led the KHA team in designing a system that is operational and provides benefit to the public, most significantly from the ability for operators to open the hard shoulder on the weekends; this is made possible by the surveillance detection system and improved software. As the first ITS design-build project, VDOT did have some lessons learned. For ITS, it was difficult for work to begin before device locations could be finalized and survey completed, which slowed the design and construction process.

Successful Methods, Approaches, and Innovations

Part-Time Shoulder Use – ***This project expanded standard business rules to extend the hours of operation and allowed for dynamic use of PTSL. This project changed the shoulder use from static part-time use to dynamic PTSL.***

Mobility – This project sought to increase travel time reliability and maximize vehicle throughput through use of HSR, dynamic speed limits, flexible use of HOV lanes, and ramp metering.

Safety – Detection, lane control, and dynamic speed limits allowed VDOT to better manage recurring and non-recurring congestion; more quickly and appropriately respond to incidents; and decrease incident-related delay.

Operability/Maintainability/Adaptability – Technology and infrastructure investments offered flexibility and adaptability to be able to accommodate future technology and innovations.

TEAM MEMBERS

Allan Myers | BM | Wallace Montgomery | Kimley»Horn

OWNER CONTACT

MD Transportation Authority
David Ferrera, 410-537-7882
dferrera@mdta.state.md.us

CONTRACT/PROJECT NO.

25-201107 | KH-1403-000-006

DELIVERY METHOD

Design-Bid-Build

CONSTRUCTION COST

Contract Value (Initial / Final):
$52,477,000 / $53,748,000
$28,136,777 / $42,664,730
Reason for Difference: Additional work requested by owner.

SCHEDULE PERFORMANCE

Completion Date (Initial / Final):
October 2010 / October 2010
September 2014 / June 2015
Reason for Difference: Additional work requested by owner.

SIMILARITIES TO I-695 TSMO

Mobility
- ✓ Tolling facility improved mobility
- ✓ Night operations to avoid peak hour delays

Safety
- ✓ Eliminated Left Exits
- ✓ Night work

Operate/Maintain/Adapt
- ✓ Improved arch culverts with steel plating

PROPOSED STAFF INVOLVED
- Eric Eastin*
- Matt Allen, PE, PTOE, CCM*
- Raj Paradkar, PE
- John Rectanus, PE, PTOE
- Bob Evans, PE, PTOE
- Paul Barber, PE

* Proposed Key Staff

I-95 Express Toll Lanes, Baltimore County, MD

These projects were a reconstruction and widening of 3.3 miles of the existing eight-lane divided interstate to eight general purpose travel lanes and four express toll lanes north of I-695 between Rossville and Campbell Boulevards, and from north of MD 43 to Joppa Road. ***This project successfully created more efficient mobility in a heavily populated urban setting. The project increased both safety and the corridor's vehicle throughput.*** The scope of work included extensive earthwork with over 546,500 CY of excavation and 87,000 CY of borrow; new retaining wall structures and construction of three noise walls; major ESC measures due to proximity to the Chesapeake Bay; extensive maintenance of traffic, carbide grinding and resurfacing, full depth pavement construction, resurfacing totaling 308,000 tons of asphalt; new storm drain improvements with more than 41,500 LF of underground utilities; arch culvert replacement under the entire width of I-95; new SWM facilities; new wetland mitigation facilities; concrete traffic barriers; landscaping; signing and marking; intelligent transportation systems; toll gantry foundations/conduit; and new turn around ramps. Under a subsequent MDOT SHA Travel Forecasting contract, our proposed staff conducted mesoscopic modeling using DTALite to evaluate the before and after performance and to understand the impacts to study area corridors and intersections. We developed and calibrated the base model to AM and PM conditions; analyzed the outputs; and developed a technical report documenting the process. ***As we propose for the I-695 TSMO Project, key staff Eric Eastin served as Construction Manager and Matt Allen served as Lead Traffic Engineer.***

Successful Methods, Approaches, and Innovations

Mobility – The tolling facility provides seven lanes of free-flowing traffic, improving mobility throughout the region. Our Team conducted comprehensive MOT planning was to ensure the existing traffic flow was uninterrupted. The project maintained the existing I-95 eight through travel lanes of traffic while widening to the outside of the existing roadway for future lanes. We avoided peak period construction delays by performing the bulk of work operations at night.

Safety – Safety was increased throughout the project by eliminating left exits, improving interchanges and reducing conflict points. Traffic shifts were safely coordinated with major projects to the north and south to minimize impacts and maximize safety.

Operability/Maintainability/Adaptability – In order to minimize maintenance, we reconstructed a major sheeted storm drain arch culvert passing under all lanes of I-95 NB/SB in phases while maintaining traffic safely, despite a crumbling existing structural steel plate arch culvert that was subject to drastic flow fluctuations during storm events. The project required the replacement of an existing deteriorated large diameter CMP culvert under I-95 with a precast concrete arch culvert.

TEAM MEMBERS

Bruce & Merrilees

OWNER CONTACT
PA Department of Transportation
Steven Laws, PE, 610-205-6677
slaws@state.pa.us

CONTRACT/PROJECT NO.
ECMS# 86055

DELIVERY METHOD
Design-Build

CONSTRUCTION COST
Contract Value (Initial / Final):
$21,732,183 / $ 21,768,487
Reason for Difference:
Add'l work requested by owner.

SCHEDULE PERFORMANCE
Completion Date (Initial / Final):
September 2013 / September 2013

SIMILARITIES TO I-695 TSMO

Mobility
- ✓ Work performed during off hours
- ✓ No permanent MOT

Safety
- ✓ Traffic pattern changes minimized

Operate/Maintain/Adapt
- ✓ Operate and maintain project – Two years after construction
- ✓ Full camera surveillance
- ✓ Equipment selected based on service life

PROPOSED STAFF INVOLVED
- Paul Barber, PE
- Andrew Helble

* Proposed Key Staff

SR 0095 Section ITB Design-Build, Chester Co., PA

The SR 0095 Section ITB Project upgraded and expanded the existing PennDOT ITS network, which will facilitate more efficient incident response and transportation management and provide valuable information to travelers to improve the safety and efficiency of their experience on the I-95 corridor. ***The devices and locations scoped for this project fit into PennDOT's overall I-95 Interstate ITS Completion Plan.*** The project also enhanced PennDOT's cooperation and collaboration with regional stakeholders located in the area, such as the City of Philadelphia, the City of Philadelphia Streets Department, Bucks County, Delaware River Port Authority (DRPA), and Delaware River Joint Toll Bridge Commission (DRJTBC). All ITS devices provided and/or upgraded on this project were connected into PennDOT's fiber optic communications system and ultimately be managed from PennDOT's Regional Transportation Management Center (RTMC), located in the District 6-0 offices in King of Prussia, PA. The SR 0095, Section ITB work entails the installation of ITS devices. The project includes the following ITS elements:

- (31) Closed Circuit Television (CCTV) Cameras (17 New and 14 upgrades)
- (14) Dynamic Message Signs (10 New and 4 upgrades)
- (3) Portable Dynamic Message Signs (PDMS)
- (51) Vehicle Detection System (39 New and 12 upgrades)
- (54) E-ZPass Travel Time System (TTS) Tag Readers (TR)
- Communications Network
- Regional Transportation Management Center (RTMC) integration/ modification
- (5) Video Sharing Systems
- (4) Videoconferencing Systems
- 2-Year Maintenance of System (ATMS communications, and devices)

Successful Methods, Approaches, and Innovations

Mobility – Due to the high volume of traffic on I-95, all work was performed during off-peak hours with temporary traffic patterns, no permanent MOT. The equipment utilized enabled the fiber-optic backbone to be installed at a rate of nearly ¾ miles/day, minimizing the overall impact to the travelling public.

Safety – Locations of all the devices were selected with a careful eye focused on the safety with which they could be accessed for maintenance, as well as their ability to be accessed without a lane closure.

Operability/Maintainability/Adaptability – ***The opportunity on the project to not only perform the design, but also to operate and maintain the project for two years after construction phase facilitated the focus on O&M.*** We performed video surveys of the new CCTV locations and DMS locations to confirm 100% video surveillance and applicability of the DMS locations as they related to providing information to the travelling public. Devices and equipment for the project were selected based upon their service life and ability to seamlessly integrate into the existing software platform – not based upon the low-cost provider but based upon the best value for the team.

TEAM MEMBERS INVOLVED

ALLAN MYERS | WALLACE MONTGOMERY

OWNER CONTACT
MDOT State Highway Admin.
David Phillips, 410-545-8823
dphillips@mdot.maryland.gov

CONTRACT/PROJECT NO.
PG4195172

DELIVERY METHOD
Design-Build

CONSTRUCTION COST
Contract Value (Initial / Final):
$30,700,000 / $33,744,188
Reason for Difference:
Upgrades for bike lanes and a WSSC watermain crossing

SCHEDULE PERFORMANCE
Completion Date (Initial / Final):
May 2014 / November 2014
Reason for Difference:
Owner directed to coincide with opening of the I-95 CD Roads.

SIMILARITIES TO I-695 TSMO

Mobility
- ✓ Focused on supporting the region's traffic needs & ensuring efficient highway operations

Safety
- ✓ Minimized traffic disruption; maintained existing traffic operations throughout.

Operate/Maintain/Adapt
- ✓ Incorporated ITS features for I-95 and ICC traveling advisories

PROPOSED STAFF INVOLVED
- Eric Sender, PE, DBIA*
- Will Fiorillo, PE, DBIA*
- Matt Allen, PE, PTOE, CCM*
- Jason Kalasky, PE
- Diane Durscher, PE
- John Rectanus, PE, PTOE
- Roberto Barcena, PE
- William Wallace, PE

* Proposed Key Staff

I-95 at Contee Road Interchange Design-Build, Prince George's County, MD

Myers and WM teamed to design and construct an arterial roadway, Contee Road (now known as Konterra Drive), and its partial cloverleaf interchange connection with I-95. The four-lane divided Contee Road replaced the adjacent existing two-lane Van Dusen Road and its crossing over I-95. The Contee Road Interchange connects within the I-95 collector-distributor (CD) roadways between MD 198 and the ICC – MD 200. The work included relocated at-grade connections of Sweitzer Lane and Van Dusen Road to Contee Road. The project increased the capacity of the collective roadway system and provided a new I-95 access point for the County's northern region traffic demands. Engineering services provided by WM include surveying; highway, structural, pavement/geotechnical, and drainage-SWM-ESC designs; traffic (signals, lighting, ITS-DMS, signing/ markings) TMP/MOT development; and utility design/ coordination; construction documents preparation; stakeholder outreach; and NEPA reevaluation/environmental compliance support. The Myers/WM Team's innovative solutions/ATCs, along with AASHTO compliant road geometric refinements, and an alternative SWM approach, resulted in $3M savings towards the Contract's $33M budget limit. Our design facilitated constructing an additional 0.5-mile segment of Contee Road and the relocated Contee Road and Van Dusen Road signalized intersection.

As we propose for the I-695 TSMO project, key staff Eric Sender, Will Fiorillo, and Matt Allen served as Project Manager and Lead Highway and Traffic Engineers on this project.

Successful Methods, Approaches, and Innovations

Mobility – This project supports regional growth and ensures efficient highway operations. WM delivered the roadway/civil and traffic designs of the new I-95 interchange and Contee Road. Our approach enhanced access with no additional delay to the local adjacent roadway network and minimized impacts.

Safety – All elements were constructed without delay. We sequenced the project in conjunction with road profile refinements to eliminate vertical differential and meet grades/provide smooth transitions between existing and proposed roads, which completed the work in the minimum number of stages and maintained existing traffic operations throughout. This minimized traffic disruption and maximized accessibility with adjacent properties. WM developed a comprehensive TMP to support MOT by performing operational analyses during each construction phase.

Operability/Maintainability/Adaptability – WM incorporated Contee Road interchange ITS-Dynamic Message Signs for I-95 and MD 200-ICC traveling advisories. ***We proactively coordinated the DMS requirements with MDTA and MDOT CHART to ensure compatibility with the two corridors' existing systems.***

SR 476 Reconstruction and Widening Design-Build, Montgomery County, PA

The SR 476 Project encompassed approximately four miles of six-lane divided highway from the PA Turnpike (SR 276) to the Schuylkill Expressway (I-76). Major quantities of work included reconstruction of 12,000 LF of concrete roadway; reconstruction of six ramps and construction of three additional ramp termini; rehabilitation of six bridges; sinkhole remediation; temporary and permanent ramp metering, traffic signals, ITS (consisting of CCTV System, DMS, RTMS Detectors, Travel Time System, and system Integration into existing TMC) and lighting; and 17 sign structures. The overall scope included landscaping, drainage, utilities, guardrail, barrier, and retaining walls.

The roadway was reconstructed in the existing footprint and the inside and outside shoulders were widened, which presented significant challenges with MOT. Myers was contracted with PennDOT for the project. MOT issues were so challenging that PennDOT included the traffic control as a design-build aspect of the contract. Myers' contracted a design team to design eight stages of construction that maintained six lanes of traffic throughout the total reconstruction and widening. An express-lane was utilized which retained two lanes of traffic on the roadway under construction and shifted a third lane to the opposite roadway. ***Providing safe access to the work zone with minimal impact to traffic flow was critical to meeting the project schedule milestones.***

The sign structures foundations were designed by PennDOT's engineer as cast-in-place foundations. To remove the sign structures from the critical path schedule, caisson foundations were submitted as a design alternative. This change moved the foundations outside of the roadway and accelerated the project schedule. Aggressive management of the project schedule included a global P6 schedule; a schedule for each stage of construction; a six-week look-ahead schedule; a weekly schedule; and ultimately, a schedule for each shift.

Successful Methods, Approaches, and Innovations

Mobility, Safety, Operability/Maintainability/Adaptability – ***ITS devices were deployed during construction to increase safety by enhancing incident detection through the deployment of temporary vehicle detectors, temporary ramp metering, and CCTV deployments.*** These applications provided insightful information to the traveling public, enhancing their ability to make decisions that could positively impact traffic flow on the corridor by giving them the option to choose an alternate route prior to the congestion. This also reduced the incidents of non-re-occurring congestion. The technology was transitioned into the permanent configuration once construction was completed thus providing the same benefits to the corridor as a completely integrated system into the existing platform.

TEAM MEMBERS
ALLAN MYERS | B&M Bruce & Merrilees

OWNER CONTACT
PA Department of Transportation
George Dunheimer, 610-205-6700
gdunheimer@state.pa.us

CONTRACT/PROJECT NO.
ECMS# 80479

DELIVERY METHOD
Design-Build

CONSTRUCTION COST
Contract Value (Initial / Final):
$71,728,383 / $85,317,213
Reason for Difference:
Add'l work requested by owner.

SCHEDULE PERFORMANCE
Completion Date (Initial / Final):
October 2012 / August 2013
Reason for Difference: Add'l work requested by owner.

SIMILARITIES TO I-695 TSMO

Mobility
- ✓ Maintained six lanes of traffic throughout construction

Safety
- ✓ Temporary Travel Time During Construction
- ✓ Temporary Ramp Metering
- ✓ Enhanced CCTV Coverage of the Corridor
- ✓ Enhanced DMS Deployments

Operate/Maintain/Adapt
- ✓ Permanent Travel Time System
- ✓ 23 RTMS Detectors and Video Detection
- ✓ Permanent Ramp Metering

PROPOSED STAFF INVOLVED
- Paul Barber PE
- Andrew Helble

* Proposed Key Staff

TEAM MEMBERS INVOLVED

WALLACE MONTGOMERY

OWNER CONTACT
MDOT State Highway Admin.
Eric Marabello, 410-545-8770
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CONTRACT/PROJECT NO.
PG4135172 and PG4945172

DELIVERY METHOD
Design-Bid-Build

CONSTRUCTION COST
Contract Value (Initial / Final):
$63,962,000 / $67,562,784
Reason for Difference:
Differing field pile driving, ground surcharge improvement(s) results and unforeseen HazMat

SCHEDULE PERFORMANCE
Completion Date (Initial / Final):
January 2017 / November 2016
Reason for Difference:
Sequence revisions for simultaneous multiple work area construction.

SIMILARITIES TO I-695 TSMO

Mobility
- ✓ Extensive traffic analysis and practical design application of AASHTO design criteria

Safety
- ✓ Reduced non-recurring event impacts to mainline traffic

Operate/Maintain/Adapt
- ✓ Incorporated ITS-CCTVs for CHART coverage of mainlines

PROPOSED STAFF INVOLVED
- Eric Sender, PE, DBIA*
- Matt Allen, PE, PTOE, CCM*
- Jason Kalasky, PE
- Diane Durscher, PE
- John Rectanus, PE, PTOE
- Roberto Barcena, PE
- William Wallace, PE

* Proposed Key Staff

I-95/I-495 and MD 5 Branch Avenue Metro Access Prince George's County, MD

WM provided engineering services for this Capital Beltway project alleviating existing and the anticipated future congestion from the Branch Avenue Metrorail Station's transit-orientated development along MD 5 and the Beltway between MD 337 and MD 414; a 5-mile distance. Services ranged from post-planning studies through PS&E, and they included highway, structural, H&H–drainage, SWM/ESC, and pavement/geotechnical designs; traffic analysis and engineering for ITS-CCTV features, and IMR/IAPA and MOT/TMP development; environmental permitting (wetland/stream/forest impacts); storm drain inspections; noise analysis; NEPA reevaluation support; and stakeholder/public outreach. ***As we propose for the I-695 TSMO Project, key staff Eric Sender and Matt Allen served as Project Manager and Lead Traffic (TMP-MOT/ITS) Engineer on this project.*** The project was constructed under two phases:

Phase 1 (PG4135172) – Consisted of modifications to the Capital Beltway and MD 5 Interchange and Capital Beltway lane continuity-departure/entrance and safety/resurfacing improvements. The primary elements were a new semi-direct flyover ramp from the Beltway Inner Loop to MD 5 South and the reestablishment of a cloverleaf ramp on a new alignment from MD 5 North to the Inner Loop. These modifications eliminated LOS F operations along the Inner Loop and MD 5 South. The design also included a dual lane departure (choice lane and auxiliary lane) from the Inner Loop to the new semi-direct flyover and MD 5 North and the reconstruction on a new alignment of the directional ramp from the Outer Loop to new semi-direct flyover for improved entry onto MD 5 South.

Phase 2 (PG4945172) – Consisted of MD 5 corridor capacity/ operation improvements with the construction of a new access road providing an added connection to the Metro. Also included operations improvements to the adjacent County road network.

Successful Methods, Approaches, and Innovations

Mobility – WM provided geometric refinements based on traffic operation analysis, constructability reviews, and practical design applications of AASHTO criteria. We documented the process/ data in the IAPA. We avoided impacting an existing noise barrier with securing a design exception for a reduced shoulder width along a dual auxiliary lane exit from the Inner Loop.

Safety – The project's final product reduced rear end collisions along both MD 5 and the Beltway, which was achieved through maximizing mainlines' traffic throughput with proper lane use or continuity, and the redistribution of traffic access to and from the Beltway and MD 5 with adequate traffic diverges and merges.

Operability/Maintainability/Adaptability – WM incorporated ITS-CCTV cameras to provide coverage of the Beltway and MD 5 mainlines. WM proactively coordinated CCTV locations and communication requirements with CHART and OOTS-TEDD.

LEGEND

- Reporting
- Communication
- Key Personnel
- XX/XX — Hours Available Per Week (Design / Construction)

DESIGN SUBCONSULTANTS

KCI	KCI Technologies
SaLUT	Soil & Land Use Technology
FTLA	Floura Teeter Landscape Architects

***Add'l Design Support to be Provided by*:**

CST	CST Engineering
DC	Daniel Consultants
MCI	Mercado Consultants
REM	Remline Corp
SE	Straughan Environmental
SCL	SuYash Consulting

Project Stakeholders | FHWA • MDOT SHA OHD, OPPE, OOTS, OOS, OED, OOC, OC, OMT & District 4 • MDOT CHART • Baltimore County Communities & Citizens/Businesses • Baltimore County Gov't & DPW • Baltimore County Public & Private Schools • Colleges/Universities incl. Goucher College, Towson University & Stevenson University • Faith-Based Organizations incl. Beth El & Chizuk Amuno Congregations • The Valleys Planning Council • Timonium Fair Grounds • Traveling Public • Baltimore County Fire Companies • Hospitals incl. Sheppard Pratt, St. Joseph & Northwest • State & Local Police • Elected Officials

MARYLAND DEPARTMENT OF TRANSPORTATION — STATE HIGHWAY ADMINISTRATION

Design-Build Project Manager
Thomas Heil, PE, DBIA (Myers) 32/24

Public Relations
Shannon Moody (Myers)

Health and Safety Manager
Chris Shertzer, CSP (Myers)

Independent Design Quality Manager
Stephen Drumm, PE (KCI) 32/8

Design Manager
Eric Sender, PE, DBIA (WM) 40/16

Design QA/QC
Tony Mawry, PE (WM)
Randy Durrenberger, PE (KHA)

Construction Manager
Eric Eastin (Myers) 16/40+

Construction Quality Manager
Ingrid Ngai (Myers)

Traffic Engineer
Matt Allen, PE, PTOE, CCM (WM) 40/16

Highway Engineer
Will Fiorillo, PE, DBIA (WM) 40/12

TSMO Expert
Lisa Burgess, PMP (KHA)

ITS Specialist
Mark Dunzo, PE (KHA) 40/16

ITS Construction Manager
Paul Barber, PE (B&M)

Electrical Superintendent
George Covert (B&M)

ITS/ATM Device Manager & Construction Expert
Andrew Helble (B&M)

Project Engineer
Jackson Panther (B&M)

Systems Integrator
TBD with Stakeholders

Project Controls/Schedule
Kathleen Leahy (Myers)

Project Manager
Laurie Bryan (Myers)

General Superintendent
Fran Purcell (Myers)

Construction Traffic Manager
Matt Ruth (Myers)

Roadway Superintendent
Rock Nicholson (Myers)

Project Engineer
John Harrington (Myers)

DBE/MBE Manager
Tuesday Nicholson (Myers)

Survey Manager
Nick Chiffons (Myers)

Construction Utility Coordinator
Paul Tabinowski (Myers)

Environmental Control Manager
Neph Eyassu (Myers)

Analysis/Modeling
Raj Paradkar, PE (KHA)

Traffic Design
John Rectanus, PE, PTOE (WM)

Highway Safety
Andy Duerr, PE (WM)

TMP/MOT
Bob Evans, PE, PTOE (WM)

Pavement Engineering
Roberto Barcena, PE (WM)

Drainage
Jason Kalasky, PE (WM)

Geotechnical Engineering
Ed Dalton, PE (SaLUT)

H&H/SWM/E&S
Diane Durscher, PE (WM)

Structures
Justin Myers, PE, DBIA (WM)

Surveys/ROW
Eric Cooper, LS (WM)

NEPA Re-Evaluation
Ray Moravec, PE (WM)

Design Utility Coordinator
William Wallace, PE (WM)

Noise
Seth Darlington, PE (WM)

Environmental Permitting
Jessica Klinefelter, CEP (WM)

Landscape Architecture
Joan Floura, PLA, LEED AP, DBIA (FTLA)

ATM/ITS Engineer
Alan Toppen, PE (KHA)

ITS Systems Engineer
Kevin Smith, PE (KHA)

ATM Design Expert
Inger VanOsdell, PE (KHA)

MDOT SHA District 4 Utility Engineer

Utilities | BGE – Electric & Gas, Verizon, Columbia Gas, Comcast, Howard County Fiber, Private Wells & Septics

Environmental Stakeholders | USACE, MDE, DNR, MD SHPO, USFWS, SHA-PRD

B.

PROJECT UNDERSTANDING AND DESIGN-BUILD APPROACH

ALLAN MYERS + BM Bruce & Merrilees + WALLACE MONTGOMERY + Kimley»Horn

Bi. STRATEGIC APPROACH TO MEETING PROJECT GOALS

The Myers Team fully understands the MDOT SHA goals for I-695 from I-70 to MD 43 (the Project) and has the staff and expertise to deliver the improvements safely, ahead of schedule, and within budget. We will utilize innovative, effective, and adaptable practical design solutions that utilize existing infrastructure to form the best solutions to meet MDOT SHA goals for part-time shoulder use, mobility, safety, and operability/maintainability/adaptability. Furthermore, our Team understands that our solutions are a part of a TSMO "system of systems" to enhance regional travel.

Our Team's Approach
Having worked around the nation, we understand that an optimal blend of operations and technology-based measures and targeted infrastructure modifications will be key to success. A systems-engineering approach that anticipates operations, maintenance, and life-cycle costs will guide the selection of improvements and technology that deliver optimal system benefits.

The goals from the RFQ are listed as Part-Time Shoulder Use, Mobility, Safety, and Operability/Maintainability/Adaptability, but the true measures of effectiveness noted in the RFQ for how these are met center around maximizing vehicle throughput; minimizing vehicle travel times and delays; improving system reliability; enhancing corridor safety and the ability for MDOT SHA to respond to incidents; minimizing operations and maintenance needs; and ensuring that the improvements can adapt to future transportation technological advancements. We will leverage our national expertise in transportation engineering, operations, and ITS; local knowledge and experience working in the project area; and innovative construction methods to meet project goals. We have developed similar TSMO solutions on past projects including the I-270 ICM project for MDOT SHA.

Extensive Similar Project Experience – The Myers Team has experience developing innovative, practical design solutions for freeways, interchanges, and arterials in the region. We have working relationships with MDOT SHA OHD, ICD, TFAD, TDSD, District 4, the TSMO Team, CHART, and MDOT MTA, as well as regional stakeholders like the Baltimore Regional Transportation Board, MDOT MPA, Valleys Planning Council, and Baltimore County. Our experience includes the I-270 ICM, I-495 Express Lanes Northern Extension, I-66 Inside the Beltway Express Lanes, I-66 Outside the Beltway Express Lanes, I-495 HOT lanes, I-95 HOT lanes, and I-395 Express Lanes. On each of these projects, we were able to identify the unique problems of the corridor, and then develop and implement sustainable solutions for each of the problems while finding a consensus between all the state, local, and regional planning agencies and stakeholders. In addition, our experience includes interchange access modifications, where our team members worked closely with RIPD and FHWA to finalize the Interchange Access Point Approval (IAPA).

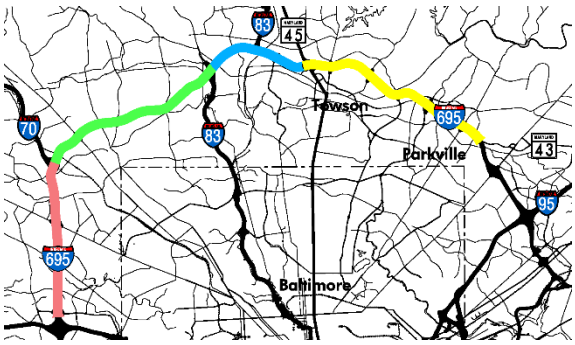
Analysis – Our Team will deliver a robust Traffic Analysis Report that follows the RFP methodology, measures desired outcomes, and clearly states results. We will analyze multiple data sources including volume counts, crash history, and the statewide transportation and land use model; field data; and "big data" sources, such as Streetlight and INRIX, to determine the root cause of the recurring and non-recurring congestion. We will use our knowledge of corridor and regional traffic patterns, along with the simulation models provided by MDOT SHA, to identify solutions for mitigation. We will utilize micro-simulation tools and scenario modeling to identify best-value benefits to the regional network. Our team members have developed productivity software to expedite inputs for simulation, explore growth scenarios, and develop graphical outputs of the measures of effectiveness. This experience has been refined with complex modeling and analysis on large interstate projects along I-495, I-95, I-66, I-395, I-270, and DC 295. Once traffic volumes are determined for each scenario, we will use a combination of HCM, Synchro, and VISSIM to assess vehicle throughput, travel time and delay, and overall system reliability. Safety effects will be determined through HSM, IHSDM, and other FHWA software. Our Team brings a deep bench of senior staff with 150 years of modeling and analysis experience.

Traffic Analysis Expertise
We understand that the purpose of conducting a robust and defendable traffic analysis is not to simply conduct analysis, but instead, to effectively identify the MOST beneficial transportation solutions for the corridor. We are uniquely able to conduct our analysis within the framework established in the RFQ, using the most reliable and best validated tools available to identify the right solutions for the corridor, as our team members have recently done on I-270.

Alternative Solutions – The way people travel, and how they make travel decisions, continues to be dynamic and ever-changing. While the system is largely static, there is great potential in adaptation. Our Team understands the changes coming to transportation and emerging trends for innovative solutions. Among many emerging trends, the Myers Team has developed alternative ways to use micro-simulation in VISSIM to evaluate impacts of connected and automated vehicles (CAV) on corridor capacity and operations. We understand the input adjustments that must be made to the MOVES air pollution model to capture electric vehicles and carpooling and will include them in the Project analysis. We

have the experience to evaluate the safety impacts to the considered solutions: PTSL, speed change lanes, intersection/geometric improvements, C-D lanes, variable speed limits (speed analyses), ramp metering, and ITS/communication improvements. We understand trade-offs between safety and mobility, such as the benefit of PTSL to relieve congestion which may require design exceptions or waivers at pinch points. We have developed tools to use crash modification factors to evaluate the safety benefits of reduced congestion and can compare benefits against impacts to safety due to design waivers.

Improvement Prioritization – Once we identify the ideal solutions for the corridor, the next step is to prioritize the solutions that maximize the mobility and safety benefits for the investment. Our Team sees the project area as four strategic areas to focus improvements: I-70 to I-795, I-795 to I-83 South, I-83 South to MD 45 (York Road), and MD 45 to MD 43. We will test each improvement stand-alone, as well as in combination with other elements, to find the most cost-effective solution that provides the greatest value and balances the measures of effectiveness. A ranking table for all solutions will help prioritize the optimal combination of solutions.



Developing a Comprehensive Program – The Myers Team understands the challenge of meeting corridor objectives within a fixed budget and amid complex and intertwined issues along I-695. On the Inner Loop near MD 542, vertical geometry creates congestion. At I-70 and I-795, poor lane balance is an issue. At MD 41 and MD 147, insufficient weaving creates friction. We must develop and strategically implement improvements based upon their ability to effect positive changes on safety, mobility, and reliability. They must also be coordinated with adjacent projects including the I-695/I-70 interchange, I-695/Cromwell Bridge Road Drainage Improvements, Crosby Road Bridge over I-695, and I-695 Inner Loop Noise Barrier project.

A "safety first" approach will help to reduce non-recurring incidents, which will increase throughput within the corridor. Our Team understands that the solutions deployed must satisfy the immediate project while minimizing long-term operation and maintenance costs for CHART and others. Consideration of how the solutions integrate with the current CHART work plan will be evaluated in a solution matrix; both from a hardware and software perspective. ITS elements will meet CHART specs, with a focus on adaptability to future needs of providing a secure, 5G network that supports/powers V2I and "Smart City" tech.

> ***Data-Driven Planning Expertise***
> *For the assessment of I-81, our team members used data from a wide range of sources, we were able to rapidly identify and prioritize cost-effective and implementable solutions to address non-recurring and recurring congestion along the entirety of both directions of the 325-mile corridor.*

Construction – A project is a success if it is safely constructed, on time, within budget, and of high quality. To accomplish this, our team members follow a structured approach to operation planning that integrates risk management and stakeholder coordination. Implementation of a formal partnering process throughout design and construction has led to successful completion of several MDOT SHA design-build projects, including the MD 404 dualization and I-95/Contee Road interchange. Construction efforts will focus on maintaining traffic flow during construction; expediting delivery of improvements to ease congestion; and maintaining a safe work zone for roadway users and construction staff. Our Team has vast experience delivering projects within budget and on schedule, and this project is a great fit for our capabilities. Having worked together on projects, we understand each team member's strengths and how to use them effectively.

Our approach to the construction will be very direct and straightforward. Our initial focus is to increase public awareness about the construction, and to focus on building the phases that provide the greatest safety, mobility, and reliability benefits in the project area. We will use temporary ITS solutions including PVMS, speed and volume collectors, and portable PTZ cameras – as well as collaborating with CHART – to monitor traffic through the work zone and make "on the fly" adjustments to maximize safety and mobility.

Public outreach is essential. The Myers Team will reach out to commuters, freight carriers, and adjacent communities through methods like meetings, press releases and newsletters, and also via e-mail blasts, VMS messages, and social media posts – all coordinated through the MDOT SHA Office of Communication.

1 Goal: Part-Time Shoulder Use

Approach to Meeting the Goal – The Myers Team understands MDOT SHA's goal to build a median PTSL to provide additional capacity during times of recurring congestion. Over some sections of the roadway, pavement is in place for easy conversion to PTSL – I-695 between MD 129 and the Jones Falls Expressway, across the new bridges at Milford Mill Road and MD 26, and a short segment between the I-

795 ramps. In other areas, we will determine where overhead signs must be replaced, as well as where full-depth pavement and drainage improvements are needed. We will explore using design exceptions and install new emergency pull-off areas. We will also investigate existing climbing lanes and assess the need for others. The dynamic signage and signaling must not be confusing to drivers, degrading safety. The design of the lane and shoulders must consider the spread of runoff, snow removal, etc. ITS instrumentation must include feedback mechanisms (cameras, sensors) that support CHART's mission, monitoring 100% of the shoulder with set procedures to open and close it. Our Team will look for opportunities to include ITS solutions on existing structures, existing overhead signs to remain, or combine with new overhead signs.

Our Team will utilize current FHWA systems engineering guidance in developing systems engineering documentation, including a comprehensive Concept of Operations (Con Ops) that defines the objectives of the PTSL, as well as the use cases for its operations, who will maintain and operate, and who will be responsible for activities such as enforcement and driver education. The Con Ops document will lay out the details of how the TSMO strategies will be operated and the trigger conditions from a user-oriented view. It will focus on project area needs, the goals and objectives, and the proposed operational approaches and strategies for attaining these goals.

Con Ops Development
Our Team developed a Con Ops document for various ATMS systems including PTSL for I-66 and I-64 that outlines how various TSMO strategies will operate and provided details of trigger conditions.

We will utilize the VISSIM model to include a PTSL through the project limits, and analyze the base year traffic, future traffic, and a sensitivity analysis to account for latent or induced demand that may now use local roads or other modes. The design will focus work in segments that have the greatest need and then add other ITS features, such as ramp metering and variable speed limits. For areas that may require design exceptions, we will complete HSM safety analyses that weigh the benefits of reduced congestion against shoulder or lane narrowing.

Applying the Relevant Expertise of the Team – Our team members' experience includes ITS systems engineering and preparing design-build documents for the I-66 facility in northern Virginia; design of the PTSL on I-64 in the Hampton roads area of Virginia; and FHWA approval for a left-side PTSL along I-64 on the Hampton Roads Bridge and Tunnel (HRBT) project. The I-66 PTSL was built as a right-side shoulder while the HRBT was a left-side shoulder. Emergency pull-offs were optimized by analyzing RITIS crash data and coordinating with the VDOT Safety Service Patrol. On both these projects, we used VISSIM microsimulation to evaluate and demonstrate the conditions with and without the PTSL. For I-64, we also effectively used FHWA's FREEVAL software to calculate PTSL reliability, and using CMFs, evaluated the safety trade-off with mobility improvements. We used VISSIM models for the I-270 ICM and tested several ramp metering algorithms to maximize peak period throughput. For the I-64 and I-66 projects, we worked with VDOT to optimize the PTSL timing and ramp metering algorithm as demand shifted to the mainline.

2 Goal: Mobility

Approach to Meeting the Goal – The Myers Team will focus on safely boosting mobility and system reliability. Drivers truly see the benefit of projects when they have a predictable commute time, regardless of the mode used. With the limited budget, our Team will create solutions that provide the biggest bang for the buck today and set the stage for easily implementing future improvements like the I-70 interchange. We understand the I-695 improvements may impact the tie-ins at the project limits and entry/exit points. Our Team will evaluate the need for new lanes in areas where noise barriers already provide mitigation, as well as for auxiliary lanes between on- and off-ramps. We will determine the need for ramp metering and extra on-ramp storage. We will develop interchange solutions to resolve those that create friction on the mainline, such as the cloverleaf designs at MD 41 and MD 147. For short weaves, we will study C-D lanes to separate merging and mainline traffic. Our Team will use traveler information systems and ITS to advise drivers of incidents early and consider alternate routes. Collaboration with MDOT SHA is essential to achieve this project goal, and our Team foresees many one-on-one meetings to discuss the proposed work. We also understand that monitoring and optimizing the system once it is active is essential.

Reliability
On I-66 Outside the Beltway, the ATMS was so successful at removing latent demand from local streets that as time went on, the shoulders were opened for longer durations.

Applying the Relevant Expertise of Our Team – Our design team is well-versed in the BRTB travel demand model; the TSMO Strategic Implementation Plan; the Integrated Freeway and Arterial Operations Master Plan; as well as the Analysis, Modeling, and Simulation (AMS) tool that MDOT SHA developed in conjunction with the University of Maryland. Our experience includes scenario modeling under various land use and demand assumptions using CUBE and placing it into a "localized" network analysis using VISSIM. Our team members have used regional travel demand models to develop forecasts and alternatives for the I-66, I-95, and I-495 corridors in northern Virginia, as well as the I-64 corridor in the Hampton Roads area.

Demand forecasts from regional models operating under saturated conditions often inaccurately account for the unserved demand in the corridor. Our Team has used post-processing tools to develop balanced volumes for corridors to account for corridor capacity constraints. We have also created proprietary tools that allow the loading of these volumes into VISSIM without losing origin-destination information, to develop a true end-to-end routing using VISUM and VHelper that maintains original corridor routes during the simulation. Our multi-resolution modeling capabilities have helped us develop solutions that do not otherwise degrade the network. Our staff has used the mesoscopic modeling tool DTA-lite for MDOT SHA to evaluate before and after ETL conditions along I-95 in White Marsh. We have used VISUM to evaluate the impact of local road diversions along I-66 Inside the Beltway before and after their conversion to HOT. We understand the importance of evaluating the problem from a multi-resolution and multi-hour level to find a sustainable solution that accounts for unserved demand. The Myers Team is experienced in designing and constructing geometric improvements; signing and marking; signals; ITS devices; and overhead sign structures. Our experience includes major interstates and freeways, interchange improvements, and ITS systems along I-95, I-495, I-695, MD 100, I-64, I-264, and I-476. Our Team will utilize this experience and understanding of PTSL functionality to anticipate issues that are due to specific operational issues in the I-695 corridor.

3 Goal: Safety

I-695 at Charles Street

Approach to Meeting the Goal – Safety is front and center in the Maryland Transportation Plan. We understand that improvements in mobility, reliability, and accessibility are a direct result of a safe system. We will work to provide a safer I-695 and increase the ability of MDOT SHA to reduce, detect, verify, respond to, and manage non-recurring congestion causes such as crashes, disabled vehicles, adverse weather, etc. We will identify frequent crash locations, root out causes, and apply countermeasures. We will use HSM methods and software (IHSDM, Safety Analyst) to quantify safety benefits of each element. We will work closely with District 4 and CHART to focus on better monitoring of incidents; improving ramp junctions (weaving areas, conflict points); addressing geometric and roadside safety concerns; incorporating variable speed limits; and providing better delineation and roadside protection. Our Team will develop a TMP that includes well-conceived MOT plans, as well as a phased public outreach, incident management, and a traffic operations and maintenance plan to reduce crashes (and their effects) during construction for roadway users and workers. ITS improvements must respond "on the fly," providing positive guidance in the event of incidents. The cameras, side-shooting radar, and weather stations must be established such that once a change is recognized (slow speed due to crash, snow event, etc.), the variable speed limit signs, DMS, PTSL closures, and ramp meter timing must autonomously adjust to slow and reduce the amount of traffic in the system. Communication with the SOC, MEMS, and local traffic operations centers must be timely.

Emergency Services Coordination
On MD 404, Myers and WM coordinated lane closures with emergency services, enabling first responders to move through the project without delay. Fire departments provided specific communication equipment to speak directly with construction forces who used visible pilot trucks and/or immediately implemented a temporary full road closure to guide responders through the work zones.

Applying the Relevant Expertise of Our Team – KHA and WM are well-versed in traffic safety. We have prepared Roadside Safety Audits in MD and nationwide. We have analyzed the alternative solutions for both corridor and intersection projects for safety using HSM methods, as well as using Safety Analyst and IHSDM software programs. For the I-64 HRBT, I-81 corridor plan, and Transform 66 projects, KHA staff used a data-driven approach to develop an understanding of the key crash types and severities throughout the corridor. Analyses identified crash hotspots and focused attention on those areas. Crash types can differ by location and facilities, and our Team used CMFs to predict crash reductions for each systemic or spot improvements that mitigate the most severe crashes. The anticipated crash reduction benefit was then compared against the cost of the work to help with prioritization. Our Team will utilize strategies and recommendations from the Strategic Highway Safety Plan (SHSP), in combination with current safety best practices, to identify both systemic and spot improvements focused on reducing fatalities and serious injuries along the corridor.

4 Goal: Operability/Maintainability/Adaptability

Approach to Meeting the Goal – The Myers Team understands that what is built today has long-term costs. The improvements must be robust, reliable, and forward-thinking; able to handle the evolving needs of MDOT SHA, such as added capacity to accommodate future CAV functions. The system must not only provide real-time traffic information to roadway users that may influence travel choices, but must also

support dedicated short-range communication and adaptive traffic control technologies to autonomously improve traffic flows on arterials and ramp terminals. The Myers Team will use the guidance in the CAV Strategic Action Plan, as well as the Maryland Statewide ITS Architecture guidebook, to develop solutions. Our Team understands that any TSMO solution implemented needs adequate monitoring and feedback mechanisms to reduce incident management times. PTZ cameras, roadside radar, dynamic message signs, and weather stations provide timely information to determine whether to open or close lanes, or to adjust variable speed limits. ITS technology evolves rapidly, and open-source solutions that are easily upgraded may reduce long-term cost. The solutions must fit the purpose, align with MDOT SHA maintenance capabilities and operations expertise, and anticipate future needs. The Myers Team will work closely with District 4 Maintenance and CHART to ensure that shoulders in constrained conditions are adequate for snow storage, and that emergency pull-off areas are provided to reduce the effects of non-recurring congestion. Our Team will consider the existing CHART infrastructure when selecting solutions, not only based upon safety and cost, but on the overall maintenance life-cycle of the device.

Applying the Relevant Expertise of Our Team – The Myers Team brings over two decades of roadway and ITS design and integration experience with maintenance managers, traffic support, and roadway designers who understand MDOT SHA's needs and the design-build process. We bring the experience of not only integrating these designs into existing software systems but operating and maintaining these systems after construction. This gives our Team a true understanding how to create a design process that creates quality construction plans that reflect the owner's input while taking advantage of the schedule and cost benefits, quality, and maintainability that result from a well-managed design-build project delivery.

In addition to serving as engineer of record on many projects, our team members also have extensive software requirements development and integration experience including serving as software system manager for the Michigan DOT statewide ATMS, as well as dozens of arterial ATMS deployments nationwide.

TSMO Expertise

Our team members have designed, deployed, and maintained TSMO devices on I-95 Inside the Beltway and on I-476. We have successfully integrated ramp metering, DMS, tag readers, Bluetooth readers, CCTV and side-fire radar detectors on an existing software without interruption of service. This skill sets our Team apart and makes us uniquely capable to deliver this Project.

Bii. MOST RELEVANT AND CRITICAL RISKS

On I-695, the Myers Team has an overarching mission to maximize person-throughput; minimize travel times and delays; improve system reliability; enhance corridor safety and the ability for MDOT SHA to respond to incidents; minimize operations and maintenance needs; and ensure the work is adaptable to changing technology. This mission is not only accomplished via improving roadway capacity, but also through advanced methods to communicate with roadway users real-time to improve incident management, which accounts for about 60% of regional congestion. The critical risks associated with achieving each of the four goals defined by MDOT SHA are outlined herein. Attached to those goals are potential improvements that we will prioritize based upon their effectiveness and contribution to mission success.

Risks Associated with Part-Time Shoulder Use

PTSL use is an effective measure to increase capacity for recurring/peak hour congestion and a suitable solution for special events. It may be used for incident management, but care must be taken to open the lane as there may already be a bit of chaos in progress. Specific PTSL risks include:

- Increased likelihood of crashes due to reduced shoulder for roadway departures;
- Limited stopping sight distance where there are bifurcated medians and curves with small radii;
- Adequate storage space for snow removal and runoff to prevent hydroplaning;
- Accommodation of larger vehicles if narrowed lanes are used, specifically on tight horizontal curves;
- Left-side ramp exits at the northern project limit at MD 43, which is contrary to driver expectancy;
- Continuity of the PTSL for extended lengths to provide greater benefits than simply a "queue jump;"
- Prevention of a bottleneck chokepoint at the PT shoulder termini, anticipated at I-70 and MD 43;
- Reduced benefit where the costs associated with full depth reconstruction, bridge widening, pavement reconstruction and barrier replacement to meet the new MASH criteria impede the overall program;
- Requirements for noise mitigation due to increased vehicle throughput and speeds;
- SWM requirements for full depth roadway reconstruction that requires treatment;
- Negative feedback on the Project solutions from roadway users and surrounding communities; and
- Potential lack of enforcement from police to prevent misuse of the lanes.

Expertise and Managing the Risks – Our Team is structured with expertise in implementing PTSLs nationwide. We understand that to convert a shoulder in an existing corridor to one that is drivable or used

part-time has its challenges but ultimately can be very effective in mitigating peak condition congestion. It is important to evaluate what times of operations or under what thresholds the PTSL should be active. The trade-off between safety and mobility improvement must be evaluated. While the initial operating conditions would be developed as part of the Project, our Team will work closely with CHART and District 4 to fine-tune business rules that govern hours of operations, conditions under which the lanes will be opened, and procedures to ensure lanes are clear upon opening. Relieving congestion at an existing bottleneck could simply move the congestion point downstream, reducing PTSL effectiveness. We recently evaluated the PTSL along the I-495 Inner Loop in Virginia, just south of the Legion Bridge, where this phenomenon caused problems on the approach, essentially only providing a "queue jump" for HOT lane users but doing nothing for overall travel time.

PTSL Expertise
Our team members have delivered PTSL projects along I-66 and the I-64 HRBT. We strategized with VDOT to determine PTSL operations and adjusted the strategy based on added traffic in the corridor.

For a left-side (median) PTSL it is important to provide a buffer from the inside barrier. Having a hard shoulder with less than a four (4) foot buffer can affect travel speeds, which creates friction in adjacent lanes. For areas where the buffer does not provide adequate stopping sight distance, it may be necessary to implement advisory speeds for curves or adjust variable speed limits. We will utilize the FHWA Guide for PTSL (Feb 2016) as a reference, as well as other best practices. We will meet regularly with OHD, District 4, and CHART during design; coordinate public information meetings; and communicate with stakeholders including emergency responders. Specific considerations we will evaluate to mitigate the risks include:

- Evaluate horizontal sight lines and incorporate barrier height improvements or countermeasures;
- Provide a permanent shoulder of 4' minimum in accordance with the AASHTO Green Book;
- Provide no less than 11' lanes with lane widening on curves;
- Analyze PT Shoulder drop at MD 43 left exit so that it continues as the ramp exit lane during peak hours;
- Use a data-driven approach to determine the best locations for emergency pull-offs;
- Implement progressive SWM solutions considering limited right-of-way;
- Consider a 'No Trucks' limitation on PTSL to minimize pavement costs and extend pavement life;
- Consider posting of advisory speeds on curves due to a reduction of sight distance

Risks Associated with Mobility

The Myers Team's focus with respect to mobility is to address both the recurring congestion challenges that plague the corridor, as well as the non-recurring congestion that results from incidents and breakdowns. Specific risks that must be considered in relation to mobility improvements include:

- Delays to the local road network, as well as increased likelihood of crashes due to ramp metering;
- Cost/benefit analysis of road widening, bridge widening, and interchange modifications;
- Creating new locations where traffic typically slows, resulting in additional crashes in the short term;
- New innovations (ramp metering, dynamic lane controls) may require a learning curve for drivers;
- Potential for bottlenecks and driver confusion at the project limits;
- Administrative challenges related to approval of the IAPA and NEPA/MEPA; and
- Potential environmental or resource impacts including SWM requirements, historic/cultural impacts and noise from increase in traffic, as well as the cost/time for mitigation measures.

Expertise and Managing the Risks – We will achieve mobility enhancements through consistent lane balance during peak and non-peak times, along with systematic deployment of technology blended with overall geometric improvements. We will focus on solutions to improve mobility on the corridor and the network – our solutions will do more than simply release traffic and create a new bottleneck downstream. Our analysis will include every ramp terminal and adjoining arterial to understand where the traffic originates and leaves, and we will develop a priority list of solutions. Improvements beyond PTSL may include modifications to gore areas/ramp terminals; elimination of substandard weaves; adding/ extending speed change lanes; installing truck climbing lanes; constructing C-D lanes; and improving lane balance.

Similar Interstate Corridor Expertise
The Myers Team will build on lessons learned from our experience working on major corridors such as I-270, I-66, I-95, and I-64 using micro-simulation modeling (VISSIM) to find the optimal solutions to improve corridor mobility. Along each of these corridors, downstream bottlenecks needed to be effectively managed.

Fixing a bottleneck on the freeway may result in increased flow to arterials. It is important to ensure that the arterial system can service the increase. If a ramp meter will create on-ramp queues, it may be necessary to expand the ramp to two lanes and explore arterial improvements. Timing of meters can be static or based on various algorithms such as ALENEA, SWARM, etc. Improving conditions on the I-695 mainline may pull some "latent" demand that is using local roads. While this shift can be anticipated through micro-simulation, we intend to revisit the algorithm once the facility is open. On the I-270 ICM, our team members tested

different ramp metering algorithms in micro-simulation and provided a queue detector along ramps to provide a two-phased solution that does not negatively penalize the arterials to improve freeway operations. In conjunction with ramp metering, there are a number of other solutions which assist with congestion such as variable speed limits, strategic DMS deployments, vehicle detectors, increased CCTV coverage for incident management, transit/freight signal priority on arterials, ITS systems, and emergency signal priority on adjacent arterials. Our Team will analyze and strategically deploy these devices to mitigate congestion.

Our Team is well-versed in FHWA and MDOT SHA Noise Policy and Procedures for highway noise analysis and mitigation design. WM will perform all analyses necessary to avoid, minimize and or mitigate noise impacts to the surrounding community. We have experience identifying noise-sensitive areas; conducting noise measurements for TNM 2.5 model development and validation; performing noise analysis; identifying impacts; and performing any necessary mitigation design. Recent project experience includes I-695 Featherbed Park and I-95/I-495 Greenbelt Metro.

Risks Associated with Safety

The Myers Team's focus on safety is addressed through minimizing the impacts of non-recurring congestion related to crashes, disabled vehicles, adverse weather, emergencies, and other incidents. Also, we seek to eliminate all corridor existing/future safety deficiencies to the maximum extent practicable for construction phase activities and the permanent condition. Specific risks that must be considered include:

- PTSLs are generally ineffective for non-recurring congestion, and may hinder emergency response;
- Existing deficiencies in geometry pose a risk to public and worker safety;
- Many existing barrier end treatments are not compliant with the latest MASH requirements;
- Drivers may not be familiar with the proposed improvements;
- General risks to travelers and workers in work zones (distracted/angry drivers, changing patterns); and
- Solving non-recurring congestion may be outside of the current capabilities of CHART.

Expertise and Managing the Risks – To analyze the safety of the proposed Project improvements, the Myers Team will pull the RITIS and crash data from at least the last five years for each roadway segment to establish baseline conditions. We will use HSM methods to analyze each corridor segment, calibrating the Safety Performance Functions (SPF) and incorporating Crash Modification Factors (CMF) for each of the proposed changes. We will use AASHTO Safety Analyst and ISATe to compare countermeasures head-to-head and will use IHSDM to assess the safety effects of changes in geometry of each alternative. Once the optimal design is developed, the Myers Team will prepare a detailed TMP that includes MOT plans for each project segment, as well as incident management and detour scenarios and a public outreach plan. The TMP will also include temporary ITS solutions that provide advance warning to drivers entering work zones, such as side-fire radar, PVMS real-time conditions, and variable speed limits. These will be useful prior to night-time two-lane closures.

> ***Safety Expertise***
> *For MD 404, we managed the risk and minimized delays by implementing a robust outreach plan that established open communication with stakeholders. Our integrated development of the TMP and staging/MOT phasing minimized delays to the traveling public, making the project a success.*

Reducing congestion can result in reduction of non-recurring incidents but improving speeds and throughput may cause some safety concerns. The key is to accurately predict the changes in speeds and throughput and then apply HSM methods to conduct predictive crash analysis; identify crash hot spots; and provide mitigation alternatives. Our strategy to managing safety risks includes reducing stop-and-go traffic on I-695; maintaining adequate emergency pull-off areas; and implementing ITS-based improvements (cameras, side-shooting speed radar, variable speed limits, DMS, enhanced communication, and fiber-optic system for future CAV and V2I advancements). Hard improvements can solve deficiencies in substandard concrete median barrier, non-compliant barrier end treatments, and narrow gore areas. Additional countermeasures include geometric improvements at ramps, shoulder pull off areas, and lighting.

Risks Associated with Operability/Maintainability/Adaptability

Part-Time Shoulders, permanent geometric improvements to address congestion, and permanent intelligent transportation solutions must be in sync with MDOT SHA maintenance and operations, both now and in consideration of future technological advancements. The improvements must enhance the ability of CHART and emergency responders to reach and ultimately clear crashes, providing space to not hinder efforts. The system must provide positive guidance to drivers during maintenance work or incidents. ITS elements must be durable, with a robust backup power supply. Specific risks to be considered include:

- Future ITS needs are known, but with limited confidence;
- Proprietary systems are costly and susceptible to hacking;
- The power needs of future ITS systems are unknown;

- Excessive system and roadway maintenance increases chance of worker injury and degrades operations;
- Roadway and ITS changes require updates to incident management plans and O&M directives/manuals;
- Delays caused by maintenance operations and safety of MDOT SHA maintenance work force

Expertise and Managing the Risks – There are numerous risk and challenges with software development/ integration process. This risk is amplified by the degree in which the system is integrated into the existing CHART system. To mitigate these risks, the Myers Team will interview potential software providers and partner with the MDOT SHA to identify the best value vendor to work through the integration process. The software will be customized to the uniqueness of the corridor, based upon our Concept of Operations, without undue burden on the existing CHART system or its operators. ITS hardware will be selected based upon service reliability, CHART Compatibility, and cost. We intend to utilize devices and technologies that are open-source, easily upgradeable, and compatible with existing systems to minimize the risks of device failure and ease of assimilation into current systems. Camera systems, side shooting radar, and vehicle identification systems will be consistent with current MDOT SHA specifications.

Our Team will partner with MDOT SHA Maintenance and CHART forces to select the best-value total life-cycle components. Through the systems engineering process and collaboration with maintenance, operations, and IT staff, we understand how to listen to concerns and past experiences. Device selection should be a best-value decision which includes service reliability, deployment, and cost consideration. The devices must be reliable and have very low frequency of failure to minimize maintenance requirement and increase system dependability.

Systems Selection Expertise
We have worked with several agencies in helping to refine their procurement specifications to obtain best value total life-cycle components including work for NCDOT, VDOT, TDOT, FDOT, Arizona DOT and Caltrans.

Process for Balancing Risks

The Myers Team will conduct a risk management review during the technical phase of selection which includes risk assessments, a risk register, and risk mitigation plans. Following award, we will invite key project stakeholders to participate in a brainstorming workshop to identify all possible project risks, and then evaluate and rate them based on the likelihood that the event will occur and the magnitude of its effect. For high-rated risks, we will prepare a risk mitigation plan which includes specific actions we will take to minimize the impact of the risk. ***The risks for the Project, as identified above, fall into four distinct categories: (1) safety; (2) effectiveness of improvements on operations/congestion reduction; (3) high costs and impacts; and (4) technology and future challenges.***

To balance risks, we will establish that Priority Number 1 is Safety and we will develop appropriate mitigation strategies (as outlined herein) so that safety is maximized. Next, we will balance the effectiveness of improvements and operations against high costs and impacts. Given that the mission of the project is to increase person throughput and solve congestion – but under the framework of a stipulated sum – these two risks must be carefully balanced to deliver for MDOT SHA the most beneficial project in terms of congestion relief. The PTSL and various geometric improvements for mobility may/will carry along costs and impacts in pavement, barrier, noise walls, drainage, utilities, geotechnical, stormwater management, resources and more. Our analysis (as per Section B.i.) will model potential improvements so that benefit/cost is maximized and MDOT SHA goals are achieved. Finally, technology and future challenges will be integrated throughout. Technology is important to mitigation strategies for safety and mobility and potential tools are described herein. However, it is also important to look ahead toward maintenance and future ITS/CHART development as both traffic demand increases, and technology gains are realized.

Biii. DESIGN-BUILD PROCESS FROM DESIGN THROUGH CONSTRUCTION

To develop a cost-effective, constructible, and high-quality design is constructed in conformance with the contract documents, our Team will implement a discipline-focused approach to design, with input from design and construction staff as well as MDOT SHA and key stakeholders. We will establish working task groups for traffic analysis, roadway, ITS/ATM, pavements, NEPA/noise/environmental, drainage-SWM, structures, and utilities. Each design package ultimately released for construction will follow the design quality management and approval workflow shown in Figure B1 and described below.

Roles and Responsibilities – Our DBPM, Tom Heil, PE, will be responsible for execution of the contract work and ultimate oversight of all design and construction activities including maximizing efficiencies of the project scope within the project budget. Design Manager (DM), Eric Sender, PE, DBIA, will be responsible for management of the Design Team to ensure timely quality design submittals. He will be supported by KHA for traffic analysis documentation and ITS Systems/ATM designs and submittals. He will integrate subconsultants as a seamless extension to the WM design team. Construction Manager (CM), Eric Eastin, will manage the construction process and will ensure that the materials used, and work

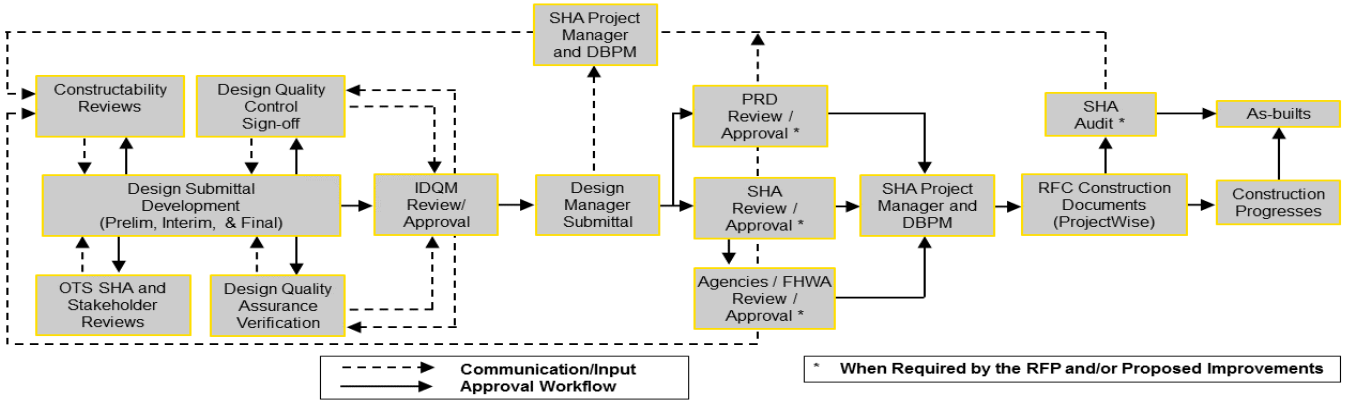


Figure B1 – Design Quality Management and Approval Workflow

performed meet the contractual requirements. He will be supported by ITS CM, Paul Barber, for ATM construction and integration of ITS devices and electrical/communication systems.

Design Development – Coordination activities will include constructability reviews, detailed scoping/over-the-shoulder input from MDOT SHA, and comment resolution with projects stakeholders. Weekly design meetings will address design status, schedule, utilities, contract administration, safety, and public outreach.

- Requesting MDOT SHA and MDOT CHART involvement early and throughout the design process;
- Engaging MDOT SHA Traffic Analysis such as OPPE TAFD/RIPD and OOTS TDSD and Design Divisions at design kickoff to confirm design assumptions and project study areas/networks;
- Coordinating specific issue/task and OTS reviews with MDOT SHA OPPE EPLD/TAFD/RIPD, OOTS TDSD, and District 4; MDOT CHART; and FHWA; and environmental agencies to ensure compliance with environmental commitments and obtain any required reevaluations or additional approvals;
- Holding over-the-shoulder (OTS) reviews with IDQM staff, MDOT SHA design divisions, PRD, MDE to ensure design solutions are acceptable, RFP compliant and constructible; and to resolve issues timely;
- Providing advance notification of design submissions to the IDQM, MDOT SHA, PRD and others to support adequate resource planning that ensures the review and design schedule can be met;
- Conducting constructability reviews with the CM, ITS CM, superintendents, and subcontractors to review the design during each stage of development to incorporate construction means/methods;

Design Quality Management – Tony Mawry, PE (Civil) and Randy Durrenberger, PE (Traffic) will oversee the design quality management process using proven methods from past design-build projects. Experienced and licensed design personnel will perform a complete check of all design, calculations, plans and specifications including overall concepts and element coordination. Design Quality Assurance will verify that all aspects of the Design Quality Control Plan (DQCP) have been followed. Steve Drumm, PE (KCI) will lead the IDQM efforts and function in the role of MDOT SHA to ensure conformance with RFP requirements. He will be engaged early at the design kickoff to confirm/align to the correct assumptions, design networks, standard growth rate assumptions, project study area, etc.As the Independent Design Quality Manager (IDQM), he will review and approve the DQCP prior to submission to MDOT SHA; review all analysis/modeling/design elements for compliance; sign, seal, and certify that design submittals meet the contract requirements prior to construction; review/approve all working/shop drawings; and review/approve revisions during construction. During construction, design staff will attend progress meetings to resolve questions and field issues as they arise.

Construction – Our Team will implement a structured approach to construction operation planning that includes quality, safety, and production goals into a single operational plan. In addition to five-week look ahead schedules that ensure all team members are aware of upcoming work activities, weekly detailed schedules are established by the construction team and field managers create daily work plans that are reviewed with construction crews at the beginning of each shift. Daily work plans are reviewed by the construction team to note any quality issues that may have been encountered.

Prior to commencement of construction, our Team will hold preparatory meetings with construction crews, design staff, and MDOT SHA to review planned construction means/methods and confirm consistency with design assumptions and compliance. During construction, we will ensure the crews responsible for building the work have the latest approved construction plans. Taking advantage of technology advancements, our field managers and construction crews have access to live working documents and the latest approved construction plans via iPads that have access to shared working sites with the latest documents. Our construction team will also ensure MDOT inspectors have the correct plans in hand and provide copies when necessary to ensure all parties are working with the most accurate and up-to-date information.

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