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2.
Key Staff and Qualifications

2.1
Design Key Staff

Olumide Adeyinka, PE, DBIA

PROJECT DESIGN MANAGER

Olu Adeyinka, PE has more than 31 years of experience leading diverse major transportation projects, including traffic management systems, intelligent transportation systems (ITS), transportation planning and engineering, congestion management systems, traffic signal system design, highway and street design analyses, operations and management, and traffic safety studies. Olu has successfully delivered traditional and design-build (DB) transportation infrastructure and system projects through development, implementation, and construction to acceptance, startup, and operations phases, serving in several key roles, such as **project manager**, **design manager**, and integration/interface manager. He successfully delivered the I-95 and I-495 Express lanes projects ahead of schedule and on budget. For the IS 270 Innovative Congestion Management (IS 270 ICM) Project, Olu will manage the entire design process, interfacing with construction staff, the SHA, and key project stakeholders during each project phase. Because the design work will likely be heavily focused on ITS components, Olu's many years of experience with the design, construction, and implementation of integrated civil-system infrastructure projects will be an asset to the team, the SHA, and the people who travel the IS 270 corridor. *Olu's civil experience ensures that all elements of the project's design and implementation, including civil, transportation system management improvements, environmental, and ITS, will be effectively coordinated and completed on-time and within budget.*

RELEVANT PROJECT EXPERIENCE

Deputy Project Manager, ITS/Tolling Task Manager, Transform 66 Inside and Outside the Beltway Program, Virginia Department of Transportation (VDOT), Northern Virginia (2015-Present). Transform 66 is a $2.2 billion program consisting of a series of design-bid-build, DB, and P3 contracts to improve mobility on this notoriously congested corridor. Inside the Beltway includes adding capacity in one direction and providing multimodal improvements to adjacent arterials. Outside the Beltway, the project will transform 25 miles of the I-66 corridor into a widened express lanes and general-purpose lanes facility with the reconfiguration of several major interchanges. Olu is responsible for program management oversight support and **management leadership of the project and design team**, development of procurement documents, managing the tolling/ITS design, and engineering implementation. He is the task lead for tolling and intelligent transportation oversight and coordination. *Similar to the IS 270 ICM Project, this ongoing project implements many congestion management components to increase throughput and reliability and improve safety along the I-66 corridor. Inside the beltway, dynamic algorithms will ensure a minimum speed along the corridor. This approach delivered a high level of travel time reliability.*

Years of Experience 31

Education

- MBA, Florida Atlantic University, 2009
- MS, Civil and Environmental Engineering, University of Rhode Island, 1992
- BS, Civil Engineering, Northeastern University, 1986

Registrations/Licenses

- Professional Engineer: MD (49534), VA (040245963), NY (08447), FL (66261)

Additional Experience

- Design Manager, Interim Traffic Management System Design and Deployment, Palm Beach County, FL (2001-2005)
- Senior Technical Representative/Systems Integration Engineer, Southern New Jersey Light Rail Group, LLC, NJ (1999-2001)
- Engineering Supervisor, Intelligent Transportation Systems, Bechtel, Frederick, MD (1998-2001)

Olumide Adeyinka, PE, DBIA (Continued)

Project Manager, I-95 Express Lanes P3, Tolling and Traffic Management System (TTMS) Implementation, VDOT, Northern Virginia (2012-2015). The I-95 Express Lanes consist of 29 miles of reversible high occupancy toll (HOT) lanes with new capacity and dynamic congestion pricing on one of Northern Virginia's most heavily congested corridors. The $925 million project reconfigured 20 miles of existing HOV lanes, added a new 9-mile extension, and access points. The expansion of the HOV lanes alleviated the worst bottleneck on the corridor. Coordination with adjacent projects was also critical to the project's success. Systems integration, interfacing with the E-ZPass system, toll equipment installation, testing under live traffic, and transitioning to an integrated I-495/95 system were all key components of the TTMS delivery. Olu was responsible for program management, project development, and **managing the design**, as well as implementation and integration of the TTMS. *Similar to IS 270 ICM, Olu interfaced with the DB contractor, subcontractors, and key project stakeholders throughout several implementation phases of the project delivery. The project provided a viable transportation option for travelers, improving overall mobility and travel time reliability in the congested corridor. Despite the complex nature of the project, it was completed on time and on budget, with zero TTMS team safety incidents. The project improved safety on the I-95 corridor by installing and operating active traffic management in the form of lane control signs notifying drivers of the need to merge when a crash occurs downstream.*

Project Manager, Interstate 495 Capital Beltway Expressway DB/P3, Tolling and Traffic Management System, VDOT, Northern Virginia (2007-2013). The I-495 Express Lanes was a $1.4 billion DB/P3 project that built four HOT lanes (two in each direction) on the Capital Beltway. These lanes are 14 miles long in each direction. The project allows for HOV-3+ to ride for free, where HOV-2 or SOVs may ride in the lanes and pay the dynamically priced toll. The project also made significant upgrades to infrastructure along the corridor, replacing more than 50 bridges and overpasses and upgrading 10 interchanges. Bike and pedestrian access was also improved. Olu was responsible for project development and managing the design, implementation, and integration of the tolling and traffic management system. He was also responsible for overseeing and interfacing with the DB contractor, subcontractors and key project stakeholders in the design and implementation phases of the project delivery. Olu conducted the overall **management of day-to-day design**, planning, implementation, testing, and commissioning of all elements of the traffic management systems and tolling, including startup of operations. Olu supervised and reviewed work tasks and efforts of staff, system integrators, vendors, and consultants. He identified, mitigated, and managed risks and ensured that quality control and quality assurance were completed on assigned deliverables. Olu negotiated technical and commercial contract terms with vendors and consultants. *Similar to the IS 270 ICM Project, this project provides a viable transportation option for travelers, improving overall mobility and travel time reliability in a notoriously congested corridor. The TTMS was delivered with zero safety incidents. The infrastructure upgrades, including general-purpose lane improvements, on-ramp upgrades, new ramp access, bridge reconstruction, traffic signal improvements, as well as ATM strategies such as dynamic lane control, improved overall safety along the corridor.*

Technical Task Manager/Lead Engineer, Coordinated Highways Action Response Team (CHART), CHART, Chesapeake, Maryland (1995-1998). The CHART Business Plan (formerly known as Chesapeake Highway Advisories Routing Traffic Program On-Call Services) is a six-year program for the implementation of ITS by the SHA in partnership with Maryland Transportation Authority (MDTA) and the Maryland State Police. Olu supported the CHART strategic planning process and functional requirements and specifications task orders. Olu provided assistance in directing the planning and design strategies for the CHART Program. This effort involved developing and preparing presentation and technical paper on short- and long-range ITS deployment and MDOT/SHA ITS initiatives. *Similar to IS 270 ICM, work for several task orders supported the overall goal of CHART, which is to improve safety and movement of traffic along Maryland's roadways in the region.*

Joshua S. Wade, PE

HIGHWAY ENGINEER

Josh Wade, PE, is a registered professional engineer (MD# 24467) with more than 22 years of experience managing the design for projects addressing goals similar to the IS 270 ICM Project. For this project, Josh will help to develop project design criteria based on Maryland, AASHTO, and FHWA standards and requirements; ensure that practical design is appropriately applied to the project; and develop concepts through to construction plans and specifications to help meet the project goals. This will include guiding the development of survey and topographical mapping, geotechnical investigations, and overall existing condition assessments and inventories to conceptual and final plan layouts that take into account design criteria for interstate roadways, including stopping and sight distances, structure types and locations, utility locations, noise walls, landscaping requirements, weave distances, access point, designs, locations and separation distances, safety clear zones, roadway curvature, and shoulder requirements and needs. Josh will lead the highway design staff to coordinate with the entire project team, including the ITS elements, to ensure that all of these design needs and project goals are met. *Josh's relevant DB experience, coupled with his knowledge of Maryland requirements and familiarity with the local area, will allow the team to develop viable solutions more efficiently.*

RELEVANT PROJECT EXPERIENCE

Lead Highway Engineer/Design Manager, Intercounty Connector (ICC) Contract B, DB, MDTA, Montgomery County, MD (2007-2013). This $560 million project includes approximately 7 miles of new controlled-access, six-lane tolled roadway and two interchanges: ICC/MD 182 and ICC/MD 650. The construction of Contract B was in some of the most sensitive environmental areas along the entire ICC alignment. The work also included mainline, ramps, crossroads, and pavement design; utility relocations; bridges; retaining walls; noise walls; earth berms; drainage facilities; landscaping; signing, signals, lighting, and pavement markings; tolling infrastructure; MOT; ITS devices; public relations support; and environmental compliance, including through MDE coordination, review, and permit approvals. Josh took a hands-on approach to the project, getting involved and overseeing every aspect of the design of the project. As a lead highway engineer, he was involved in all design activities, including geometric, roadway and structures, environmental, construction, and all coordinated with third parties. *Similar to the IS 270 ICM Project, this project's goals included improving safety conditions, enhancing mobility along the corridor, and enhancing multimodal accessibility. Josh's experience with coordinating with adjacent projects and environmental compliance will also benefit the IS 270 ICM project.*

Years of Experience 22

Education

- MBA, University of Maryland, 2009
- BS, Civil Engineering, University of Maryland, 1993

Registrations/Licenses

- Professional Engineer: MD (24467) and VA (0402 032924)

Additional Experience

- Highway Engineer, Intercounty Connector, Contract A DB, Montgomery County, MD (2007-2011)
- GIS Manager, Task Order 309 Corridor Transportation Plan, FRA, Baltimore, MD (2002-2004)
- Engineering Task Lead, Manassas National Battlefield Park Bypass Study, Design, FHWA, Manassas, VA, US (2001-2006)
- Engineering Task Lead, I-495/Capital Beltway Major Investment Study, Fairfax County, VA, United States, VDOT (1996-2006)

Joshua S. Wade, PE (Continued)

Lead Highway Engineer/Design Manager, I-395 High-Occupancy Vehicle Ramp and Auxiliary Lane at Seminary Road, DB, VDOT, Alexandria, VA (2013-2016). This $56 million project includes a new reversible HOV ramp on I-395 connecting to an existing interchange at Seminary Road, a new pedestrian bridge across I-395, widening along I-395, widened auxiliary lane, and the widening of an existing mainline bridge on I-395. Josh was responsible for all elements of the project design from concept development through final design and into construction support, including highway geometric design. He led the team through the design phase of the project to develop changes to the RFP concept to improve overall safety and reduce costs and improved operations. The project included the analysis of existing shoulders for potential short-term/temporary traffic usage and long-term/permanent traffic usage. A major aspect was extensive coordination of ITS elements on the project with those throughout the corridor and region and statewide systems. The project included the installation of elements of the I-395 Express Lanes gate system, CCTV cameras, ramp monitoring, and ITS backbone elements. *The project is a key component in relieving the traffic congestion created by the relocation of thousands of federal workers to the Mark Center, a new Department of Defense Base Realignment and Closure (BRAC) facility near the I-395 and Seminary Road Interchange. Similar to the IS 270 ICM Project, this project's goals are to improve traffic operations along I-395, connect to the I-395 Express Lanes project and HOV network, increase safety for transit users and those working at or near the Mark Center, and improve pedestrian access for the surrounding neighborhoods and businesses.*

Lead Highway Engineer/Design Manager, Interstate 64/Route 15 Interchange at Zion Crossroads, DB, VDOT, Louisa County, VA (2012-2013). This $6 million project improved the Route 15 and I-64 interchange in Louisa County, Virginia. The project converted the existing standard diamond interchange into a diverging diamond interchange (DDI) and improved the Route 15 and Spring Creek Parkway intersection. This project was the first DDI implemented within the Commonwealth of Virginia. Josh oversaw the development of the concept plans through to the development of the construction plans and construction support. Josh helped develop the design criteria, a complex task, as design criteria for DDIs did not exist at the time. The work on the project assisted the state in the development of statewide guidance for future DDIs. *Similar to the IS 270 ICM Project, this project's goals included improving safety and increasing capacity. Josh participated in the development of the innovative DDI solution including the design criteria, complex geometry, and the transition/opening plan. One of the goal of this project was to bring low cost innovative solution, the overall concept saved VDOT $20M dollars by eliminating need for bridge replacement over I-95.*

Lead Highway Engineer/Design Manager, Military Highway Widening and Continuous Flow Intersection (CFI) DB, DDOT, Norfolk, VA (2015). This $59.8 million DB project is located along Military Highway (US Route 13 and State Route 165) and Northampton Boulevard (US Route 13) and Princess Anne Road (State Route 166) in the City of Norfolk, Virginia. The project length along Military Highway is approximately 1.58 miles. The project includes the installation of CFI elements along Military Highway, near the Norfolk Airport, in a very urban area that is lined with businesses on each side of the roadway. The CFI elements will direct the left turning vehicles on Military Highway away from the main intersection to avoid conflict with opposing through movement. This is the first application of the CFI configuration in Virginia. Additionally, the project includes CCTV and interconnected signals throughout the corridor and traffic monitoring requirements, such as corridor timing and queue length monitoring during construction. Josh led and participated in the development of the innovative CFI solution, design criteria, detailed MOT and construction phasing plans and overall geometric layout. *Similar to the IS 270 ICM Project, this project's goals included improving safety and increasing capacity through the congested corridor. This is yet another example of innovative roadway design to improve safety and mobility on the existing corridor.*

Sunita V. Nadella, PE, PTOE

TRAFFIC ENGINEER

Sunita Nadella, PE, PTOE, is a registered professional engineer and professional traffic engineer with 15 years of experience completing traffic analysis for projects addressing goals similar to the IS 270 ICM Project. She has experience using Synchro, SimTraffic, VISSIM, Sidra, TransModeler, and Cube traffic modeling software. For the IS 270 ICM Project, Sunita will be responsible for managing all work related to traffic modeling, conducting operational analysis, and developing alternatives for congestion relief and improved mobility. Sunita will also perform traffic studies to identify specific operational and safety improvements throughout the corridor. She will be responsible for updating interchange modification studies along the corridor including system to system interchanges. Sunita will develop the signing and pavement marking plans for the corridor. *Sunita's previous experience developing VISSIM models throughout the 270 corridor gives our team the added advantage of familiarity with the unique attributes of the corridor.*

RELEVANT PROJECT EXPERIENCE

Lead Traffic Engineer, Northwest Corridor DB Project, Georgia Department of Transportation (GDOT), Atlanta, GA (2013-2016). This $599 million DB-finance project includes 29.7 miles of reversible managed toll lanes along I-75 and I-575 in Cobb and Cherokee counties in metropolitan Atlanta. The scope of work includes earthwork, roadway, asphalt paving, pavement widening/overlay, grading, drainage, retaining walls and noise walls, interchanges, 39 bridges, ITS, construction staging, utilities, landscaping, aesthetics, lighting, and tolling construction. The team saved approximately $100 million through innovative designs and alternative technical concepts. Sunita is responsible for all the traffic analysis related to interchange justification/ modification studies, environmental studies and maintenance of traffic development. She developed micro and macro simulation models for alternative technical concepts and traffic studies related to those. She developed the traffic management plan and is leading the development of signing and marking plans for the entire corridor, as well as signal design, interconnect plans, and signal timing plans for managed lane interchanges. *Sunita's role on this project is identical to her role on IS 270 ICM. She will bring her extensive experience with traffic modeling software, such as VISSIM, to the IS 270 ICM project, enhancing the reliability of our traffic models.*

Years of Experience 15

Education

- MS, Civil Engineering Technology, Ohio University, 2002
- College of Engineering, Osmania University, Hyderabad, India, 1998

Registrations/Licenses

- Professional Engineer: VA (0402053066), GA (033094), NC (38771)
- Professional Traffic Engineer (2573)

Additional Traffic Engineer Experience

- Fort Gordon Transportation Master Plan, Fort Gordon, GA (2009-2011)
- Newton Road at State Route 92, Fayette County, Ga (2010)
- County Line Road Corridor Study, Cobb County, GA (2008)
- Oconee County Transportation Master Plan, Oconee County, GA (2006-2007)
- Interstate 75 Interchange Ramps, Turner County, GA (2005-2006)
- Cumberland Community Improvement District Traffic Signal Timing, Cobb County, GA (2003-2004)
- Perimeter Community Improvement District Traffic Signal Timing, DeKalb County, GA (2002)
- Old Towne mixed-use DRI study on South Central Avenue, Hapeville, GA (2001)

Sunita V. Nadella, PE, PTOE (Continued)

Lead Traffic Engineer, I-395 High Occupancy Vehicle Ramp and Auxiliary Lane at Seminary Road, DB, VDOT, Alexandria, VA (2013-2015). This $56 million project includes a new reversible high occupancy vehicle (HOV) ramp on I-395, a new pedestrian bridge across I-395, and the widening of an existing mainline bridge on I-395. Sunita was responsible for all the traffic analysis related to maintenance of traffic development. She developed VISSIM simulation models for MOT phases and signal timing along Seminary Road during MOT and permanent conditions. *The project includes mitigation of congestion at the interface of the new reversible ramp and existing highway. It was a key component in relieving the traffic congestion created by the relocation of thousands of federal workers to the Mark Center, a new Department of Defense Base Realignment and Closure (BRAC) facility near the I-395 and Seminary Road interchange. Similar to the IS 270 ICM Project, this project's goals were to improve traffic operations along I-395, increase safety for transit users and others working at or near the Mark Center, and improve pedestrian access for the surrounding neighborhoods and businesses.*

Lead Traffic Engineer, Interstate 64/Route 15 Interchange at Zion Crossroads, DB, VDOT, Louisa County, VA (2012-2014). This $6 million project improved the Route 15 and I-64 interchange in Louisa County, Virginia. The project converted the existing standard diamond interchange into a diverging diamond interchange (DDI) and improved the Route 15 and Spring Creek Parkway intersection. This project was the first DDI implemented within the Commonwealth of Virginia. Sunita was responsible for traffic analysis, MOT analysis, VISSIM modeling, signing and marking, and signal plans for all MOT phases, as well as the final signal plans along with signal timing plans for the entire corridor. *Similar to the IS 270 ICM Project, this project's goals included improving safety conditions, enhancing mobility along the corridor, and enhancing multimodal accessibility.*

Lead Traffic Engineer, Interstate 75 Managed Lanes Planning and Design, GDOT, Henry and Clayton Counties, GA (2011-2013). The project involved various design services for the construction of a 1.25-mile auxiliary lane northbound on I-75 from Eagles Landing Parkway/Hudson Bridge Road to I-675 and 12 miles of managed southbound lanes, from SR 155 to SR 138 in Henry and Clayton counties. Sunita was responsible for the traffic design, including volume forecasting, travel demand modeling, the crash analysis, intersection and freeway capacity analysis, and simulation analyses of the existing condition and proposed alternative conditions. She was involved in developing alternatives for the corridor, as well as environmental documentation for the project. She prepared IMR/IJR analysis and concept reports for the study corridor involving nine existing interchanges, one new interchange, and a system-to-system interchange. *Managed lanes, a key component of Atlanta's transportation system for reducing air pollution, improving congestion, and ensuring time savings for commuters, were introduced to metro Atlanta in the mid-1990s. This project involved improvements along 16 miles of I-75 south of Atlanta, including managed lanes and interchange facilities from SR 155 in Henry County to SR 54 in Clayton County. These counties are two of the fastest growing in the greater Atlanta metropolitan region and are strong economic and employment centers. The project involved the implementation of a barrier-separated managed lane system on a 16-mile corridor of I-75 just south of Atlanta, which encompasses several new managed lane interchange facilities.*

Russell C. Ruffing, QP

ENVIRONMENTAL COMPLIANCE MANAGER

Russell Ruffing, QP, with JMT, has more than 30 years of direct environmental management and compliance experience for major transportation, park, and ecological restoration projects, including several large DB projects in MD, D.C., and California. His experience includes extensive transportation DB environmental compliance, compliance inspections, NEPA analyses, public outreach, agency coordination, wetland delineation and permitting, functional wetland assessments, stream and wetland mitigation design and monitoring, avoidance and minimization analyses, natural resources inventories, RTE investigations, Section 4(f) and Section 106 coordination, and socioeconomic investigations. He has served as the Environmental Manager for three large DB projects totaling $2.6 billion in size. Russell's extensive experience with the MEPA/NEPA process and his working knowledge of the federal, State, and local permitting and approval agencies will ensure the risks related to permits and approvals are minimized on the IS 270 ICM Project.

RELEVANT PROJECT EXPERIENCE

Environmental Compliance Manager, Upper Little Patuxent Stream Restoration DB, SHA, Howard County, MD (2012-2015). This was the first DB stream restoration project undertaken by the SHA. This award-winning project provided a cost effective and stable solution utilizing stream and floodplain restoration efforts to meet NPDES, MS4, and TMDL reductions for total nitrogen, phosphorus and sediment contributing to the degradation of the Bay. Through close collaboration between design/construction personnel, additional avoidance and minimization opportunities were realized throughout the project corridor. These efforts resulted in reductions of impacts below conditional authorization provided based on concept plans. Russ oversaw all permit modifications requesting authorization based on final design plans, as well as oversight for environmental compliance efforts, prepared bi-weekly environmental compliance reports, and tracked impacts. *This experience will assist Russ in providing agency coordination and permit negotiation as well as preparation of regulatory permit applications needed for the project; avoiding and minimizing environmental impacts to the maximum extent practicable; inspecting, tracking, and ensuring compliance with regulatory approvals and permit conditions; and developing mitigation measures that may be required by regulatory and/or permitting agencies.*

Environmental Compliance Manager, 11th Street Bridges and Interchanges over the Anacostia River, DDOT, Washington, D.C. (2009-2015). Russ was responsible for all 188 environmental compliance efforts/environmental design and construction measures and managed a 5-person compliance team responsible for drafting the project

Years of Experience 30

Education

- BS, Environmental Resource Management, Pennsylvania State University, 1976

Registrations/Licenses

- MD DNR Qualified Professional (QP)
- MDE Green Card ESC #25655
- SHA Yellow Card ESC #07-744

Additional Experience

- Environmental Compliance Manager, Western Parkway DB, Charles County DPGM, MD (2006)
- Senior Environmental Manager, I-81 Corridor Improvement Study - Tier 1 Final Environmental Impact Statement, VDOT, Western VA (2005-2007)
- Senior Environmental Manager, Environmental Impact Statement - Bayou LaFourche Restoration, U.S. Environmental Protection Agency, LA (2005-2006)

Russell C. Ruffing, QP (Continued)

Environmental Compliance Plan for the $378.8 million project. He obtained all environmental permits and/or permit updates, including Section 404, 401, Section 10, NPDES, USCG permits, and NPS Use Permits and performed quarterly compliance audits, environmental commitment tracking/database updates, and compliance inspections of ESC elements. Russell addressed contaminated/hazardous materials discovered on the project and provided training in environmental compliance to over 1,200 construction personnel that worked on the site. *This experience will assist Russ in providing agency coordination and permit negotiation as well as preparation of regulatory permit applications needed for the project; avoiding and minimizing environmental impacts to the maximum extent practicable during both design and construction phases; inspecting, tracking, and ensuring compliance with regulatory approvals and permit conditions; and developing mitigation measures that may be required.*

Environmental Compliance Manager, US 40 at MD 715 Interchange and Improvements DB, SHA, Harford County, MD (2010-2013). Russ was responsible for the DB team's environmental compliance for an interchange enhancements project adjacent to Aberdeen Proving Ground (APG). Work for this $17.8 million project included stream relocation designs for the relocation of 800 linear feet of a stream, drainage design, SWM, ESC, landscaping, obtaining MDE permits for construction, and tracking impacts to wetlands, waterways, and forests for the project duration. *This experience will assist Russ in providing agency coordination and permit negotiation as well as preparation of regulatory permit applications needed for the project; avoiding and minimizing environmental impacts to the maximum extent practicable; inspecting, tracking, and ensuring compliance with regulatory approvals and permit conditions; and developing mitigation measures that may be required.*

Environmental Compliance Manager, I-95/I-695 Interchange (Section 100) Express Toll Lanes, MDTA, Baltimore, MD (2004-2009). Russ managed the environmental assessment and permitting team supporting the MDTA on this $216 million 9-mile long project. His primary responsibilities included monitoring and tracking to ensure that environmental commitments were fulfilled during design and construction. He ensured all environmental commitments were addressed during the plan review process, including community, parkland (4f), cultural resource, rare/threatened/endangered wildlife and habitat, hazardous waste, noise, forests and water resources including wetlands and streams. Other duties included reviewing wetland mitigation and stream restoration designs, overseeing environmental studies, and developing designs for environmental restoration. *This experience will allow Russ to assist the SHA with information needed about the project and possible mitigation actions to support the NEPA/MEPA as well as the public involvement processes.*

Senior Environmental Manager, NEPA Environmental Assessment - Anacostia Riverwalk Trail, DDOT, Washington, D.C. (2006-2007). This NEPA study supported the National Park Service and the District of Columbia in developing a riverwalk trail through Anacostia Park. Russ was responsible for identification and analysis of natural and human resources within the project area to support an Environmental Assessment. Studies included communities and neighborhoods, economics, socioeconomic analysis, environmental justice, land use plan consistency, aesthetics, historic and archaeological resources, wetlands, habitats, and rare, threatened, and endangered species. Russell managed the assessment including use of GIS for impact analyses. He also organized, led, and presented at multiple public scoping and public NEPA public review meetings. *This experience will allow Russ to assist the SHA with information needed about the project and possible mitigation actions to support the NEPA/MEPA as well as the public involvement processes.*

Ian St. Yves, PE

ADDITIONAL DESIGN KEY STAFF - ITS DESIGN MANAGER

Ian St. Yves, PE, brings 14 years of experience in ITS design. He is responsible for project scope, schedule, and budget and coordinates and leads on-site engineering design and integration teams and remote software support teams. He is also routinely responsible for the development and review of specifications and design drawings; site surveys; system integration; cost estimation; construction, operational, and maintenance support services; construction management; and system acceptance testing. For the IS 270 ICM Project, Ian will work closely with the SHA, and a wide array of Parsons technical experts to analyze existing and emerging technologies and recommend the best solutions for the project-specific innovations aimed to reduce congestion. Ian will coordinate the ITS design with other project disciplines, contractors, and stakeholders and will provide plans and specifications accountable to the goals of the SHA and actual field conditions. *Ian's experience with designs for ITS will be integral to developing and implementing ITS solutions to improve traffic conditions and travel times along the corridor.*

Years of Experience 14

Education

- BS, Electrical Engineering, University of Massachusetts, Dartmouth, 2002

Registrations/Licenses

- Professional Engineer: VA (0402054040), NY (088240), MI (6201057900), FL (78998), GA (PE037215), IN (PE11200212), KY (28769)

Additional Experience

- ITS Engineer, Northwest Corridor Express Lanes DB, GDOT, Atlanta, GA (2013-2016)
- Communications Systems Engineer, Williamsburg Bridge, Reconstruction Contract 8, NYSDOT, New York, NY (2006-2012)
- Communications Systems Engineer, Dubai-T111 Expansion of ITS Design, Dubai, UAE (2008-2009)
- Communications Systems Engineer, MDOT North Region Traffic Signal Optimization, Program Management, Alpena, MI (2008-2009)

RELEVANT PROJECT EXPERIENCE

Communications Systems Engineer, Intercounty Connector (ICC) Contract B, DB, MDTA, Montgomery County, MD (2009-2012). This $560 million project included approximately 7 miles of new controlled-access, six-lane tolled roadway and two interchanges: ICC/MD 182 and ICC/MD 650. The construction of Contract B is in some of the most sensitive environmental areas along the entire ICC alignment. The work included mainline, ramps, crossroads, and pavement design; utility relocations; bridges; retaining walls; noise walls; earth berms; drainage facilities; landscaping; signing, signals, lighting, and pavement markings; tolling infrastructure; MOT; ITS devices; public relations support; and environmental compliance. Ian provided system design and construction support services of all ITS and ETCS, including CCTV cameras, DMS, HAR, infrastructure support of high-speed tolling systems, and fiber-optic communications to support TCP/IP communications. He also provided power distribution system and fiber-optic communication infrastructure design. *The construction of MD-200 provided increased mobility within the heavily congested region. Ian's team considered operations and maintenance within the constructability reviews and in accordance with the project technical provisions to provide automated monitoring, incident detection, and information dissemination. He led weekly task force meetings with the developer and the owner to ensure open communication. Ian will use this experience to ensure communication and coordination are consistent to develop an innovative solution.*

Ian St. Yves, PE (Continued)

Communications Systems Engineer, Intercounty Connector (ICC) Contract A, DB, MDTA, Montgomery County, MD (2009-2011). The $478 million DB project reconstructed a 7.2-mile segment of the ICC and prepared construction documents for roadways, traffic signals, maintenance of traffic, utilities, interchange lighting, 18 bridges, drainage and stormwater management facilities, stream relocations, and landscaping. Ian provided expanded system design and construction support services of all ITS and ETCS, including CCTV, DMS, HAR, infrastructure support of high-speed tolling systems, and fiber-optic communications to support Ethernet communications. *Ian's understanding of Maryland ITS systems will enhance our team's ability to provide innovations that minimize SHA's operations and maintenance activities.*

Project Manager, New York State ITS Maintenance, Design Phases V-VI, New York State Department of Transportation (NYSDOT), Bronx and Queens Counties, NY (2012-2016). The services include maintenance of ATMS equipment, management of systems integrity, engineering support for ITS, ITS program coordination with other agencies, and knowledge transfer. Ian is responsible for the project scope, schedule, and budget. He serves as a liaison with the client and coordinates the overall project work. He provides operational support to system operators and provides troubleshooting and corrective procedures to maintainers. He supervises and trains project staff and participates in design tasks to provide specifications and purchase assistance for field maintenance and test equipment, as well as modifications or upgrades to existing ITS equipment. *The project increases the Agency's efficiency to identify, troubleshoot, and correct issues within the ITS system, thereby increasing safety of personnel and the public on the roadway. Use of the asset management system improves operations and maintainability of the system. Regular meetings are held with major stakeholders, NYSDOT regional personnel, traffic management personnel, network administrators, field engineers and project controls to ensure open communication and efficient resolution of project tasks. His experience will help the team consider all operations and maintenance elements to minimize the SHA's activities as much as possible.*

Communications Systems Engineer, Staten Island Advanced Traffic Management System (ATMS), NYSDOT, Staten Island, NY (2003-2016). The project will complete the design and implementation of the Staten Island ATMS, which will be used to collect, process, and disseminate travel-related information to improve safety and efficiency. The new system will help travelers make informed trip decisions and assist authorities with detecting and responding to emergencies. The project work includes the installation of CCTV cameras and traffic detectors to continuously monitor traffic conditions and incidents. The traffic monitoring technology will support VMS, HAR, and other traveler information services. Ian provides operational support to system operators and provides troubleshooting and corrective procedures to maintainers. He develops standard specifications for ITS devices in support of NYSDOT ITS deployments and regional goals. He designs ITS component layout as well as fiber-optic and wireless communication systems and the power distribution network layout. Ian supervises acceptance test procedures for ITS equipment and communications infrastructure, including the SONET backbone, CCTV, and VMS. *The project increases the traffic operational efficiency, motorist safety, and level of public service in the region by deploying ITS technologies within the project limits. Surveillance, incident detection, and information dissemination is accomplished by cameras, sensors, and changeable message signs that are controlled manually and automated through the TMC. The project was the first in the state to implement the travel time information system using center-to-center communication to share information and provide automated delivery of that information to the traveling public. Ian will use this experience to help the SHA develop a fully integrated solution to improving mobility and safety.*

2.2
Construction Key Staff

Brian Quinlan, PE

DESIGN-BUILD PROJECT MANAGER

Brian Quinlan, PE, has more than 37 years of experience in heavy civil construction, including 15 years managing DB projects. For the IS 270 ICM Project, Brian will be responsible for the overall project design, estimating, construction, quality management, and contract administration. He will be involved during all project phases and provide leadership and direction to the project team. He brings a wealth of experience in managing complex construction projects in congested freeway corridors, including the $115 million I-95 Interchange at Pocahontas Parkway DB (Richmond, VA); the $56 million I-395 Interchange at Seminary Road DB (Alexandria, VA); and $54 million and $87 million contracts for segments of the I-95 Express Toll Lanes DB projects (Baltimore, MD). *Brian will be a partner to the SHA throughout all phases of the IS 270 ICM Project. His extensive experience on similar DB and traditional projects in Maryland and the Mid-Atlantic brings the advantage of numerous lessons learned. He fully understands every aspect of project development and execution and will facilitate a well-managed project.*

RELEVANT PROJECT EXPERIENCE

DB Project Manager, I-395 HOV Ramp at Seminary Road and Auxiliary Lane Extension DB, VDOT, Alexandria, VA (2013-2015). This $56 million DB project includes a new reversible HOV ramp on I-395, a new pedestrian bridge across I-395, replacement and widening of the superstructure of the existing Seminary Road Bridge, widening of the Seminary Road off-ramp, and extending the Duke Street on-ramp into a continuous auxiliary lane to the Seminary Road off-ramp. It also included installation of multiple new ITS devices and integration of those devices into the existing VDOT system. Brian's responsibilities and authorities extended from procurement through construction. Brian was the main point of contact for VDOT and directly supervised the design, construction, quality assurance, and safety managers. His tasks included supervising preparation of the project schedule; coordination and management of subcontract and supplier solicitation, negotiation, and award; selection of salaried staff and the means and methods for self-performed work; and ensuring the efficiency and efficacy of self-performed work. *Similar to the IS 270 ICM Project, this DB project was located on an interstate corridor that is a major commuter route. Applicable solutions to improving throughput and safety included adding an auxiliary lane on northbound I-395 for the length of the project, widening the Seminary Road off-ramp to expand queue capacity, and adding a reversible HOV ramp to the Seminary Interchange. Collaboration with VDOT was essential to project success, one facet of which was a post-award VECP altering the design and location of a pedestrian bridge across I-395. Brian's experience will help the SHA deliver a well-managed project that achieves all project goals.*

Years of Experience 37

Education

- MBA, University of Maryland, 2006
- BS, Civil Engineering, Georgia Tech, 1979

Registrations/Licenses

- Professional Engineer: MD (33431), VA (042033291)

Additional Experience

- Project Executive, 9th Street Bridge DB, DDOT, Washington, D.C. (2007-2008)
- Project Executive, I-495 Interchange at Branch Avenue, SHA, Suitland, MD (2006-2008)
- Project Executive, Taylor Street Bridge DB, DDOT, Washington, D.C. (2005-2007)
- Project Executive, I-895 at Chesaco Ave, SHA, Baltimore, MD (2007-2008)
- Project Executive, SR 836 Extension DB, MDX, Miami, FL (2004-2005)
- Assistant Project Manager, I-676 Vine Street Expressway, PennDOT, Philadelphia, PA (1987-1990)

Brian Quinlan, PE (Continued)

Project Executive, I-95 Bridges Reconstruction, VDOT, Richmond, VA (2010-2014). This $72 million project reconstructed the superstructures of 20 bridges in the I-95/I-64 corridor, including localized widening to improve corridor safety. An accelerated bridge project, the bridgework was notable for the composite precast units used for the new superstructures, the installation of which required rigorous expressway traffic control for overnight demolition and installation activities. In addition to client relations, Brian's responsibilities and authorities included overseeing the estimate and the project, including supervising the lead estimator and construction and safety managers. His tasks included bid development; coordination and management of subcontract and supplier solicitations, negotiation, and award; selection of salaried staff and the means and methods for self-performed work; development of the project schedule; and ensuring the efficiency and efficacy of self-performed work. *This project featured significant construction work in a vital urban corridor, while minimizing disruption during AM and PM peak travel periods. It also required extensive engineering efforts throughout construction for shop drawings, demolition/erection procedures, and traffic control. Collaboration with VDOT was essential to project success, including a post-award VECP altering the design of bridge substructure elements. Brian's experience coordinating with owner agencies will help ensure a collaborative partnership will all project team members and stakeholders.*

Project Executive, I-95/I-895 Interchange Reconstruction, MDTA, Baltimore, MD (2006-2007). This $54 million project reconstructed the I-95/I-895 interchange and Moravia Road interchanges just north of the harbor tunnels, including the addition of express toll lanes to increase capacity. In addition to client relations, Brian's responsibilities and authorities included overseeing the project and supervising the construction manager and safety manager. His tasks included coordination and management of subcontract and supplier solicitation, negotiation, and award; selection of salaried staff and the means and methods for self-performed work; development of the project schedule; and ensuring the efficiency and efficacy of self-performed work. *Brian will use this experience to make sure our project management and work plan address effective communication, coordination, and risk management.*

DB Project Manager, Dolphin Expressway (SR 836) and Florida Turnpike Interchange Reconstruction DB, Miami-Dade Expressway Authority, Miami, FL (2003-2005). This $36 million DB project reconstructed the SR 386 at the interchange with the Florida Turnpike, as well as the adjacent interchange at NW 107th Ave. Brian's responsibilities and authorities included overseeing the project and supervising the design, construction, and safety managers. His tasks included overseeing the permanent design; coordinating and managing subcontract and supplier solicitation, negotiation, and award; selecting salaried staff and the means and methods for self-performed work; developing the project schedule; and ensuring the efficiency and efficacy of self-performed work. *This project improved capacity and reduced the frequency of accidents by providing high-speed ramps with longer merge zones, eliminating weaves, and improving signage. Brian's DB experience will ensure effective coordination and communication among all project team members and stakeholders.*

Construction Manager, I-95/Route 150/Route 895 Interchange Reconstruction DB, VDOT, Richmond, VA (1999-2002). This $115 million DB project constructed a new high-level crossing of the James River, including an expansion of the existing I-95/Route 150 interchange. Brian's responsibilities and authorities included the day-to-day direction of on-site construction activities through the supervision of the general superintendent, site safety officer, and engineering staff. His tasks included coordination and constructability reviews of bridge designs; coordination and management of construction engineering; coordination and management of subcontractor and supplier solicitation, negotiation, award, and contract administration; selection of the means and methods for self-performed work; development and maintenance of the project schedule; and ensuring the efficiency and efficacy of self-performed work. *The project required extensive and ongoing interaction with the design team both for the permanent design and for construction engineering. This experience will help ensure a well-managed project for the SHA.*

Paul Price, PE

CONSTRUCTION MANAGER

Paul Price, PE brings more than 28 years of on-site construction management to the IS 270 ICM Project. He has filled various roles with similar responsibilities on three DB projects, including the Intercounty Connector A &D and the Woodrow Wilson Memorial Bridge Replacement projects, in Maryland. Paul's experience gives our team the advantage of an enhanced understanding of local regulations and specifications. He is also familiar with ITS hardware installation, as well as power and fiber-optic communication infrastructure installation of these devices. For the IS 270 ICM Project, Paul will be involved during preconstruction to provide constructability and pricing input as solutions are developed and vetted. During the construction phase, Paul will transfer the knowledge gained during the previous phase to effectively manage work packages, as well as all construction activities. He will manage the schedule to ensure that milestones are achieved and coordinate material deliveries and work crews to minimize storage and maximize production efficiencies. *Paul is seasoned in the fast-paced nature of DB projects and is adept in working with owners to price and evaluate change orders. Paul's experience will facilitate a one-team approach to achieve the project's goals and deliver a well-managed project.*

RELEVANT PROJECT EXPERIENCE

Construction Manager, SR 91 Corridor Improvement DB Project, Riverside County Transportation Commission, Corona, CA (2014-2016). This $630 million DB contract is part of a total $1.4 billion program. The project consists of widening 8 miles of SR 91 to provide two new express toll lanes, one new general purpose lane, and one new auxiliary lane in both directions, as well as adding 4 miles of dedicated express toll lanes to I-15 two in each direction via a new express lanes flyover bridge connecting in the medians of both SR 91 and I-15. Paul was responsible for the construction of 11 new bridges, widening 21 existing bridges, improving 22 city intersections, and relocating 92 full utility systems. He managed a 42-person staff to ensure quality assurance for construction, environmental compliance, community relations, and relocation of utilities. He also serves as liaison between the design-builder's design staff, the owner's design staff, construction staff, and Caltrans' staff. *SR 91 is the only major surface transportation connecting Orange and Riverside counties, and the DB delivery method was chosen as the best choice to quickly relieve traffic congestion in what has been identified as the fifth most congested highway in the nation. Successful completion was achieved through the cooperation, coordination, and complete buy-in by all stakeholders Paul fostered.*

Years of Experience 28

Education

- BS, Civil Engineering, University of Cincinnati, Ohio, 1989

Registrations/Licenses

- Professional Engineer: MD (26724), OH (58414)

Additional Experience

- Asst. Resident Engineer, Butler County Transportation Improvement District, Hamilton, OH (1998-2000)
- Resident Engineer, I-71, I-75, I-275, US50, SR 562, SR48, ODOT, OH (1986-1998

Paul Price, PE (Continued)

Resident Engineer, Intercounty Connector (ICC) MD 200 – Contract A, SHA and MDTA, Rockville, MD (2007-2011). This $480 million Contract A portion of the ICC project was the first of four of the largest DB contracts ever awarded in Maryland. The entire project built a new 19-mile east-west electronically tolled expressway connecting the heavily traveled I-95 and I-270 corridors north of the Washington, D.C., Capital Beltway. Paul was responsible for work package management and construction quality assurance for all aspects of building a new six-lane highway, including 18 bridges, interchanges at I-370 and MD97, utility relocations, noise walls, ITS gantries and fiber-optic infrastructure, signing, lighting, and signals. He worked closely with the design-builder during the design phase and participated in task forces to ensure that all state requirements were met. Paul managed a field staff of 10 to ensure quality assurance for design and construction, environmental compliance, community relations, and utility relocations. *Similar to the IS 270 ICM Project, this project was constructed to relieve congestion along the heavily traveled corridor. His experience with ITS installation, work packages, and local regulations will help the project achieve the goal of being a well-managed project.*

Assistant Resident Engineer, Intercounty Connector (ICC) MD 200 – Contract D/E, SHA and MDTA, Beltsville, MD (2011-2014). The $100 million Contract D/E portion of the ICC, in Maryland. The final segment of a 19-mile, limited-access, six-lane, all electronically tolled highway. This is the first of its kind in the state. Paul was responsible for all aspects of construction on 2.5 miles of the collector-distributor roads along I-95, three interchanges, and the final 1-mile segment of the six-lane highway. He managed work packages, construction activities, and material clearance for utility relocations of water, sewer, electrical, telephone, cable and fiber-optic lines; full-depth HMA pavement; signing, lighting, signals; ITS and fiber-optic infrastructure; and one bridge. He also managed eight to 18 personnel to ensure quality assurance for design and construction, environmental compliance, community relations, and utility relocations. *Similar to the IS 270 ICM Project, this project was constructed to relieve congestion along the heavily traveled corridor. His experience with ITS installation, work packages, and local regulations will help the project achieve the goal of a well-managed project.*

Chief Structural Inspector and Assistant Resident Engineer, I-95/I-495 Woodrow Wilson Memorial Bridge Replacement, SHA and VDOT, Washington, D.C.; Oxon Hill, MD; and Alexandria, VA (2002-2007). This $2.5 billion project include the signature bridge structure and six interchange contracts, three each in Maryland and Virginia, respectively, and a precast segmental bridge over the Potomac River in Washington, D.C. The project replaced the original 1961 six-lane, 5,900-foot-long bascule bridge with twin six-lane bascule structures that provide 70 feet more vertical clearance over the navigational channel than the original to decrease the number of drawbridge openings. Paul managed work packages and had direct responsibility for scheduling; daily job coordination; construction issue resolution; monitoring and inspecting segment casting; erection; calculating and processing pay estimates; liaising with the owner, joint venture members, and contractors; and working with the owner to price and evaluate change orders. *Similar to the IS 270 ICM Project, this project was constructed to relieve congestion along the heavily traveled corridor. His experience with fast-paved project execution, ITS installation, work packages, and local regulations will help the project achieve the goal of being a well-managed project.*

William C. Karle

COST ESTIMATOR

Bill Karle has 35 years of experience as a cost estimator for heavy civil construction projects, including roadway, bridge, utility, environmental, precast segmental, and traffic control. For the IS 270 ICM Project, Bill will attend key meetings and develop the Opinion of Probable Construction Cost (OPCC) , and participate in the negotiation of CAPs. His vast project experience will be invaluable to the SHA and our team as alternatives, which include industry standard operating and maintenance costs to evaluate life-cycle costs of the alternatives, are developed. He will provide insight on risks and risk mitigation measures, as well as challenge assumptions. Our open-book estimates will have the benefit of his experience with DB and CM/GC contracts, providing a well-organized estimate that will be easy for SHA staff and the independent cost estimator to evaluate. *Bill's mix of developing OPCC and DB project estimates provides the SHA with a construction estimator who can provide true cost information and allow the SHA to make the best possible decisions for the IS 270 ICM Project. In this way, he will help the SHA achieve all of its goals for the project.*

Years of Experience 35

Education

- Associate of Science, Liberal Arts, Delta College, Michigan, 1983

Additional Experience

- Cost Estimator, SR 532 DB Corridor Improvements, WSDOT, Camano Island, WA (2008-2009)
- Cost Estimator, I-5 Grand Mound to Maytown, WSDOT, Lewis County, WA (2007)
- Cost Estimator, I-81 Truck Climbing Lanes, VDOT, Rockbridge County, VA (2004-2007)
- Cost Estimator, US 29 Bypass over the James River, VDOT, Amherst, VA (2004-2004)
- Project Engineer/Cost Estimator, Skanska, Fairfield, Virginia (1998-2004)
- Senior Construction Inspector, US 29 Bridge over the Robinson River, VDOT, Madison, VA (1996-1998)
- Senior Transportation Construction Inspector, VDOT, VA (1987-1996)

RELEVANT PROJECT EXPERIENCE

Cost Estimator, Active Traffic Management System DB, Washington State Department of Transportation (WSDOT), Seattle, WA (2009). This $41 million project installed traffic management systems on the Interstate 5, State Route 520, and Interstate 90 corridors in the greater Seattle area. Work included digital lane control and variable message signs, traffic sensors and detectors, a fiber-optic backbone system, and civil works. Bill developed the construction cost estimates and coordinated with electrical and traffic control systems subcontractors to create and establish the critical path method (CPM) schedule for the DB project bid package. *This estimate was used for the FHWA cost estimate review and the risk assessment and was used by VDOT to validate and accept the P3 proposer's bid. Bill's understanding of ITS devices and cost estimating will help the SHA make the best decisions to alleviate congestion on IS 270.*

Lead Cost Estimator, Downtown Tunnel/Midtown Tunnel/Martin Luther King Extension Program Management, VDOT, Norfolk and Portsmouth, VA (2011-2015). This $1.9 billion project includes a new two-lane tunnel under the Elizabeth River adjacent to the existing Midtown Tunnel; maintenance and safety improvement of the existing Midtown Tunnel; minor modifications to the existing Downtown Tunnel; and extending the MLK Freeway from London Boulevard to I-264, with an interchange at High Street in Portsmouth. Bill coordinated and led a multinational estimating team to determine the OPCC estimate for VDOT. Bill and the estimating

William C. Karle (Continued)

team worked independently and in conjunction with the DB construction joint venture estimating staff to determine the most probable cost for construction of the project and presented the OPCC estimate to VDOT and the FHWA as part of the FHWA review and approval process. The estimate looked at proposed construction activities and costs, as well as evaluated design alternatives and innovations for the project. *The project was developed to improve the traffic flow and relieve traffic congestion in the Portsmouth and Norfolk region in the Tidewater area of Southeastern Virginia. Bill provided construction cost analysis to assist in analyzing various options to improve throughput in the region.*

Lead Cost Estimator, Louisville Southern Indiana Ohio River Bridges Project (LSIORB), Kentucky Transportation Cabinet/Indiana Department of Transportation, Louisville, KY (2011-2012). This $2.9 billion project focused on construction of the Route 265 Bypass Loop east of Louisville, KY, and reconstruction of the "Spaghetti Interchange" (I-64/I-65/I-71) in Louisville, KY. It included two new cable-stayed bridges across the Ohio River, the twin tube 2,000-foot-long GBR tunnel, pavement, drainage, structures, active traffic management system. The project included innovative design concepts, including a proposed diverging diamond interchange. Bill led the development of the OPCC estimates based on the current design level of the project. The OPCC estimate was used as the basis for a revised FHWA cost estimate review of the project and based on this estimate, more than $300 million in contingencies were removed from the project budget pre-procurement, which helped both states to refine their procurement processes. *The LSIORB project was designed as a multi-pronged method for reducing and redirecting the severe traffic congestion occurring through downtown Louisville by constructing a new bypass to the east of Louisville and reconstructing and renovating the existing interstate highways through Louisville. Bill provided construction cost estimates that allowed the owner to make actionable decisions. His knowledge of construction pricing will allow the SHA to potentially benefit from similar pre-procurement savings.*

Cost Estimator, SR 91 Corridor Improvements, Riverside County Transportation Commission, Riverside County, CA (2009-2010). This $1.3 billion DB project focuses on increasing capacity for an existing 14-mile stretch of SR 91, from SR 241 to Pierce Street in the City of Riverside and I-15. This segment of SR 91 is one of the most congested routes in Southern California, with current average daily traffic expected to increase 50 percent to 70 percent by 2030. Bill assisted with preparation of the civil works construction cost estimates and development of the preliminary construction schedule. Variants of original study designs for retaining walls and overcrossing structures were evaluated and estimated to determine the most suitable and cost-effective alternatives for construction. The results of the OPCC estimates were presented to the RCTC and FHWA as part of the approval process to advertise the project for public bidding as a DB project. Bill also performed cost evaluations for the project once the project had been awarded to a DB contracting joint venture to analyze project change order costs submitted by the contractor. *The SR 91 Corridor Improvements project was designed to alleviate major traffic congestion on SR 91 and I-15 in Riverside County, CA. This is being done by widening and reconstructing existing roadways and bridges, as well as implementing traffic measures such as an active traffic management system and adding HOV/HOT lanes on the project. As part of the work, additional right-of-way was required to be purchased, so private property owners, local municipalities, private and public utilities, and a major railroad were involved in the development of the design concepts.*

Richard Chylinski

ADDITIONAL CONSTRUCTION KEY STAFF - SYSTEMS INTEGRATION MANAGER

Richard Chylinski has more than 30 years of experience in the design, specification, and development of ITS. Richard has been responsible as a project manager and systems integration lead for the successful ITS deployments of integrated corridor management (ICM) and coordinated traffic signal control systems, active traffic management systems (ATMS), advanced traveler information systems (ATIS), and automatic vehicle location systems (AVL). On the IS 270 ICM Project, Richard will identify, review, assess, analyze, and recommend ITS technologies and solutions for project innovations aimed to reduce congestion. He provides expertise in the design and integration of ITS field devices, communications systems, and central management systems; DMS for dynamic lane management, hard shoulder running, and variable speed management; CCTV cameras, video analytics systems, digital video management and distribution systems; system-wide adaptive ramp metering; adaptive traffic signals systems; congestion performance monitoring; and analysis solutions and congestion prediction solutions. *Richard will help the team develop improvements that minimize SHA operations and maintenance activities, while being adaptable to future transportation technologies. He will ensure systems integration is a part of the early design phase and oversee the deployment phase. He also will lead all necessary systems integration activities, including the specification, design, and development of all interfaces with CHART and any systems required to interact with the systems managing other modes (e.g., transit) operating on the corridor.*

Years of Experience 30

Education

- BS, University of Manitoba, 1984

Additional Experience

- Project Manager, Halifax, Nova Scotia, Traffic Signal Control System – Intelligent NETworks® (2014-2020)
- Project Manager, Unified Transportation Coordination Centre Monitoring System, PanAm Games, Ontario, Canada (2015)
- Software Manager, Adaptive Traffic Signal Control Pilot Project, City of Surrey, British Columbia (2011-2014)
- Software Manager, "ImFlow" Traffic Adaptive Control System Project, Amersfoot, The Netherlands (2007-2010)

RELEVANT PROJECT EXPERIENCE

Project Manager, ATMS – Intelligent NETworks®, City of Mississauga, Ontario (2015-2021). The project will replace the City's existing legacy traffic signal systems with the supply, installation, integration, testing, commissioning, and five years of maintenance of Parsons' Intelligent Networks® ATMS in the City's IT environment. The ATMS provides traffic signal control, event management, CCTV control, arterial travel time advisory, adaptive signals control, traveler information, AVL fleet integration, RWIS, asset management, and integration with the Ministry of Transportation ATMS. Richard is responsible for the successful implementation of this project. He manages a team of Parsons ITS professionals and manages subconsultants, while reporting to the City's project manager. *This project implemented several innovations to increase mobility and travel time reliability on the main transportation corridors in the city. The new ATMS allows the City to be proactive by providing automated traffic responsive capabilities to manage congestion on the arterial network due to freeway incidents or heavy peak period congestion in coordination with the agency owner, which manages the freeway network. The deployment includes adaptive signal control implementation on a major arterial with freeway ramp intersections to improve traffic flow.*

ATM Assignment Manager, Virginia Statewide ATMS – Intelligent NETworks® Implementation, VDOT, Virginia (2011-2015). This project completed the design and development the ATMS module, which includes variable speed limits, dynamic lane management, and dynamic shoulder use. The ATMS is deployed on sections of I-66 and I-495 freeways in Virginia. Richard was responsible for the successful implementation of

Richard Chylinski (Continued)

the ATMS solution in coordination with VDOT and the I-66 installation contractor, ATM solution design reviews and approvals, interface specifications, coordination of integration, and testing and commissioning. *The new I-66 ATMS facility provides VDOT with the necessary tools to dynamically manage congestion and improve safety and mobility through the use of variable-speed algorithms and dynamic lane and shoulder use.*

Project Manager, I-15 Integrated Corridor Management System (ICMS), San Diego Association of Governments, San Diego, CA (2011-2015). The San Diego I-15 ICMS is one of two FHWA-funded ICM demonstration deployments. The ICMS is an integrated multimodal system providing proactive multi-agency coordinated operations of the freeway, arterials, and transit. The Parsons Intelligent Networks® ATMS was deployed and included a data exchange hub using NTCIP C2C standards to integrate ITS in the corridor, including three urban traffic control systems, ATMS, ramp metering system, parking systems, transit AVL system, and an online decision support model that provides traffic network prediction and impact assessment of multimodal response plans. Richard was fully responsible for the successful implementation of the project. He managed a team of ITS professionals and subconsultants to design the ICM solution, deploy it in a hosted IT infrastructure, and integrate to existing agency systems. *The San Diego I-15 ICMS was an innovative project using leading-edge ITS technologies to improve travel time reliability and mobility along the I-15 corridor through effective use of available capacity by coordinating operation of the freeway, parallel arterials, managed-lane facility, and a BRT facility.*

Project Manager and Solution Architect, TransLink, iMove™, Regional Advanced Traveler Information System (ATIS), Vancouver, TransLink, Vancouver, British Columbia (2004-2008). This project involved the design, specification, and deployment of the regional traveler information system for the Greater Vancouver Area, iMove™. iMove™ provides the traveler one-stop-shopping for multimodal transportation information from both public and private transportation providers. The project included a regional ATIS architecture, an ATIS data warehouse, GIS spatial database, and a web portal using Google Maps to provide an interactive map facility that integrates incidents and closures, bus routes, and schedules with road conditions, CCTV, border crossing queues, cycling routes, etc. Richard managed a team of Parsons ITS professionals and subconsultants. The project received three industry awards, including the 2009, International Road Federation - Global Road Achievement Award for Traffic Management and ITS for iMove®. *The iMove solution was unique and innovative because it integrated information available from all the major transportation agencies (freeway, arterial, transit, air, ferry) in the greater Vancouver area. It benefited from agency cooperation through membership in the ITS Corporation, the sponsor of the project, all with the goal of improving mobility and travel time reliability.*

Software Manager, Route 8 Traffic Control and Surveillance System, Hong Kong Transport Department, Hong Kong (2005-2010). The project involved the design and deployment of an incident management and real-time traffic control system for the new 13.5-kilometer-long dual three-lane toll road between Sha Tin and Tsing Yi consisting of three reversible-lane tunnels and a bridge. The system manages traffic using variable message, variable speed signs; lane control signals; traffic signals; movable barriers; video detection; and speed control cameras and integrates CCTV, toll equipment, tunnel ventilation SCADA, weather monitoring, and bridge structural health monitoring. The system uses a rule-based decision support system (DSS) to automatically build a response plan to suit the event and provide an operational interface using a GIS map displaying traffic conditions and operational status of equipment. Richard was responsible for managing a team of software and ITS engineers to develop and deploy the TCSS solution and included functional specifications, detailed designs, FAT and SAT plans and procedures, training, operations, and maintenance documentation. *The Route 8 TCSS uses dynamic speed control, dynamic lane and merge control, and queue warning strategies to manage heavy congestion and incidents, improving safety and mobility.*

3.
Project Understanding and Progressive Design-Build Approach

3 Project Understanding & Progressive Design-Build Approach

3.1 Understanding of the Project Goals & Significant Issues

The commitment by the Maryland State Highway Administration (SHA) to invest in improvements to the heavily traveled IS 270 corridor is timely and necessary. The innovative decision to do so through a progressive design-build (PDB) model underscores the SHA's concern that traditional civil solutions, such as widening, are likely not regionally thoughtful solutions, given the factors associated with the corridor, while emphasizing that a collaborative approach and new ideas are essential to reaching an optimal result.

The IS 270 corridor is home to some of the worst congestion in the region and the nation, and the problem worsens with each passing year. According to INRIX, a leading traffic data provider, the Washington metro area has the second worst traffic in the nation, with an average 75 hours per person wasted in traffic each year. The congestion issues on the corridor are complex, so economical solutions are not easy to identify or implement. Congestion occurs at different points on the corridor, in different roadway configurations, for different reasons, and at different times of the day, week, month, and year.

3.1.1 PROJECT GOALS

Despite these challenges, opportunities exist to achieve and further the project goals of the IS 270 Innovative Congestion Management (IS 270 ICM) Project. Parsons will partner with the SHA to investigate a variety of innovative infrastructure and intelligent transportation system (ITS) solutions to **improve mobility** by maximizing throughput while delivering a **safer IS 270 corridor** with fewer and less-severe incidents. Parsons' solutions will have the benefit of the expansive experience outlined in Section 4 to **minimize SHA operations and maintenance activities** while introducing solutions that have proven **adaptable to future technological advances**.

The individuals identified as key personnel, subject matter experts, and executive management will work to maximize the SHA's budget with right-sized solutions, providing the best possible value to the citizens of Maryland. We will apply best practices developed with the experience of 106 DB and hundreds of ITS projects throughout the world to execute a **well-managed project,** on which communication and coordination are fostered by a commitment to partnering at every level and with every stakeholder.

3.1.1.1 MOBILITY

Mobility, including maximizing vehicle throughput, minimizing vehicle travel times, and improving travel time predictability for commuters, is the most critical goal. The SHA has made a number of important investments to improve mobility across the State, including the following:

- Continued expansion and enhancement of the Coordinated Highway Action Response Team (CHART)
- Development and implementation of Maryland 511
- Optimizing signal timing at congested intersections
- Adding park-and-ride facilities
- Implementing HOV and reversible lanes

Certainly, these efforts have mitigated the impact of congestion, but more is needed. According to the latest Maryland Mobility Report (*co-authored by exclusive team member **JMT***), IS 270 continues to hold the dubious honor of being one of the State's most congested and most unreliable roadways during both the a.m. and p.m. peaks.

Improving mobility will require implementing a combination of proven and innovative coordinated traffic management techniques for the IS 270 corridor, with solutions addressing both recurring and non-recurring congestion. Parsons has partnered with agencies in the U.S. and around

the world to design, build, furnish, and install comprehensive solutions addressing network-level challenges, like those on the IS 270 corridor. On many of these projects, Parsons' innovation resulted in firsts, such as the following:

- **FIRST** to deploy System-Wide Adaptive Ramp Metering in the U.S. (Caltrans D7 DLMS)
- **FIRST** rule-based dynamic lane management/ managed motorways deployment (Hong Kong)
- **FIRST** to deploy multi-agency center-to-center transportation information sharing network (Toronto 2015 Pan Am/Parapan Am Games)
- **FIRST** to deploy an intelligent decision support system (DSS), active junction control, and integrated corridor management (ICM) using an intelligent DSS model. (Caltrans D7 DLMS)
- **FIRST** to incorporate network traffic prediction into an ICM solution (San Diego I-15 ICM)

The effectiveness of any mobility solution is directly dependent on the degree to which traveler behavior characteristics are addressed. Traveler behavior and patterns must be considered and understood, and educating and informing the public will be critical to achieving mobility improvement objectives. With the IS 270 financial resources available, **Parsons' reputation for analytical rigor and innovation offers the SHA the capabilities needed to ensure that funding is allocated in a manner that provides optimal results and solid value.**

3.1.1.2 SAFETY

On a high-volume corridor such as IS 270, implementing changes to improve safety will positively affect many lives, and reducing crashes has the added benefit of decreasing delay and improving travel time reliability. Parsons will make the safety of the traveling public and those who build and maintain Maryland's roadways a fundamental element of all design and construction activities. While the number of fatalities in Maryland has decreased from 614 in 2005 to 442 in 2014, more is required to continue to progress toward the goal of zero deaths.

Making IS 270 a safer corridor for users will require an innovative combination of approaches to address known safety issues and overall network safety. Fortunately, mobility improvements often positively affect safety. Whether it is the extension of a merge lane, the implementation of advanced traffic management initiatives, continued improvement in incident clearing, expanded public outreach, or traveler behavior modification, every option must be examined through the prism of safety, as well as mobility.

Parsons has demonstrated our capacity to deliver optimal combinations of innovative solutions to improve safety. Parsons developed cost-effective ITS solutions that reduced the number and severity of incidents on the I-15 corridor in San Diego and the I-80 corridor in Northern California; improved incident management through its freeway service patrol programs in Virginia, Georgia, and Hawaii; and improved traffic flow/ interactions at major interchanges, such as I-395/ Seminary Road. Parsons not only understands the importance of full-spectrum solutions, we have delivered them from start to finish.

3.1.1.3 OPERABILITY/MAINTAINABILITY/ ADAPTABILITY

Practical Design encompasses many elements, including developing innovative solutions while minimizing operations and maintenance costs. Parsons will partner with the SHA to develop appropriate solutions that take into account future operations and maintenance (O&M) costs and that have the flexibility to adapt to new technologies and transportation innovations. The challenge of securing funding for ongoing O&M underscores the importance of solutions that endure, as well as the importance of seeking mutually beneficial partnerships with stakeholders. These partners often include other government agencies, as well as business entities.

Parsons is the preeminent global leader in ITS system integration and has first-hand experience with designing for interoperability, sustainability, and service life. Additionally, we have been working with and exploring new relationships with businesses

— some of which provide enhanced operational data and others that are pioneering innovative public-private partnerships with the potential to revolutionize personal mobility and restructure the costs associated with infrastructure O&M. Parsons works extensively with data providers like HERE, INRIX, and others to change the traffic information business model and the information systems that facilitate operational decision making. Parsons is also working with innovators like Metropia, which is piloting a travel demand management solution that aims to reduce peak traffic volumes and promote transit use and ridesharing.

As autonomous vehicles, improvements in vehicle-to-infrastructure communications, and/or other technologies mature, even larger shifts in the O&M model will take place, including providing the groundwork for the eventual elimination of some traditional signage and traffic control devices. Parsons is regularly engaged with researchers and decision makers to explore the potential of such solutions, and we are working hand-in-hand with agency and business leaders to continue to revolutionize design, engineering, and O&M practices to reduce financial and functional burdens on state agencies.

3.1.1.4 WELL-MANAGED PROJECT

Parsons' experience successfully delivering DB projects across the country has taught us the importance of a symbiotic relationship among the designer, owner, and builder. Parsons' unique in-house partnership provides a true balance between design and construction, allowing our designers to emphasize developing solutions that best meet owner goals while incorporating features to provide cost-effective and quality construction.

Parsons' project management processes, expertise in diverse markets, and experience in infrastructure and integrated systems projects across the world, including the Intercounty Connector A and B DB (ICC A&B DB) projects in Maryland, demonstrate our capability to successfully deliver projects that meet owners' requirements on schedule and within budget. Our extensive DB experience enhances these processes, as these projects require a high degree of collaboration, coordination, and communication to effectively develop, plan, and deliver solutions directly relevant to the PDB process. Parsons' project management process includes the following:

- A **communications plan** that identifies and addresses stakeholder needs and prioritizes options. This ensures that state, municipal, and county stakeholders are engaged throughout the project.
- The **coordination plan** will include weekly/biweekly meetings between our DB Project Manager, Brian Quinlan, PE, and the SHA project manager to review status, issues, upcoming activities, and schedule. We will also hold technical task force meetings with our team and the SHA, where innovative solutions will be defined and vetted.
- Our **risk management plan** will provide a structured, disciplined process for identifying and mitigating risks throughout the project and is embedded into our management approach.

Parsons also has specialized construction management skills and tools that are the foundation for project success. Our PAR-PRO™ requirements tracking solution will be available throughout each phase of the IS 270 ICM Project. It is an innovative step forward from traditional management techniques and is well suited to environments such as PDB, as it enhances transparency and efficiency while providing cost and schedule benefits. This tool was used successfully in our work on the ICC A&B DB projects and has garnered awards around the U.S. for the money it has saved our clients.

3.1.2 SIGNIFICANT ISSUES

3.1.2.1 HIGH OCCUPANCY VEHICLE (HOV) LANES

Options exist to enhance throughput while preserving HOV lane mileage. These range from incentive programs to promote more ridesharing, to reversible lanes, whereby the HOV lane passes through a slip ramp to leverage underutilized capacity in the opposite direction. By combining these approaches, mobility could be significantly enhanced without requiring additional right-of-way (ROW), reducing the HOV lane mileage,

or compromising the State's commitment to environmental responsibility. **Parsons' experience with express lane programs in California and elsewhere ensures that appropriate safety features will be incorporated,** including the following:

- Appropriate pavement marking to improve visibility and compatibility with vehicle lane guidance systems
- Proper advance warning signs
- Guidance delineators

3.1.2.2 MAXIMIZE SCOPE WITHIN THE BUDGET

Manageable Packets for Congestion Mitigation. Parsons and the SHA will team to establish a collaborative, analytical approach to define the most appropriate package of solutions. We will implement the same transparent analytical process we have used on similar projects to provide the appropriate basis for decisions regarding scope.

Reliability of Available Modeling. Parsons will use our extensive in-house modeling expertise to ensure that complex multi-point solutions are tested and that they provide reliable outputs. Our modelers have the ability to use data in any format and to output in any model format required by the SHA.

Rapid Evolution of Transportation Technology. Parsons' ITS Group continually works with a wide variety of manufacturers and suppliers to ensure that our knowledge base and technical capabilities offer our clients access to the most innovative and cost-effective technology solutions. Parsons' Intelligent NETworks® advanced transportation management system (ATMS) is a modular platform that has been proven to offer a solid foundation for the delivery of successful ICM and ATM solutions. We will engage the ITS and technology groups within Parsons to analyze and mitigate risk related to new technologies.

Complexity of the IS 270 Corridor. Parsons will consider all modes of transportation in the corridor, as well as the full network of surrounding roadways, to address the SHA's mobility goal of congestion reduction. Mainline roadway solutions alone are not likely to offer optimal mobility improvements. The potential contributions of every significant element of the network, including alternative routes and modes, as well as other roadways and existing systems, must be considered as part of a comprehensive solution. Parsons has an award-winning track record of delivering successful ICM deployments, demonstrating our technical expertise and delivery experience. Subcontractor **Sharp & Company** is one of the region's premier stakeholder engagement firms and will help ensure traveler participation through effective communication.

Traveler Education & Behavior Modification. Promoting ridesharing and transit use should continue to be foundational elements of the SHA's congestion mitigation efforts. The opportunity exists to accomplish those objectives as part of this project. The first element would focus on creating a positive experience for a traveler who carpools or uses transit. This would involve capturing network performance data and communicating to corridor users the benefits of getting out of their cars in more meaningful terms, such as money/fuel saved and emissions reduced. A second element could involve travel incentive programs. In exchange for congestion reduction behavior, motorists could accumulate reward points to potentially exchange for discounts on anything from goods from local merchants to fuel taxes or registration fees.

3.1.2.3 COORDINATION WITH OTHER PROJECTS

Parsons understands the IS 270 ICM Project will not be completed in isolation. We will factor in the likely effects of the Watkins Mill interchange on traffic patterns and bottlenecks, both on IS 270 and the balance of the corridor network, as well as projects along MD 355, the existing feeder network, and transit agencies along the corridor. Parsons will engage the SHA and the Watkins Mill design team to gather the information necessary to complete our modeling efforts. We will provide output and assumptions from our modeling effort as needed. **We will coordinate with the Watkins Mill team and the SHA to determine whether any modifications to either project might enhance the overall performance on the network, particularly at the locations in and around the interchange.**

In the unlikely event that our solution impacts the current design of this project, there will be a need for permit modifications for stream impacts, storm water management, sediment and erosion control,

and environmental compliance. We will consider cost and schedule impacts due to permit modifications including permit applications and coordination with permitting agencies, and team members.

3.1.2.4 NEPA/MEPA

Compliance with NEPA and MEPA provisions is essential, beginning at the very start of the design process and carrying through to verification during the build out. This includes the identification of necessary permits and coordination with the SHA, the MDE, and all appropriate stakeholder groups to ensure that all necessary information and documentation is provided and that clear communications of proposed changes are made available in all required forums. **Parsons' environmental engineering and compliance staff are experienced in all aspects of the applicable permitting processes, having completed them on projects like the ICC A&B DB**, as well as many others throughout the country.

3.1.2.5 MINIMIZE ENVIRONMENTAL IMPACTS

Parsons has managed project impacts to endangered and protected species, notably on the western end of MD-200, near IS 270, and is familiar with expectations of the State and environmental groups with respect to preserving the natural environment. **Parsons anticipates most, if not all, of the project elements will take place within existing ROW and will consist largely of technology-driven solutions.** This means environmental impacts will be minimal or nonexistent. We will coordinate with the SHA and the MDE to ensure that appropriate mitigation strategies and remedies are defined and applied.

3.1.2.6 MINIMIZE UTILITY AND PROPERTY IMPACTS AND RELOCATIONS

Utility and Geotechnical. Subsurface investigations for poles, gantries, and roadway structures, e.g., hard shoulder running, extended merge lanes, etc., will be required and may present unexpected results and foundation requirements. Parsons' history of projects in this area, particularly regarding the IS 270 approaches to MD-200, will provide a reasonable baseline expectation for the soil quality in the project area. Our strategy will include early and frequent communication with utility companies, utility designation, and the early identification of any geotechnically unsuitable areas. We will accomplish this by coordinating with the SHA and utility companies and by early geotechnical exploration.

Right-of-Way. The northern portion of the IS 270 corridor includes undeveloped ROW and adjacent land that is potentially available for acquisition, while much of the land within or adjacent to the ROW is developed and unavailable. This limited ROW presents constraints on constructability and could present issues for roadway modification solutions as part of congestion management alternatives. Parsons will consider and explore opportunities beyond these limitations in cooperation with the SHA. We expect the most cost-effective solutions will be technology driven, and we will limit designs that encroach beyond the existing ROW. We will pursue signage, lighting, and ITS designs that use innovative power and communications conduit and foundation installation designs to limit impacts to the existing ROW. **Our principal mitigation strategy will be to avoid or minimize additional ROW impact.**

3.1.3 SIGNIFICANT RISKS

Parsons' experience with mobility improvement initiatives, DB, and ITS implementations has afforded our staff a comprehensive perspective of the risks associated with such projects, and we have accumulated a considerable compendium of best practices for mitigating them. Parsons has identified significant risks to the successful completion of effective solutions in Table 1.

3.2 Approach to Progressive Design-Build

Parsons is a recognized leader in DB procurement methods, including PDB. Our experience includes the recently completed the Mid-City Exposition LRT project, completed under a PDB contract; and the Miami International Airport North and South Terminals, completed under GM/CMAR and At-Risk CM, respectively. Combined with our extensive history working with agencies as a

program manager, construction manager, designer, and contractor, we have a multidimensional understanding of how to generate maximum value through collaboration with the SHA and key stakeholders. **Our experience has honed Parsons' processes into best practices to implement on the IS 270 ICM Project.** The tools we use to ensure a collaborative atmosphere during this process include the following:

- Co-location of SHA representatives in our jobsite office
- Regularly scheduled meetings
- SHA input regarding advancing concepts into the CAP process
- SHA participation in the selection of subcontractors and suppliers through the CAP approval process

The key to successful PDB on the IS 270 ICM Project will be identifying and implementing solutions that provide the most value. Parsons will draw on our extensive corridor expertise to analyze performance data, whether that data is currently available or project generated. We will also investigate ideas provided during public outreach meetings and partnering sessions. To manage this creative process, we will maintain a suite of solutions in tabular form that includes a synopsis of the solution, an explanation of the expected benefit, an approximate time requirement for design and construction, and an approximate cost estimate. Parsons will periodically review these solutions with the SHA to identify candidates to advance through the CAP process.

Table 1: Risks and Potential Mitigation Strategies (Red = High; Yellow = Moderate Risk Level)

Risk	Potential Mitigation Strategies
Ineffective traveler education/ behavior modification	A well-designed public outreach/education program.
Poorly defined, inadequate, or costly performance measures	Partnering with the SHA and other stakeholder to define performance measures and tracking. Change course if the solution is off the mark.
Failure to suitably size project phases	Plan various parts of the improvement that can be done economically with SHA consensus.
Public perception of success	A well-designed public outreach/education program.
Safety	Well-defined safety and properly developed traffic control and access management plans.
Schedule	Proper planning, timely execution, constant monitoring and control.
Multiple stakeholders with competing priorities	Actively managing and mapping expectations and how they measure with the success of the project through frequent communication along proper channels.
Political climate	Sharing and partnering with local and State representatives.
MDOT adaptation of innovative ideas	Sharing and partnering with the MDOT agencies.
Congestion at end of project limits	Region-wide planning and analysis and frequent communication with all stakeholders regarding the impact of proposed solution.
Solutions creating unexpected impacts	Mesoscopic and microscopic simulation tools will be used to analyze potential impacts for all proposed solutions, including corridor, region, transit, and parking management.
Failure to adequately prepare for technology enhancements	Ensure solutions introduced can be adapted to seamlessly incorporate new technologies.
Consideration of the system as an integrated system	Develop solutions that consider all modes of transportation, as well as the full network of roadways within the project corridor.
Improper testing and modeling of the data	Test program in place to manage implementation of the variety of system components and elements through quality control/quality assurance of testing.
Financial	Advance planning and securing procurements for certain material with contractual terms that positively affect the project at early design stage (60%) completion level.
FHWA approval	Engage the FHWA early on in the solution development.
M-NCPPC approval	Understand the M-NCPPC's long-term plan and engage it early in solution development.

On this project, Parsons will implement PAR-PRO™, our proprietary project management optimization tool, which was also used on the ICC A&B DB projects. It is a well-defined approach and modular data management tool set, including the following:

- Requirements/scope management
- Design verification
- Design comment tracking
- Construction verification
- Construction materials test result tracking
- Pay request processing
- Final acceptance/closeout

The Parsons team has the appropriate talent and resources to deliver the innovative solutions that are the hallmark of PDB. Being One Parsons, a single firm capable of delivering design and construction services, offers a fundamental advantage. Parsons has earned international recognition for its strength in roadway design and ITS design and integration and has led or participated in some of the most complex and challenging DB construction projects in the U.S. The IS 270 ICM Project will also benefit from Parsons' experience as a construction manager. We understand project management from all perspectives and have developed efficient processes to improve communication and coordination among team members to execute a well-managed project.

3.3 Design-Build Team Composition

The Parsons team is a truly integrated team, with Parsons Construction Group as the design-builder and design leadership provided by Parsons Transportation Group. **Other teams will profess the ability to deliver a fully integrated approach, but only the Parsons team will be seamless.** We will take advantage of Parsons' wide range of in-house skills and services, ensuring an adequate depth of resources and ease of management from the viewpoint of the SHA. As demonstrated in the resumes in Section 2 and the experience described in Section 4, the staff and firms brought together for this project have worked together on numerous similarly scoped projects of various sizes within Maryland and the Mid-Atlantic.

Benefits of Parsons' Approach to PDB

- Parsons will evaluate corridor congestion and stakeholder concerns to identify promising measures to address project goals.
- We will engage key stakeholders early and often through partnering in the project.
- Parsons will involve construction staff during design to determine means and methods early in project development.
- Parsons will work interactively with the SHA to design and price an array of improvement initiatives.
- The SHA will retain control and make final determination of scope through the CAP process in order to get the most out of budgeted funds.
- Parsons and the SHA will collaborate to identify and mitigate risks and deploy the most cost-effective solutions.

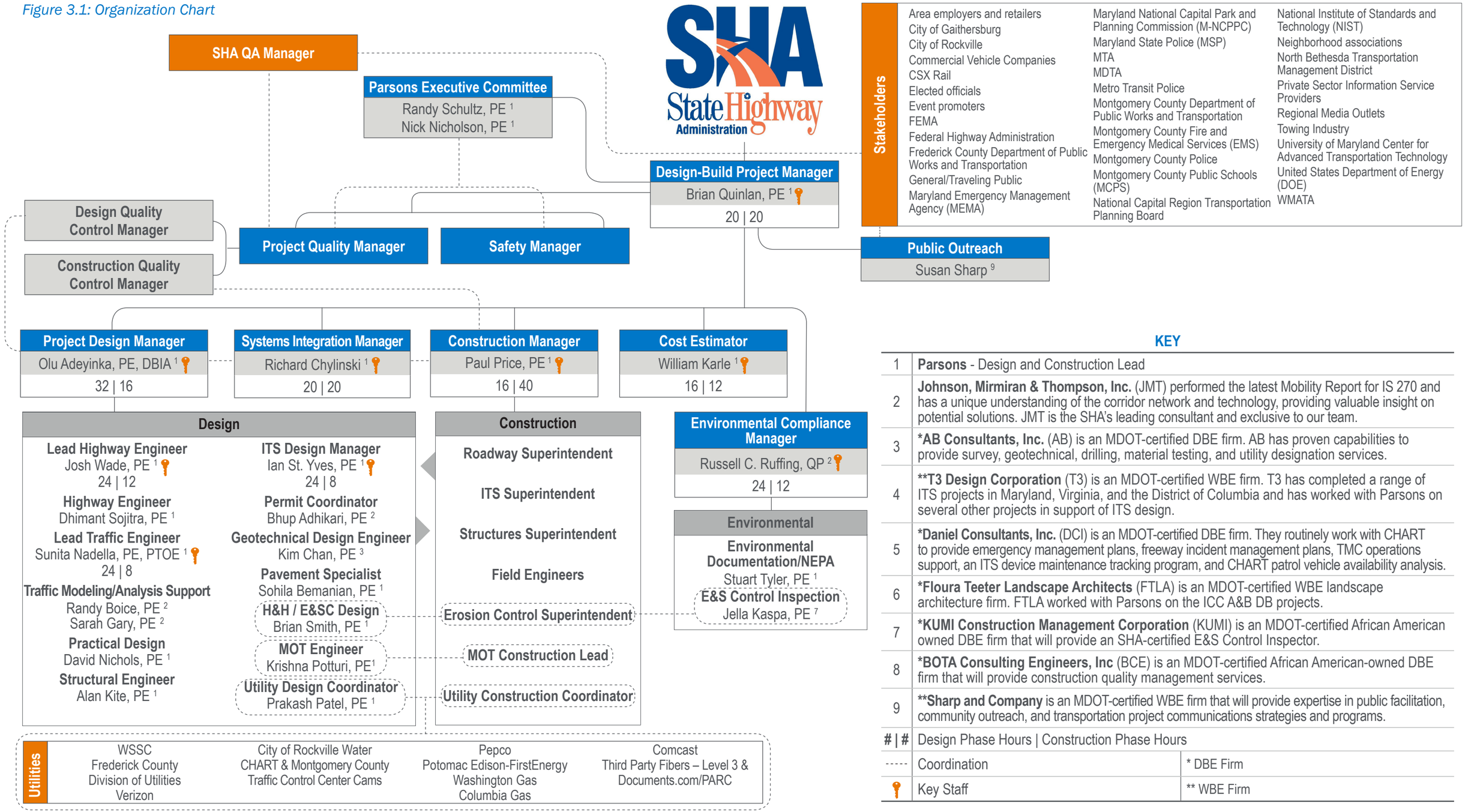
Our additional design and construction key staff positions, **ITS Design Manager, Ian St. Yves, PE**, and **Systems Integration Manager, Richard Chylinski**, respectively, were added because we believe to successfully achieve the SHA's goals, the IS 270 improvements will rely heavily on ITS improvements. Ian's experience in the design, furnishing, installation, and testing of ITS, combined with Richard's experience overseeing the integration of new and existing systems, rounds out a team of professionals that will work with SHA to develop innovative solutions for the IS 270 corridor.

We have provided a closely linked group of design and construction experts to ease coordination and speed of delivery during the design phase. Parsons is responsible for contractual obligations and has overall responsibility for the project, including all project management, technical direction, and quality control and assurance of each work product, as well as all coordination with the SHA, management of stakeholder expectations, and partnering. As shown in the key for Figure 3.1, **the Parsons team includes carefully selected subconsultants to complement our capability to achieve and further the SHA's project goals for the IS 270 ICM Project.**

3.3.1 ORGANIZATION CHART

Figure 3.1 displays the organization of the Parsons team for the IS 270 ICM Project.

Figure 3.1: Organization Chart



KEY

1	**Parsons** - Design and Construction Lead
2	**Johnson, Mirmiran & Thompson, Inc.** (JMT) performed the latest Mobility Report for IS 270 and has a unique understanding of the corridor network and technology, providing valuable insight on potential solutions. JMT is the SHA's leading consultant and exclusive to our team.
3	***AB Consultants, Inc.** (AB) is an MDOT-certified DBE firm. AB has proven capabilities to provide survey, geotechnical, drilling, material testing, and utility designation services.
4	****T3 Design Corporation** (T3) is an MDOT-certified WBE firm. T3 has completed a range of ITS projects in Maryland, Virginia, and the District of Columbia and has worked with Parsons on several other projects in support of ITS design.
5	***Daniel Consultants, Inc.** (DCI) is an MDOT-certified DBE firm. They routinely work with CHART to provide emergency management plans, freeway incident management plans, TMC operations support, an ITS device maintenance tracking program, and CHART patrol vehicle availability analysis.
6	***Floura Teeter Landscape Architects** (FTLA) is an MDOT-certified WBE landscape architecture firm. FTLA worked with Parsons on the ICC A&B DB projects.
7	***KUMI Construction Management Corporation** (KUMI) is an MDOT-certified African American owned DBE firm that will provide an SHA-certified E&S Control Inspector.
8	***BOTA Consulting Engineers, Inc** (BCE) is an MDOT-certified African American-owned DBE firm that will provide construction quality management services.
9	****Sharp and Company** is an MDOT-certified WBE firm that will provide expertise in public facilitation, community outreach, and transportation project communications strategies and programs.
# | #	Design Phase Hours | Construction Phase Hours
-----	Coordination | * DBE Firm
🔑	Key Staff | ** WBE Firm

4.
Design-Build Team's Ability and/or Experience

4 Design-Build Team's Ability and/or Experience

Parsons is one of the few firms able to claim expertise as both a designer and a builder, and no firm can claim a longer history of successful alternative delivery projects, including design-build; CMAR; CM/GC; and numerous variations of DB, including DB-Finance, DB-Finance-Operate, P3, and progressive design-build (PDB). Parsons is among the most experienced DB-capable firms in the country, having successfully delivered 106 projects totaling $35.3 billion in more than 25 states. We will draw on this expertise to identify and implement whatever form of innovative congestion management is determined to be optimal on the IS 270 corridor.

Parsons is also the nation's leader in the planning, design, deployment and integration of large scale intelligent transportation solutions. We lead the industry in the design and deployment of innovative and award winning solutions. Our list of industry firsts is extensive. Our industry firsts typically become industry norms. We have been particularly successful in projecting where the industry is heading, and picking technical solutions that not only meet the client's current needs, but also prove to have long and successful life cycles. Our success is based on a deep pool of worldwide ITS experts that share experiences and lessons learned. Parsons will apply best practices, developed from experience gained on hundreds of ITS projects, to ensure that the most appropriate solution is selected and implementations are completed efficiently and correctly. Parsons' combination of design and construction capabilities offers the SHA a full-service team supported by the experience of more than 14,000 professionals worldwide.

Together with our carefully chosen team of subconsultants, identified in Section 3, we are qualified and equipped to partner with the SHA and key stakeholders to address the IS 270 project goals of mobility, safety, operability, maintainability, and adaptability and to ensure a well-managed project for the SHA and the citizens traveling the IS 270 corridor.

4.1 Experience Achieving Project Goals

Parsons, as a firm, and particularly our staff, has led and supported efforts to improve corridor-wide mobility at locations across North America and throughout the world. Similar to the IS 270 corridor, these corridors presented the challenge of formulating and delivering solutions to address severe congestion on roadways where the addition of significant lane miles was impractical or impossible. Figure 4.1 provides an abbreviated snapshot of the wealth of experience the Parsons team brings to the IS 270 ICM project.

Parsons has received 42 awards for ITS project innovation. We are known for pushing envelopes and being the FIRST to deploy many ITS technologies and concepts, including the following:

- FIRST to incorporate network traffic prediction into an ATMS solution (San Diego ICM)
- FIRST to integrate on-line microsimulation into an ATMS deployment (San Diego ICM)
- FIRST to deploy System-Wide Adaptive Ramp Metering in the U.S. (Caltrans D7 ATMS)
- FIRST to deploy fiber-optic communications for an ITS solution – Toronto Compass
- FIRST to deploy a rules-based expert system decision support system (Caltrans D7 ATMS)
- FIRST multivendor traffic signal system (Region of York)
- FIRST rule-based dynamic lane management/managed motorways deployment (Hong Kong)
- FIRST to deploy fiber-based network protocol communication network (Hong Kong)
- FIRST web-based, thin-client ATMS software in the world – Parsons iNET ATMS
- FIRST web-based field traffic controller interface – Kansas City SCOUT CARMA
- FIRST to command our own Cyber Solutions Center, assessing the security of transportation agency technology systems
- FIRST to deploy multi-agency center-to-center (C2C) transportation information sharing network (Project Showcase)
- FIRST to deploy an intelligent DSS, active junction control, and ICM using an intelligent DSS model

Figure 4.1: Parsons experts have achieved similar goals.

Project Name, State	Value	Demonstrated Relevance to IS 270 ICM
ICC A&B DB, Montgomery County, MD	$54M / $1.06B	1 2 3 4 2 3 4 5 6 6 15 16
I-395 HOV Ramp & Auxiliary Lane Ext DB, VA	$6.5M / $56M	1 2 3 4 1 2 3 5 6 1 3 4 11 16
I-15 Integrated Corridor Management System, CA	$3.8M	1 2 3 4 2 3 5 3 4 6 9 14 17
I-80 Integrated Corridor Mobility, CA	$85M	1 2 3 4 3 2 3 4 6 9 11 17
Staten Island ATMS, NY	$10.8M	1 2 3 2 3 4 6 5 8
I-95 Express Lanes P3, Tolling and Traffic Management System Implementation, VA (*Staff Project*)	$925M	1 2 3 4 1 2 3 4 5 6 2 4 5 6 8 11 13 15 16 18
Hong Kong Route 8 ATM & TCSS	$38M	1 2 3 4 2 6 8 10 11 17
Pan Am Games, Toronto, Ontario	$1.4M	1 2 3 4 2 3 5 6 6
Northwest Corridor Managed Lanes Project, GA	$51M	1 2 3 4 1 3 4 5 6 5 6 8 11 16 17
Transform 66 - Inside and Outside the Beltway, VA	$13M	1 2 3 4 1 3 4 5 6 1 2 6 11 16
I-495 Capital Beltway Expressway DB/P3, Tolling and Traffic Management System, VA (*Staff Project*)	$2.2B	1 2 3 4 1 2 3 4 5 6 4 6 13 15 16
ALDOT Statewide ATMS, AL	$2.1M	1 2 3 4 1 3 5 6 5 8 11 15 17
Caltrans System Wide Adaptive Ramp Metering, CA	<$1M	1 2 3 4 2 3 6 3 4 6 9 17
Portland Automated Traffic Management, OR	<$1M	1 2 3 4 2 3 6 7 8 10 17
KC Scout, Kansas City, MO	$500k	1 2 3 4 3 3 9 17
NaviGAtor 3/Roadway Access Closure System, GA	$2.3M	1 2 3 4 3 5 6 8 11 17
I-90 Corridor Integration, IL	$2.5M	1 2 4 3 5 6 6 8 15 17
Caltrans D7 DLMS, Los Angeles, CA	$250k	1 2 3 4 3 6 7 11
Houston METRO LRT Expansion DB, TX	$124M / $1.2B	1 2 3 4 3 5 6 16
vivaNEXT, Ontario, Canada	$14.8M	1 2 3 4 3 5 6 6 12 16
SH-130 Segments 5 & 6 Toll & TMS, TX	$7.5M	1 2 3 4 3 5 6 6 16 17
Williamsburg Bridge, NJ/NY	$800M	1 2 3 4 2 5
VDOT Safety Service Patrol	$40M	1 2 4 3 5 6 8 13
Statewide Incident Management Unit, GA	$3.6M	1 2 4 3 5 6 8 13
LSIORB Ohio River Bridges Project, IN	$1.7M	1 2 3 4 3 5 6 16
SH-183 Managed Lanes, TX	$53M	1 2 3 4 3 4 5 6 5 11 16 17

Key: Featured Projects **Value:** Design/Construction **# Project Goals** **# Project Key Issues** **# Project Elements**

 # Project Goals
1. Mobility
2. Safety
3. Operability/Maintainability/Adaptability
4. Well-Managed Project

 # Project Key Issues
1. HOV Lanes
2. Maximize scope within budget
3. Coordination with other projects
4. NEPA/MEPA Approval
5. Minimize environmental impacts
6. Minimize utility and property impacts and relocations

 # Project Elements
1. Hard shoulder running/bus on shoulder
2. Variable speed limits
3. Adaptive ramp metering
4. ICM/Coordinated signals
5. Crossover(s)/Express Lane(s)
6. Enhanced integration/data sharing
7. Queue End Warning
8. Incident Management/Automated Incident Detection
9. Adaptive Traffic Signal Control
10. Dynamic Junction Control
11. Dynamic Lane Management/Merge Control
12. Bus Rapid Transit (BRT)
13. Freeway Service Patrol
14. Parking Demand Management/ Information
15. Road Weather Information Systems
16. Design-Build
17. Design-Furnish-Install
18. Connected Vehicle (V2V, V2I)

Intercounty Connector (ICC) Contract A, DB, MDTA and SHA, Montgomery County, MD

The ICC Contract A is the first segment of the ICC, constructing 7.2 miles of new controlled-access six-lane tolled road and three interchanges. A key feature of the joint venture's solution was the innovative reconfiguration of the Metro Access interchange. Pre-bid as an alternative technical concept, the innovation reduced environmental impacts, simplified maintenance of traffic, and reduced construction costs. The team responded to community requests and optimized the concept plans to depress ICC below MD 77, lowering its profile relative to the surrounding residential neighborhoods. ITS elements included closed-circuit television (CCTV), dynamic message signs (DMS), highway advisory radio (HAR), road weather information system (RWIS), fiber-optic communications, telephone communications, electrical services, and other improvements to provide a fully functioning system.

Key Staff: **Joshua S. Wade, PE:** Highway Engineer - roadway design; **Ian St. Yves, PE**: Communications Systems Engineer - ITS design; **Paul Price, PE:** Resident Engineer - construction management.

Relevant Awards: 2012 Project Achievement Award, project value greater than $100 million, from CMAA, Baltimore Chapter; 2012 Transportation - National Design-Build Award from DBIA.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- The project increased mobility within this Mid-Atlantic corridor.
- Increased safety for transit users and improved pedestrian access.
- ITS was integrated with existing AOC and CHART programs.
- Design staff were co-located with MDTA and contractor staff to successfully achieve an 18 month design schedule.

Intercounty Connector (ICC) Contract B, DB, MDTA and SHA, Montgomery County, MD

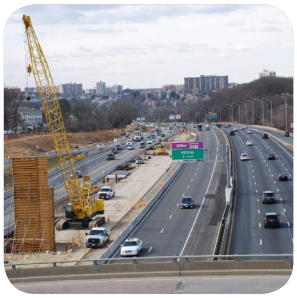
The $576 million ICC, Contract B, DB project consisted of approximately 6.9 miles of six-lane, controlled-access toll road in Montgomery County. The project constructed a diamond interchange at MD 182 and a single-point urban interchange at MD 650. Systems design considered operations and maintenance during constructability reviews and in accordance with the project technical provisions to provide automated monitoring, incident detection, and information dissemination. An extensive partnering effort was developed for public involvement and outreach, which resulted in Parsons winning the 2013 Award of Excellence Partnering Silver Award from Maryland Quality Initiative.

Key Staff: **Joshua S. Wade, PE:** Design Manager and Highway Engineer – oversight of all aspects of design, including roadway; **Ian St. Yves, PE:** Communications Systems Engineer – power distribution system and fiber-optic communication infrastructure design.

Relevant Awards: 2012 Globe Awards program winner, ARTBA Transportation Development Foundation; 2012 Transportation - National Design-Build Award, DBIA; 2012 Best Large Transportation Project in the Mid-Atlantic Region, ENR; 2012 Project Achievement Award (project value > $100 million), CMAA Baltimore Chapter.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- The construction of MD 200 provided increased mobility within the heavily congested region.
- Increased safety for transit users and improved pedestrian access.
- ITS was integrated with existing AOC and CHART programs.
- Weekly task force meetings were used to optimized design to accommodate redundant treatment systems.



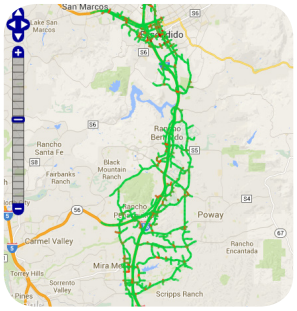
I-395 HOV Ramp at Seminary Road and Auxiliary Lane Extension DB, VDOT, Alexandria, VA

The I-395 HOV Ramp and Auxiliary Lane DB project is a key component in relieving the traffic congestion created by the relocation of thousands of federal workers to the Mark Center, a new Department of Defense Base Realignment and Closure facility near the I-395 and Seminary Road interchange. Located on an interstate corridor and a major commuter route, applicable solutions to improving mobility and safety included adding an auxiliary lane on northbound I-395 for the length of the project, widening the Seminary Road off-ramp to expand queue capacity, and adding a reversible HOV ramp to the Seminary Road interchange. Design innovations included optimizing the concept plans to provide proper vertical clearance at the hammerhead pier, minimizing utility impacts, and reducing the number of construction phases. These innovations improved safety and reduced costs.

Key Staff: Brian Quinlan, PE: DB Project Manager; and **Josh Wade, PE:** Design Manager, worked together with VDOT to revise the concept design, saving schedule and costs, while reducing future VDOT maintenance. **Sunita V. Nadella, PE, PTOE:** Traffic Engineer - VISSIM modeling.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- Relieved traffic congestion created by the relocation of thousands of federal workers.
- Added auxiliary lane to reduce congestion and increase driver and corridor safety.
- Optimized retaining wall design and eliminated deck joints to reduce future maintenance costs.
- Collaboration with VDOT allowed the team to deliver a safer and more maintenance-free facility at 70% of the original estimate and reduced ROW



I-15 Integrated Corridor Management System (ICMS), SANDAG, San Diego, CA

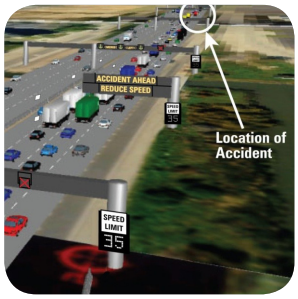
The San Diego I-15 ICMS was an innovative project using leading-edge ITS technologies to provide improvements in travel time reliability along the I-15 corridor through effective use of available capacity by coordinating operation of the freeway, parallel arterials, and a managed-lane and BRT facility. I-15 is the primary north-south highway, serving local, regional, and interregional travel. The corridor is a heavily traveled regional commuter route, connecting communities in northern San Diego County with major regional employment centers. Parsons' designed, developed, installed and integrated our Intelligent NETworks® traffic management system to monitor and manage the various facilities and modes in this corridor and recommend response plan strategies for various types of scheduled and unscheduled events.

Key Staff: Richard Chylinski: Project Manager - led efforts to develop and implement the integrated multimodal system that provides proactive multi-agency coordinated operations of the freeway, arterials, and transit.

Relevant Awards: 2013 Best of ITS Award from ITS America; 2014 California Transportation Foundation (CTF) Award for the Operational Efficiency Program of the Year; 2015 CTF, Operational Efficiency Program of the Year.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- Provides proactive multi-agency coordinated operations of the freeway, arterials, and transit along the corridor.
- Congestion-event-finding capabilities were implemented to reduce crashes and improve safety.
- Solution integrated into existing systems and is built on NTCIP standards to remain adaptable to future technologies.
- Parsons' project management processes were implemented on this award-winning project.



I-80 Integrated Corridor Mobility, ACTC, Alameda County, CA

For the I-80 Integrated Corridor Mobility project, as prime, Parsons provided project management, the software development and integration of Caltrans District 4 ATMS and East Bay Smart Corridor software applications, with various field devices along the I-80 corridor from the Bay Bridge Smart Corridor software applications, with various field devices along the I-80 corridor from the Bay Bridge to the Carquinez Bridge. The project also included implementing Adaptive Ramp Metering (ARM) and Active Traffic Management (ATM) strategies. The project allows sharing of real-time traveler information among public agencies and the public, and implemented new traffic management strategies. Similar to the IS 270 ICM Project, the primary goal of the I-80 project is to reduce congestion and improve safety and reliability along the I-80 corridor. Field elements of the project include CCTV cameras, changeable message signs (CMS), vehicle detection systems (VDS), ramp metering stations (with a central corridor-wide adaptive ramp metering algorithm), lane use signals (LUS) (with a central corridor-wide interface and algorithm), variable speed limit signs (VSLS) (with a central corridor-wide interface and algorithm), trailblazer signs, and communication network links.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- ITS solution to improve mobility along a heavily congested corridor.
- Fuzzy logic ramp metering was installed to help drivers merge onto I-80 smoothly and safely.
- Integration at the Caltrans District 4 Regional Transportation Management Center, and local TMCs is adaptable to future technologies
- Parsons' project management and ISO 9001 quality system ensured on time and within budget completion.

Staten Island Advanced Traffic Management System (ATMS), NYSDOT, Staten Island, NY

The project increases traffic operational efficiency, motorist safety, and the level of public service in the region by deploying ITS technologies within the project limits. The new system will help travelers make informed trip decisions and assist authorities with detecting and responding to emergencies. Surveillance, incident detection, and information dissemination is accomplished by cameras, sensors, and changeable message signs that are controlled manually and automated through the TMC. The project was the first in the state to implement the travel time information system using center-to-center communication to share information and provide automated delivery of that information to the traveling public.

Key Staff: Ian St. Yves, PE: Communications Systems Engineer – power distribution system and fiber-optic communication infrastructure design.

Relevant Awards: 2009 Outstanding ITS Project of the Year, Joint Traffic Management Center from Intelligent Transportation Society of New York (ITSNY); 2007 Outstanding ITS Project of the Year, Traveler Information Systems from ITSNY; 2006 Outstanding ITS Project of the Year, Transportation Asset Management from ITSNY; PS&E Quality Award from NYSDOT, Design Quality Assurance Bureau.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- First in the state to communicate travel times to the public to increase mobility.
- Incident detection allows pro-active responses to crashes, clearing them faster and increasing safety.
- Traffic monitoring technology will support multi-channel traveler information services.
- Regular meetings are held with stakeholders and NYSDOT staff to ensure efficient completion of project tasks.

I-95 Express Lanes P3, TTMS Implementation, VDOT, Northern Virginia *(Staff Project)*

The project includes 29 miles of reversible HOT lanes with new capacity and dynamic congestion pricing on Northern Virginia's heavily congested corridor. The $925 million project reconfigured 20 miles of existing HOV lanes, new access points, and a new 9-mile extension to alleviate the worst bottleneck on the corridor. Similarly to the IS 270 ICM Project, coordination with adjacent projects was critical to provide a full corridor solution. Systems integration, interfacing with the E-ZPass system, testing under live traffic, and transitioning to an integrated 495/95 system were all key components of the TTMS delivery.

Similar to the IS 270 ICM Project, this project provided a viable transportation option for travelers, improving overall mobility and travel time reliability in the congested corridor. The project improved safety on the I-95 corridor by installing and operating active traffic management in the form of lane control signs, notifying drivers of the need to merge when a crash occurs downstream.

Key Staff: Olumide Adeyinka, PE, DBIA: Project Manager – project development and design and implementation and integration of the TTMS.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- Viable new transportation option to alleviate I-95 corridor congestion and improve mobility.
- Improved safety by installing and operating lane control signs, notifying drivers of merge needs when a crash occurs downstream.
- Life cycle considerations were included in the final solution to reduce future O&M costs.
- Project was completed on time and on budget, with a "Zero" TTMS team safety incident record.

Route 8 ATM Project & Traffic Control and Surveillance System (TCSS) Project, Hong Kong Highway Department, (HKHD), Hong Kong

Among the most comprehensive technology-based congestion and safety solutions implemented is the Route 8 ATM & TCSS project. Parsons' completed design and software development and implemented traffic control solutions in real time within this corridor. The TCSS system monitors traffic conditions for at-grade roads, viaducts, three tunnels, and a cable-stayed bridge. The Route 8 TCSS uses dynamic speed control, dynamic lane and merge control, and queue warning strategies to manage heavy congestion and incidents, improving safety and mobility. The scope included the design, supply, installation, testing, and commissioning of the following major items: central system software, including automatic incident detection (AID) algorithms, incident management and response facilities, central monitoring and control systems (CMCS), supervisory control and data acquisition (SCADA) system, and wind and structural health monitoring system (WASHMS); TCSS facilities in the operations, computer and communications, and telecom rooms inside the R8K Administration Building and all portal buildings; and required field equipment.

Key Staff: Richard Chylinski: Project Manager - led efforts to develop and implement the integrated multimodal system.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- Dynamic speed, lane, and merge control manages heavy congestion and improves mobility.
- Queue warning strategies increase safety along Route 8.
- SDH over Ethernet communication network was used to promote transmission speed and system resilience.
- Richard Chylinski will bring innovative and proven processes developed on this international project.

Pan Am Games, Toronto, Ontario

Parsons' designed, installed and developed software to integrate data for multi-agency traffic and transportation operations during the 2015 Pan Am/Parapan Am Games. Customized for the Ontario Ministry of Transportation's monitoring system at the Unified Transportation Coordination Centre (UTCC), the iNET® system collects real time data from Greater Horseshoe transportation, transit, and emergency services agencies and integrates them into one common interactive situation map. The UTCC monitoring system includes information on traffic incidents, transit service disruptions, power outages, game venue schedules and travel times, weather, road congestion, closures, and construction. Parsons developed 40 dashboards for the various agency's unique needs. The system provides real-time travel information for more than one million people attending 52 separate events in 15 municipalities across the Greater Golden Horseshoe region. Similar to the IS 270 ICM Project, Parsons integrated data from multiple agencies and developed highly customized dashboards pertinent to each agency's specific needs and disseminated the traveler information to the public.

Key Staff: **Richard Chylinski:** Technical lead for design and implementation of the center to center software integration.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- ITS solution to improve mobility through multi-agency cooperation
- Unified interactive map and customized dashboards tailored to the agency's mission.
- Multi-agency solution minimized operations and maintenance and enhanced integration.
- Parsons delivered within very tight schedules, many stakeholders, and a solution the traveling public was dependent on.

Northwest Corridor Express Lanes DB, GDOT, Atlanta, GA

This $599 million DB-finance project is completing the design and construction of the largest transportation project in Georgia's history. The project corridor is northwest of downtown Atlanta, Georgia. It begins as a two-lane reversible facility that continues north along I-75 to the I-75/I-575 interchange, where it transitions to a single, reversible-lane facility and continues north to just beyond Hickory Grove Road. The traffic control system includes automatic gating systems for the reversible lanes. A similar single-lane reversible facility will be constructed along I-575 between the I-75/I-575 interchange and Sixes Road. Reversible ramps providing connection to and from the I-285 general-purpose lanes are also a part of the proposed improvements.

Key Staff: **Sunita Nadella, PE, PTOE:** Traffic Engineer - responsible for all the traffic analysis related to environmental studies and maintenance of traffic development. **Ian St. Yves, PE:** ITS Design Manager - responsible for providing system design for 29.7 miles of new reversible managed lanes, including all ITS, and the lanes will employ CCTV, fiber-optic communications to support TCP/IP communications, and low- and medium-voltage power distribution systems to support ITS and lighting systems.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- Increased management of traffic efficiency to improve throughput.
- Traffic is monitored through the expressway's entire length with cameras for traffic monitoring.
- ITS infrastructure is being constructed to be easily adaptable to future needs.
- The Parsons design team significantly reduced the need for additional right-of-way for the project.

Transform 66 Inside and Outside the Beltway Program, VDOT, Northern Virginia

Transform I-66 - Outside the Beltway Segment is a $2.1 billion P3 which will transform 25 miles of the I-66 corridor into a widened express/general purpose lanes facility with the reconfiguration of several major interchanges, construction of parking facilities, and multi-year transit payments. The proposed improvements envisioned for Transform I-66 include:

- High-frequency bus service with predictable travel times.
- Enhanced commuter park-and-ride lots and direct access between the express lanes and new or expanded commuter lots.
- Dynamically-priced toll lanes.

Transform I-66 - Inside the Beltway Segment is a $180 million multiphase program introducing peak-hour tolling and widening the eastbound lanes of the 7-mile stretch of I-66 between Capital Beltway and the Washington, D.C. line. Proposed improvements include:

- Providing multimodal improvements to the adjacent commuter arterial routes.
- Widening the eastbound lanes of I-66 to three-through lanes between the Dulles Toll Road Connector and the Ballston area.
- Introduction of dynamic-price tolling during the peak hour in the peak direction.

Parsons is part of the general engineering consultant (GEC) team responsible for providing program management, National Environmental Policy Act (NEPA) assessment, procurement, preliminary engineering, and tolling services. Parsons is developing conceptual, preliminary, and final engineering plans, studies, and analysis to complete the project within specified budgets and schedules. In addition to managing the project scope, schedule, and budget, Parsons participates in stakeholder outreach and coordination. The Transform I-66 Program is an example of Parsons' ability to assist its clients in leveraging available assets fully. The 35-mile I-66 corridor, which serves Northern Virginia, is experiencing heavy traffic as a result of steady growth in the area. The program consists of a series of design-bid-build, DB, technical and P3 contracts to address congestion on this heavily traveled corridor.

Similar to IS 270 ICM, this ongoing project implements many congestion management components to increase throughput and reliability and improve safety along the I-66 corridor.

Key Staff: **Olumide Adeyinka, PE, DBIA:** Task manager - responsible for program management oversight support, management leadership of the project team, development of procurement documents, and design and engineering. He is also the task lead for tolling and ITS oversight and coordination.

MEETING OR EXCEEDING GOALS SIMILAR TO IS 270 ICM

- Multimodal improvements are also being made to commuter arterial routes adjacent to I-66. A combination of in-pavement sensors, microwave-based detection systems, and video cameras will be used to monitor the speed and density of traffic.
- Inside the beltway, dynamic algorithms will ensure a minimum speed along the corridor to improve safety.
- Implemented technology is integrated into the existing system and adaptable to future advancements.
- The project team participated in stakeholder outreach and helped VDOT fully leverage available assets.

4.2 Additional Considerations and Qualifications

The sections that follow offer innovative suggestions regarding the priorities that the SHA might find useful to consider when scoping the assignment and selecting a firm with which to work.

THE NEED FOR INNOVATION AND CREATIVITY

If funding were available, if ROW were available, if environmental stewardship were not a priority, and if the challenges on the corridor were isolated from upstream and downstream influences, then simply adding lane miles would provide for all the capacity necessary to address congestion and eliminate delay and improve reliability along the length of IS 270. Of course, none of these "if" conditions exist. Even if they did, such an approach might not constitute a responsible expenditure of taxpayer investment.

It is the goal of the SHA to explore creative alternatives to the fullest extent possible. That means maximizing the utility of every available asset; ensuring that attractive, reliable alternatives exist; and making full use of technology. Parsons has received 42 awards for ITS project innovation and is known for pushing the boundaries and being the first to deploy what eventually become essential ITS systems.

EXPLOITING EVERY AVAILABLE ASSET TO ITS FULLEST

The least intrusive starting point for congestion relief is to make the most of infrastructure that already exists. Utilizing underused capacity requires creativity, but has the potential to realize benefits in a comparatively inexpensive manner. In our experience, one particularly successful strategy is to deploy an ATM solution that incorporates reversible lanes and hard shoulder running. Reversible lanes allow for underutilized capacity in the opposite direction to be apportioned to vehicles traveling in peak congestion conditions. Done correctly, in a corridor such as IS 270, where there is clear delineation of traffic by AM and PM peak periods, significant capacity can be added while preserving HOV lane mileage.

Hard shoulder running can be particularly effective during peak periods, where consistently lower speeds enable the creation of auxiliary lanes. If designed and signed correctly, reducing shoulder widths under these conditions should not negatively affect safety. Both solution types have been successfully deployed, and Parsons has significant experience designing and implementing them, including as part of our Transform I-66 Program – Inside the Beltway Segment Project.

The **Transform I-66 Program** is an example of Parsons' ability to assist clients in taking full advantage of available asset capabilities.

The 35-mile I-66 corridor, which serves Northern Virginia, is experiencing heavy traffic as a result of steady growth in the area.

Parsons' proposed improvements will provide new travel choices, while enhancing transportation safety and travel reliability by maximizing vehicle throughput along the corridor.

Similar improvements will be investigated for the IS 270 corridor.

ENSURING ATTRACTIVE AND RELIABLE ALTERNATIVES EXIST

In addition to ensuring existing capacity has been fully utilized, it is essential to provide, maintain, and promote alternatives to sitting in traffic in single occupancy vehicles. Improved transit options offering seamless connections, reliable service, convenience, and comfort can be very effective at addressing congestion. Transit alternatives that move quickly; stay on schedule; and are clean, comfortable, and easy to reach from home and places of work are a must if they are to draw people out of their cars.

Transit alternatives exist on the corridor, but they are neither perceived nor managed as an integrated set of services. Furthermore, if travel time reliability is considered a priority among commuters, transit operations in the region as a whole are not perceived by the public to offer better performance than the roadway network. Operations on the Metro Red Line have been unreliable in recent years, and with the exception of train arrival information at stations, little real-time information is available to the public.

Parsons has extensive experience designing and deploying multimodal solutions that are linked across a corridor. This experience includes numerous transit systems. Parsons has conducted Bus Rapid Transit (BRT) assignments across the U.S. and Canada, including system and corridor planning, environmental process approvals, design and design-build. Our BRT DB experience includes the Los Angeles Expo Line, the Minneapolis Hiawatha Line and the Denver T-REX corridor BRT.

Parking lots at stations along the corridor are routinely at or near capacity, forcing potential customers to blindly assume the risk that a departure from the highway will result in securing a parking space and catching a train within a reasonable time period. Buses can and do utilize the HOV lanes, but motorists again must venture into the unknown regarding the availability of parking and the bus meeting a schedule. Parsons has extensive public transit system design, design-build, construction management, and communications system engineering. Parsons has engineered systems in North America and around the world that employ:

- Multimodal Coordination
- Transit Vehicle Location
- Automatic Fare Collection
- Transit Signal Priority
- Passenger Information Systems
- Transit Communications Systems
- Systems Design

In 2002, York Region commenced the implementation of an extensive rapid transit network as a key element to support and manage rapid growth, reduce dependence on the automobile, and maintain quality of life for its communities.

The system plan includes both BRT and light rail transit (LRT) technologies and will complement the region's local bus service and an expanded Toronto Transit Commission (TTC) subway and GO Transit commuter rail network.

Parsons is an integral part of the DB Partnership assigned to undertake the detailed design and construction support services including architecture, environmental, engineering and project management services.

The $1.7 billion plus Viva BRT program is being delivered through innovative public-private partnership and design-build approaches with the support of Metrolinx and Infrastructure Ontario.

For GO Transit, in the Toronto region, Parsons designed a train tracking system and a train and bus departure system, designed and built platform and station signs and a communications system, and supervised all construction.

Parsons also designed and prepared specifications for, and supervised the construction of, an automated fare collection system for the Taiwan High Speed Rail system. Parsons has deployed parking systems nationally and internationally, including systems at the Tambo South Africa Airport and in conjunction with the San Diego I-15 ICMS project. The key goal for these projects was to give information to motorists concerning the number of available spots in a parking garage to reduce the time and fuel wasted searching for spaces and the stress of searching and possibly not finding available parking. Correct, reliable information provides motorists — and potential transit users — the ability to make informed decisions about whether to continue to their destination by car or to take transit.

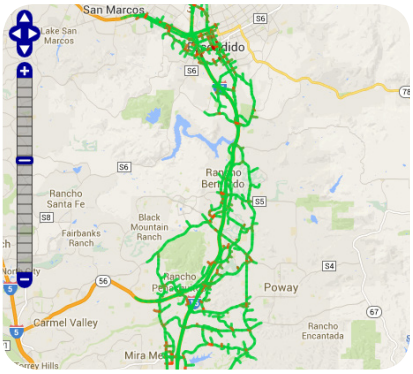
PREPARING FOR A CONNECTED FUTURE

A critical aspect in planning and deploying any technology based solution is understanding where the industry is headed and how it will get there. The long term future is clear, connected and autonomous vehicles are on the way. The key questions are, when will they arrive, and what must be done now to ensure that solutions designed to address current needs remain viable and sustainable for years to come.

Parsons has been supporting the evaluation and planning for connected vehicles for many years, including the following projects:

- Real-Time Data Capture and Management State of the Practice Assessment and Innovations Scan
- FHWA Assessment of Emerging Opportunities for Real-Time Multimodal Decision Support Systems (DSS) in Transportation Operations
- Integrated Network Flow Optimization (INFLO) – Concept Development for Dynamic Mobility Applications
- Connected Vehicle Smart Roadside Initiative
- Connected Vehicle DCM/DMA Standards Coordination Plan
- USDOT Connected Vehicle Test Bed – Turner Fairbank Highway Research Center

With hundreds of ITS deployments and significant involvement in the assessment and planning for connected vehicles, we have the right background to help SHA assess, and plan for, a solution that provides the right balance and consideration for current needs and long term technology trends.



For the **I-15 ICM in San Diego**, Parson's developed monitors the parking supply in real-time at regional transit centers and disseminate this information to travelers via various traveler information systems, such as roadside changeable message signs (CMS), SANDAG's 511 services, web applications, and mobile phones.

Simultaneously, the ICM also monitors the bus rapid transit (BRT) schedules and travel times and compares them with the I-15 travel times.

The system recommends BRT when there is available parking and the BRT travel times are less than remaining on I-15.

We understand that there is a need for a solution now, and we understand that the industry is changing. In planning for an IS 270 solution, we will assess the character and nature of the solution, determine how it will be best implemented, determine how to implement it to take advantage of currently available technology, and to ensure it is adaptable to future innovation.

This approach is essential when making decisions regarding infrastructure deployment and system architecture, particularly those associated with the type and use of traffic data sources. For example, a full set of freeway and arterial field traffic detection stations may no longer be the most appropriate or cost-effective method for deploying an integrated corridor solution. Instead, it may make sense to use a combined set of limited detection and alternative data sources to derive current conditions. Parsons has been investigating some exciting potential opportunities in this area that may be available in the near future.

MAKING FULL USE OF TECHNOLOGY

Technology can be a powerful way to manage both capacity and demand. It can be used to optimize the use of current infrastructure, it can enable and promote alternatives to single occupancy commuting during peak periods, and it can provide essential operational information for commuters and system managers. Intelligently designed and strategically deployed, technology can produce tangible, measurable improvement at a fraction of the cost of traditional infrastructure.

The ATM suite of technologies offers an *a la carte* set of options that can be deployed in various combinations, several of which could have a pronounced effect on congestion delay on the IS 270 corridor. Table 1 offers a summary view of these applications, including a brief description of how they might apply to the IS 270 corridor and where Parsons has deployed them successfully.

Table 1: Parsons' team has implemented potential solutions for the IS 270 corridor across North America.

Application	IS 270 Sample Opportunities	Parsons' Team Deployment Experience
Adaptive Ramp Metering (ARM)	Controlling the rate of vehicles entering the mainline traffic stream could smooth flow and increase reliability at several locations on the corridor, such as the entrance from MD-80 and MD-109, or at slip ramps where vehicles enter the express lanes from the local lanes.	**Caltrans- System Wide Adaptive Ramp Metering (SWARM)** **Kansas City Scout**
Adaptive Traffic Signal Control	Linking traffic signals along parallel and connecting routes and enabling them to adjust cycle times automatically can smooth flow, reduce excessive queuing and enhance reliability along the entire corridor.	**San Diego I-15 ICM**
Multi-modal Trip Planning	Provide true multi-modal travel alternatives and travel times to the public including available parking at transit stops	**I-15 ICMS, SANDAG, San Diego, CA**

Application	IS 270 Sample Opportunities	Parsons' Team Deployment Experience
Reversible Lanes	Reversible lanes allow for unused capacity in the opposite direction to be apportioned to vehicles traveling in peak congestion conditions, and could be particularly effective in Montgomery County, where available ROW is already limited.	**Northwest Corridor in Suburban Atlanta, Williamsburg Bridge in New York**
Dynamic Junction Control	Controlling lane usage in interchange areas where high volumes of vehicles enter the mainline, and possibly using shoulders, by monitoring and adapting to conditions offers system managers the opportunity to facilitate smoother, safer and more reliable flow in areas like the Father Hurley Blvd., Montgomery Village Ave. and Shady Grove Rd. interchanges. It could also be beneficial at the exit to the commercial vehicle weigh and inspection station just south of MD-109.	**I-5 in Los Angeles**
Dynamic Lane Management	Managing and controlling specific lanes by changing the lane configuration to respond to changes in traffic demand can be used to allow temporary or interim use of shoulders as travel lanes. On the IS 270 corridor, lanes can be designated for use by special vehicles only, such as buses, high occupancy vehicles, etc. This can be used wherever temporary reassignment of lanes is possible on the corridor, most notably where hard shoulder running and reversible lanes are added (see below).	**22 Deployments around North America, including I-95 HOT Lanes in Northern Virginia**
Dynamic Merge Control	Dynamically managing the entry of vehicles into merge areas with a series of advisory messages can prepare motorists for an upcoming merge and drive consistent merging behavior. Applied conditionally during congested (or near congested) conditions, dynamic merge control can help create or maintain safe gaps and reduce shockwaves upstream of merge points. Several locations on the corridor, such as the lane drops at the end of HOV lanes, or where local lanes end, might benefit from this strategy.	**Transform I-66 and I-95 HOT Lanes in Northern Virginia**
Hard Shoulder Running/Bus on Shoulder	These can be particularly effective during peak periods, where lower vehicle operating speeds make operating with reduced shoulder width significantly safer. Opportunities exist at multiple locations along the corridor, particularly near lane drops and entry and exit points.	**Transform I-66, I-395 Seminary Road, and I-495 HOT Lanes**
Variable Speed Limits	Coupled with an effective public information campaign that describes the effects, VSL can significantly smooth traffic flow in areas where large volumes of vehicles enter and exit the mainline, such as between Father Hurley Boulevard and Montrose Road, in both directions. Allowing for a higher operating speed on HOV lanes can also encourage additional ridesharing.	**Transform I-66 and I-95 Hot Lanes in Northern Virginia, NaviGAtor 3/Roadway Access Closure System, GA**
Trail Blazer Signage	Integrated corridor management is dependent on providing clear signage to reroute the public that may not be familiar with alternative routes other than I-270 during incidents and congestion	**I-80 Integrated Corridor Mobility**
Transit Signal Priority (TSP)	Bus Rapid Transit as a multi-modal recommendation needs the shortest possible travel times to be an effective alternative solutions along the I-270 corridor.	**Chicago Transit Authority and PACE Transit**
Road Weather Information Systems (RWIS)	Real time weather integration for forecasting travel delays, providing traveler information and weather information integration for deploying winter maintenance activities along I-270 and the surrounding corridors	**NE DOR, Michigan ATMS, I-15 ICM**

Application	IS 270 Sample Opportunities	Parsons' Team Deployment Experience
Use of alternate data sources	Alternative traffic data sources are becoming more and more accurate. In addition, with the onset of connected and autonomous vehicles there may soon be more cost effective and more accurate ways to assess real time traffic conditions and drive transportation management solutions. For I-270, the integrated use of multiple sources may be the best solution.	**Chicago Citywide ATMS, Illinois Tollway, MDOT Statewide ATMS, Lake County ATMS**
Automated Incident Detection (AID)	Real time integrated data collection and incident detection algorithms to more quickly detect incidents and non-recurring congestion and provide quick clearance activities along I-270	**Louisiana DOT, Alabama DOT, Johannesburg, South Africa, Hong Kong Rt 8**
Winter Maintenance Decision Support Systems (MDSS)	Parsons' Snowplow mobile data computer and MDSS to apply the proper amount of anti-icing chemical at the proper time to minimize icing and dangerous roadways along I-270 and major corridors in the region	**Michigan DOT, South Dakota DOT and Nebraska DOR**
Queue End Warning	Real-time displays of warning messages that alert motorists that queues or significant slowdowns are ahead can reduce rear-end crashes and improve safety. This can be very effective in areas where hills can hinder a driver's view ahead, such as in several locations in Frederick County, or where incidents occur with relative frequency.	**Portland ATMS, Caltrans D7 DLMS,**

ENCOURAGING A NEW USER MINDSET

The emergence of dynamic ridesharing applications like Uber and Lyft offers a powerful argument for exploring alternative approaches to travel demand management (TDM). Such TDM concepts and their application to the IS 270 corridor should be considered reasonable alternatives and examined and evaluated. Whether it is defining new ways to implement these applications or facilitating the use of others, the SHA has the opportunity to significantly affect the travel habits of motorists on the corridor at minimal cost.

Among the more creative applications is one offered by a firm called Metropia. Under the Metropia model, motorists enroll in an incentive program that rewards desirable behavior, such as ridesharing, traveling in off-peak periods, and using less congested routes. Incentives accrue in the form of points that the motorist can redeem for various goods and services offered by partnering businesses. The program is being piloted at multiple locations around the country, and initial results are promising.

These programs could multiply benefits if members could accrue rewards in the form of discounts for vehicle registrations, fuel taxes, and/or HOV usage waivers. This would require the SHA to partner with the application provider and other State agencies, but could

Changing the way commuters use the roadways can make a significant impact in **providing for a safer IS 270 corridor** at little to no cost. Parsons' staff are at the forefront of developing connected vehicle technologies to minimize accidents and other delays. Along with travel demand management, these potential solutions will be evaluated for the IS 270 corridor.

substantially increase the attractiveness of the service, thereby enhancing its demand management effects. Incentives could be offered for using transit rather than personal vehicles, including discounts and/or points accrual for using transit during peak periods.

APPLYING TRADITIONAL METHODS

In some cases, making a difference requires the addition of traditional infrastructure. Sometimes, additional lane miles of pavement are the right, and most effective, solution. Along the IS 270 corridor, that might include extending or widening ramps to extending existing lanes or adding new ones.

For example, extending the return ramp from the truck weigh station on the southbound side to the point two miles downstream, where a third lane is added just north of Clarksburg Road, could reduce both congestion and incidents related to trucks re-entering the traffic stream from the station. Such a solution might also be useful along the 2-mile stretch northbound from the end of the local lanes to the Middlebrook Road interchange, another significant delay point during the evening peak period.

While these types of projects can be costly, and the risk exists that bottlenecks simply move elsewhere on the corridor, they, along with other options, should be considered as part of a comprehensive corridor improvement program. Parsons has a long history of designing and building such improvements. Parsons' construction experience includes the $53 million SR 532 DB Corridor Improvement, Washington; the $1.3 billion Houston METRO Light Rail Expansion DB, Texas; and DB Project Manager Brian Quinlan's experience on the I-395 HOV Ramp and Auxiliary Lane DB, Virginia.

FULLY LEVERAGING CHART

The CHART system offers a solid backbone for the collection, fusion, and interpretation of data and the formulation and execution of advanced transportation management protocols. This investment must be leveraged if an ICM concept is to work properly and deliver optimal results. For the IS 270 corridor to fully realize the benefits, connections, and modifications necessary to link and utilize CHART functionality must be designed into the IS 270 ICM improvement efforts. To make this happen, the SHA will need a partner with firsthand CHART knowledge and considerable ITS integration experience.

Among the more notable Parsons projects is the Alabama DOT's advanced transportation management system (ATMS). This system interfaces, monitors and controls all ITS field devices and infrastructure to allow the Alabama DOT to manage its devices through Parsons' Intelligent NETworks® ATMS. This three-phase project includes deployments occurring in Montgomery, Mobile, and Birmingham.

The **Houston METRO Light Rail Expansion DB** included three new corridors, totaling approximately 15 miles of double-track LRT, 23 stations, storage and inspection facilities, system safety and operational upgrades to the existing 7.5-mile LRT system, 58 new light rail vehicles, a new operations control center, and major renovations to the existing operations control center to allow it to operate as a backup.

A unique aspect of the project was the requirement for all civil design to be performed by local and disadvantaged firms, most of which had no transit experience before the project started. Parsons provided management and scope definition such that the civil designers resources could be focused.

As an example, Parsons provided layout for a new maintenance and storage facility to the point that the civil designers could perform the detail civil and structural design.

Our Design Manager, Olu Adeyinka, PE, and subconsultants bring CHART expertise and combine it with Parsons' ITS development and integration experience. Parsons has designed and built full systems and components that integrate with facilities such as CHART.

ENHANCED TRAFFIC DATA CAPTURE AND ATMS OPPORTUNITIES

Situational awareness of the roadway network has undergone a significant transformation over the last 10 years, and the evolution will continue as long as third-party providers, such as Inrix, HERE, and TrafficCast, continue to expand their information-gathering efforts. These alternative data sources can serve as a means to multiply the availability and improve the timeliness of information about what is happening on the surrounding transportation network. Access to their data has the potential to dramatically improve transportation system management by providing additional high-quality information for more informed decisions.

Parsons has extensive experience with third-party providers, including those identified above, and has integrated their data into our Intelligent NETworks® traffic management system deployments to supplement data gathered by transportation agencies. Parsons has been working with additional providers to explore data types and methods of capture for transportation applications and proposes to leverage those developing relationships on the IS 270 corridor. These relationships could transform data delivery methods and would prove to be some of the most innovative and robust traffic data sources to date.

SUMMARY: WHY PARSONS

As an industry leader in ITS and DB project development and execution, Parsons provides the SHA a team of experts and innovators who are experienced in working alongside agency owners to investigate, develop, and implement innovative solutions to complex transportation challenges. We look forward to teaming with SHA to solve congestion challenges along the IS 270 corridor and helping SHA achieve the goals of increased mobility and safety, by developing solutions that will minimize the SHA's operations and maintenance activities and be adaptable to future technological advancements. Our proven approaches and innovative best practices for delivering similar projects means SHA is assured we will provide a well-managed project that fully achieves the IS 270 ICM project goals.

Parsons' design-build projects have received more than 270 industry awards, including five Marvin M. Black Partnering Excellence Awards. Both Intercounty Connector A & B DB projects were Design-Build Institute of America (DBIA) Transportation - National Design-Build Award winners.

Public Works Finance, the journal of record for P3 projects since 1988, recognizes Parsons as the top designer for DB projects since 1991.