

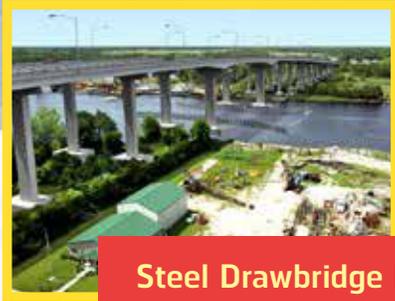


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Spring 2016

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**Steel Drawbridge Now
Just a Memory**

See page 6

**Flyover bridge
looking back at
downtown
Columbus, OH**

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» Pittsburgh



**2016 ASHE National Conference
Details and Registration**

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Robert A. Hochevar, PE
ASHE National President 2015-2016



New Directions

My tenure as National President of the American Society of Highway Engineers will conclude at the banquet on Saturday evening at the ASHE 2016 National Conference in Pittsburgh. I have truly enjoyed the unique opportunity to serve the membership as National President of this outstanding organization. When I pass the gavel to incoming National President Larry Ridlen, you can be assured that ASHE will be in good hands under his leadership and with the support of the dedicated National Board.

I believe that the American Society of Highway Engineers is as strong as it has ever been. We continue to utilize the latest technologies and social media to stay relevant in the highway/transportation industry. We have recently updated our website to be more user friendly and beneficial as a resource to the membership. We have created and continue to develop new promotional materials, such as display banners, brochures and a promotional video to enhance our image and showcase our group. The interactive *digital scanner magazine* has provided more visibility and attracted additional advertisers who see the benefit of being associated with ASHE.

Our recently updated Strategic Plan provides the vision and goals to guide us over the next three years and beyond. We are making changes to our National Governance Model to improve the organization for the membership and the highway/transportation industry. We want to maintain our status as a vibrant and respected professional national society. We are attempting to remain current by exploring ways to increase our presence on additional social media sites. We realize that to attract and retain younger members, we have to make it easy for them to connect with what is happening in ASHE. Equally as important, we need to retain our existing members, many who have served as officers, directors and committee members at all levels. Experienced members bring leadership and knowledge that are vitally important to our group. Younger members are our future leaders who bring fresh ideas and technological skills required in today's high-tech environment.

Thankfully, the long-term federal transportation bill, Fixing America's Surface Transportation (FAST) Act, is law and we are under way with implementation. With the passage of this five-year legislation, the nation's surface transportation infrastructure, including our roads, bridges, transit systems and passenger rail network, will be improved. A safe, efficient surface transportation system is essential to the economy and Americans' quality of life. The FAST Act will help ensure that Americans can get to where they are going more safely and spend less time in congested traffic, and that raw materials and products can get to their destinations more efficiently.

In January, the National Board met in sunny Fort Lauderdale, FL. Gold Coast Section officers joined us for dinner Friday evening and attended the National Board meeting on Saturday. It was encouraging to hear how well the Gold Coast Section is doing and what their future plans are to remain a vibrant and successful Section.

In early April, the National Board meetings will be held in the Arlington, Texas, area. The National Board will have the pleasure of meeting and socializing with the Dallas-Fort Worth Section officers and members. Several National Board members will also attend the Section luncheon meeting on Driverless Cars at the

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ASHE Central Ohio Section

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Now that I've been working with fellow members of ASHE who help make *scanner* possible, I think of them as "mechanics," who ensure that the publication process runs smoothly. Greg Dutton, Sandy Ivory and Tom Morisi are experienced professionals who "go the distance" to make our production of *scanner* so efficient. The ASHE National Directors and Shirley Stuttler add great "drive," providing highly informative articles for every issue. The support of our advertisers "greases the wheels" so we can produce a publication that ASHE members can be proud of. Without everyone's outstanding efforts, *scanner* wouldn't be possible!

I am excited to join you again at the National Conference in May, especially since it will be in Pittsburgh, one of my favorite cities, where I graduated from the Art Institute of Pittsburgh. Please stop by, say hello and tell us how we're doing!

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Steel Drawbridge Now Just a Memory:

by Danelle Prezioso, Vice President, Communications and Marketing, MBP, ASHE Chesapeake Section

View of high-rise bridge under construction from the Elizabeth River (old bascule bridge in the background)

Now halfway through a four-year roadway improvement project, the Dominion Boulevard/US Route 17 in Chesapeake, Virginia, was once labeled a safety hazard. Most commuters traveling the 3.8-mile corridor didn't know that the accident rate was the highest in the Hampton Roads region. But the City of Chesapeake noticed—and took action.

Rated by Congress as one of 20 National Highway System High Priority Corridors, the two-lane roadway and steel drawbridge could not accommodate traffic demands and the delays resulting from an average of 16 bridge lifts per day (more than 6,000 per year). Designated a hurricane evacuation route, approaches to the bridge were prone to flooding. Construction began in 2013, and more than 100 personnel from various firms, along with the City of Chesapeake, are committed to the project.

Replacing the two-lane drawbridge built in 1964 is a new four-lane, fixed-span, 95-foot-high bridge that now eliminates the need for bridge openings and the stop-and-go traffic that caused the majority of the accidents along the corridor. Maritime safety has also been significantly enhanced due to the increased overhead clearance.

Capital costs for the project total \$345 million, and the City of Chesapeake is the sole owner, funding the project through toll revenues, existing reserves, bonds and state and federal funding, along with a loan from the Virginia Transportation Infrastructure Bank. Tolls at \$1 per vehicle, which will begin when the project is complete in 2017, will fund operations and maintenance costs, along with the repayment of bonds and loans. By avoiding the use of private investors via a Public-Private Partnership initiative, the city is able to exercise added control on toll increases.

"These transportation improvements have already enhanced safety by reducing congestion and increasing traffic flow," said Senior Vice President Michael Prezioso, PE, CCM with MBP, the construction manager for the project, adding, "It also improves hurricane evacuation and allows for faster response by public safety vehicles."

With one-half of the bridge complete, commuters have already experienced the positive impacts two years into construction and can look forward to getting to where they need to be—safely and on time. 🇺🇸

Hazardous Two-Lane Road Gets Facelift



City of Chesapeake Construction Project Highlights:

- Approximately 10 miles of utilities have been relocated
- 400,000 cubic yards of excavation
- 1.2 million cubic yards of embankment fill
- 5.8 million linear feet of wick drains
- 50,000 cubic yards of cast-in-place concrete
- 2000+ precast concrete piles (157,500 linear feet – over 30 miles)
- 66,400 linear feet of precast concrete beams (over 13 miles)
- 245,000 square feet of mechanically stabilized earth walls (retaining walls)
- 26,000 square feet of sound barrier
- 1,000 linear feet of box culvert (650 cy)
- 36,000 linear feet of reinforced concrete pipe
- 8 million pounds of reinforcing steel



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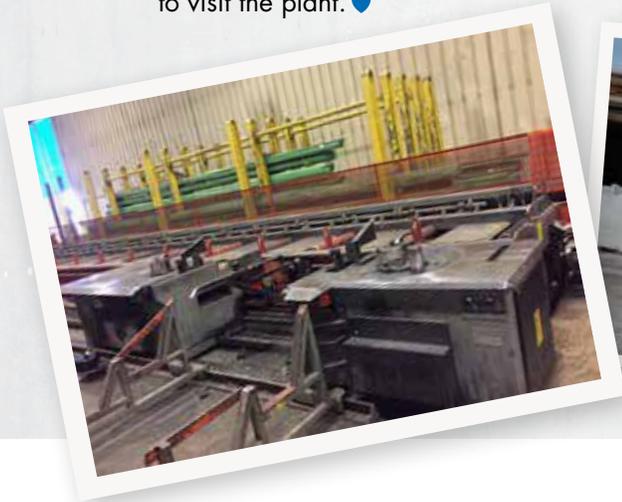


Members of Mid-Allegheny Section Tour A.C. Miller Plant

Last summer, members of the Mid-Allegheny Section, West Central Pennsylvania, were able to take a tour of A.C. Miller Concrete Products, Inc., in Blairsville, PA. A.C. Miller has been in business for over 40 years, supplying major electric, telephone, transportation and gas companies with an extensive variety of precast concrete components.

The tour participants observed the entire production process, from engineering services to fabrication of the forms and rebar, to placement and curing of the concrete, to final products waiting for delivery. By taking the tour, they were better able to relate the design process to the production process.

The Mid-Allegheny Section thanks the A.C. Miller company and its tour guides Walt Buchan, Rob Buchan and Bill Bloom for providing the opportunity to visit the plant. 🇺🇸



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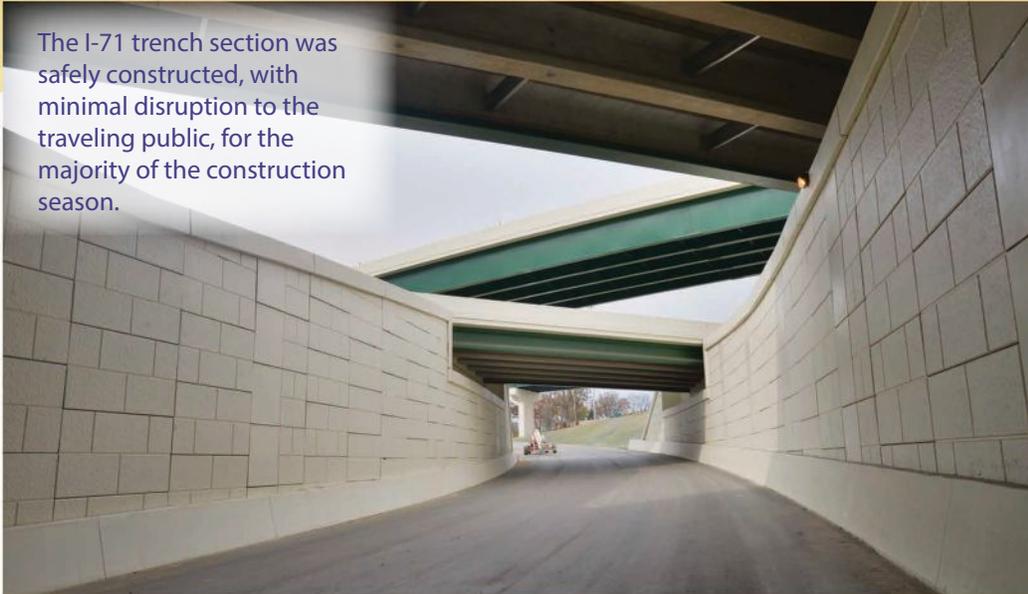
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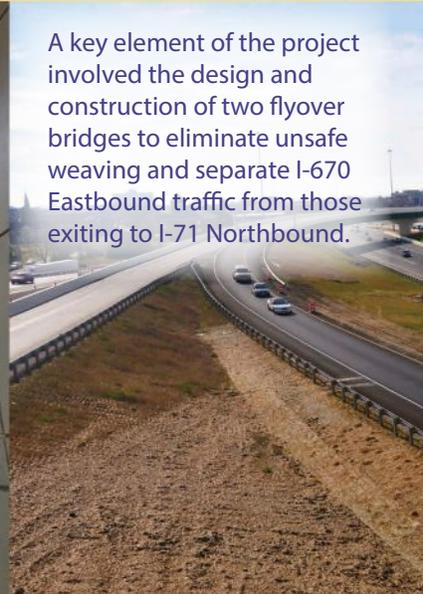



Moving Central Ohio's I-71/I-670 Interchange

The I-71 trench section was safely constructed, with minimal disruption to the traveling public, for the majority of the construction season.



A key element of the project involved the design and construction of two flyover bridges to eliminate unsafe weaving and separate I-670 Eastbound traffic from those exiting to I-71 Northbound.



by Shawn Thompson, PE, CQE, **ASHE Central Ohio Section**

When the I-71/I-670 Interchange was originally built in the 1960s, it was not designed to handle the 137,000 vehicles that currently travel through the interchange each day. Prior to beginning the project, the interchange was home to 500 crashes a year, placing it in the top five hot spot crash locations in Ohio. With these challenges in mind, the goals of this \$200M design-build (DB) project were to improve safety and operational efficiency, relieve traffic congestion and reconnect local communities separated by the original interstate construction. In May 2011, the Ohio Department of Transportation (ODOT) awarded the reconstruction contract to the design-build team (DBT) of Kokosing Construction Company and CH2M. The project added capacity to I-71 and I-670 Eastbound, reconfigured the overall interchange layout to eliminate weaving and improved connections into and out of downtown Columbus. It also reconstructed several of Columbus' local streets to create urban avenues with aesthetics and enhancements to reconnect the neighborhoods and make the interchange a safer place for the citizens of Columbus.

The project reconstructed approximately one mile of I-71 and one and a half miles of I-670 Eastbound, along with 18 ramps within the project area. Twenty new bridges, including two new flyover bridges, two reconstructed bridges, 29 retaining walls, two new local urban avenues, a realigned 60-inch storm sewer and a 54-inch micro-tunnel represented the major construction elements. The 29 retaining walls featured an assortment of structural systems, including cast-in-place, mechanically

stabilized earth, and a precast, post-tensioned T-Wall system—the first in Ohio.

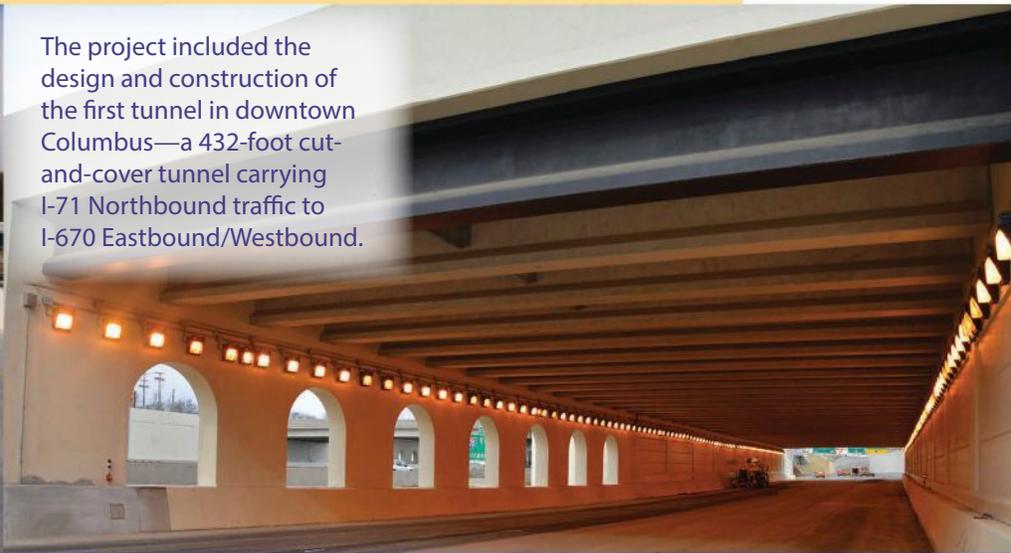
To minimize impacts to the neighborhoods east of I-71, the contract placed a \$10,000 per day incentive/disincentive on the 180-day allowable closures on Long Street and Spring Street to reconstruct these major urban arterial routes. Without any disincentives assessed, work on Spring Street involved the complete removal of the two existing bridges and construction of a new, three-span bridge. To reopen Spring Street, the team also had to complete the northern 125 feet of a 425-foot new cut and cover tunnel, all in close coordination with the construction of 11 interstate lanes below. The Long Street Bridge is the southernmost surface street bridge over I-71 within the project limits and includes a 60-foot-wide public space cap that was landscaped as part of the project and has been designed to accommodate a future building for commercial or retail development. The bridge also includes a 240-foot by 8-foot cultural wall that displays public art to reconnect the neighborhoods separated by I-71.

Challenges included safely maintaining interstate traffic while minimizing inconvenience to the traveling public, completing the project on a demanding schedule and integrating project team members. The contract required construction of the interchange to take place while maintaining traffic on I-71 and I-670 Eastbound and to keep all system ramps open except for allowable closure periods. ODOT's best value DB selection criteria allowed a maximum project duration of 42 months,

Exchange into the 21st Century



The project included the design and construction of the first tunnel in downtown Columbus—a 432-foot cut-and-cover tunnel carrying I-71 Northbound traffic to I-670 Eastbound/Westbound.



ASHE Central Ohio Section 2015 Project of the Year Winner Over \$5 Million category

and the Kokosing-CH2M DBT committed to completing the project in 37 months. To meet the demands of the project and maintenance of traffic requirements, the majority of the I-71 roadway was built “offline” by designing the construction phasing to utilize the existing roadway and proposed ramp alignments to maintain traffic, which increased efficiencies in constructing the proposed I-71 roadway. Additionally, after contract award, the project team partnered to initiate a re-route of I-670 Eastbound during the 2012 construction season. A crossover directed I-670 Eastbound traffic onto the existing I-670 Westbound Section into/out of downtown Columbus and removed a major portion of traveling public from the project work area. This re-route allowed construction of more concurrent work and gave full use of the interstate and ramps to the public seven months sooner than the originally proposed 37-month schedule.

The project benefited through the use of the DB Alternative Technical Concept (ATC) process, which is a pre-bid change to the project scope that provides a solution that is equal to or better than what is required by scope. Both the ATC process and value engineering proposals allowed for innovative and cost saving solutions to obtain the best value for the public. Through the ATC process, CH2M was able to implement alternative pavement designs and provide design refinements to roadway geometry, which reduced construction complexity, necessary maintenance and construction materials. In addition, during the design phase, an existing, triple barrel sanitary sewer siphon under I-71 was salvaged. Nonperforming this siphon work significantly

reduced utility and motorists’ impacts while providing a \$1M savings to taxpayers.

Downtown gateways were created on Jack Gibbs Boulevard and Cleveland Avenue that communicate a positive first impression for those visiting downtown. These gateways are located in high-profile locations that are heavily traveled, with signature elements that are visible to travelers from the highway and convey a sense of entering downtown Columbus. They are large in scale and designed for both daytime and nighttime impact, with common elements and themes that are identified as welcoming entry features for downtown and the City of Columbus.

Bridges on Spring Street and Long Street over I-71 created the opportunity to mark the entrance into the downtown and adjacent neighborhoods. These streets reflect the transition from downtown into the smaller-scale character of the neighborhoods. The neighborhood gateway theme was further realized with the inclusion of the “Cultural Wall” on the south side of the Long Street Bridge over I-71. The project team worked with a 30-member, community-based Cultural Wall Advisory Committee and the public to select the artists and provide input on the wall’s goals and imagery. The wall features 10 sections honoring churches, theater, music, dance, artists, authors, education, business, sports and public service. On July 10, 2014, the Long St. Bridge/Cap and Cultural Wall were unveiled to more than 2,000 people in attendance. An area once known as a barrier was transformed into a destination. 🇺🇸



MileMarkers

News From Across ASHE-Miles

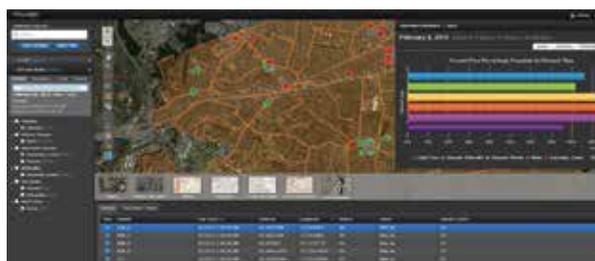
ASHE Phoenix Sonoran Section Gives Back

The St. Vincent de Paul Dream Center Kids Program provides opportunities for volunteers to help tutor or lead children's activities in the St. Vincent de Paul Family Dining Room weekdays from 4:00 to 6:30 p.m. In January, ASHE Phoenix Sonoran Section volunteers helped in the family kitchen, packaged lunches and worked with children to facilitate activities. ASHE believes in giving back to the community and invites you to visit a St. Vincent de Paul in your area, to volunteer with these important programs.



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AsTheWheelTurns

ASHE Members on the Move!



Charles Flowe Bolsters KCI's NC Transportation Expertise

Raleigh, NC—KCI Associates of North Carolina, a subsidiary of KCI Technologies, Inc., announces the return of **Charles L. Flowe, PE, ASHE National Secretary**, to KCI Associates of North Carolina, a subsidiary of KCI Technologies, Inc. as a senior associate and senior project manager in the Highway Practice in Raleigh. He will oversee major transportation design and planning projects along with business development throughout North Carolina.

With nearly 40 years of experience in all aspects of planning, design and construction management for infrastructure projects throughout the eastern United States, Flowe has overseen numerous planning and final design projects ranging from roadway widening to superstreets and complex interstate interchanges. He has experience in most of the modes of transportation in use today.

"Having Charlie rejoin the firm allows us to capitalize on his technical expertise and extensive experience with the North Carolina Department of Transportation [DOT] to strengthen our highway design capabilities in Raleigh," said Executive Vice President Harvey M. Floyd, PE. *"He will help us better serve the DOT and assist them in moving their construction program forward."*

Flowe received a Bachelor's degree in Civil Engineering from North Carolina State University in 1983. He is a registered professional engineer in North Carolina, South Carolina, Virginia, West Virginia and Florida. He also serves on the board of directors for the American Council of Engineering Companies of North Carolina and is an associate member of the Institute of Transportation Engineers.



Richard Prentice, former ASHE National President, received the 2016 Delaware Valley Outstanding Service Award presented by Adam Fontecchio, 2015 Delaware Valley Engineer of the Year.

Prentice Honored During 2016 Delaware Valley Engineers Week

Philadelphia, PA—**Richard Prentice**, former **National President of the American Society of Highway Engineers (ASHE)** in 2006-07, received the 2016 Delaware Valley Outstanding Service Award from the Engineers' Club of Philadelphia during Delaware Valley Engineers Week, February 19-27.

After joining ASHE in 1972 as a member of the Delaware Valley Section, Prentice served on the Section's various committees and programs and was elected to the Section's Board of Directors in 1984, eventually moving on to become National President.

Prentice also helped to establish an ASHE Student Section at the University of Delaware and worked with the Delaware Valley Section establishing a scholarship effort, providing its first student awards in 1972. The scholarship was later renamed the Donna Prentice Memorial Scholarship in memory of his wife, who passed away in 2003. To date, the program has awarded financial assistance

totaling more than \$120,000 to 130-plus students.

Prentice began his engineering career with the Pennsylvania Department of Highways in 1968 as a bridge engineer. He advanced to the position of project engineer and ultimately to assistant district traffic engineer. After 36 years in public service, he moved to the private sector with a position at McMahon Associates, Inc., at the firm's Fort Washington office. He retired from McMahon in July 2015.

He holds a Bachelor of Science degree in Structural Engineering and a Master of Science degree in Civil Engineering from Drexel University, as well as a degree in architecture from Temple University.

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New Directions (continued from page 3)

North Texas Tolling Authority the day before the Board meetings. The Dallas-Fort Worth Section is doing well, having grown from 51 chartered members in June 2015 to now over 80 members!

I hope to see you at the National Conference in downtown Pittsburgh on May 19 to 22 at the Wyndham Grand Hotel, where the Allegheny and Monongahela Rivers form the Ohio River. The Conference will offer many educational opportunities, fabulous entertainment and a first-class venue to meet with business associates and friends. Information, including a registration form, is included in this issue of *scanner* (on page 17) and on the Conference website at <http://2016conference.ashe.pro>.

As an employee of the Ohio Department of Transportation, I am grateful that its leadership and staff have provided me with the support and flexibility to be able to fulfill my commitment as the National President of ASHE this past year. I also want to thank the National Board and committee members for all their time and effort that they have expended for the betterment of our organization. These are the individuals who..... *Keep the Momentum Going!* 🇺🇸

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The Pittsburgh Section is proud to host our sixth ASHE National Conference (which equals the same number of Steelers' Super Bowl wins!) during our 50th year as a Section. We hope you plan to join us as we start connecting the next 50 years in the transportation industry. Since our area has 1,308 bridges, three major rivers, three major tunnels and two funicular railways (locally known as inclines), you may have to cross a river, go through a tunnel, drive on the Parkway or park in a driveway on your way to the Conference.

The newly renovated Wyndham Grand Hotel in downtown Pittsburgh will welcome the arrival of our members and their guests. The hotel offers unique vistas of Pittsburgh's three rivers and skyline, and is steps away from Point State Park, comprising 36 beautiful tree-lined acres in downtown Pittsburgh.

We have considered, at great length, our selections of technical sessions, guest tours, meals and entertainment. By attending the technical sessions on Thursday and Friday, you can earn up to 4.5 professional development hours. The Friday Night event will be held at PNC Park in the World Series Suites, where we will watch the Pittsburgh Pirates take on the Colorado Rockies. Saturday's golf outing will be held at the Quicksilver Golf Club, a previous host of the Senior PGA Tour and ranked in the top 15 public courses in Pennsylvania by Golfweek Magazine. You may also choose to visit the Carnegie Museum of Natural History, Phipps Conservatory, take a riverboat cruise or kayak along Pittsburgh's rivers. Mike Super, magician and illusionist, will perform for us on Saturday after the banquet. Mike was the winner of NBC's hit TV show *Phenomenon* and a top-six finalist on NBC's #1 rated summer series, *America's Got Talent*.

Our success is largely due to our sponsors and exhibitors. Please plan to visit the exhibit hall and spend quality time with them during the Ice Breaker Reception on Thursday evening and breakfast on Friday morning to show them that we appreciate and value their support.

If you have questions or need help during the Conference, our committee chairs and co-chairs will be sporting yellow (well, maybe bright yellow) shirts, and committee members will be wearing their black shirts.

We hope to see you in Pittsburgh to enjoy the City of Bridges which is on a list of the "eleven most livable cities in the world."

Sincerely,

Kevin Duris, PE (Trumbull Corporation)
Pat Kane, PE (A & A Consultants Inc.)
2016 ASHE National Conference Co-Chairs



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2016 ASHE NATIONAL CONFERENCE REGISTRATION FORM

Wyndham Grand Pittsburgh Downtown Hotel
 Pittsburgh, PA
 May 19 - 22, 2016

Register online and get more information at www.2016conference.ashe.pro

LAST NAME		FIRST NAME		COMPANY	
STREET ADDRESS		CITY		STATE	ZIP CODE
PHONE		CELL PHONE		EMAIL ADDRESS	
<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> YES	<input type="checkbox"/> NO
ASHE MEMBER	ASHE SECTION	SPEAKER	PAST NATIONAL PRESIDENT	NATIONAL BOARD POSITION	
SPOUSE/GUEST LAST NAME		FIRST NAME		NAMES OF CHILDREN	
NAME AS YOU WOULD LIKE IT TO APPEAR ON BADGE			COMMENTS OF SPECIAL NEEDS (ACCESS/DIETARY)		
SPOUSE/CHILD NAME AS YOU WOULD LIKE IT TO APPEAR ON BADGE			COMMENTS OF SPECIAL NEEDS (ACCESS/DIETARY)		

CHECK ONE	Register on or before 4/21/2016	Register after 4/21/2016	TOTAL
ASHE MEMBER	\$185	\$250	
NON-ASHE MEMBER	\$225	\$300	
GOVERNMENT EMPLOYEE	\$125	\$200	
ASHE MEMBER 1 DAY REGISTRATION	\$125	\$150	
NON-ASHE MEMBER 1 DAY REGISTRATION	\$140	\$175	
GOVERNMENT 1 DAY REGISTRATION	\$75	\$125	
GUEST/CHILD 10 & OVER (no charge for child under 10)	\$35	\$45	
EXHIBITOR (Purchase of an exhibit space includes two full registrations). See details in Exhibitor Package. Please pay for Exhibit Booth by check.			N/C
SPONSOR (Qualifying for free full registration). Please pay for Sponsorship by check. See details in Sponsorship Package.			N/C
SPEAKER (Qualifying for free one-day registration)			N/C
CONFERENCE REGISTRATION SUBTOTAL			\$
GOLF REGISTRATION SUBTOTAL (from Golf Registration Form)			\$
ACTIVITIES REGISTRATION SUBTOTAL (from Attendance and Activities Form)			\$
GRAND TOTAL			\$

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 HDR Inc.
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 Pittsburgh, PA 15222-1357**

Registration questions: John Lepri 412.497.6032 or Judy Iszauk 412.497.6074, or email: judy.iszauk@hdrinc.com

Registrants are responsible for booking their own hotel rooms directly through Wyndham Grand Pittsburgh Downtown. Note: Hotel reservations **must be made by May 17, 2016** for ASHE rate of \$175/night for single/double occupancy; \$195/night for triple; and \$215/night for quad. Estimated tax is 14%.

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2016 ASHE NATIONAL CONFERENCE



ATTENDANCE AND ACTIVITIES REGISTRATION - PAGE 1

FILL IN HIGHLIGHTED BOXES AS APPROPRIATE - CARRY TOTAL OVER TO CONFERENCE REGISTRATION FORM

TIME	EVENT	COST	Number Attending	TOTAL
THURSDAY, MAY 19, 2016				
10:00 AM to 7:00 PM	Registration	-	Use Registration Form	-
12:00 PM to 6:00 PM	Hospitality Room	n/c	-	-
Technical Sessions				
3:00 PM to 3:30 PM	1A - <i>How Did the American City Become an Automotive City?</i>	n/c		n/c
	1B - <i>Underground Archaeology</i>	n/c		n/c
3:30 PM to 4:00 PM	2A - <i>Development of the Great Allegheny Passage</i>	n/c		n/c
	2B - <i>History of Pittsburgh Bridges</i>	n/c		n/c
4:00 PM to 9:00 PM	Exhibits Open	n/c	-	n/c
6:00 PM to 9:00 PM	Icebreaker Reception with Exhibitors	n/c		n/c
9:00 PM to 12:00 AM	Hospitality Room	n/c	-	-
FRIDAY, MAY 20, 2016				
7:00 AM to 5:00 PM	Registration	-	Use Registration Form	-
7:00 AM to 8:00 AM	Breakfast in Exhibit Hall	n/c		n/c
7:00 AM to 1:30 PM	Exhibits Open	-	-	-
8:00 AM to 10:00 AM	Opening Session	n/c		n/c
10:00 AM to 10:30 AM	Break with Exhibitors	n/c	-	n/c
9:30 AM to 12:00 PM	Guest Tour 1 - Visit the National Aviary	\$15		\$
11:30 AM to 3:00 PM	Guest Tour 2 - Shop at the Strip District w/lunch at the famous "Primanti Bros"	\$10		\$
10:30 AM to 11:30 AM	Region/Section Officers Meeting	n/c		n/c
Technical Sessions				
10:30 AM to 11:00 AM	3A - <i>Robotic Vehicles</i>	n/c		n/c
	3B - <i>Alternative Energies - Clean Cities Program</i>	n/c		n/c
	3C - <i>Asset Management: PennDOT's Planning Tools</i>	n/c		n/c
11:00 AM to 11:30 AM	4A - <i>Connected Vehicles</i>	n/c		n/c
	4B - <i>Replacement of the Masontown Bridge</i>	n/c		n/c
	4C - <i>3D-4D Construction Modeling</i>	n/c		n/c
11:45 AM to 1:15 PM	National Past Presidents' and Robert E. Pearson Award Luncheon	\$40		\$
1:30 PM to 2:30 PM	Past Presidents' Meeting (Past National Presidents Only)	n/c		n/c
Technical Sessions				
1:30 PM to 2:00 PM	5A - <i>Automated Systems: Traffic Incident Management</i>	n/c		n/c
	5B - <i>City of Pittsburgh Complete Streets Program</i>	n/c		n/c
	5C - <i>Case Study: New Baltimore Landslide - PA Turnpike</i>	n/c		n/c
2:00 PM to 5:00 PM	Guest Tour 3A - Gateway Clipper Tour on the Three Rivers	\$10		\$

ATTENDANCE AND ACTIVITIES REGISTRATION - PAGE 2

TIME	EVENT	COST	Number Attending	TOTAL
2:00 PM to 5:00 PM	Guest Tour 3B - Kayak the Allegheny and Ohio Rivers	\$20		\$
	Technical Sessions			
2:00 PM to 2:30 PM	6A - ITS	n/c		n/c
	6B - K & L Gates Legal Presentation	n/c		n/c
	6C - PennDOT Rapid Bridge Replacement Project	n/c		n/c
2:30 PM to 3:00 PM	7A - Cashless Tolling Implementation on the PA Turnpike	n/c		n/c
	7B - Green Sustainable Highways	n/c		n/c
	7C - PennDOT Rapid Bridge Replacement Project	n/c		n/c
3:00 PM to 3:30 PM	Break	-	-	-
	Technical Sessions			
3:30 PM to 4:00 PM	8A - Robotic Bridge Inspection	n/c		n/c
	8B - The Art of Designing Highways and Bridges	n/c		n/c
	8C - Traffic 21 - CMU - Heinz	n/c		n/c
4:00 PM to 4:30 PM	9A - Pavement Analysis	n/c		n/c
	9B - Ethics in the Transportation Industry	n/c		n/c
	9C - Engineering Education in the 21st Century	n/c		n/c
4:30 PM to 6:00 PM	Hospitality Room	n/c	-	-
6:00 PM to 10:00 PM	Off-Site Event: PNC Park - Pittsburgh Pirates vs. Colorado Rockies, World Series Suites	\$70		\$
10:00 PM to 12:00 AM	Hospitality Room	n/c	-	n/c
SATURDAY MAY 21, 2016				
6:00 AM to 11:00 AM	Registration	-	Use Registration Form	-
6:00 AM to 9:00 AM	Breakfast	n/c	-	n/c
7:00 AM	Bus Departs for Golf Outing	n/c		n/c
9:00 AM to 4:00 PM	Golf Outing - Quicksilver Golf Club	-	Use Golf Registration	-
9:00 AM to 12:00 PM	Technical Tour - Liberty Bridge	\$5		\$
9:30 AM to 2:30 PM	Guest Tour 4A - Phipps Conservatory w/lunch on "Burgh Bits & Bites" Tour	\$25		\$
9:30 AM to 2:30 PM	Guest Tour 4B - Carnegie Museum of Natural History w/lunch on "Burgh Bits & Bites" Tour	\$25		\$
1:00 PM to 5:00 PM	Hospitality Room	n/c	-	-
1:45 PM to 4:45 PM	Guest Tour 5 - Monongahela Incline to Mt. Washington for the best view of the City Skyline	\$5		\$
6:00 PM to 7:00 PM	President's Reception	n/c		n/c
7:00 PM to 10:30 PM	Annual ASHE Banquet and Entertainment (business attire)	\$80		\$
10:30 PM to 12:00 AM	Hospitality Room	n/c	-	n/c
SUNDAY MAY 22, 2016				
7:00 AM to 9:00 AM	Breakfast	n/c	-	n/c
8:30 AM to 12:00 PM	National Board Meeting (National Board Members Only)	-	-	-
9:00 AM to 11:00 AM	Conference Debriefing	-	-	-
∞∞ ACTIVITIES TOTAL				\$

∞∞ Transfer subtotal to Conference Registration Form
 Technical Session schedule is tentative and subject to change



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May 19-22, 2016

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SPONSORSHIP LEVELS

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- ✓ Exhibit Booth (Standard Booth)
- ✓ 4 Conference Registrations
- ✓ Golf Foursome
- ✓ Option to Provide Promotional Materials for Registration Packets
- ✓ Complimentary 2016-2017 Dues for Pittsburgh Section Century Club Members

PLATINUM – \$3,500:

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- ✓ Golf twosome
- ✓ Complimentary 2016-2017 Dues for Pittsburgh Section Century Club Members

GOLD – \$2,500:

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- ✓ Logo on the Website, plus a link to your site
- ✓ 2 Conference Registrations
- ✓ Complimentary 2016-2017 Dues for Pittsburgh Section Century Club Members

SILVER – \$1,500:

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- ✓ Logo on the Website
- ✓ 1 Conference Registration

BRONZE – \$750:

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**See website for artwork specifications, file formats and submission instructions www.2016conference.ashe.pro
To ensure that your ad appears in the Program Book, we must receive your artwork by **April 30, 2016.***

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THANK YOU FOR YOUR SUPPORT!



2016 ASHE National Conference | PITTSBURGH

May 19-22, 2016

CALL FOR EXHIBITORS

As 2016 is also the 50th anniversary of the Pittsburgh Section, we are planning a special event and are expecting record attendance by hundreds of transportation professionals, contractors and suppliers. Our theme, "Connecting the Next 50 Years," is the basis for our events and programs.

To make this historic Conference a success, we need the support of firms and individuals, not only as attendees but as exhibitors, sponsors and advertisers as well. A variety of options will provide you with opportunities to showcase your products and services and increase your visibility.

Exhibit space is now available. Each space includes:

- 10' x 10' pipe and drape booth
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- Two chairs
- Wastebasket
- Standard head sign bearing your company's name

We are offering exhibit spaces priced at \$1,000 for a standard booth and \$1,200 for a premium booth, depending upon location in the Exhibit Hall. Exhibitors receive two free Conference registrations, a program listing, and a listing on the conference website.

Take advantage of this opportunity by selecting your desired booth space on the Exhibit Hall Floor Plan found on the Conference website, www.2016conference.ashe.pro and contacting one of the committee members listed below to reserve your booth.

Booth availability is limited, so show your support for ASHE and generate interest in your company!

Call one of our Exhibits Committee Members TODAY to reserve a booth:

Giuseppe Mammana (Co-Chair)
412.375.3061
Gmammana@mbakerintl.com

Blair Stocker (Chair)
412.263.2200
Blair.Stocker@rve.com

Mark Markosky
724.238.4138
mmarkosky@markosky.com



2016 ASHE National Conference | PITTSBURGH

May 19-22, 2016

GOLF REGISTRATION FORM

Please join us at the 2016 ASHE National Conference GOLF OUTING at
QUICKSILVER GOLF CLUB
 2000 Quicksilver Road, Midway, PA
 May 21, 2016

Registration: 8:00 AM Shotgun Start: 9:00 AM

Registration Fees:

\$110 if registered for the Conference
 \$135 if not registered for the Conference

Format:

4-person teams with a rotating 2-man scramble
 (detailed instructions will be provided)

Outing Includes:

\$10,000 Hole-in-One Prize!!
 Cash Prizes for the top 5 teams!
 Skill Prizes!
 Door Prizes and 50/50 Drawing!
 Refreshments, snacks, and
 hot dog at the turn

Online Registration and Hole Sponsorships are also available!

Please visit the Conference website for more details: www.2016conference.ashe.pro

Please designate someone as your Team Captain for reference (Golfer #1 below).

If registering/paying here as an individual, please indicate the Team Captain you would like to play with: _____

Golfer #1 Team Captain	Name: Transportation required: Yes / No Payment covered by Sponsorship: Yes / No	Company: Email:	Phone:	Conference Attendee? Yes / No
Golfer #2	Name: Transportation required: Yes / No Payment covered by Sponsorship: Yes / No	Company: Email:	Phone:	Conference Attendee? Yes / No
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Number of golf registrations covered through Conference Sponsorship ____ x \$0 = \$ 0

Number of golf registrations (registered for the Conference) ____ x \$110 = \$ ____

Number of golf registrations (not registered for the Conference) ____ x \$135 = \$ ____

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◇ **Golf Subtotal** \$ _____

For more information, please contact:

GOLF:

Maggie Moore

mmoore@foresightcsllc.com

(412) 339-0233

REGISTRATION:

John Lepri

john.lepri@hdrinc.com

(412) 497-6032

SPONSORSHIP:

Glenn Stickel

gstickel@saiengr.com

(412) 392-8771

Golf club rentals are available directly through Quicksilver Golf Club. Call (724) 796-1594 for pricing and availability.

Breakfast will be served at the hotel beginning at 6:00 AM.

Transportation provided from the Wyndham Hotel. Meet in the lobby of the hotel at 7:00 AM.

Bus will return to the Wyndham between 4:30 – 5:00 PM.

Cancellation Policy: ASHE reserves the right to cancel the golf outing if there is insufficient registration or for any other reason. ASHE is not responsible for cancellation charges assessed by the golf club or other losses incurred due to programs and/or other events being cancelled. See the Conference website or registration form for details on the cancellation policy.

A Safer, More Prosperous Main Street

by Caroline F. Duffy, PE, ASHE Triko Valley Section

Fairfax, a small village bordering the east side of Cincinnati, OH, has its half-mile-long central business district (CBD) on US 50, an arterial that runs along the Ohio River and connects the City of Cincinnati with communities in eastern Hamilton County. US 50 (known as Columbia Parkway within the Cincinnati limits) is a limited-access, high-speed facility as it enters Fairfax, known as Wooster Pike. Prior to the successful completion of the Wooster Pike Revitalization project, motorists continued with high rates of speed through the village's CBD, causing potentially unsafe situations with the numerous driveways along the corridor, and a lack of economic development.

Fairfax leadership commissioned Johnson, Mirmiran & Thompson's (JMT) Cincinnati office to review several planning studies with multiple goals in mind.

The village wanted to create a livable, walkable community, provide economic revitalization in the CBD, enhance safety within the Wooster Pike business district by lowering the traffic speed and support new traffic patterns within the village's residential district. After coordination with local



leaders and multiple public agencies, JMT developed a concept plan for the project. That plan was presented at two public meetings, and several individual meetings were also held with business and residential property owners that allowed for refinement of the concept plan into the final version that was agreeable to all stakeholders.

The project incorporated the components of a Complete Streets project by providing safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. It resulted in numerous safety improvements, wider travel lanes and sidewalks, along with elimination of visual clutter, landscaping and traffic calming, all of which have helped convert a high-speed pass-through corridor into a



Project: The Wooster Pike Revitalization

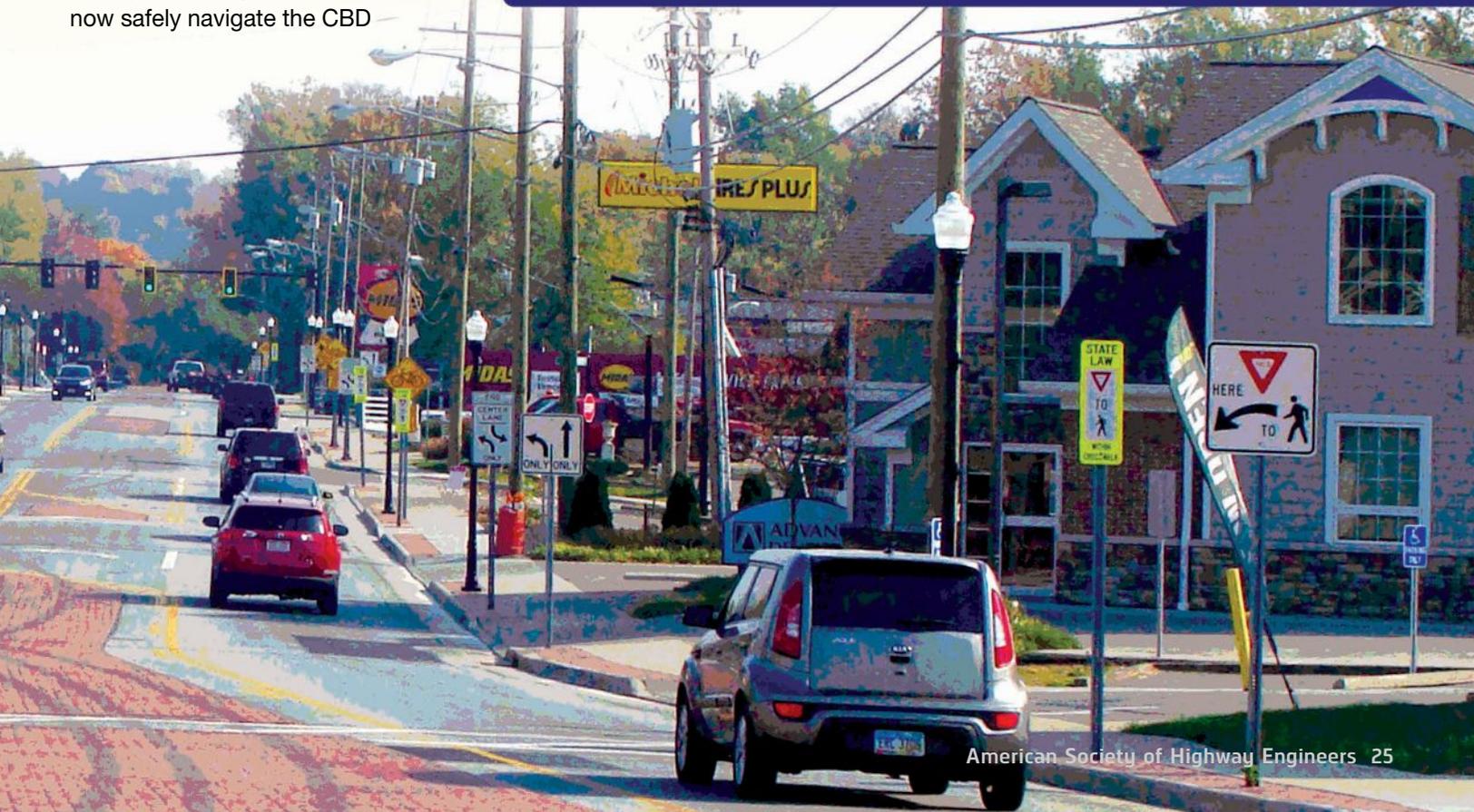
low-speed roadway through the CBD that is safe for all modes of travel. One of the Complete Streets design features included a “Road Diet” that converted Wooster Pike from four 10-foot lanes to three 12-foot lanes, with a new five-foot-wide sidewalk with ADA-compliant curb ramps. The median between the through travel lanes is now composed of a decorative, colored and stamped concrete that is driveable and functions as the turn-lane, providing access into the local businesses’ parking lots, while calming traffic on US 50.

Some of the other Complete Streets features incorporated into the project included the conversion of five residential streets into culs-de-sac to deter cut-through traffic into the residential areas while allowing pedestrian access from the residential area to the Wooster Pike CBD. The traffic signals, which were single-phase and decades old, were replaced with fully-actuated signals with multiple and pedestrian crossing phases, thus eliminating delays and frustration for both drivers and pedestrians utilizing the corridor. The 14-foot single travel lane in both directions now allows for “Share the Road” pavement markings and signing to accommodate bicyclists. Additionally, bicycle parking at the bicycle shop on the corner of Wooster Pike and Lonsdale Street and a bike trail connection to the Murray Avenue Bike Trail further support safe bicycle travel through the village. Transit users can now safely navigate the CBD

through the addition of bus stop pull-overs and an unloading/loading area that encourages these functions to be performed out of the travel lane. In addition to the new bus pull-overs, a bus shelter was added to the project at the Frisch’s Park-’n-Ride for transit users’ comfort. Drivers, pedestrians, bicyclists and transit users all now enjoy upgraded landscaping, removal of unsightly visual clutter, such as unused utility poles, and consolidation of the utility poles from both sides of the street to only the south side of the street. Finally, decorative street lighting, signing and signals installed throughout the corridor provide the finishing touches that tie the whole project together into a cohesive, aesthetically pleasing and functional finished product. Fairfax, through the completion of this project, has now positioned itself as a prosperous, stable and exciting community that is ready to grow and thrive well into the 21st century.

As a result of this project, there has been substantial redevelopment in the business corridor. A new fire station has been built; Dr. Sayre has been able to double the size of his dental practice; Skyline Chili has purchased an adjacent property and expanded its business; a vacant Subway restaurant has reopened;

ASHE Triko Valley Section 2015 Project of the Year Winner
Under \$5 Million category



a vacant parcel of land has developed into a Dunkin' Donuts; and a vacant Wendy's property has been redeveloped by Chipotle. Additionally, Smitty's Cyclery, an existing business that has been located in the village for several decades, has also benefited economically from the CBD improvements. Frank Henson, the president of Queen City Bike, talked with the owners of Smitty's Cyclery about the project. "They said a customer asked them how long they had been in this location, and the staff responded that it had been there for close to 30 years. The customer said that he had been driving the corridor every day for 20 years, but this was the first time he noticed their store." Mayor Carson Shelton agrees: "Over the past few years, we have seen redevelopment that has not occurred in decades in the business district." The primary goal of the Wooster Pike Revitalization project has been met.

This project, substantially finished in November 2014, was successful because all of the goals of the stakeholders were considered, addressed through the project design, modified based on the public's input and ultimately achieved. Since the project's completion, it has been recognized for several awards, including the **ASHE Triko Valley 2014 Project of the Year** (for projects under \$5M), the **ASHE Great Lakes Region 2015 Project of the Year** (for projects under \$5M), the **Mid America Association of State Transportation Officials (MAASTO) Region Award** in the Quality of Life/Community Development category and an **American Council of Engineering Companies of Ohio Honor Award** in their 2016 Engineering Excellence Awards competition. 🇺🇸



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The Tennessee Department of Transportation (TDOT) has embraced the concepts associated with Accelerated Bridge Construction (ABC) in the delivery of several diverse projects. Additionally, the Department has completed several successful alternate delivery projects utilizing the Design-Build delivery method. Through guidance from the Federal Highway Administration (FHWA) Every Day Counts Initiative, TDOT developed policies to allow the use of a Construction Manager/General Contractor (CM/GC) as a tool to streamline project delivery. The Department selected a high-profile project in downtown Nashville where four pairs of bridges were rehabilitated, utilizing only 10 full closure weekend periods. A closer look at the scope of this massive urban bridge rehabilitation project shows:

Scope of the CM/GC Project

The scope of work for the project included the design and construction of bridge deck or superstructure replacements for four pairs of bridges on I-40 over Charlotte Avenue, Jo Johnston Avenue, Herman Street/Nashville & Western RR and Clinton Street/CSXT RR, using ABC methods. The project also included milling and resurfacing the roadway, along with incidental grading, drainage, lighting and signage. In addition, the contractor (Kiewit Infrastructure South Co. – KISC) was involved in the design development by providing input to TDOT and the design consultant (Gresham Smith and Partners – GS&P) concerning various design elements and constructability concerns throughout the CM/GC process.

The driving issue to complete the project was the rapid deterioration of the existing bridge decks. All of the structures had exhibited some degree of deck failure, but the Charlotte Avenue Bridge had

TDOT Fast Fix 8 Project

Design and Construction Experience

by Ted Kniazewycz, PE, Gresham, Smith & Partners, ASHE Middle Tennessee Section



photo 1





three major deck failure issues over the summer of 2013. These failures required the closure of multiple traffic lanes and an emergency weekend closure to replace two bays of the existing deck.

A major factor supporting the accelerated construction schedule included the traffic load carried by I-40 that exceeded 140,000 Average Daily Traffic (ADT). This section of I-40 hosts the central and mid-town business district's primary access points, along with five major hospitals and burgeoning medical campuses. Additionally, Nashville's sport, tourist and entertainment venues are all accessed primarily from this I-40 segment. At the time of the project, there were over 20 major high-rise projects under construction in the area.

Some of the specifics of the existing roadway facility, originally constructed in the 1960s, to be addressed by the team included:

- Three lanes of original concrete pavement with asphalt shoulders in each direction;
- Narrow inside shoulders at 0.00% cross-slope with median drainage; and
- Asphalt overlaid roadway with deterioration and reflective cracking.

Bridge site specifics included:

- I-40 over Herman Street/Nashville & Western Railroad: Composed of four continuous spans of structural steel beams with a continuous concrete deck;
- I-40 over Clinton Street/CSXT Railroad: Composed of six continuous spans of structural steel beams with a continuous concrete deck;
- I-40 over Jo Johnston Avenue: Composed of three prestressed American Association of State Highway and Transportation Officials (AASHTO) Beam spans with a continuous concrete deck; and
- I-40 over Charlotte Avenue: Utilizing a three-span structural steel "K-Frame" design with a continuous concrete deck.

Some of the additional project challenges included:

- The project site was congested, with all of the bridges located inside a half-mile segment of I-40, and frontage roads paralleling both sides of the interstate;
- Existing structures had complex geometry, including horizontal and vertical curves, tapering widths and on/off ramps leading to challenging construction and fabrication;
- The existing cross-slope on the bridges was substandard by current policy and contributed to the drainage issues along this stretch of interstate highway;
- The CSXT railroad track was the only connection heading west out of Nashville to other regional transportation hubs. Additionally, 75 percent of all CSXT network traffic travels through downtown Nashville's severely limited open track periods; and
- Availability of work weekends was dependent on minimizing conflicts with major downtown, university and professional sporting events.

Design Alternatives Studied with CM/GC Input

The project team held a series of meetings to evaluate various aspects of the project. For the bridge sites, options were presented that included:

- Full superstructure replacement with prestressed concrete box beams and full depth deck panels;
- Precast superstructure units with steel beams and full-depth concrete slabs;
- Full span replacements utilizing lateral slide or SPMT units;
- Elimination of spans or even the entire structure; and
- Combinations of the various options.

Criteria were established to rank and aid in evaluating which options should be carried forward for further project consideration. The criteria included:

- Duration of closure – number of impacted weekends;
- Rough Order of Magnitude (ROM) costs;
- Life-cycle analysis of option;
- Railroad/Utility/Right of Way (ROW) Impacts;
- Procurement of materials and impact on overall schedule;
- Constructability; and
- Risk.

The evaluation process was a valuable tool in paring down the numerous site specific options. One major item, material procurement, played an important role in the ultimate selection of final options for the bridge sites. In evaluating the various options for the different bridge sites, the project team had to factor in the availability of structural steel plates and fabrication

capacity in concert with the desired construction schedule. KISC checked with their network of suppliers and quickly realized that meeting a completion date in 2015 would be a challenge without early procurement of structural steel. While finalizing the preferred site options, this information was entered into the final selection matrix.

Selected Alternatives Per Bridge Locations

With the evaluation factors weighed for each location, the selected option turned out to be unique for each bridge site. For the Herman/NWRR structure, it was decided to use superstructure units composed of two beam plate girders units with a cast-in-place deck. This option was selected based on ROW restrictions and the overall favorable condition of the existing substructure units. The ultimate configuration of these two bridges resulted in installing the replacements over two 58-hour weekend periods. Basic tasks accomplished during the weekends included superstructure demolition, bearing and endwall modifications, superstructure unit placement, paving and striping before reopening to rush-hour traffic. **[Photo 1]**

For the six-span Clinton Street/CSXT structure, the selected option combined span elimination with precast beams and deck panels. Elimination of spans 1, 3, 4 and 6 allowed for the construction of two single-span bridges

over the road and railroad. Cast-in-place walls bracketing the existing bents on either side of the railroad aided in this construction. The wall backfill was engineered to be self-supporting so as not to overload the existing bents now acting as abutments. To support the new roadway pavement installed during the weekend closures, existing spans 3 and 4 were encased inside of a Mechanically Stabilized Earth (MSE) wall system. Span 5 became a single span bridge over Clinton Street, and span 6 was filled in behind an MSE wall. The two single spans were constructed with precast prestressed concrete box beams, full depth prestressed deck panels and precast endwall blocks. Additionally, precast approach slabs supported by geosynthetic reinforced soil were installed at each bridge end. **[Photo 2]**

Constructing MSE walls in front of the existing piers and modifying them into abutments for a single span transformed the existing three-span structure at Jo Johnston Avenue with the elimination of the two end spans. The backfill on these walls was again engineered to limit the load that would be applied to the existing bents. Weekend work included the construction of the single span with precast, prestressed concrete box beams, full depth prestressed deck panels, precast endwall blocks and approach slabs. Additionally, the contractor had to complete the backfill of the eliminated spans and place full depth pavement. **[Photo 3]**

(continued on page 35)



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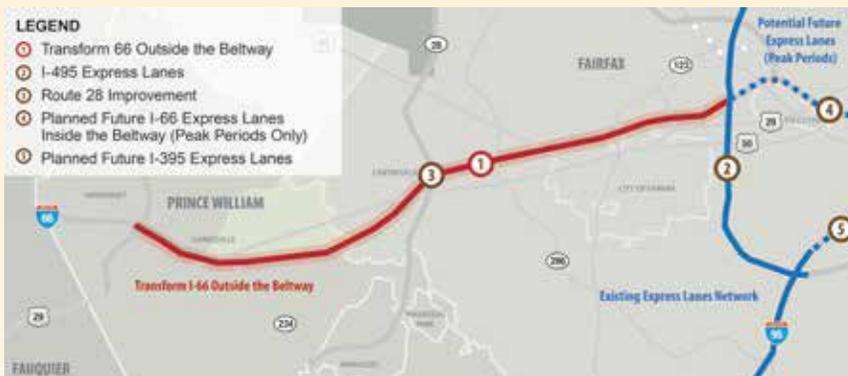
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Buckling Up More Safety

by John Martin, Kimley-Horn and Associates, ASHE Potomac Section

The Virginia Department of Transportation (VDOT), in partnership with the Virginia Department of Rail and Public Transportation (DRPT), and in coordination with the Federal Highway Administration (FHWA) and local jurisdictions, is implementing multimodal improvements for 25 miles of the I-66 corridor from U.S. Route 15 in Prince William County to the Capital Beltway (I-495) in Fairfax County. Extensive project development efforts have resulted in environmental and transportation technical documents being submitted to the agencies for project approval. Parallel to this effort is an ongoing project delivery process led by the Virginia Office of Public-Private Partnerships (VAP3) and involving three teams vying for a design-build, finance, operate and maintain (DBFOM) concession. The project, named Transform 66 Outside the Beltway, is scheduled to begin construction in 2017, with improvements open to traffic in 2021. The current cost estimate for the construction of the project is \$2.1 billion.



Corridor Today

I-66 in northern Virginia is notorious for its traffic jams during weekday mornings and afternoons, as well as on weekends. This critical regional corridor moves as many as 210,000 vehicles per day, but the average speed during peak travel times is only 29mph. Contributing to the congestion is an inconsistent cross section with choke points in several locations. A high-occupancy vehicle

(HOV) lane in each direction is separated only by pavement markings, making the HOV-2 restriction difficult to enforce. While VDOT currently operates an active traffic management (ATM) system to help manage the traffic, a longer-term solution is needed to improve safety and move more people more efficiently.

Multimodal Solutions Proposed

Through an extensive technical evaluation of various alternatives over an 18-month study period—supported by stakeholder and public input from nearly 200 meetings since January 2014—a preferred alternative emerged as a combination of improvements that focus on multimodal solutions. This preferred alternative consists of the following elements:

- Three regular or general purpose lanes in each direction
- Auxiliary lanes between interchanges in the more urbanized areas of the corridor
- Two managed lanes (also referred to as Express Lanes) in each direction that would support:
 - Toll-paying customers with one or two people per vehicle
 - HOV users with three or more occupants, exempt from tolls
 - High-frequency, high-quality bus service in the Express Lanes with predictable travel times
- Dynamic toll prices for the Express Lanes to keep traffic flowing at a minimum speed of 55mph
- Enhanced commuter park-and-ride facilities with direct access to the Express Lanes
- Travel Demand Management (TDM) strategies making it easier and more affordable to use a variety of travel options
- Preservation of space in the median for the future extension of Metrorail or other robust transit service
- Dedicated Express Lane access points
- Safety and operational improvements at key interchanges throughout the corridor
- Corridor-wide bikeway, trail and sidewalk improvements

Project Features

Consistent cross section with minimum widening: The proposed improvements will result in the repurposing of existing right-of-way (ROW) with a consistent cross section and with minimum widening of the I-66 corridor. Given the elements described above and shown in the *figure 4*, the width of the cross section is 222 feet (or 248 feet with auxiliary lanes).

and Efficiency on the Beltway

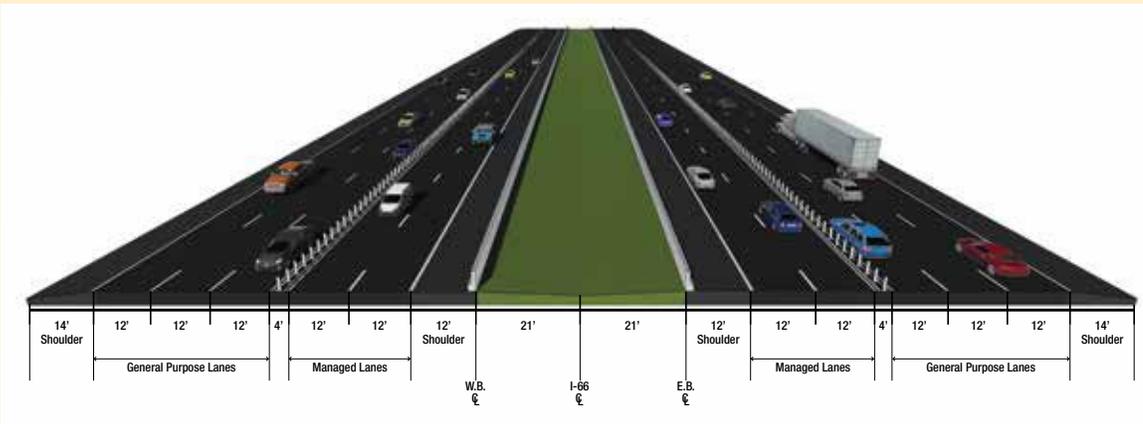


figure 4

Most of the existing corridor will support this width with minimal ROW impacts. In some segments, shoulders may be narrowed to avoid utilities, minimize ROW impacts or accommodate sound walls or retaining walls.

Tiered approach: The development of multimodal improvements in this corridor is following a tiered National Environmental Policy Act (NEPA) process. The Tier 1 Final Environmental Impact Statement (FEIS) was completed in November 2013 and concluded that the transportation needs in this corridor cannot be met with a single stand-alone improvement concept. Therefore, a combination of improvements will be necessary, some of which can be implemented in the near term, while others can be realized over a longer term. Since these improvements cannot be implemented simultaneously, the tiering process provides phased implementation that will allow a variety of improvements to act as independent elements of an overall long-term program of projects. Accordingly, Transform 66 Outside the Beltway is a Tier 2 project, representing a combination of concepts over the 25 mile long corridor.

System-wide studies: The complex characteristics of the corridor have compelled VDOT's environmental and transportation study teams to take a system-wide approach to determine potential environmental impacts, analyze existing and future traffic operations and develop concept plans for highway and interchange modifications that mitigate impacts and respond to future traffic conditions. These studies were completed in December 2015 in close coordination with DRPT and FHWA. The anticipated results are as follows:

- Final Tier 2 Environmental Assessment (EA), approved by FHWA with a Finding of No Significant Impacts (FONSI)
- Final Interchange Justification Report (IJR), approved by FHWA with a Finding of Engineering and Operational Acceptability

Project Delivery

The Commonwealth of Virginia has considered a number of ways to deliver this project, including publically financed design-build with alternative technical concepts (DB/ATCs) and design-build, operate and maintain (DBOM) procurement methods, as well as the DBFOM option. In the fall of 2015, VAP3 invited teams to submit proposals considering all three methods, and conceptual proposals for delivery of the project were received from 13 teams. In December 2015, the VDOT Commissioner of Highways selected three concession teams to move forward with the DBFOM method. The pending terms of the DBFOM concession include:

- Maximum public cost of up to \$600 million and private financing of remaining construction costs
- Direct payments to the Commonwealth for transit capital and operating costs over the 50-year concession period
- \$350 million in net present value provided back for corridor improvements over the term of the deal

Moving More People

The Transform 66 Outside the Beltway project strives to move more people through the corridor through a combination of one- and two-occupant vehicles, HOV-3+ and public transit. Ultimately, this project will also improve safety and fix choke points; connect regional transit, high-occupancy vehicle and Express Lanes network; expand mode choice and transit options; reduce hours of congestion per day; reduce cut-through traffic on local roads; and better accommodate future travel demand. Essentially, this project, as envisioned, will provide more reliable travel choices to travelers by having general purpose and Express Lanes, interchanges and access points, and transit, TDM and park-and-ride facilities all working together. 🇺🇸

For more information on the project, visit the project website at <http://outside.transform66.org>.

Network Mapping Using Multichannel 3D GPR Array Technology: New Jersey Route 70

by Manuel Celaya, PhD, Project Manager, and Kaz Tabrizi, PhD, PE, Executive Vice President, Advanced Infrastructure Design; and Michael L. Grantner, PE, Senior Civil Engineer, McCormick Taylor; ASHE Southern New Jersey Section



Multichannel GPR Array System used in this project

What Is SUE?

The lack of reliable underground utility information has long been a troublesome problem for highway engineers as Departments of Transportation need to reliably identify subsurface utilities during the development of highway projects. This engineering practice is known as Subsurface Utility Engineering (SUE). SUE has evolved considerably over the past few decades and combines civil engineering, surveying and geophysics while utilizing several technologies such as vacuum excavation and surface geophysics. Since 1991, the Federal Highway Administration (FHWA) has been encouraging the use of SUE on highway projects as an integral part of the preliminary engineering process.

Ensuring a proper and successful application of SUE investigation is beneficial because unnecessary utility relocations may be avoided, thereby reducing project delays and costs. Also, unexpected conflicts with utilities can be eliminated since exact locations of

virtually all utilities are predetermined and accurately shown on construction plans.

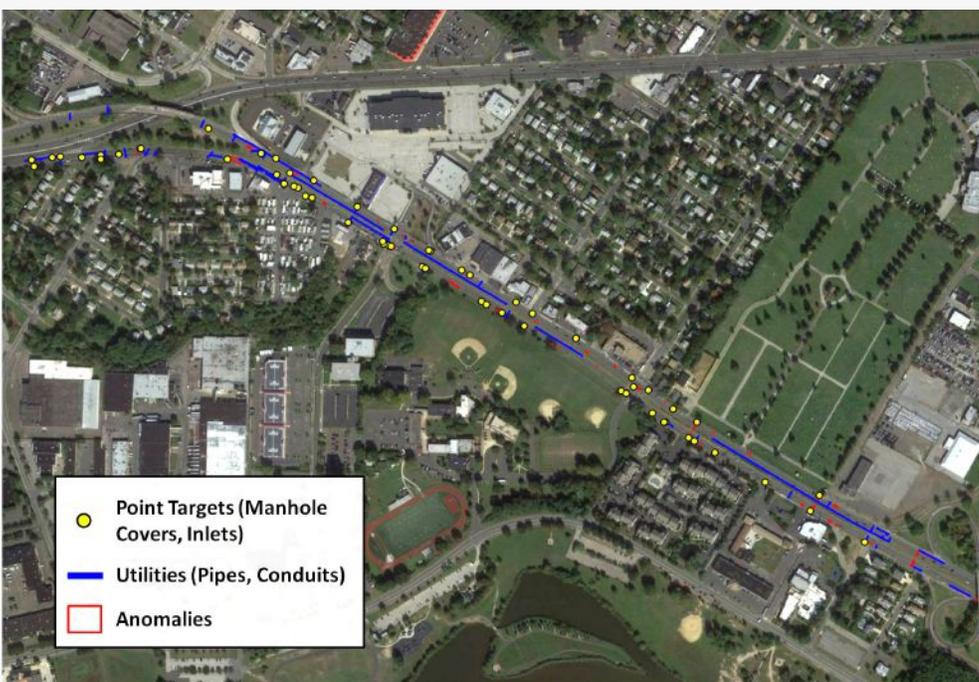
There are four recognized quality levels of underground utility information, ranging from Quality Level D (the lowest level) to Quality Level A (the highest level). Quality Level D comes solely from existing utility records or verbal recollections, which are typically unreliable. Quality Level A provides information for the precise plan and profile mapping of underground utilities through the nondestructive exposure of utilities. It also provides the type, size, condition, material and other characteristics.

Quality Level B is typically applied throughout the entire project limits. It involves the application of appropriate surface geophysical methods to determine the existence and

horizontal position of utilities. The information obtained is typically surveyed to project control.

It addresses problems caused by inaccurate utility records, abandoned or unrecorded facilities and lost references. Information provided by this level can assist the design process and produce substantial cost savings.

Different geophysical techniques are readily available for conducting Quality Level B. The proper selection and application of surface geophysical techniques is critical. The current version of the American Society of Civil Engineers (ASCE) "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utilities" contains an appendix on surface geophysical



Typical results exported to GIS Platform

techniques that may be useful in the evaluation of providers' equipment lists.

The most common geophysical methods for utility location include electromagnetic methods. Pipe and cable locators (time-domain electromagnetics) are the most common instruments for detecting and tracing underground utilities. Although this equipment is easy to use, it still requires expertise, and the level of success depends on the equipment specifications and the type of utility.

Emerging Use of GPR

Ground Penetrating Radar (GPR) is another geophysical electromagnetic tool, whose use for utility detection began in the 1960s. This technology works by sending an electromagnetic pulse into the ground. Some portion of this pulse signal is transmitted through boundaries, and some is reflected from the boundaries back to the receiving antenna. GPR is becoming more common as equipment becomes available, ease of use improves and multi-sensor platforms or antenna arrays are being developed. With such advancements, hardware/software has consequently become more sophisticated, requiring operators and analysts to have in-depth knowledge of underlying theory behind wave propagations, etc. This is important since data interpretation is the key to producing reliable information about the existence of and the horizontal/vertical distances to utilities and other subsurface anomalies.

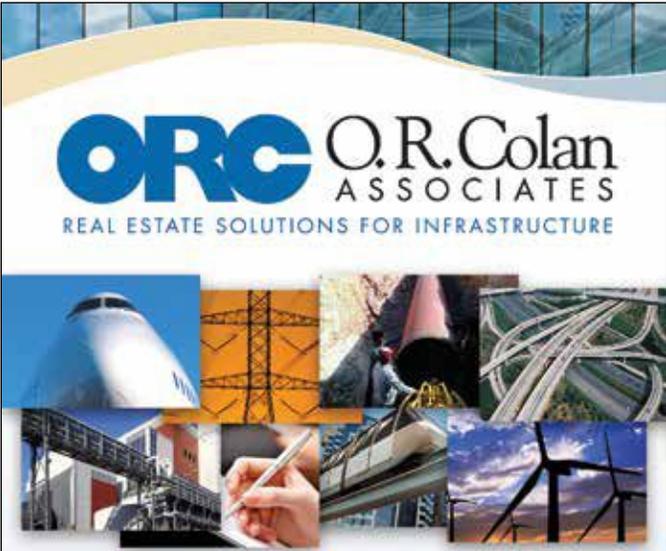
The equipment used in this study was a multi-channel GPR array system equipped with RTK GPS. The system is a dual-frequency (200-600MHz) and dual-polarized (HH and VV) system that acquires full-resolution data up to 16 feet depending on soil type. This allows complete surveying while driving the system in only one direction. The system covers a six-foot-wide swath with each pass and can be used up to a speed of 10mph.

NJ Route 70: Putting SUE Technology to Use

AID's GPR system was used on the reconstruction of State Route 70 for NJDOT in Pennsauken and Cherry Hill Townships, Camden County, and Evesham Township, Burlington County, New Jersey. The project limits included the East Bound and West Bound lanes between Mileposts 0 and 8, totaling approximately 50 lane-miles. Detailed information about the pavement structure and the location and depth of underground utilities was unknown. In addition to the roadway pavement, the scope of utility mapping also included sidewalks, medians and some overpasses. Approximately 3.5 million square feet of surface was investigated.

To obtain data collection for each lane and shoulder, a minimum of two passes with the GPR system was conducted to ensure complete coverage of the test area.

After data collection was completed, analysis was carried out and three types of targets were identified: Point Targets that were associated with manholes, steel covers and inlets; Linear Targets that corresponded to pipes, conduits or linear utilities; and areas with Anomalies



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to identify suspected voids. Analyzed data was exported as CADD files for integration with existing roadway base maps. In those files, locations, orientations and depths of utilities were included. Findings were also exported as GIS files for easy reference. An example is shown on page 32, with targets found between Mileposts 0 and 1. Point, linear and anomaly targets are displayed as yellow circles, blue lines and red polygons, respectively.

The Findings

After the GPR analysis was completed, results were compared with existing utility maps of unknown accuracy. More than 1,500 targets were found within the project limits. Using the GPR array system, AID was able to identify 90 percent of the utilities that were shown on existing utility maps. Additional utilities that were not displayed on the utility base map were identified by the GPR array system. The promising results from this project indicate that GPR array systems are capable of accurately collecting and detecting utility data. Used as either a stand-alone tool or to complement conventional methods, this technology can potentially save your project cost, time and traffic disruptions. 🇺🇸

References: Federal Highway Administration (FHWA) webpage, Subsurface Utility Engineering: www.fhwa.dot.gov/programadmin/sueindex.cfm#s01; Standard Guidelines for the Collection and Depiction of Existing Subsurface Utilities American Society of Civil Engineers, Standards ASCE/CI 38-02 (2002).



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photo 4

TDOT Fast Fix 8 Project Design and Construction Experience

(continued from page 29)

The final bridge involved the replacement of the existing three-span "K" frame structure with a new single span bridge supported by a new end bent buried in engineered backfill. The existing end spans were excavated down to solid rock, and the area was filled with leveling concrete to an elevation that would allow for the construction of new footings, columns and bent caps. The site was so constrained that portions of the new cap had only one inch of vertical clearance from the existing beams. As the substructures were built, block type MSE walls were constructed to contain the fill for the elimination of the end spans. Fill was placed as high as possible to minimize the amount of work that needed to be completed during the weekend closures. [Photo 4]

Conclusion

As the project moved through the scheduled weekends of construction toward completion, crews were able to

finish in the required time to have the Interstate open for Monday morning rush hour traffic. The team of owner, designer and contractor worked collaboratively throughout the project, utilizing the CM/GC process to deliver a project that will serve the traveling public for many years. The highlight of the project is the fact that a two- to three-year construction project, with continuous lane closures and severe impacts to the public, was completed in only 10 weekend closure periods within one construction season. 🇺🇸



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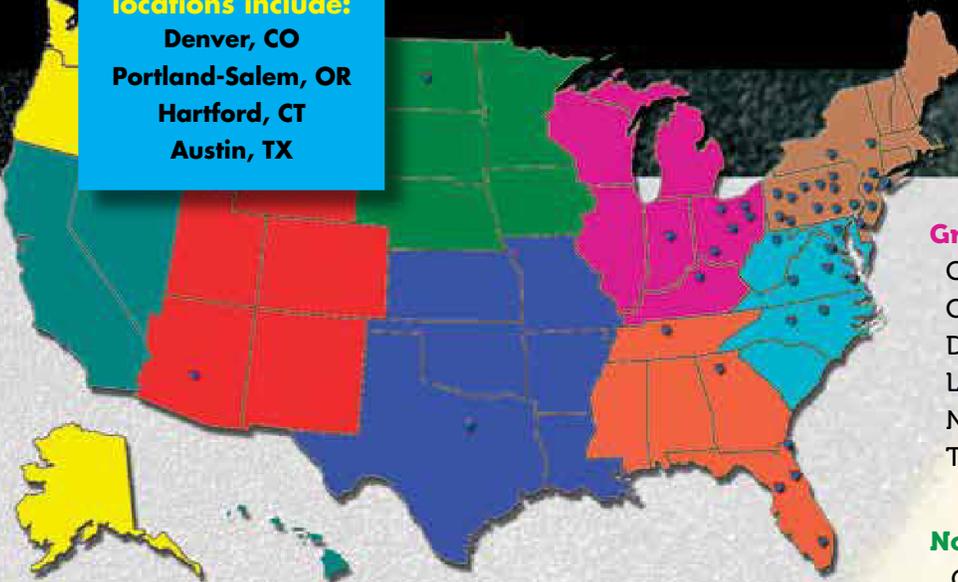
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North East Penn	127
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Williamsport	129

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Greater Hampton Roads	131
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Old Dominion	96
Potomac	275
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Northeast Florida	203
Tampa Bay	97
Subtotal	949

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Cuyahoga Valley	120
Derby City	82
Lake Erie	140
Northwest Ohio	42
Triko Valley	172
Subtotal	741

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