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New Sullivan's Bridge  
Spanning the  
Schuylkill River,  
Pennsylvania

*See page 14*



**Collaborative Teamwork  
Creates Jewel of a New  
Interchange**

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**Greg Dutton, PE**  
ASHE National President 2017-2018



**New Directions**

*Greetings, ASHE!* I write to you on the morning of the 241st anniversary of our nation's bold and courageous Declaration of Independence, feeling proud of our heritage and the foundation upon which those daring patriots started the greatest nation the world has ever known. This statement is not made out of ignorant pride or brash arrogance, but from knowing enough of history and the philosophy of the thinkers and leaders who risked their lives, fortunes and sacred honor in its establishment and defense. Besides the blessings of heaven, the opportunities we are afforded are due to their wisdom, foresight and sacrifice, and due to the priceless cost of all those since who have understood the meaning of honor and liberty and who have fought to keep those principles flourishing. So many have paid the ultimate cost, and I wish to honor their memory and sacrifice with this small tribute.

While the scale of what we do at ASHE is not quite the magnitude of establishing new states and developing a new Republic, we do have a representative form of leadership structure, and we wish to grow into new areas around the nation. In the implementation of our volunteer efforts, we will continue to promote the same principles employed by the founding fathers: Faith, honor, respect, fairness, strength, hard work and good communication. I have seen these virtues displayed through the wonderful folks I have met and worked with so far in my ASHE travels. I am excited to see more of our membership this year, as I plan to visit various Sections when they celebrate anniversaries, or just celebrate each other in various social activities. Those Sections having anniversaries this fiscal year are:

- |   |  |
|---|--|
| Franklin-55 ( <i>September 1, 1962</i> )      | Central Florida-25 ( <i>January 27, 1993</i> ) |
| Mid-Allegheny-30 ( <i>October 1, 1987</i> )   | Georgia-20 ( <i>February 5, 1998</i> )         |
| Altoona-55 ( <i>October 4, 1962</i> )         | Cuyahoga Valley-40 ( <i>March 28, 1978</i> )   |
| Southwest Penn-55 ( <i>January 25, 1963</i> ) | Chesapeake-30 ( <i>April 21, 1988</i> )        |

Franklin, Altoona and Southwest Penn were the fourth, fifth and sixth ASHE Sections chartered, respectively.

I was honored to meet many of you and get to know a few of you better at the National Conference held at the Sheraton Times Square Hotel in New York in June. Distinctive memories for me include catching a Mets game at Citi Field; sharing an amazing day of golf at the North Hempstead Country Club on Long Island with fellow members; hearing not one, but four excellent keynote speakers on Friday; interacting with the leadership of ASHE at every level; seeing old friends and meeting new ones; receiving new knowledge and continuing education credits at the technical sessions; and finally, sharing the atmosphere of the Conference, the city sights and the evening events with my entire family. The New York Metro Section members and Conference Committee, led by Manny Beigelmacher and Glen Kartalis, were gracious hosts. Much gratitude to them and to each and every volunteer who sacrificed time and energy to make it a special event for all. It is my hope that everyone had a special time and will make plans to attend next year's Conference in Cleveland.

As we forge ahead into the new fiscal year, our purpose is straightforward: 1) simplify our processes, 2) strengthen old relationships and develop new ones, 3) help each Section to succeed, 4) increase ASHE's prestige and 5) grow deliberately. We have already begun to streamline our committee structure

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ASHE Delaware Valley Section

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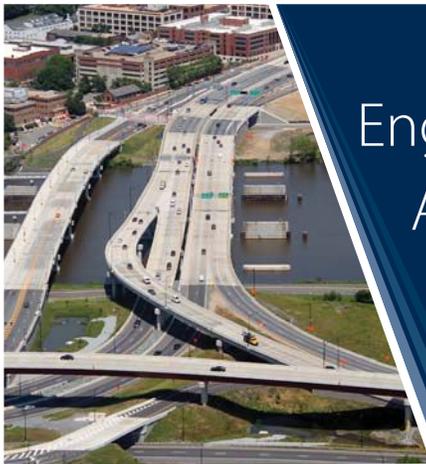
  
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# Less Is More for Ohio's Tallest Span: Designing the New Jeremiah Morrow Bridge

by Tony Shkurti, Ph.D., SE, PE, HNTB Corporation, ASHE Triko Valley Section

**T**he new Jeremiah Morrow Bridge—still the tallest in Ohio—is a pair of slender, concrete structures that soar nearly 250 feet over scenic Little Miami River gorge in southwest Ohio, northeast of Cincinnati. Beneath the I-71 thoroughfare, kayakers, hikers and bikers enjoy the National Scenic River, while visitors to the nearby Fort Ancient Archaeological Park experience that National Historic Landmark. The new 2,250-foot-long bridges were carefully designed to minimize disruption to both the environment and the vista.

## Choosing Reconstruction or Replacement

When a deck widening study in 2000 determined that a reconstruction of the previous steel truss bridges was not feasible, the Ohio Department of Transportation (ODOT) faced an opportunity to replace the structure with a design that would better fit the recreational area. ODOT selected HNTB Corporation to design and engineer the new structure. Because of the environmental sensitivity of the area, ODOT looked to HNTB to deliver an integrated approach to both design and the environmental permitting process.

## Exploring Design Options

As part of the design process, HNTB explored a wide array of conceptual alternatives before detailing six of the most promising alternatives. From these, ODOT chose to move forward with the “segmental concrete box”—a bridge design featuring post-tensioned concrete box girders with spans from 200 to 440 feet. Of this decision, Daniel Mendel, ODOT construction administrator, said, “The design alternative was chosen for several reasons: both initial costs and maintenance costs for cast-in-place concrete were less expensive; the longer span capabilities allowed us to limit the number of piers; and balanced cantilever construction required a smaller right-of-way footprint and could be performed in the limited available area for construction.”

## Engineering the Vision

With these preliminary hurdles out of the way, design for the new bridges started in 2005. It was time for the design team to make it work. Using extensive modeling with the in-house program T-187, the HNTB design team performed step-by-step

analysis from the beginning of construction to the end of bridge service life. Design and engineering elements included:

- Minimalist aesthetics: Next to the Little Miami River Valley below, less was more. It was essential to the design team that the bridges did not compete with the scenic nature of the Little Miami River Valley. To the extent possible, the bridges were designed to read as a coherent structural form when viewed from many vantage points, particularly from the perspective of the Little Miami and Recreational Trail users, as well as the traveling public. By reducing the number of piers and cantilevering the structure, the team reduced the visual weight of the bridges. In addition, the long overhang cantilevers cast shadow lines along the superstructure to reduce the visual mass even more.

- Span length, layout and arrangement: Each 55-foot-wide roadway is supported by a one-cell, single box girder with spans of 270, 440, 440, 440, 416 and 229 feet. The segments were carefully laid out to achieve the most economical solution in the superstructure and substructure. To decrease construction impacts to the river and provide an open view of the valley floor below the superstructure, the design team minimized the number of piers. The height of these piers varied from 60 to 220 feet and was founded under the complicated geotechnical profile of the valley below.

- Balanced cantilever with cast-in-place construction: To reduce the amount of equipment positioned at the valley floor during construction, the superstructure was constructed using the balanced cantilever method. HNTB's design included a special provision with requirements for the means, methods and sequencing for the manufacturing of the cast-in-place concrete segments for the bridge superstructure. After each pier was completed, two form travelers on each side of column were used to build a segment of the total span, 16 feet at a time. For this project, the 16-foot segment cycle was carried out in three to six days. The repetitive nature of this construction method increased safety for the crew and reduced errors during the process.

*(continued on page 27)*



Old next to new bridge



A traveling construction site



# Complete Streets: Paving the Way for Suburbs

Rendering shows roads transformed into Complete Streets with bike lanes, wide sidewalks and roundabout for better traffic flow, along with other bike- and pedestrian-oriented land uses.

by Andrew Babb, EIT, ASHE Georgia Section

Urban hubs across the country have proudly proclaimed allegiance to Complete Streets, the supposed metaphorical honey for young, affluent millennials as they flock to downtowns nationwide. In contrast to traditional streets and roadways, which are predominantly designed for the safe and efficient movement of cars and trucks, a Complete Street is a roadway that has been designed to accommodate travel for everyone who would use it, including people traveling by car, on foot, by bike, on buses and trains, etc.

Over the last 10 years, there has been a heightened awareness of Complete Streets in urban planning circles and in-town business networks, but, like many young couples who reach that pivotal point in life, it's time for these innovations to migrate to the suburbs as well. Over the last 50 years, a number of people have made their homes in the suburbs. Many of them go for a greater sense of community and a slower pace of life. Other prized qualities of suburban living include good schools and safe neighborhoods, parks

and recreation, historic districts and civic spaces. All of these existing amenities can be enhanced by creating roadways that make walking and biking to them possible, but these kinds of streets don't exist in all suburban areas.

A 2013 survey indicated that finding somewhere with sidewalks and places to take walks was the second-most important criteria for movers when deciding where to live<sup>1</sup>. Even though people consider this an important criterion when choosing a home, many don't live in areas with these conveniences. In a separate 2013 survey, four out of 10 respondents said that their neighborhood was not very walkable or not walkable at all<sup>2</sup>. That latter survey also found that eight out of 10 respondents wanted streets that make walking safer, even if it meant driving slower.

Complete Streets would benefit residents of suburban areas, providing enhancements and alternatives to safety, lifestyle and commuting. Connections for pedestrians and cyclists from neighborhoods to public spaces could provide residents with an alternative to driving when

walking might be preferable. In many cases, a family might prefer to take a stroll from their home to a local festival or performance, as opposed to loading kids into the car, sitting in traffic and struggling to find a parking spot. Navigating neighborhoods and surrounding areas by foot also allows residents to build familiarity and a sense of community with one another. Neighbors who recognize each other are more likely to feel comfortable offering and asking for help, whether that means for a cup of flour, a babysitter for date night or some help with the lawn. Growing concern for personal health has also begun to motivate people to walk or bike, and people would typically prefer to do so in their own neighborhoods, rather than driving to parks or gyms. Unfortunately, many people who would like to engage in outdoor activities, whether for health or for leisure, are trapped by a lack of sidewalks in neighborhoods or on adjacent roads.

Though Complete Street enhancements would be beneficial in certain suburban areas, the differences between urban and suburban spaces should be realized and respected when introducing these changes to streets and connecting roadways. In some congested downtowns, narrowing a vehicular lane to add a bike lane would be sufficient. However, in many suburban areas, this type of treatment isn't useful or appropriate. Drivers of vehicles move more slowly and are more conscientious of vulnerable roadway users on congested, narrow streets than they are on wide, high-speed highways. Therefore, cyclists in a bike lane on the side of a major suburban road probably wouldn't feel much safer than they would in the middle of traffic.

When choosing where to put sidewalks, trails, bike lanes or other places for people to walk and ride, thought should be given to where people would actually use them. A neighborhood built on the side of a highway, 10 miles from any local amenities, might be well served by sidewalks within the neighborhood, but a sidewalk along that highway probably wouldn't see a lot of foot traffic. Investments in sidewalks and bike facilities are best situated around places where people want to go and the roads that connect those places to their homes.

Optimization and efficiency have brought added value to many aspects of modern living, including the home, workspace and technology. As communities attempt to integrate additional modes of transportation, they must balance them with the need for pedestrian safety and the necessity to make the most efficient infrastructure investments possible. When placed appropriately, sidewalks, trails and bicycle facilities in suburban communities can bring added value to the lives of residents. ❤️

- 1: [www.realtor.org/sites/default/files/reports/2013/2013-community-preference-analysis-slides.pdf](http://www.realtor.org/sites/default/files/reports/2013/2013-community-preference-analysis-slides.pdf)
- 2: [https://everybodywalk.org/wp-content/uploads/2014/06/WalkingAsAWayOfLife1\\_Final.pdf](https://everybodywalk.org/wp-content/uploads/2014/06/WalkingAsAWayOfLife1_Final.pdf)



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# An Inviting New Gateway to the Community:

by ASHE Delaware Valley Section

The Holme Avenue Bridge Replacement Project simplified an outdated, structurally deficient, grade-separated traffic circle over US Route 1 (Roosevelt Boulevard) by constructing a new two-span bridge. This completed project for the Pennsylvania Department of Transportation (PennDOT) is a fiscally conscious, Complete Streets solution that improves pedestrian and vehicle flow. Located in the Rhawnhurst section of northeastern Philadelphia, Pennypack Circle was a traffic circle that connected Holme Avenue and Solly Avenue to Roosevelt Boulevard (US 1). The existing Pennypack Circle utilized two bridges built in 1964 to span over the express lanes of US 1.

As a result of this project, a single two-span bridge was constructed between the two existing bridges. The new bridge includes six lanes, with wide bicycle-accommodating outside lanes and 10-foot-wide sidewalks. Reconfiguration of Poquessing Avenue and Fairfield Street also helped facilitate improved traffic flow for local streets and emergency access for Nazareth Hospital and the City of Philadelphia Fire Department Engine Company No. 18. The existing stop-controlled entrance to the hospital, along Fairfield Street, was improved with countdown pedestrian

signals and curb bump-outs to decrease pedestrian crossing lengths and increase pedestrian safety.

The scope of this project also included the design and construction of water and sanitary sewer facilities for the Philadelphia Water Department (PWD), the rehabilitation of nearly a mile of retaining walls between Rhawn Street and Benson Street and the resetting of a city-owned pedestrian bridge, just north of Hoffnagle Street, by way of jacking.

PennDOT had wanted to address the two structurally deficient bridges, as well as the increased corridor demand. Since the original construction of the traffic circle, traffic volumes increased significantly (up to 20,000 ADT along Holme Avenue and Solly Avenue), resulting in bottleneck conditions.

HNTB Corporation was selected to develop a design, with the primary goal of addressing the two structurally deficient bridges. Also, because the existing geometric layout contributed to traffic congestion, the project stakeholders saw an opportunity to improve the movement of traffic in the neighborhood and emergency access for the adjacent Nazareth Hospital and Fire Engine Company No. 18 through the reconfiguration of Poquessing Avenue and Fairfield Street.

View of new bridge construction (overhead) from US 1 below



# Holme Avenue Bridge Replacement Project

As a result of this project, the Rhawnhurst community members, commuters and visitors have an improved quality of life. Traffic flow was improved with the reconfiguration of a complex signalized traffic circle into a simplified urban street traffic signal. Additional enhancements include improved pedestrian safety by incorporating bump-outs, lighting and signalized crossings at Fairfield Street. The community also benefited from improved access for emergency services and upgraded water and sewer facilities.

In addition, this project exemplified how structures, geotechnical, roadway, water resources, utility engineering, lighting, traffic design and construction management disciplines can collaborate to successfully deliver a bridge replacement project over a limited access roadway. Industry professionals can use this project as an example of how to construct a new bridge within the tight confines of existing structures in an urban environment. And industry professionals can reference this project's "smart" LED street lights special provisions, which were a first for a PennDOT project in Philadelphia.

One of the most challenging aspects of the project was the constructability of a structure replacement while maintaining traffic at this urban interchange.

After an analysis of six alternatives, the design team recommended the single new bridge in the center of the traffic circle. That option proved to be the most cost-effective and justifiable solution for the project, due to advantages in structure life, maintenance and protection of traffic during construction and constructability. A traffic control scheme was devised that maintained a minimum of two lanes of traffic along the 50,000 Average Daily Traffic (ADT) on Boulevard's local and express lanes during peak hours. Resulting from early coordination with the hospital, multiple lanes were maintained between Roosevelt Boulevard and Fairfield Street to minimize impacts to the hospital's access. Once the new structure was built and opened to traffic, the existing structurally deficient bridges were then removed. To limit impacts to US 1 under the structures, demolition occurred at night, using directional closures of the express lanes to remove one span at a time.

*(continued on page 12)*



New Holmes Avenue Bridge over US 1, looking west

## An Inviting New Gateway to the Community: Holme Avenue Bridge Replacement Project

(continued from page 11)

The tight urban environment proved to be a challenge when reconfiguring the layout of the roads in the project area. Nazareth Hospital's emergency room access and the fire company's ingress/egress needs were identified early in the design process, allowing the team to design around critical public safety elements. The design included the transformation from a side street stopped, controlled intersection at the hospital's main driveway into a signalized intersection complete with a dedicated left turn lane. Also a depressed median along Holme Avenue to allow fire trucks to make left turns from Poquessing Avenue.



Brick form-lined parapet wall with ornamental fencing

The wide structure, the close proximity of intersections to the bridge abutments, along with the requirement to maintain vertical clearance to the roadway beneath the new structure and the need to provide positive drainage, all proved to be geometrically challenging. The structural engineers worked to develop a shallow superstructure depth and collaborated with the road design team, allowing for a "needle to be threaded" due to the geometric constraints.

The major changes to the roadway layout recommended by this project became an opportunity to create a gateway to the community. This gateway feeling was accomplished through aesthetics, specifically the use of brick form liners on the bridge parapets, ornamental fencing and color-coordinated signal equipment and light poles. In addition, the extensive repairs to the retaining walls along Roosevelt Boulevard were incorporated into the project, improving the structure and the aesthetic condition of the walls. 🇺🇸



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# Enhancing Safety for Cyclists and Pedestrians: Old Betzwood Bridge Trail Project

by ASHE Delaware Valley Section

The purpose of the Old Betzwood Bicycle/Pedestrian Trail Project (aka Sullivan's Bridge) is to improve the connections of the existing trail system in Valley Forge National Historical Park (VFNHP) and the regional trail network in Montgomery County. A temporary four-foot-wide trail connection on the US 422 Expressway Bridge has been used for 20 years to provide bicycle and pedestrian access across the Schuylkill River. This trail connection was inadequate as a regional river crossing as part of the expanding Circuit Trail Network, a vast regional network composed of hundreds of miles of interconnected trails. The old connection occupied the eastbound shoulder of US 422 Bridge over the Schuylkill River.

Sullivan's Bridge enhances bicycle and pedestrian travel and provides a safe, regional connection between the Schuylkill River Trail and the trail system in the park. The River Bridge is a four-span continuous composite prestressed concrete bulb-T beam bridge that is 14 feet wide (16 feet out to out) and 604 feet long. An observation area in the center of the bridge allows trail users to view the State Scenic Schuylkill River and VFNHP, a national historic landmark.

In addition to building Sullivan's Bridge on the alignment of the former Old Betzwood Bridge, PennDOT replaced the nearby South Trooper Road Bridge over the Schuylkill River Trail with a 60-foot-long reinforced

concrete arch structure. The 73-foot-long bridge over Norfolk Southern Railroad was rehabilitated and replaced the South Trooper Road pavement with a 14-foot-wide asphalt trail between Station Lane (on the south side of the river) and the Riverview entrance (on the north side of the river). PennDOT also rehabilitated South Trooper Road to accommodate two 14-foot-wide travel lanes between the Riverview entrance and Susan Lane. The project included landscaping and special railing designs in close coordination with National Park Service (NPS) staff.

Sullivan's Bridge creates a critical link in the Circuit Trail Network. The bridge establishes a new multi-use trail connection between the Schuylkill River Trail and VFNHP, further connecting the Circuit Trails between Montgomery and Chester Counties. The trail bridge improves recreational opportunities, expands bicycle commuter options and improves access for VFNHP visitors. Prior to opening Sullivan's Bridge, non-motorized travelers crossed the Schuylkill River by traversing a narrow boardwalk path on the west side of US 422. This four-foot-wide path opened in 1994 following the closure of the Old Betzwood Bridge over the Schuylkill River in VFNHP. The Old Betzwood Bridge closed in 1993 and was removed in 1995. The next-closest dedicated trail facility for crossing the Schuylkill River is the Manayunk Bridge Trail nearly 15 miles away.

The success of this unique project can be attributed to stakeholder coordination and collaboration. By working closely with NPS and environmental agencies, design of both aesthetics and protection of the endangered red-bellied turtles were accommodated. This project required close coordination between Montgomery County, Upper Merion Township, West Norriton Township, PennDOT, the NPS and the Federal Highway Administration. Sullivan's Bridge is constructed with PennDOT funds, but future ownership/maintenance will be the responsibility of the NPS. This critical agreement allowed the project to move forward and provided cost savings to PennDOT, allowing recon-



Bicyclist traversing the new Sullivan's Bridge

Observation area looking north

struction of the adjacent US 422 Bridge to move along a quicker time line.

Design elements incorporated architectural details, such as fencing, railing and custom materials that preserve the historical aesthetics of the park. An observation platform at the midspan of the bridge offers sweeping views of the Schuylkill River and park lands. Customized bridge piers provide a basking area for the endangered red-bellied turtle.

The Sullivan's Bridge and Trail connect with the Heuser Park Trail in Upper Merion Township (UMT), providing new and safer access for bicyclists and pedestrians with VFNHP. And, for the first time, it connects with the Circuit Trail Network that links with the Southeastern Pennsylvania Transportation Authority's Norristown Transportation Center and Regional Train Station, the City of Philadelphia and the northern half of Montgomery County.

Sullivan's Bridge is part of the Schuylkill River Crossing Complex of transportation improvement projects designed to enhance multi-modal travel on US 422 between the Route 363 (Trooper Road) and Route 23 (Valley Forge Road) interchanges. In addition to Sullivan's Bridge, the improvements include the \$97 million project currently under construction. This project rebuilds US 422 between the two interchanges, which require new bridges over the Heuser Park Trail, the Schuylkill River, Schuylkill River Trail, South Trooper Road and the Norfolk Southern railroad tracks. It also involves the recent opening of two additional ramps built to complete the US 422/Route 363 (Trooper Road) Interchange, and the relocation of North Gulph Road at Route 23 (Valley Forge Road) in VFNHP, which is expected to move to construction in 2019.

Driver and trail user safety was addressed throughout the design process, and unique project features were introduced to ensure a safe facility for all modes of

transportation. The most impactful project feature is the island at the end south of the vehicular roadway (Trooper Road) and the beginning of the trail to Sullivan's Bridge Trail. An extensive safety review considered the transition to the boat launch, Riverview at Valley Forge entrance, in conjunction with the connection to the Schuylkill River Trail where two-way vehicular traffic terminates on Trooper Road. Additionally, Americans with Disabilities Act (ADA)-compliant convex markings (raised pavement markings) were used between Sullivan's Bridge and the island to alert trail users of the upcoming change in trail conditions when coming off the approximately three percent downgrade from the bridge.

The trail is a significant safety improvement, providing alternate routes and eliminating the need for pedestrians and bicyclist to traverse the busy Rt. 23 and US 422 interchange, as well as the adjacent Valley Forge Road (Rt. 23) and North Gulph Road intersection in order to access VFNHP's Trail System, visitors center and headquarters area.

The health and safety of the traveling public has been enhanced with the limitation of this trail system. This infrastructure dramatically improves the general health and welfare by promoting exercise and reducing air pollution with alternate non-vehicular modes of transportation. 

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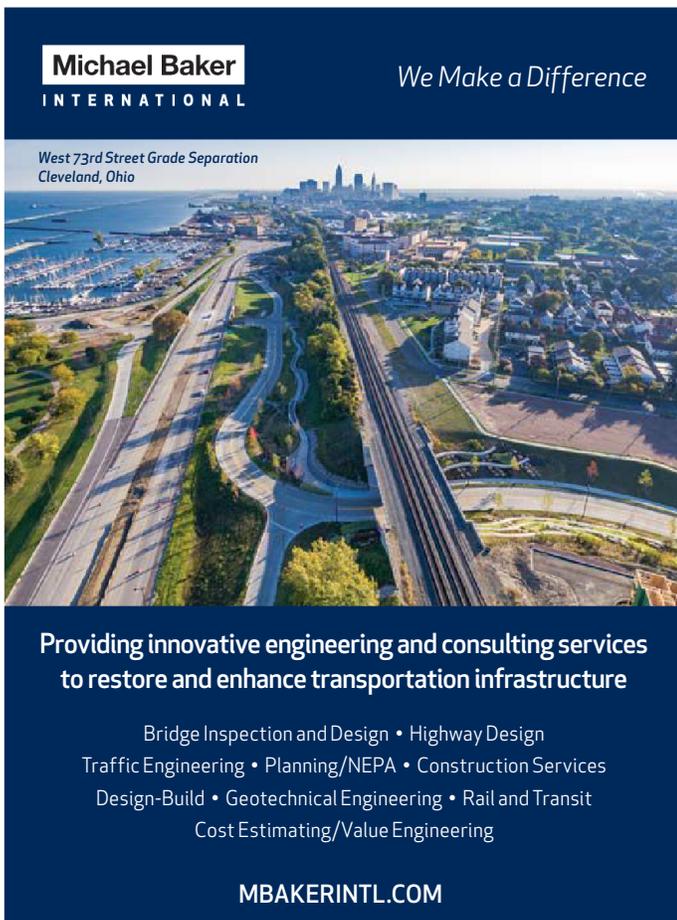


## New Directions *(continued from page 3)*

while maintaining opportunities for members to be involved. Relationships are being fostered through partnerships and corporate influence in areas where we do not yet have Sections. Establishing a trusting affiliation between ASHE and government entities is a principal focus. Nearly all of ASHE National's energy is spent on helping the Sections to thrive, grow, inspire and benefit their memberships, especially through the Regions. As individual Sections prosper, other new Sections have been able to start, such as at Lexington, KY, (Bluegrass) recently. ASHE is on the verge of establishing new Sections in Texas, Utah and possibly Arizona, due to the vigor of members in active Sections nearby. Boston, MA, and Hartford, CT, are potential new Sections in the Northeast. The rest of National's energy is spent in making sure ASHE is recognized for its benefits to members and that it operates efficiently and with integrity. A new three-year Strategic Plan is being developed that will address specific details, achievable metrics and the means by which the ASHE membership will see these goals reached.

To stay viable and continue performing to expectations as your servants, ASHE leaders are working to stay accountable to each other and to you in the use of expenditures. The Board anticipates receiving a recommendation this fall from a committee of leaders among the National Board who represent each Region. The recommendation will cover current program costs anticipated to be necessary in the coming years. Questions will be addressed, such as what we want to accomplish, which programs should receive our attention and spending and how we will fund them responsibly. This Ad-Hoc Committee is collaborating with the Strategic Plan and Governance Committees with the purpose of strengthening the foundation of ASHE over the next few years. ASHE remains one of the best values as a professional society in the transportation industry because we are an all-volunteer organization that has kept a low overhead—one of the least expensive societies in the nation. You may be assured that the results of this committee and the deliberations of the National Board will be beneficial to the entire body, and that ASHE will continue to be a low-cost, high-value, exceedingly desirable organization.

I am motivated by the prospects of a brighter ASHE future. I am eager to travel to see as many Sections as I can this year. I remain always open to suggestions for improvement. Finally, I encourage each of you to be proud of your association with ASHE and to talk about us with your peers. Let's strengthen our local Sections together with our fellowship, energy and ideas. Thank you for being a part of this great American institution! 🇺🇸



**Michael Baker**  
INTERNATIONAL

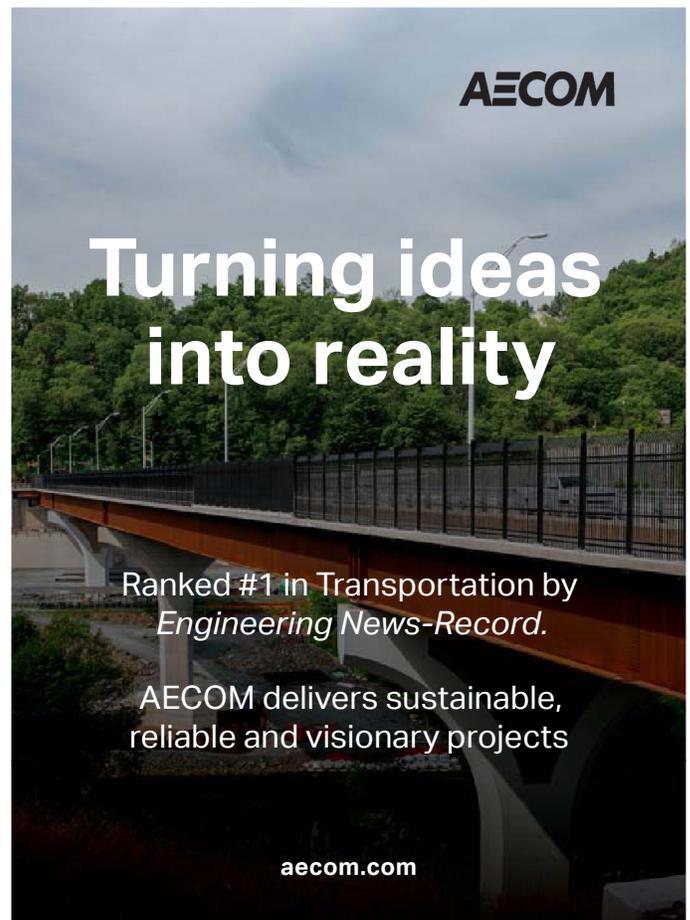
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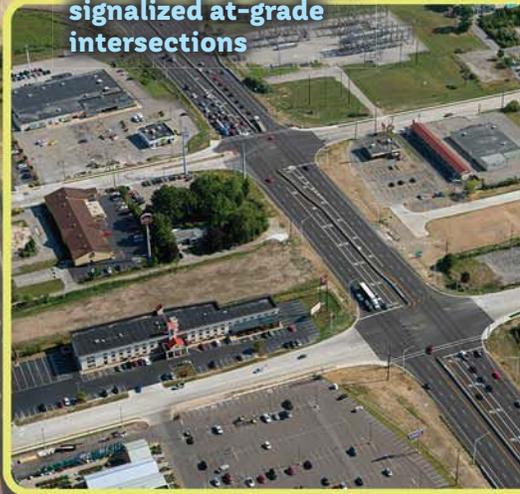
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Looking west, an aerial view of the newly constructed SR 57 and I-90 signaled diamond interchange



Looking north, an aerial view of the new signaled at-grade intersections

# SR 57 Corridor Project Improves Safety and Connectivity

by KS Associates, Inc., ASHE Lake Erie Section



The project required the relocation of a stream to accommodate the Ohio Turnpike ramp modifications.



Looking north, an aerial view of the completed SR 57 corridor improvements; I-90/SR 2 is to the north, and the Ohio Turnpike is to the south

## 2016 Outstanding Transportation Project Over \$5 Million

The SR 57 Corridor Project area is a heavily traveled one-and-one-third-mile stretch of highway in Elyria, Ohio. It carries traffic from the Ohio Turnpike (I-80) north to I-90. Flanking the east and west sides of SR 57 are a variety of hotels, restaurants, businesses and retailers, including Lorain County's only enclosed regional shopping complex, Midway Mall. For years, Elyria residents and other drivers traveling through the corridor had difficulty exiting SR 57 to access the mall and nearby establishments. To get to the opposite side of SR 57, motorists were required to exit the highway, then wind their way to and cross over the 49th Street Bridge. In addition, the corridor, which carries more than 47,000 vehicles per day, experienced a high incidence of accidents in Ohio.

From 2004 to 2006, feasibility studies were conducted to evaluate alternatives for improving this section of the SR 57 corridor. In June 2008, ODOT District 3 hired KS to conduct a preliminary engineering study and provide recommendations, design alternatives and cost estimates for the project.

The preferred alternative and final design called for widening SR 57 from two to three lanes in each direction, adding signalized intersections at Midway Boulevard and Griswold Road, removing the 49th Street Bridge and replacing loop ramps at I-90 with a full-diamond interchange.

### Importance to the Traveling Public

SR 57 is the primary route for Ohio Turnpike traffic to reach I-90/SR 2 westbound, and for I-90/SR 2 eastbound traffic to reach the Ohio Turnpike. Sandwiched between these two limited-access routes is the Midway Mall business district.

Access to the district was difficult. When traveling on SR 57 and needing to get to the opposite side of the highway, drivers had to exit SR 57 to their right, turn at the next intersection, turn onto and cross the E. 49th Street bridge over SR 57, turn at the next intersection, then arrive back at SR 57. Drivers had to reverse this procedure to get back to SR 57. This confusing route, also had a substandard ramp design and short weave zones between the three interchanges.

The project called for widening SR 57 to three lanes in each direction, constructing two at-grade signalized intersections at Midway Boulevard and Griswold Road, removing the 49th Street Bridge and removing the remaining two loops at I-90 and replacing them with a signalized diamond interchange. These improvements eliminated several weave zones, updated the corridor to current standards and significantly simplified the traffic pattern, which ultimately reduced accidents and improved access to establishments on both sides of SR 57.

### Complexity

The Ohio Turnpike, Midway Boulevard, Griswold Road and I-90 are all less than three-quarters of a mile apart. Managing the weave zones between the I-90 interchange with the new at-grade intersections was critical to the success of the project. To accomplish this, the I-90 eastbound ramps were relocated to the north to increase this distance. Signalizing this intersection also controlled traffic to eliminate the high-speed weave. Four new signalized intersections were constructed, and two signalized intersections were rebuilt to manage the new traffic pattern. All signals were interconnected with adaptive radar detection. Ohio Turnpike ramps were modified to accommodate the widening, which required relocating a stream, constructing a retaining wall and extending a culvert.

### Innovative Features

This was one of the first projects in Ohio to specify an adaptive signal timing system within the bid. Although this system had previously been used by ODOT under a change order, this was the first project to include the system as a bid item. The advantage of the system is that the radar detection can count the traffic and adjust signal timing as required. This was important to Elyria and to ODOT. The change in traffic pattern was so dramatic that the clients wanted the system to adapt to the actual traffic volumes as opposed to predicted patterns. The system dynamically tracks the speed, estimated time of arrival and the range of all vehicles as they approach the sensors.

Given the amount of traffic that uses SR 57 to access the business district, and that SR 57 is the only route for Ohio Turnpike traffic to get to SR 2 west of SR 57, it was

*(continued on page 34)*



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## Bolt joins Pennsylvania Team to lead Business Development

Fairfax, VA—**Jill Kathleen Bolt** has joined Dewberry's Pennsylvania operations as the Business Development Director. **A member of the American Society of Highway Engineers**, Bolt will lead the firm's transportation business development efforts throughout the Commonwealth, including expansion into southeastern Pennsylvania.

Bolt brings more than 28 years of experience as a public engagement professional and administrator. Prior to joining Dewberry, she served as director of marketing and business development for engineering firms, and was responsible for securing multimillion dollar contracts, developing and implementing the companies' marketing and business strategies and managing client services for transportation projects. She is also a member of the Women's Transportation Seminar, American Highway Users Alliance and a former Government Affairs Committee Chair of the American Council of Engineering Companies, Pennsylvania.



## BEG Group LLC wins Award for Big Switch™

Cambridge, OH—The BEG Group won for its Big Switch™ Bio Preferred Erosion/Filtration Medium, winning a 2017 Environmental Protection New Product of the Year award. The award honors the outstanding achievements of industry manufacturers whose products are considered particularly noteworthy for making environmental professionals' jobs easier.

The president of BEG and one of its co-founders, **Joe Greco**, *is a member and former president of the ASHE Franklin Section.*

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## McMahon names David C. DiGioia, PE, as Office Lead in Pittsburgh

Fort Washington, PA—McMahon Associates, Inc., has appointed **David C. DiGioia, PE**, as the Office Lead for the firm's Pittsburgh office. DiGioia currently serves *on the Board of the Pittsburgh Chapter of ASHE.*

With nearly a quarter-century of experience in traffic engineering services, from traffic studies through Highway Occupancy Permits and Plans, Specifications and Estimates plan designs, for both public and private sector clients, he is charged with expanding McMahon's western Pennsylvania market presence.

DiGioia has been responsible for managing the planning, design and delivery of multiphase transportation projects in western Pennsylvania. His experience encompasses all facets of transportation engineering, including design for site, signal, highway, street, structure and drainage, traffic impact studies, stormwater and erosion control, environmental impacts, right-of-way acquisition and preparation of plans, specifications and estimates for construction.

DiGioia has served the Mid-Colonial District and Mid-Atlantic Sections of ITE as a Past President. He is the Chairman of the Transportation and Development Institute for the Pittsburgh Section of ASCE.

# Collaborative Teamwork Creates

by Josiah Roberts, PE, AECOM, ASHE Phoenix Sonoran Section



Ramp mechanically stabilized earth wall construction between new bridges (looking northwest along US 60)

The intersection of US 60 (Grand Avenue) and Bell Road is located in the Phoenix metropolitan area, within the city of Surprise. It is one of the most heavily traveled intersections in the region, serving approximately 85,000 Vehicles Per Day (VPD), and is located adjacent to a major regional shopping center, Surprise Marketplace. US 60 is a principal arterial aligned parallel to Burlington Northern Santa Fe (BNSF) Railway tracks and serves motorists traveling between Phoenix and Las Vegas. Bell Road is also a principal arterial, crossing US 60 at a 45-degree skew. Both roadways include six lanes divided by a raised median, with right- and left-turn bays located at street and major driveway intersections. Prior to this project, Bell Road crossed US 60 and the BNSF tracks with at-grade intersections. Due to the high traffic volumes and the at-grade railroad crossing, significant traffic queues formed during peak demand periods.

The Arizona Department of Transportation (ADOT), in conjunction with the Maricopa Association of Governments, developed a concept to increase the intersection capacity and grade-separate Bell Road over the BNSF tracks and US 60, while retaining the traffic connection between the high-volume regional roadways. The concept includes construction of a Median Urban Diamond interchange with a single signalized intersection on Bell Road to serve new median ramp connections to US 60. Placing ramps within the US 60 median allowed right-in/right-out access to adjacent businesses to remain intact and significantly reduced the amount of land acquisition.

ADOT used the design-build delivery method to reduce construction costs and duration. ADOT, assisted by a team of



Proposed detour route

# Jewel of a New Interchange

consultants led by AECOM, developed the design-build request for proposal packages. The team identified and mitigated challenges and potential risks, including land acquisition from 26 separate owners, significant utility relocations, phased construction of Bell Road, BNSF Railway requirements and many schedule constraints. The team initially planned for 18 months of design and construction.

The most significant challenge was the phased construction approach for Bell Road, requiring temporary modifications to the existing railroad crossing signals and gates. This would have required BNSF to design and construct the modifications during the design-build contract, posing a schedule risk to the design-builder. In addition, BNSF officials do not allow any construction within the vicinity of their tracks during their busy season from October through December every year. In order to mitigate the schedule

Bridge pier mock-up



risks, reduce the project's duration and lessen the overall impacts of construction, ADOT worked with the city of Surprise and over 300 local businesses to schedule a full closure of Bell Road. The full closure began in April 2016, timed to occur after the conclusion of the Cactus League spring training baseball season at Surprise Stadium, and the new roadway would open in time for the 2016 holiday shopping season. The timing of the closure was also planned to span the summer months when traffic volumes are typically lower in this area. The closure required a three-mile detour on adjacent arterial streets, but allowed for a single phase of construction on Bell Road, eliminating the need for the temporary modifications to the railroad crossing and achieving a schedule savings of four months.

The design-build team was led by Coffman Specialties, Inc. (contractor), and T.Y. Lin International (designer). Design and construction began on the \$42 million project in January 2016. The initial focus was on the first phase of work on US 60 to shift the alignment of the westbound

*(continued on page 24)*

Construction complete (looking northwest along US 60)

## Collaborative Teamwork Creates Jewel of a New Interchange

(continued from page 23)



New bridge over westbound US 60 and the BNSF railway

roadway and make way for construction of the Bell Road bridges. Bell Road was closed in April, as planned, and work continued to construct its new elevated section. Due to the skew of the roadway and required clearances to the BNSF tracks, one bridge span was designed to utilize special Type V Modified AASHTO precast girders with a length of 158 feet. Embankment for the elevated Bell Road and ramps was retained with the use of Mechanically Stabilized Earth (MSE) walls.

The new section of Bell Road was constructed in just over seven months and opened to traffic in November 2016, as planned, prior to the holiday shopping season. The closure yielded few complaints from the public, and the overall response was positive because of the fast pace of progress. Work continued on US 60 and the new ramps until the project was completed in March 2017, prior to the start of the next spring training baseball season. The overall duration was just over 14 months, nearly four months faster than initially planned.

Joseph R. Salazar, RLA (ADOT), developed aesthetics concepts to be implemented on the project, inspired by the agave plant that lives in the area, and architect Frank Lloyd Wright. The concept included agave patterns cast into the MSE wall panels, roadway barriers and bridge piers. In addition, metal agave leaves and flower stalk forms would be fabricated and attached to the new bridge fencing. T.Y. Lin International utilized 3D imaging and printing of the agave patterns, allowing the project team and stakeholders to visualize the concept. Coffman Specialties, Inc., constructed full-scale mock-ups of the patterns to allow for paint color selection, and the final color scheme was selected with input from the city, creating a distinctive appearance for the new interchange.

ADOT defines partnering as a formal process of collaborative teamwork that allows groups to achieve measurable results through agreements and productive working relationships. Partnering was first used by ADOT in 1991. Through the years, the value of partnering has been shown in the dramatic reduction of claims and litigation. Partnering has resulted in projects being delivered on time and under budget and ensured public and community acceptance. This project is another example of that process. The project team and stakeholders embraced the process, leading to a focus on the common goals of the project, even during discussions of difficult issues. Team members took pride in their work and made the project's success a priority. As a result, ADOT presented project team members with 12 individual Partnering Spirit Awards for their dedication to partnering. 

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## Less is More for Ohio's Tallest Span: Designing the New Jeremiah Morrow Bridge *(continued from page 6)*

### Constructing the Design

Kokosing Construction Company, Inc., general contractor for the project, started construction in fall 2010. First, the new southbound bridge was built between the existing twin bridges. When the southbound bridge was completed in 2013, northbound traffic was temporarily routed to the new bridge while the existing northbound bridge was demolished. Then, the northbound bridge was built and opened to traffic in 2016. At this time, traffic was routed to its permanent position, and the final existing bridge was demolished.



Practice makes perfect.

### Looking Forward

Blending better into the environment, the new twin bridges are built to last, at least 100 years. In contrast to the large maintenance expense of the old truss bridges, this concrete design will save ODOT in long-term painting and maintenance costs. The new structure was also designed to support additional lanes as the transportation population in the area grows. "Each bridge is constructed with room to accommodate three lanes of traffic with a six-foot and 10-foot shoulder. Being able to add post tensioning to address future increased capacity and possible future maintenance will be critical," said Mendel, ODOT's administrator. The Jeremiah Morrow Bridge is now a subtle, but vital part of the southwestern Ohio landscape. 🇺🇸



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COLLABORATIVE ENGINEERING

# Straightening the Way Forward for Motorists, Pedestrians, and Bicyclists: PA 980

by Ned Williams, Montour Trail Council, and  
Jonathon C. Balko, PE, The Markosky Engineering Group, Inc.,  
ASHE Southwest Penn Section

Where horses and wagons once traveled along dirt paths, winding their way under the Montour Railroad, today's PA 980 and PA 50 roads are now far better shaped to carry the heavy load of cars and trucks to homes and businesses throughout northern Washington County. From its beginnings in the State Transportation Commission, this project—a collaboration of the Southwestern Pennsylvania Commission, Pennsylvania Department of Transportation (PennDOT) Districts 11-0 and 12-0 and the Montour Trail Council (MTC)—advances multimodal transportation in the region.

The MTC started in 1989 with the vision to complete a continuous non-motorized trail from Coraopolis on the Ohio River to Clairton on the Monongahela River, sweeping through Pittsburgh's western and southern suburbs. Since then, this vision has been largely realized. Completed and opened are 46 miles of the total 48-mile mainline and 56 miles of the 63-mile trail system, the longest suburban rail trail in the United States.

The intersection of PA 980 and PA 50 was previously configured an offset "T" intersection with only 110 feet between intersections. In October 2001, the portion of the former railroad bridge that spanned PA 50 was removed to improve

motor vehicle traffic flow and reduce collisions with the remnant structure abutment. The continuity of the Montour Trail was severed by PA 50, requiring trail users to cross PA 50 at-grade between the PA 980 approaches, creating challenging conditions for both trail users and motorists. The existing span over Millers Run was left intact, remaining a functional part of the trail.

The general scope of this PennDOT District 12-0 project included the realignment of the southern approach of PA 980 to form a "plus" intersection and construction of a new bridge. The bridge carries the trail over the intersection to fully separate trail-using families, pedestrians and bicyclists from surface motor vehicle traffic. The new bridge, approximately 379 feet long, is a three-span composite steel girder structure, which allowed the span lengths to be maximized while minimizing the structure depths. This provided the necessary vertical clearances for both PA 980 and PA 50 while meeting the trail's requirement of a maximum approach grade of three percent and limiting the height of approach fills. The new bridge also completes the final Montour Trail gap in Washington County, the heavily traveled central part of the trail.

The project incorporated numerous innovative aspects.



The trail is situated on the former Montour Railroad alignment, which is an eligible historic resource. To preserve this contributing element, the project included the adaptive reuse of the remaining railroad span. The existing two-girder structure was built in 1913 by the Montour Railroad. This span was the only remaining portion of the original railroad structure. During preliminary design, the span was inspected and preservation repair details were prepared. The existing span was lifted during construction to install new bearings, including pedestals and repair of the existing substructure units. The existing girders were fitted with shear studs to achieve composite action with the new concrete deck. The new spans were designed to be a two-span continuous steel plate girder unit with a three-girder cross section.

In order to increase the clearance of the new bridge over the roadways, the structure and approach embankments were raised approximately five feet. The required alignment shift of the southern trail approach and the resulting bridge skew over PA 50 were minimized by using Geosynthetic Reinforced Slope (GRS) embankments. This design also allowed the already steep railroad embankment to be increased in height without increasing the embankment footprint, thereby avoiding right-of-way impacts to adjacent businesses and potential waste sites. The GRS embankments were designed to be tucked directly into the new abutment wingwalls.

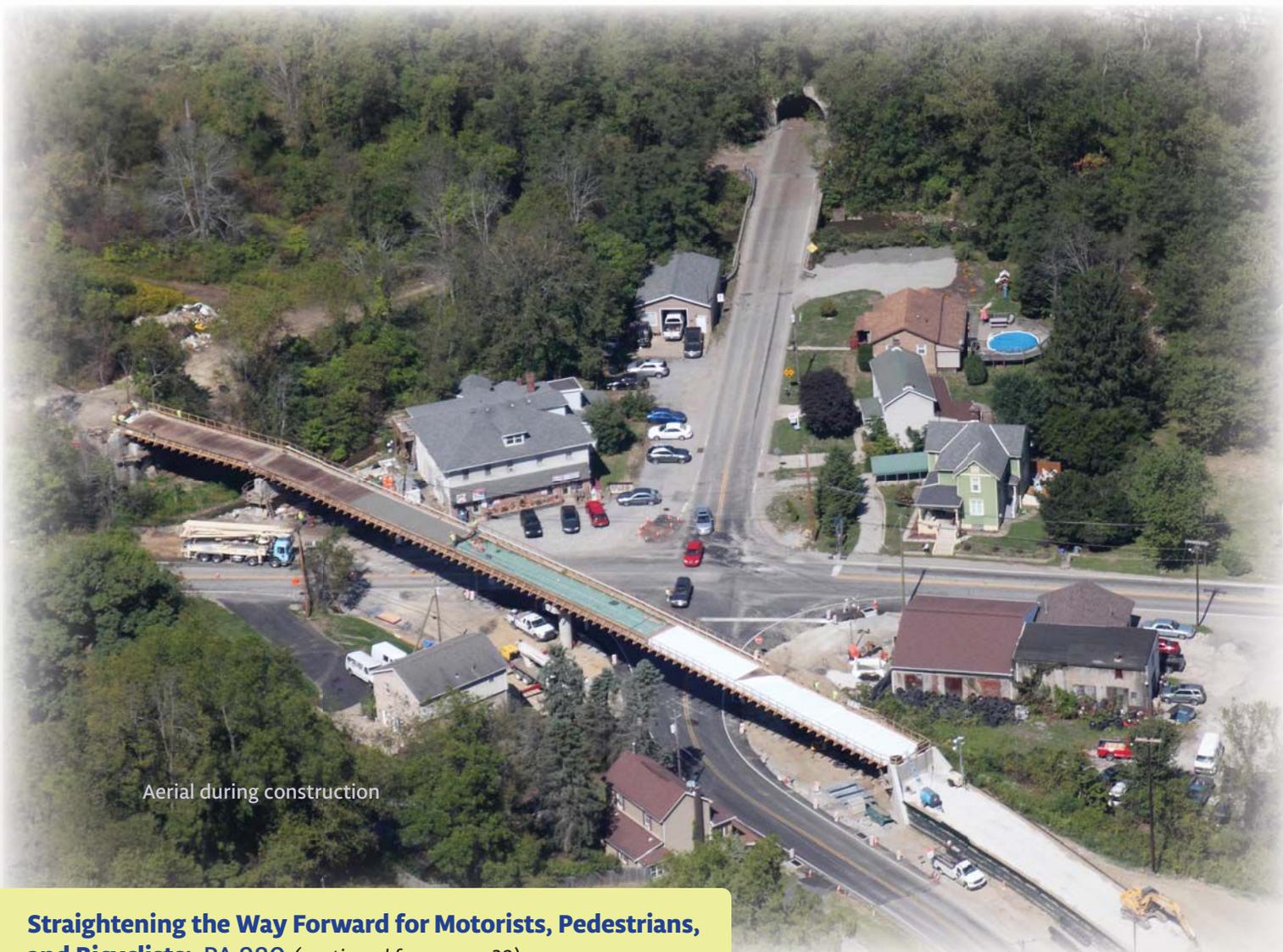
*(continued on page 30)*



View of completed intersection from south



Existing offset intersections



Aerial during construction

## **Straightening the Way Forward for Motorists, Pedestrians, and Bicyclists: PA 980** *(continued from page 29)*

Another innovative solution incorporated into the project was a trench drain to address an issue identified during the public involvement process. There was a low point along PA 50, approximately 150 feet east of the intersection, where water would pond during significant rainfall events, extending onto the westbound lane. Due to the topography and the shallow depths of other drainage facilities in the area, the issue could not be addressed by conventional methods without permitting a new discharge point and acquiring additional right-of-way. A custom drainage solution was developed to address the issue in the least disruptive manner to the overall project schedule without impacting adjacent properties. The solution included a short section of elliptical pipe and a concrete trench drain that allowed positive drainage to be provided with minimal cover, while maintaining the existing ground profile.

Through careful and strategic design, the entire project was constructed within existing PennDOT and Montour Trail property, with the exception of two temporary construction easement areas totaling 1,303 square feet. The MTC donated adjacent property to PennDOT for needed roadway improvements, allowing the project design and construction to be

completed one year in advance of the originally anticipated completion.

The project footprint and length of relocated PA 980 were minimized to provide only what was necessary, resulting in lower project costs. This allowed milling/overlay of the remaining intersection approaches to be added during final design, providing a more complete finished project.

The Markosky Engineering Group, Inc. (Markosky) was the prime engineering consultant. Markosky's team included Gannett Fleming (geotechnical), A.D. Marble (environmental), Sucevic, Piccolomini & Kuchar (survey and right-of-way plans), Cardno (subsurface utility engineering), Highland Professional Consultants (right-of-way acquisition) and Keystone Valuation Group (appraisal services). The prime contractor, CH&D Enterprises, Inc., opened the new bridge to traffic in November 2015, and completed the remaining construction in December 2015. Through PennDOT's Agility Program, the District 11-0 Construction Unit oversaw construction in conjunction with their SR 0050- A23 project that was located several miles east on PA 50 in Allegheny County. McTish, Kunkel & Associates provided construction inspection for District 11-0. 



# 2017 ASHE NATIONAL CONFERENCE NEW YORK CITY

The American Society of Highway Engineers held their 2017 National Conference in New York City, attended by over 550 registrants and 50 exhibitors. The four-day event began with golf at the North Hempstead Country Club and a technical tour of the billion-dollar LaGuardia Airport Redevelopment Program, one of the few public-private partnerships in the country. An Ice Breaker event was held on Thursday evening in the Grand Ballroom of the Sheraton New York Times Square Hotel.

Friday's opening session featured two keynote speakers, Phil Eng, PE, Chief Operating Officer of the MTA, one of the largest transportation agencies in the country, and Sarah Kaufman, Assistant Director for Technology Programming with the New York University Rudin Center for Transportation and Policy. The day also included technical sessions and a luncheon honoring ASHE Past Presidents.

Conference attendees went on technical tours as well as sightseeing in the city. Friday night's entertainment included a New York Review of Broadway songs, along with a DJ and Karaoke. The Saturday night Gala concluded the conference.

Congratulations to all the winners of awards presented throughout the Conference and to the new officers installed. Larry Ridlen, PE, was thanked for serving as the National President this past year, and congratulations extended to the incoming President, Greg Dutton, PE.

Appreciation to the Conference speakers, committee chairs and our 115 sponsors and 45 journal sponsors. Thanks to all the Section members who traveled to New York (*way to go, Georgia, for the largest showing!*), and to all the volunteers and local ASHE members and firms whose efforts helped make this year's gathering a success.

See you in Cleveland next year! 🇺🇸

*(continued on page 32)*



LaGuardia Airport Redevelopment  
Program Technical Tour



# 2017 ASHE NATIONAL PROJECT OF THE YEAR AWARD

*presented at National Conference in New York City*



Winners of the Under \$20 Million Award for the Skip Spann Connector Project included, left to right: Chris Rideout (Croy Engineering), Tracy Rathbone (Town Center CID), Greg Teague (Croy Engineering), and Adam Grist (CW Matthews).

The inaugural ASHE National Project of the Year Awards program was a success. Congratulations to the teams of this year's winning projects, the Skipp Spann Connector, Under \$20 Million Category, from ASHE Georgia Section, and the Ohio River Downtown Bridges, Over \$20 Million Category, from ASHE Derby City Section. The winners received their awards at the National Conference in New York City. Kudos to the ASHE leadership for supporting this program and to the National Project of the Year Awards Committee for bringing it to fruition.



*The Metropolitan Museum of Art Tour*



*World Trade Center 9/11 Memorial Technical Tour*



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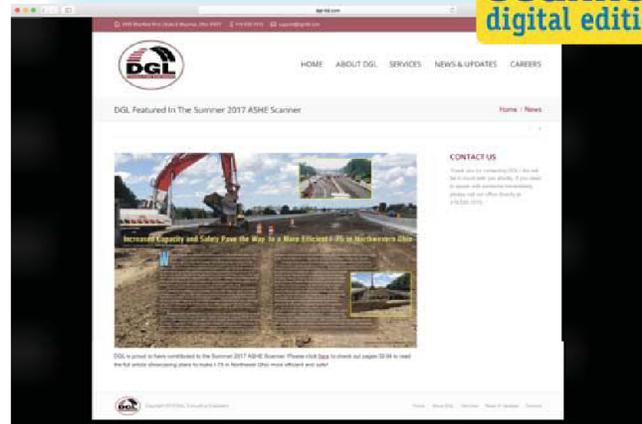
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## *In Memoriam*

### Brief Obituaries to Appear in *scanner*

The *scanner* will begin to include brief notices of the passing of Sectional, Regional, or National ASHE officers. When submitting the announcements, please include the person's full name, date of his or her death, ASHE Section and affiliated company or business, if relevant. (For an example of these announcements, please see the *In Memoriam* section of our 2017 summer issue of *scanner*, page 17.) Please submit to Tammy at [tntsince87@comcast.net](mailto:tntsince87@comcast.net).

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**SR 57 Corridor Project Improves Safety and Connectivity** (continued from page 19)



necessary to maintain traffic at all times. Six phases of Maintenance of Traffic (MOT) were used over two years, and access to all routes and businesses was maintained for the duration of the project.

**Aesthetics and Sustainable Features**

A retaining wall was constructed near the Ohio Turnpike to minimize impacts to the existing stream channel. Several alternatives were prepared to limit degradation of the stream. As part of the project, a wetland study was conducted, and as a result, the design was tailored to avoid wetland areas.

The stream relocation near the Ohio Turnpike ramp modification provided a natural sinusoidal stream pattern. Vegetation was selected to promote a healthy, biologically friendly stream habitat.

**Enhanced Safety, Better Connectivity and Potential for Economic Growth**

The \$22 million project broke ground on July 1, 2014, and was substantially complete in the fall of 2016. It greatly improves access to the Midway Mall business district and provides Elyria with the transportation infrastructure needed to serve as a foundation for economic growth in this area of the city. ❤️

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Lexington, KY  
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### Northeast Region

Albany	103
Altoona	194
Central New York	49
Clearfield	176
Delaware Valley	375
East Penn	109
First State	140
Franklin	134
Harrisburg	348
Long Island	45
Mid-Allegheny	129
New York Metro	162
North Central New Jersey	180
North East Penn	134
Pittsburgh	571
Southern New Jersey	97
Southwest Penn	282
Williamsport	133
<b>Subtotal</b>	<b>3,361</b>

### Mid-Atlantic Region

Blue Ridge	77
Carolina Piedmont	65
Carolina Triangle	252
Chesapeake	244
Greater Hampton Roads	124
North Central West Virginia	37
Old Dominion	95
Potomac	239
<b>Subtotal</b>	<b>1,133</b>

### Southeast Region

Central Florida	48
Georgia	397
South Florida (formerly Gold Coast)	11
Middle Tennessee	273
Northeast Florida	196
Tampa Bay	90
<b>Subtotal</b>	<b>1,015</b>

### Great Lakes Region

Bluegrass	48
Central Ohio	181
Cuyahoga Valley	119
Derby City	85
Lake Erie	152
Northwest Ohio	38
Triko Valley	182
<b>Subtotal</b>	<b>805</b>

### North Central Region

Central Dacotah	123
<b>Subtotal</b>	<b>123</b>

### Rocky Mountain Region

Phoenix Sonoran	153
<b>Subtotal</b>	<b>153</b>

### South Central Region

Dallas-Fort Worth	81
<b>Subtotal</b>	<b>81</b>

### Other Memberships

Domestic At-Large	12
International At-Large	2
<b>Subtotal</b>	<b>14</b>

### National Total

<b>6,685</b>	
Professional Status	58%
Government	13%
Consultant	69%
Contractor	5%
Other	13%

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