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See page 15



**Pioneering Roundabout
Improves Traffic Operations**

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Leigh Lilla, PE, LEED
ASHE National President 2022-2023



NEW DIRECTIONS

As we say in the South, Happy Fall, y'all!

I hope everyone had a wonderful summer and you are looking forward to getting back in the swing of things. I think we all needed some time to recuperate from the wonderful National Conference hosted by the Central Ohio Section, and here's hoping all Sections feel refreshed and ready to hit the ground running for this membership year.

One of the highlights I would like to emphasize from our time together at the Conference was the collaboration and sharing we accomplished during the Region/Section Officer Meeting. We discussed best practices for conducting meetings in our "new normal" as we are once again able to gather in person. It seemed one of the most successful meeting strategies for a Section was a hybrid approach, where perhaps a Section can alternate an in-person meeting one month and opt for the hybrid option the following month. The hybrid meetings can help boost meeting attendance in that they attract remote workers, and companies are not concerned about losing productivity for travel across town for a luncheon. It also helps bridge the gap of geography, making it possible for more people to attend. Of course, the networking opportunities are more valuable in-person, which is why the hybrid structure seemed to be an optimal balance. I'd like to thank everyone who attended and contributed during that meeting. It is an annual favorite, and I hope you can bookmark it for your schedules next year.

Additionally, I would like to highlight the "Best Practices Manual – Membership" compiled earlier this year by the Membership Committee. On the heels of National Past President Tim Matthews' Membership Diversity initiative, there are some excellent tips and tricks for encouraging membership growth and increasing public sector and contractor participation, an important goal for this year. I would like to acknowledge Rob Prophet and the Membership Committee for putting together this document for member reference. It is located in the Resource Center of the ASHE website.

Thanks to the power of virtual meetings, I attended the Middle Tennessee Section's meeting for the swearing in of their 2022-2023 Board and the Tampa Bay Section's June Board meeting, and I sat in on a planning call for the National Conference Committee. I also want to recognize the Southwest Region for hosting their first regional summit. We are working across the Board to empower Regions to be able to host similar events and are excited to see this take shape.

In August, the Executive Committee convened in person in Chattanooga, TN, to kick off the Strategic Plan renewal and discuss some tasks for the Technology Committee, all with the goal of better serving our membership base. The full ASHE Board will gather in October in Raleigh, NC, to wrap the Strategic Plan and collaborate on other goals for the year, including reviewing the role of the Regions and accompanying committee structure.

I would like to reiterate our wish to have Sections send invitations to the National Board to attend their events and meetings. We have a Board full of people ready to hit the road and visit with the Regions and Sections; there is no event or milestone too small. My belief is that you get out of ASHE what you put into it, so please reach out if you have an interest in getting involved in your local Section, Region or a committee. There are so many ways to participate, and we look forward to collaborating with you! 🇺🇸

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Correction:

On page 31 of the printed summer 2022 *scanner*, the author, as well as the full name of the award, were inadvertently substituted with a strange typeface. The article *Replacing the Delaware River's Scudder Falls Bridge* was contributed by the **ASHE Delaware Valley Section**, and the award was for the Section's **2021 Project of the Year Over \$20 Million**. We sincerely apologize for these errors.



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Putting a Creative Spin on an Intersection Problem

by Chris Rideout, PE,
ASHE Georgia Board Member,
ASHE Georgia Section

The Roswell Street roundabout, shown in a variety of angles, used a relatively small footprint for a vital neighborhood interchange.



For years, the intersection of Roswell Street, Hawthorne Avenue and Matthews Street in Smyrna, GA, approximately 10 miles northwest of Atlanta, caused problems. It had a six-legged, multiphase signal with difficult vehicle travel paths and long cycle times, resulting in significant delays for drivers during peak morning and evening commutes. Other issues included the high number of vehicular accidents at the intersection and the need to increase safety for pedestrians.

The City of Smyrna chose Croy Engineering (Croy) to lead the Roswell Street intersection improvement project, including its design, concept development, survey, right-of-way acquisition and construction oversight tasks.

To solve the intersection's problems and improve mobility, the Croy team installed a five-legged roundabout. Their design removed the signal, realigned the eastern Hawthorne Avenue leg away from the intersection and provided enhanced pedestrian features. These improvements resulted in maintaining or improving access to all legs of the intersection and neighboring parcels. They also reduced the traffic back-up during peak hours, the number of accidents and the unsafe aspects for pedestrians at the intersection.

In addition, the roundabout design accommodated larger commercial vehicles traveling this intersection daily, using truck-specific guide signage. The vehicles were encouraged to make one circle of the roundabout to easily maneuver the sharpest right turns. Through this approach, the roundabout had a much smaller footprint

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Putting a Creative Spin on an Intersection Problem

(continued from page 7)

than is typically required of one with as many approaches. The design helped minimize impacts to local businesses and residents, integrating the roundabout into the surrounding area and existing land uses. Additionally, the smaller footprint meant a reduction in overall material quantities and right-of-way, helping to deliver a lower cost project within the city's budget.

Through value engineering efforts, Croy determined that utilizing easily routed nearby detours would allow for a temporary closure of the intersection, enabling the roundabout to be completed in one year. This reduced the construction time and project cost significantly for Smyrna.

Finished in early summer of 2020, the project received two industry innovation awards. It was presented with a Georgia Partnership for Transportation Quality (GPTQ) Preconstruction Design Award in the category of Traffic Safety and/or Intersection Design in April 2021. The GPTQ Preconstruction Design Awards are presented annually by the Georgia Department of

Transportation and the American Council of Engineering Companies (ACEC) of Georgia to recognize complex transportation projects across the state. The project also received an Engineering Excellence Award from ACEC Georgia in March 2022.

"We are excited to have this transformative project in our Smyrna community," said Smyrna's Mayor Derek Norton. "We've enjoyed a long and successful partnership with Croy on various transportation projects, all of which have helped to bring mobility, safety and pedestrian-friendly solutions to keep our growing city moving efficiently. 🇺🇸"

The American Council of Engineering Companies of Georgia presented an Engineering Excellence Award to representatives of the City of Smyrna and Croy Engineering for the Roswell Street intersection improvement project. From left are Gregory D. Teague, PE, CEO, Croy; Chris Rideout, PE, Vice President, Croy; Mayor Derek Norton, City of Smyrna; Eric Brisse, PE, Senior Project Manager, Croy;



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McAfee Retires from Urban Engineers

Philadelphia, PA—Urban Engineers (Urban) announced the retirement of **Joseph McAfee**, PE, FCMAA, board director of the company. McAfee, **a member of ASHE's Delaware Valley Section**, was the immediate past Executive Vice President and Chief Operating Officer of Urban, positions that he stepped away from in 2015. He will continue to serve the company as a senior adviser. McAfee joined Urban in 1967 and became one of the company's principal owners in 1993, overseeing responsibility for design, construction and program management activities. He received his Bachelor's degree in Civil Engineering from Drexel University. A recipient of several awards during his career, he has given presentations and seminars on construction management practice, claims avoidance and construction site safety.



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News From Across ASHE-Miles



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ASHE Dallas-Fort Worth Section Hosts Speaker

The ASHE Dallas-Fort Worth Section had the largest turnout of the year to hear Michael Morris, PE, talk about projects in their region. Morris is Department Director in the Transportation Department of the North Central Texas Council of Governments, the Metropolitan Planning Organization (MPO) for the Dallas-Fort Worth area. The MPO develops transportation plans, programs and projects that address transportation needs of the fourth largest region in the country. Morris received his Master's in Civil Engineering from State University of New York at Buffalo. A registered Professional Engineer in Texas, he received the Ron Kirby Award in 2021. Previously, he served as Chairman of the Transportation Research Board Executive Committee and as a National Associate of the National Academies.



During the event, Michael F. Knowles, CPSM, Business Development Manager of IMS Infrastructure Management, was installed as the Section's new President. Knowles said his service theme, "Together We Can Move Mountains," was inspired by Morris' presentation to the group.

Thanks to all who attended and to everyone who organized the gathering. #ASHEdfw 🇺🇸

ASHE Dallas-Fort Worth Section's new President, Michael F. Knowles, CPSM, at left, with Michael Morris, PE. The ribbon (at upper right) was awarded to the Section for having the biggest increase in membership in 2021, and four more members have joined since then.



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Pioneering Roundabout Improves Traffic



Montgomery's
roundabout
improved traffic
operations in
the area.

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Montgomery, OH

The city of Montgomery, OH, a suburb northeast of Cincinnati, converted a trumpet interchange to a multi-lane roundabout, the first conversion of a freeway interchange to an at-grade roundabout in Ohio.

Located in a dense urban area, the previous grade-separated trumpet interchange connecting SR 126 (Ronald Reagan Highway) and US 22 (Montgomery Road) experienced significant congestion at peak hours. The interchange did not fit the city's objectives for an urban, walkable environment just south of the Montgomery Heritage District. As part of a new vision for Montgomery, vacant land adjacent to Montgomery Road was identified for potential development to create a regional attraction in the core of the city's business district.

The proposed \$150 million development project, called the Montgomery Quarter, included plans for retail, restaurants, office space, luxury condominiums and a boutique hotel. Along with the proposed development, the city saw an opportunity to create a gateway entry from Ronald Reagan Highway. Strand Associates, Inc. (Strand), was selected to evaluate alternatives that would accommodate the proposed Montgomery Quarter development, provide safe and efficient traffic operations and create an aesthetic entrance to the city at the intersection of Montgomery Road and Ronald Reagan Highway.

A preliminary traffic analysis included developing forecasted traffic volumes and evaluating several alternative intersections to eliminate the existing loop ramps. Projected growth rates were obtained from Ohio Department of Transportation (ODOT) and the metropolitan planning

(continued on page 16)

**Triko Valley 2021
Schramm Award
Over \$5 Million**

by Carl Ruf, PE, and Jeff Heimann, PE, Strand Associates, Inc., ASHE Triko Valley Section



The roundabout's design also made it possible for future development of 12 acres of adjacent land.

Pioneering Roundabout Improves Traffic Operations, Spurs Development

(continued from page 15)

organization, Ohio-Kentucky-Indiana Regional Council of Governments. Extensive trip generation and distribution calculations determined the additional traffic added by the proposed development. Three alternatives, including a roundabout, traffic signal and half diamond configuration, were analyzed using the forecasted traffic volumes. The analysis focused on traffic operations, footprint, cost, aesthetics, maintenance of traffic, safety and pedestrian/bicycle accommodation. The study concluded that a multi-lane roundabout was the preferred alternative.

An Interchange Operations Study (IOS) compared the roundabout to the existing condition. The study area for the IOS included six signalized intersections in addition to the roundabout. Those intersections were initially analyzed using the Highway Capacity Manual (HCS) in accordance with ODOT standards. By using Synchro software, the coordinated signal system was analyzed to determine coordination timings. Because the proposed roundabout has a three-lane entry, HCS software could not be used as an analysis tool. As a result, the roundabout was analyzed using the HCS equations in Sidra software. Additionally, Vissim software was used to verify the results of the previous modeling exercises.

The design required more than 56,000 cubic yards of fill to position the roundabout at approximately the same elevation as the previous bridge that carried Montgomery Road over Ronald Reagan Highway. Other design features included roadway widening, traffic signal upgrades and stormwater management features coordinated with the adjacent development. Additional work involved removal of the existing roadway bridge, signing, pavement marking and lighting.

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Pioneering Roundabout Improves Traffic Operations, Spurs Development

(continued from page 16)

A five-phased maintenance of traffic (MOT) plan allowed the contractor to complete the improvements without the closure of any local roadways or highway ramps. In addition to keeping the interchange open, the MOT plan addressed impacts to traffic along SR 126 to avoid excessive queue lengths and prevent backups at the I-71 interchange just five-tenths of a mile to the west. A portion of the previous loop ramps was improved to create a runaround of Montgomery Road to allow most of the roundabout to be built without disruption. The plan also included several temporary signals to control traffic during construction.

An extensive traffic analysis was performed for each of the five MOT phases of this congested interchange that served nearly 36,000 vehicles per day. Just before construction was completed, the roundabout was temporarily opened as a single-lane roundabout. This gave contractors room to build the center island. It also allowed drivers to become accustomed to the new intersection without overloading them with a new traffic pattern and the decisions that come with a multi-lane roundabout. After about a month, when drivers were more familiar with the new intersection, all lanes of the roundabout opened to traffic.

The federally funded transportation project required close coordination with various stakeholders, including utilities and the Montgomery Quarter development team. The public was engaged early in the design process to gain support for the project and keep everyone informed, as this was the first roundabout in the city. The roundabout design team worked closely with the city, ODOT and the developers to formulate and implement a public engagement plan. This involved creating video content and striping a paved scaled model of the roundabout for children and adults to “drive.”

The project, constructed over 18 months, took place immediately adjacent to the area where the development contractor worked at the same time. The final construction cost was \$7.5 million, and the roundabout opened to traffic on schedule in August 2021. The roundabout provided access to the Montgomery Quarter, the Montgomery Heritage District and Ronald Reagan Highway. It also gave access to an additional 12 acres of prime real estate at the southern gateway to Montgomery, allowing the city and developers to bring to life a mixed-use development. This project, over a decade in the making, took the first step toward Montgomery's goals of enhanced traffic operations and the potential for future development. 🇺🇸

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Bluegrass		\$ 0.00	\$ 0.00	\$ 1,000.00	\$ 1,000.00
Central Dacotah	\$ 0.00	\$ 1,000.00	\$ 0.00	\$ 0.00	\$ 3,000.00
Central Ohio	\$ 5,000.00	\$ 5,000.00	\$ 7,500.00	\$ 7,500.00	\$ 5,000.00
Cuyahoga Valley	\$ 4,000.00	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00	\$ 3,000.00
Derby City	\$ 0.00	\$ 0.00	\$ 0.00	\$ 1,500.00	\$ 1,200.00
Lake Erie	\$ 1,500.00	\$ 1,500.00	\$ 3,000.00	\$ 3,000.00	\$ 2,500.00
Northwest Ohio	\$ 3,000.00	\$ 3,000.00	\$ 0.00	\$ 0.00	\$ 0.00
Triko Valley	\$ 2,500.00	\$ 2,500.00	\$ 4,000.00	\$ 4,000.00	\$ 4,000.00
TOTAL	\$ 20,600.00	\$ 15,000.00	\$ 17,500.00	\$ 20,000.00	\$ 19,700.00
Mid-Atlantic Region					
Blue Ridge	\$ 0.00	\$ 3,500.00	\$ 0.00	\$ 0.00	\$ 0.00
Carolina Piedmont	\$ 0.00	\$ 0.00	\$ 2,500.00	\$ 1,250.00	\$ 0.00
Carolina Triangle	\$ 6,000.00	\$ 6,000.00	\$ 8,000.00	\$ 8,000.00	\$ 8,000.00
Chesapeake	\$ 9,000.00	\$ 9,000.00	\$ 0.00	\$ 20,000.00	\$ 13,000.00
Greater Hampton Roads	\$ 5,000.00	\$ 4,000.00	\$ 4,000.00	\$ 4,000.00	\$ 4,000.00
North Central West Virginia	\$ 4,500.00	\$ 4,500.00	\$ 6,000.00	\$ 0.00	\$ 0.00
Old Dominion	\$ 4,000.00	\$ 7,000.00	\$ 4,200.00	\$ 4,000.00	\$ 4,000.00
Potomac	\$ 5,000.00	\$ 5,500.00	\$ 6,000.00	\$ 6,000.00	\$ 8,000.00
South Carolina	N/A	N/A	N/A	N/A	\$ 0.00
TOTAL	\$ 33,500.00	\$ 39,500.00	\$ 30,700.00	\$ 43,250.00	\$37,000.00
Northeast Region					
Albany	\$ 4,000.00	\$ 2,500.00	\$ 3,000.00	\$ 1,000.00	\$ 3,000.00
Altoona	\$ 1,500.00	\$ 3,000.00	\$ 4,500.00	\$ 0.00	\$ 4,500.00
Central New York	\$ 500.00	\$ 500.00	\$ 1,000.00	\$ 0.00	\$ 0.00
Clearfield	\$ 5,000.00	\$ 4,500.00	\$ 5,500.00	\$ 5,500.00	\$ 5,500.00
Delaware Valley	\$ 10,000.00	\$ 15,000.00	\$ 12,000.00	\$ 12,000.00	\$ 11,250.00
East Penn	\$ 4,000.00	\$ 3,000.00	\$ 12,000.00	\$ 20,000.00	\$ 20,000.00
First State	\$ 9,000.00	\$ 13,000.00	\$ 15,000.00	\$ 15,000.00	\$ 15,000.00
Franklin	\$ 4,000.00	\$ 6,000.00	\$ 6,000.00	\$ 10,000.00	\$ 10,000.00
Harrisburg	\$ 12,000.00	\$ 20,000.00	\$ 24,000.00	\$ 27,000.00	\$ 26,000.00
Long Island	\$ 2,500.00	\$ 2,500.00	\$ 0.00	\$ 0.00	\$ 0.00
Mid-Allegheny	\$ 2,000.00	\$ 2,000.00	\$ 1,500.00	\$ 0.00	\$ 1,500.00
New York Metro	\$ 7,500.00	\$ 11,000.00	\$ 0.00	\$ 25,000.00	\$ 33,000.00
North Central New Jersey	\$ 14,500.00	\$ 15,500.00	\$ 15,000.00	\$ 8,000.00	\$ 15,000.00
North East Penn	\$ 11,000.00	\$ 12,500.00	\$ 70,000.00	\$ 20,000.00	\$ 20,000.00
Pittsburgh	\$ 2,000.00	\$ 2,500.00	\$ 4,000.00	\$ 2,500.00	\$ 0.00
Southern New Jersey	\$ 12,500.00	\$ 7,000.00	\$ 11,000.00	\$ 12,000.00	\$ 19,500.00
Southwest Penn	\$ 8,500.00	\$ 9,150.00	\$ 8,000.00	\$ 13,000.00	\$ 13,500.00
Williamsport	\$ 0.00	\$ 1,500.00	\$ 1,698.00	\$ 1,868.00	\$ 2,057.00
TOTAL	\$110,500.00	\$131,150.00	\$194,198.00	\$172,868.00	\$199,807.00
Southwest Region					
Central Texas	N/A	N/A	N/A	N/A	\$ 0.00
Dallas-Fort Worth	N/A	N/A	N/A	N/A	\$ 0.00
Houston	N/A	N/A	N/A	N/A	\$ 0.00
Phoenix Sonoran	\$ 4,000.00	\$ 7,500.00	\$ 9,000.00	\$ 9,500.00	\$ 10,000.00
TOTAL	\$ 4,000.00	\$ 7,500.00	\$ 9,000.00	\$ 9,500.00	\$ 10,000.00
Southeast Region					
Alabama	N/A	N/A	N/A	N/A	\$ 2,050.00
Central Florida	\$ 0.00	\$ 0.00	\$ 600.00	\$ 600.00	\$ 600.00
Georgia	\$ 4,500.00	\$ 3,000.00	\$ 6,000.00	\$ 6,000.00	\$ 6,000.00
Middle Tennessee	\$ 3,000.00	\$ 3,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00
Northeast Florida	\$ 14,500.00	\$ 5,000.00	\$ 11,500.00	\$ 0.00	\$ 19,494.70
South Florida	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
Tampa Bay		\$ 2,000.00	N/A	\$ 0.00	\$ 0.00
Tennessee Valley					
TOTAL	\$ 22,000.00	\$ 13,000.00	\$ 23,100.00	\$ 11,600.00	\$ 33,144.70



Region Totals
Great Lakes
\$211,800
Mid-Atlantic
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Northeast
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Southeast
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Climate change impacts are typically emphasized with images of wildfires, drought warnings and violent storms. However, changing weather patterns are causing havoc to 100-year-old “Main Street” infrastructure. Keansburg Borough and Hazlet Township, communities of less than 35,000 people in Monmouth County, NJ, have experienced significant rain events and full-moon high tides. As a result, flooding issues for the area’s Bridge R-12 and CR 7 (Monroe Avenue) have, at times, made the roadway impassable.

“During our first site visit, we witnessed flooding at the bridge and at the low point of CR 7, which is about 350 feet from the bridge,” said Sara Steib, PE, French & Parrello Associates (FPA). “We knew immediately we would have to raise the roadway and improve flow through the bridge opening. But there were also several major challenges to overcome.” These included:

- Ensuring compliance with New Jersey Department of Environmental Protection and other agency regulations
- Providing pedestrian access across the bridge
- Maintaining access to a residence less than 10 feet from the structure
- Handling right-of-way impacts
- Addressing several constructability concerns

FPA provided the design and is currently supporting reconstruction of Bridge R-12 on Monroe Avenue over Waackaack Creek. After signing plans in less than 18 months, FPA’s team has provided bridge and roadway engineering and design, surveying, geotechnical expertise, hydraulic and hydrologic analysis, environmental permitting and utility coordination. Work on the structure began earlier this year.

Constructed in 1927, Bridge R-12 is a 32-foot long, single span, supported by a reinforced concrete slab, and steel stringer super structure supported on reinforced concrete abutments. The wing walls are

(continued on page 24)



Existing bridge southwest parapet (upstream)



Backwall rebar under construction with Acrow bridge providing pedestrian access

Rising to the Occasion: Adapting Infra





Existing bridge southeast parapet (downstream)

Structure to Changing Weather Patterns

by Sarah Steib, PE, Discipline Manager, Bridges and Dams, French & Parrello Associates,
ASHE North Central New Jersey Section



North abutment under construction with Acrow bridge to provide pedestrian access



Box beam placement construction with Acrow bridge to provide access for pedestrians

Rising to the Occasion: Adapting Infrastructure to Changing Weather Patterns

(continued from page 22)

supported on timber planks. It has no skew. The bridge was classified as structurally deficient and functionally obsolete.

The new bridge is being widened to 38 feet, three inches out-to-out, and will maintain the existing 30-foot-wide roadway with a five-foot-wide sidewalk added on the north side. The new bridge will have precast concrete box beams supporting a cast-in-place concrete deck on full-height concrete abutments and footings founded on concrete-filled steel pipe piles. One design component involves placing the permanent cofferdam in front of the abutments and wingwalls for constructability purposes, limiting environmental disturbance and protecting against scour.

“There are quite a few design features that stand out,” said Jon Moren, PE, FPA’s Project Manager. “We were able to widen the bridge opening between the abutment walls to 60 feet, which increased the waterflow through the structure. We also provided permanent sheeting along the southeastern roadway to limit environmental disturbance to wetlands while raising the roadway. We could also handle the utility issues and provide sound decisions for permitting challenges.”

FPA’s design called for relocating 400 linear feet of an existing six-inch diameter gas main line via directional drilling from two upland jacking pits, as well as relocating 90 linear feet of existing 34.5-kilovolt overhead electrical wires.

Located in a Coastal Area Facility Review Act zone, the project also mapped coastal wetlands along the roadway and at the bridge. A Tidelands Claim Line was located to the east of the bridge. FPA’s team identified these elements early and ensured that all proper permitting documentation was submitted the first time to receive all permits without delay. 🇺🇸

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News From Across ASHE-Miles



ASHE Middle Tennessee Section Toasts Milestone

The ASHE Middle Tennessee Section finally hosted its inaugural Awards Banquet on July 29, after COVID-19 caused the event to be postponed from 2020. The banquet celebrated the Section's 15-year anniversary, highlighted past events and marked recent achievements.

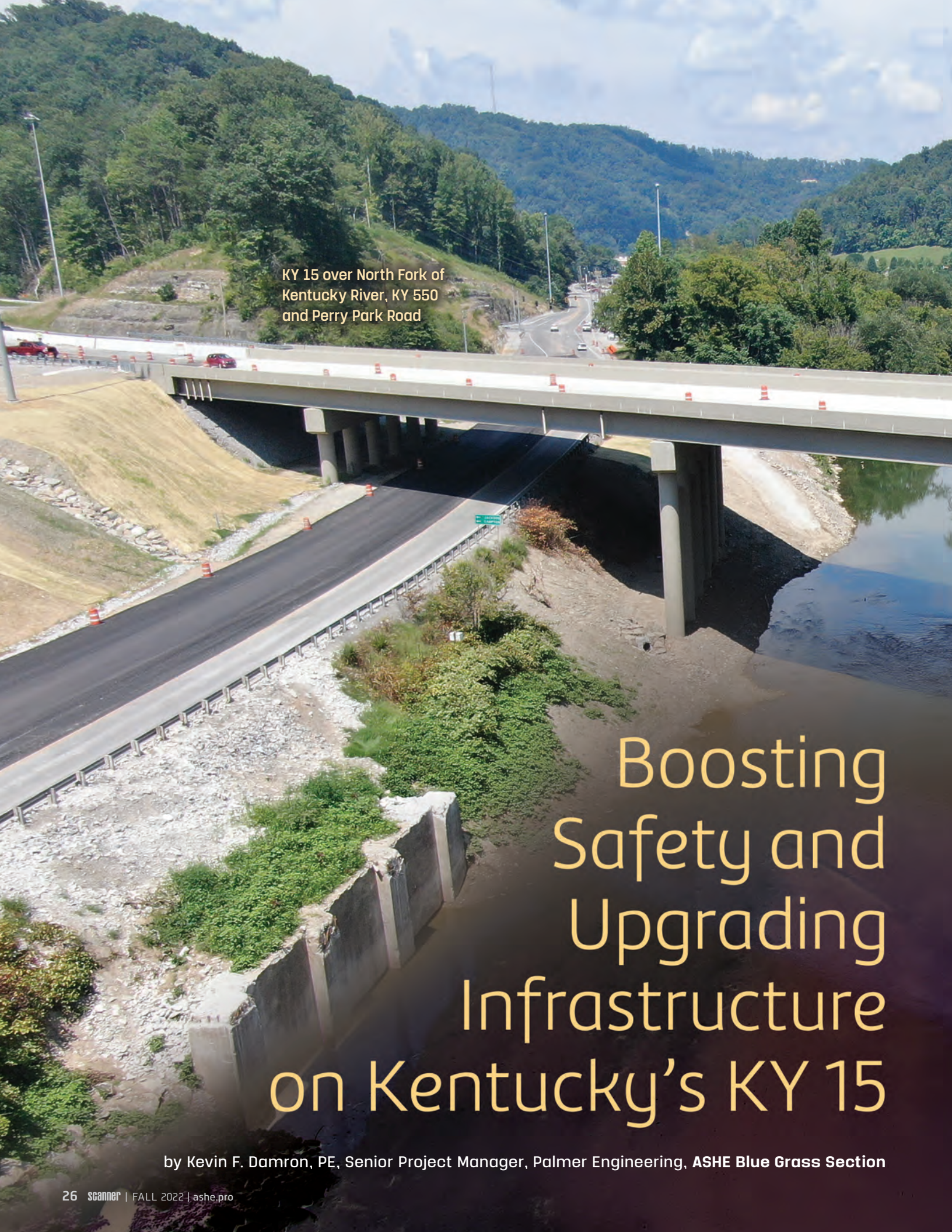
More than 100 transportation industry professionals gathered at the Bell Tower in Nashville to share stories about how the Section got its start, along with memories of early social gatherings. Several Charter Members received recognition, and a plaque honored the Section's Past Presidents for their contributions.

Two longtime members who are also current officers received recognition. The 2021 Member of the Year award went to Leanna Whitwell, and Jeff Shaver received the award for 2022. Out of several Tennessee project nominations, two stood out. The I-24/I-75 Interchange Design Build was awarded 2022 Project of the Year over \$20 Million, and the Composite "Smart" Bridge Deck Replacement received the award for 2022 Project of the Year under \$20 Million.

The Section created the ASHE Middle Tennessee Hall of Fame Award to honor members who have helped the organization grow to what it is today, continuing to provide support and guidance when needed. Recipients of the award, *shown at right*, included ASHE National Past President Larry Ridlen, Sharon Schutz, Brad Winkler and Joe Deering.

Special thanks to all the sponsors and members who made the banquet a success. 🇺🇸





KY 15 over North Fork of
Kentucky River, KY 550
and Perry Park Road

Boosting Safety and Upgrading Infrastructure on Kentucky's KY 15

by Kevin F. Damron, PE, Senior Project Manager, Palmer Engineering, ASHE Blue Grass Section



For drivers traveling between Morton Boulevard and the KY 15 Bypass in Hazard, KY, frequent crashes and congestion made it a dangerous road. The corridor was a vital arterial route into the Appalachian region of the state, which has historically lacked sufficient transportation infrastructure and system linkage. This section's geometric deficiencies and high traffic volumes further added to safety issues.

The Kentucky Transportation Cabinet (KYTC) selected Palmer Engineering (Palmer) to provide engineering and environmental services that would improve safety, upgrade geometrics and address capacity issues along the corridor. Proposed improvements included a five-lane typical section, a median barrier wall and improvements to both Perry Park Road and Morton Boulevard intersections. In addition to improving safety and relieving congestion, the project would contribute to the transportation infrastructure improvements needed to support and enhance economic vitality in eastern Kentucky.

The project involved multiple design activities, initiated by Palmer in 2012, including grade-separated intersections/interchanges at KY 550, Morton Boulevard and Perry Park Road.

It included the design of new bridges for Morton Boulevard over KY 15 and a new bridge over the North Fork of the Kentucky River that also spans Perry Park Road. Pavement designs for the corridor consisted of an overlay for the existing KY 15 corridor, widening strategies for KY 15 and ramp pavements for the KY 550 and Morton Boulevard ramps.

Overlay designs entailed coordination with the Kentucky Transportation Center to use ground-penetrating radar and falling weight deflectometer testing results to minimize overlay thickness along the corridor. A substantial false cut was created parallel to the highway by stacking and benching a significant portion of the excess material due to the limited locations near the project. A special study was required for the KY 15 intersection with Morton Boulevard, where all traffic movements were not permitted at that time. Vissim software was used to model existing, no-build and proposed conditions. The simulations were used at a public meeting to portray proposed alternatives. Measures of effectiveness aided in selecting the preferred alternative, and the project was awarded to Bizzack Construction, LLC, in January 2018.

(continued on page 28)



Roadway Design
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Boosting Safety and Upgrading Infrastructure on Kentucky's KY 15 *(continued from page 27)*

Structures designed for the project included two PCI-beam bridges, a culvert extension, a retaining wall and a layout for over 200 feet of mechanically stabilized earth (MSE) wall. The most prominent structure on the project carried KY 15 over Perry Park Road, the North Fork of the Kentucky River and KY 550. With a length of 700 feet, the five-span, 93-foot-wide structure carried five lanes of traffic and was skewed 40 degrees to parallel the river. Piers were founded below the anticipated scour depths on large-diameter drilled shafts that transitioned to individual columns. Large breast wall abutments bookended the bridge, one founded on spread footings and the other on driven piles. Hybrid beams were selected to minimize superstructure depth to help meet vertical clearance requirements for the roads underneath.

Another PCI-beam bridge was constructed at the Morton Boulevard interchange. This two-span, 150-foot-long structure also featured low-profile, hybrid beams to meet vertical clearance requirements over KY 15. The substructure consisted of integral abutments independently founded on driven piles behind MSE walls with a pier in the median of KY 15 founded on drilled shafts.

Reconfiguration of Ramp A leading to KY 550 required a 320-foot-long extension of the existing five-foot by four-foot reinforced concrete box culvert below KY 15. The new geometry required a change in grade from the current to the new culvert by over three percent. To provide necessary sight distance, the access to businesses on Willies Way along the new KY 15 alignment required reconfiguration. This resulted in the design of a 150-foot-long cantilever retaining wall paralleling the new horizontally curved entrance. The wall's footing was stepped to maintain access to Willies Way during construction, minimizing any excavation behind the wall.

Finally, the MSE walls wrapping the integral abutments of the Morton Boulevard Bridge extended 200 feet behind Abutment 1, allowing for the new slip ramp that provided access from Morton Boulevard to KY 15. Palmer chose an MSE wall configuration for economic benefits rather than extending the bridge. It also facilitated interchange geometry since the roadway surface above the MSE wall could be easily graded to accommodate any roadway template.

Palmer was involved in all project phases, including the environmental, right-of-way acquisitions and utility relocations. The company's environmental baseline studies included



socioeconomic, terrestrial and aquatic biology, underground storage tanks/hazardous materials, air, noise and cultural resources. An environmental overview was completed, and a Categorical Exclusion Level III document was approved by the Federal Highway Administration.

The project included a socioeconomic analysis for up to 36 residential relocations. Palmer bought the right-of-way for the project, including the acquisition of a carpet store and temporary easements for waste sites. Palmer also relocated a cluster of family members whose homes had to be acquired to construct the project. The firm assisted KYTC's District 10 with the utility relocation coordination, taking all utility plans from various companies and overlaying them together over the roadway set to look for constructability issues and utility conflicts. The Palmer team also orchestrated group coordination meetings with all utility companies to examine the complexities and develop constructible utility relocation plans. Those plans for water and two separate sewer companies were included with the project and relocated by the highway contractor.

Palmer's final work included signing, lighting and utility plans from two utility districts, structure plans for two bridges and two retaining walls and signal plans. The project also included

a mandatory pre-bid meeting to address construction issues that would impact traffic in the narrow corridor.

The roadway opened to traffic November 2021 at a final cost of \$44,508,580. At the project's completion, Aric Skaggs, District 10 Project Development Branch Manager, said, "In



Construction on SR 15





less than six years, this complicated project was fully developed and put out on the street for bids. Pretty remarkable for a one-and-one-quarter-mile section of highway with no viable detour and three interchanges." 🇺🇸



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Pictured, from left:
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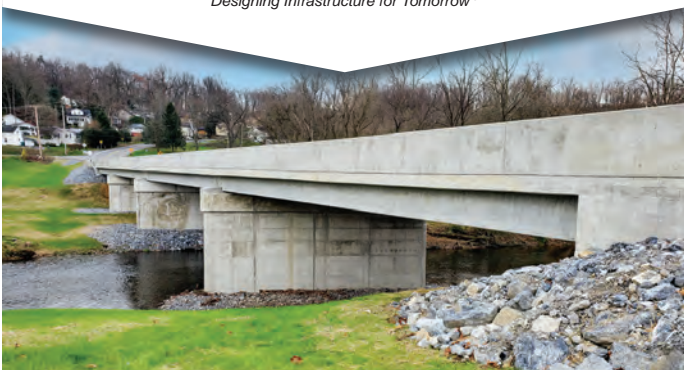
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East Penn	112
First State	198
Franklin	123
Harrisburg	369
Long Island	47
Mid-Allegheny	126
New York Metro	134
North Central New Jersey	136
North East Penn	134
Pittsburgh	523
Southern New Jersey	170
Southwest Penn	271
Williamsport	76

Subtotal 3,267

Mid-Atlantic Region

SECTIONS

Blue Ridge	64
Carolina Piedmont	68
Carolina Triangle	216
Chesapeake	281
Greater Hampton Roads	83
North Central West Virginia	51
Old Dominion	87
Potomac	157
South Carolina	101

Subtotal 1,108

Southeast Region

SECTIONS

Alabama	55
Central Florida	85
Georgia	541
Middle Tennessee	298
Northeast Florida	181
South Florida	11
Tampa Bay	46
Tennessee Valley	106

Subtotal 1,323

Great Lakes Region

SECTIONS

Bluegrass	95
Central Dacotah	96
Central Ohio	194
Cuyahoga Valley	106
Derby City	85
Lake Erie	209
Northwest Ohio	48
Triko Valley	158

Subtotal 991

Southwest Region

SECTIONS

Central Texas	71
Dallas-Fort Worth	35
Houston	101
Phoenix Sonoran	135

Subtotal 342

National Total

7,031

Professional Status	56%
Government	12%
Consultant	75%
Contractor	5%
Other	8%

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