



Dallas, TX

**The Northaven
Trail Bridge
connects bike
and pedestrian
trails over
US 75**

See page 45

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Provide a forum for members and partners of the highway industry to promote a safe, efficient and sustainable transportation system through education, innovation and fellowship.

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Donato Di Zuzio, PE
ASHE National President 2024-2025



New Directions

I am honored to join a dedicated group of ASHE Presidents. This year marks my 30th year as a member of this organization. I want to thank all of you in advance for the trust and support you are giving me for the 2024-25 year. I also want to acknowledge immediate National Past President Stan Harris for the leadership he provided during his term and time on the Board. My primary goal is to continue growing the membership by supporting the Sections and Regions. Last year the National Board, led by Kathryn Fink, approved the 2023-26 Strategic Plan. We provided funds to the Regions for future growth, under Jim Shea's leadership. Now we are creating an ASHE National Scholarship Foundation, headed by Glen Kartalis, and this will fund a yearly national scholarship for the next generation of leaders.

We will continue to charter new Sections, as we did for Colorado in May. We have initiated the process for a Kansas City Section and a San Antonio Section as potential new locations. The committee has also established contacts for future Boston and Hartford locations. Brian O'Connor has taken over the committee from Sam Mody, our new Treasurer, who was instrumental in chartering several new Sections over the last 13 years. I look forward to working with you all.

For the first time in our history, we presented the SAY (Scanner Article of the Year) Awards during the Luncheon Honoring National Past Presidents at the recent National Conference. Articles submitted from the past year were scored and selected by the Scanner Committee to receive recognition. In addition, Conference attendees voted on their favorite article from the past year. The one with the most votes received the People's Choice Award, presented at the President's Banquet. I encourage all Sections to submit articles to the scanner and join the friendly competition for next year's awards. Thanks to Rhonda Cardone for leading this initiative.

The work demonstrated by all the individuals I have mentioned helps build our organization. I appreciate the commitment of everyone on their respective committees, the reason this is the best organization in our industry. I want to thank all for serving in a leadership capacity, especially in recognition of the fact that everyone is a volunteer.

These initiatives are components of our three-year strategic plan. An important part of my focus will be to reinforce this organization's mission statement: to provide a forum for members and partners of the transportation industry to promote the advancement of a safe, efficient and sustainable transportation system through education, innovation and fellowship. We will continue to strengthen ASHE core values, such as inclusivity, transparency, accountability and communication, in addition to innovation and education excellence.

Please step up and do your part. Join and become active in ASHE committees. Encourage nonmembers to become part of ASHE. The rewards are priceless. I offer my support and that of the National Board to any member, Sections or Regions that may need it. 🇺🇸

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From scanner's Chair

The journey to success can be filled with challenges and uncertainties, but at *scanner*, we are committed to navigating this path with determination and inspiration. We invite YOU to join us on this exciting journey!

This year marked the inaugural SAY Awards Program for the *Scanner* Article of the Year, unveiled at the 2024 ASHE National Conference in Raleigh, NC. Out of 27 articles evaluated across four issues of *scanner* magazine, summer and fall 2023 and winter and spring 2024, four exceptional pieces received recognition. These articles were evaluated for their contribution to the engineering field, value to the community, innovation, photographic excellence, connection to content, distinctiveness and alignment with the ASHE Strategic Plan Objectives. Presentation of the awards took place during the Luncheon Honoring Past National Presidents on Friday, June 7. Additionally, we engaged all Conference attendees in the selection process for the People's Choice Award by providing a QR code for convenient voting. The winner was honored at the President's Reception Banquet on Saturday, June 8.

Moving forward, the SAY Awards Program will be a standard feature of *scanner*, with all submitted articles eligible for consideration. There is a wave of exciting developments at this magazine, and we encourage you to contribute your articles, share your local and regional news and be a part of our collective success story!

Congratulations to all our winners and participants. Your contributions are what make *scanner* a beacon in the advancement of knowledge and innovation in the transportation engineering community.

Scanner
Article of the Year
AWARD

Champion Award (1st Place):

"City Walk BHAM: Creating New Connections" - Fall 2023 issue, by Janie Mauter, Barge Design Solutions, **ASHE Alabama Section, ASHE Southeast Region**
Miles Watkins accepted the Award

Platinum Award (2nd Place):

"The Casho Mill Road Clankers: Stop Now or...KABOOM!" - Fall 2023 issue by Matt Buckley, Whitman, Requardt and Associates, **ASHE First State Section, ASHE Northeast Region**
Brian Kisner accepted the Award

Gold Award (3rd Place):

"Unmanned Aerial Systems: Useful Above and Below a Surface" - Winter 2024 issue, by Douglas Ford, Tennessee Department of Transportation, **ASHE Tennessee Valley Section, ASHE Southeast Region**

Humanitarian Award:

"For Humanitarian Engineering: San Jose del Guano's Pedestrian Bridge" - Spring 2024 issue, by Daniel Jordan, HDR, **ASHE Middle Tennessee Section, ASHE Southeast Region**

PEOPLE'S CHOICE *Award*

"Complete Streets, Roads, and Highways Manual, Developed by Kentucky Transportation Cabinet" - Summer 2023 issue, by Katie Rowe and Jeremy Kubac, Gresham Smith, Past President of ASHE Derby City Section, **ASHE Derby City Section, ASHE Great Lakes Region**
Dave Stills accepted the Award



Rhonda Cardone, *scanner* Chairwoman
ASHE New York Metro Section





Streetscape Improvements Add Safety, Amenities for a Downtown

by Jared R. Kaelin, PLA, ASLA, and John Eckler, PE,
Gresham Smith, **ASHE Derby City Section**

The Downtown Danville Streetscape Project provided safer sidewalks and created more space between pedestrians and traffic.



Danville, KY, a small city of 16,000 people, also includes Centre College and Ephraim McDowell Regional Medical Center. The need for streetscape improvements originated from the Downtown Danville Master Plan, with a study area focusing on three main corridors: Main, Third and Fourth Streets. Running north to south and east to west through the heart of downtown, they made up most of that area, offering opportunities for improvement. The plan's primary goals were to increase pedestrian safety and encourage slower traffic.

Danville's pride in its neighborhoods, college and local history helped underscore a core aspect of the plan: downtown Danville should serve as the focal point for regional tourism, connecting everyone to the city through placemaking, trails, public art, civic programming and storytelling. The Downtown Danville Streetscape Project began in the summer of 2022.

For the master plan, Gresham Smith co-led an eight-month planning process, speaking with residents, business owners and institutional leaders to identify opportunities for improving Danville's future. Engaging with the community helped bring out diverse perspectives and identified new opportunities to reimagine downtown. Meetings with the community spurred discussion about challenges and ideas involved with the plan, setting the tone for advancing the project.

As part of stakeholder engagement, an understanding of the story that the community wanted to tell was critical. One aspect was the historical context of downtown. Through interviews and tours with the Danville-Boyle County African American Historical Society (DBCAAHS) and other community members, the team

learned about Danville before it underwent urban renewal. It involved many Black-owned businesses and buildings along Second Street. By working with DBCAAHS as well as landscape architecture students from North Carolina Agricultural and Technical State University, the team developed concepts for incorporating design elements that shared the history of the Black communities, businesses

(continued on page 8)



Danville's leaders saw the need to put people first and make its downtown safer and more inviting.



Streetscape Improvements Add Safety, Amenities for a Downtown

(continued from page 7)

Danville's enhanced Main Street is not only safer for pedestrians but also encourages people to walk more. Wider sidewalks and shorter crosswalks made the corridor more welcoming.

and people who played a role in Danville's story. The result of this work was incorporated into placemaking projects, such as the downtown streetscape project.

Downtown Danville had been experiencing a higher-than-expected rate of crashes, especially for pedestrians. To reverse this trend, an idea, evaluated initially through the installation of temporary parklets, showed the potential of downtown Danville with an activated public realm and streets full of energy and commerce.

With the guiding principles revolving around safety and supporting local businesses, the streetscape project's design took a Complete Streets approach and prioritized space for pedestrians, dieting vehicular travel lanes and tightening

intersection radii to shorten crosswalk distances and widen sidewalks.

As Kentucky Transportation Cabinet (KYTC) owned Main, Third and Fourth Streets, it served as a stakeholder in the project. With KYTC's collaboration, the project helped transform core downtown Danville streets and sidewalks into a place that encouraged and protected pedestrian traffic. It is also where small businesses could engage with customers in an environment where everyone felt safer and more welcome.

Distinct features of the new corridors included wide, aesthetically designed sidewalks, enhanced street and sidewalk lighting and tree canopies and functional landscaping. Also included are street furniture and other amenities, along with

upgraded pedestrian signal infrastructure. The project activated the underutilized open public spaces to create an entertainment and business district to help stimulate redevelopment through cohesion between such institutions as Centre College and the City of Danville.

Stakeholders for the \$7.5 million project held a public ribbon cutting in February of this year. The redesign of Main Street illustrated the power of a connected community. New partnerships have formed, and existing collaborations strengthened. From the City proactively purchasing land for development, to Centre College exploring new investment opportunities, the alliance among stakeholders is helping to build a better downtown Danville. 🇺🇸

Intelligent Transportation Systems: Are you ready?

Middle Tennessee's momentum demands cutting-edge ITS.

Kenny Freer

CEI Practice Leader

Vehicular traffic is on the rise everywhere. Construction costs are increasing every day, and, in many cases, the option of adding right-of-way is just not there. DOT's are having to think differently than they used to. Safety and mobility are being improved using intelligent transportation systems, rather than adding lanes. TDOT and local governments are starting to implement the latest technology, and RaganSmith is excited to be a part of that movement.

What challenges do you face when integrating ITS into highway projects?

Many are intimidated by much of this new technology, and resistant to implement it until there is a clear track record of its benefits. In many respects, it takes the buy-in of the traveling public for the technology to really pay off. Take for example the use of variable speed limits, which reduce stop-and-go traffic and allow for more uniform speeds in heavy traffic areas. As more and more drivers abide by these decreased limits the results will improve more and more.

What role do you see RaganSmith playing in the future of ITS?

RaganSmith has called Tennessee home for over 90 years and has worked with TDOT for over 35 years. Over the years RaganSmith has grown to have offices in Chattanooga and Murfreesboro and has worked with TDOT and multiple municipalities across the State. A full range of services are offered, including survey, environmental, transportation planning, engineering, landscape architecture, design, and CEI.

At RaganSmith, we recognize that implementation of properly designed and constructed ITS components can make roadways safer and allow increased traffic efficiency. We have been fortunate to be on the leading edge of ITS construction in Tennessee, and we look forward to being involved in taking the new technology statewide.



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News From Across ASHE-Miles

ASHE Middle Tennessee Section Presents Awards



Left to right: ASHE Middle Tennessee Section Second Vice President Matt Zlokovich with Project of the Year Award winners Donald McCrary, Mark Holleran and Ben Coles, all of Gresham Smith; Ashley Smith, CDM Smith; and Nate Pickering, LDA Engineering.

ASHE Middle Tennessee Section hosted its first Awards Dinner Banquet in Nashville, TN. The January event featured presentations by recipients of the 2023 Project of the Year Awards, both over and under \$20 million.

Winner of the Project of the Year Award over \$20 Million was **Gresham Smith**, for the Broadway Viaduct Bridge Replacement (BVBR) in Nashville, TN. The construction took place on a busy corridor through downtown Nashville. Built in 1948, the existing bridge showed signs of deterioration. The project, begun in July 2023, was also located near developments,

historic sites and active CSX rail lines, presenting challenges for the Tennessee Department of Transportation (TDOT).

The original structure was approximately 700 feet long and 98 feet wide, composed of structural steel beams and support columns. The roadway consisted of six 10-foot travel lanes (three in each direction), one 12-foot center turn lane and 10-foot sidewalks. The replacement structure remained on the same alignment and general width of the existing structure.

The roadway configuration changed slightly by maintaining the six 10-foot travel lanes, but it also received an eight-foot striped median with one-foot shoulders, curb and gutter. Construction increased the width of the sidewalks to 11-foot, eight-inch sidewalks. The additional space allowed for planters on the sidewalk to separate vehicular and pedestrian traffic, providing another layer of protection for walkers and other multimodal users.

To expedite project delivery, TDOT used Accelerated Bridge Construction (ABC) techniques and completed the project using a Construction Manager/General Contractor (CM/GC) contract. ABC's planning, design, materials and construction techniques can provide a safer, more cost-effective way to reduce the on-site construction time of building, replacing or rehabilitating bridges. It often uses precast or hybrid cast-in-place bridge elements. The CM/GC project delivery method involves a contractor in the design and construction phases of the project. The partnership between TDOT, the Designer and Contractor reduced risks and improved constructability with the project.

The **winners of the Project of the Year Award under \$20 Million** were **CDM Smith** and **LDA Engineering** for Nashville's Twelfth Avenue South Complete Streets Project. The City of Nashville in 2017 initiated a Walk-n-Bike master plan for the city. The section of Twelfth Avenue South between the Gulch and the





12 South neighborhoods ranked as the number one bikeway project priority in Nashville. Although there were already bike lanes in most of that section, they did not provide a bike connection that was safe and comfortable for all ages and abilities.

The project for 12th Avenue South included bike lanes physically protected from traffic along the entire route. The lanes are separated from the driving lanes with bioswales (vegetated islands that manage stormwater). These also provide the benefit of protecting



the bikeway and adding landscaping. The project improved bus stops, added more crossings and upgraded existing ones (including flashing beacons) for pedestrians and those using mobility devices. The roadway was also repaved and restriped. The Twelfth Avenue South project represented one of Nashville's first Complete Streets designs.

Both project teams representing the award winners had attended community meetings to present the project details and engage community members. The commitment to public outreach and incorporation of their feedback, where possible, helped make ASHE Middle Tennessee Section's award-winning projects successful.



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ASHE Colorado Section Chartered in May

The ASHE New Section Committee welcomed ASHE Colorado Section to the ASHE Southwest Region. Several members representing the ASHE National Board, ASHE Southwest Region and ASHE New Section Committee attended the May 8 formal chartering event in Lone Tree, CO. The group became the organization's 49th Section and the sixth one west of the Mississippi. Thanks to all for your assistance in the formation of ASHE Colorado Section! 🇺🇸

Charter ASHE Colorado Section Board

President: Josh Hollon, Kiewit

Vice President: Lee A. Kunselman, PE, PMP, Atlas

Treasurer: Marie Thoming, PE, City and
County of Denver

Secretary: Mike Cates, AECOM

Regional Director: Evan Fischgrund, PE, ADS

Director: Tanmay Tripathi, PE, ENV SP, Kiewit

Director: Jordan Falzetti, PE, Atkins

Director: Michael Tanner, PE, CFM, Colorado
Department of Transportation



Josh Hollon, ASHE Colorado Section President, signed the charter.



The charter received the signature of ASHE Colorado Section Treasurer Marie Thoming.



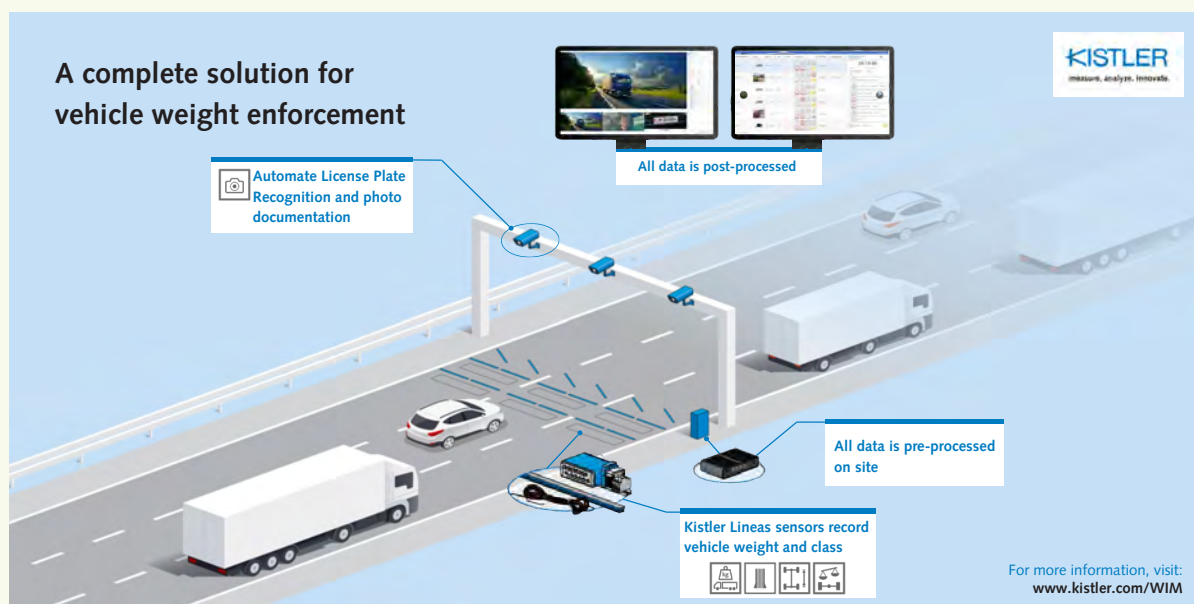
ASHE Colorado Section Charter Board members and guests display the ASHE Colorado Section Banner.

Automated Enforcement of Weigh-In-Motion Pilot Program

by Tanvi Pandya, PE, DBIA, New York City Department of Transportation, **ASHE New York Metro Section**

The impact of overweight vehicles on infrastructure is a nation-wide crisis. Deteriorating conditions threaten cities, economies and most important, lives. Studies state that one in five miles of U.S. highways are in poor condition, and vehicles traveling with excess weight, or overweight vehicles, are a major contributor. Vehicles with heavy axle loads inflict more damage on roads. For example, a 40-ton truck with eight axles causes 625 times more road damage than a two-ton passenger sedan with two axles.

New York State authorized New York City to deploy the Weigh-In-Motion (WIM) system technology on a section of the Brooklyn Queens Expressway under a pilot program, resulting in a significant reduction of overweight vehicles. The governing calibration certification standards are covered in the National Institute of Standards and Technology (NIST) Handbook 44. This handbook is undergoing amendment to include WIM systems for direct enforcement. The WIM



system road sensors determine the weight of vehicles in motion; equipment associated with the sensors then issues violations directly to the owners. This frees up enforcement personnel to focus on other safety-related events.

Officials from each state's Department of Agriculture, along with other enforcement officials, will vote on updating the NIST Handbook 44 (for more details, visit <https://www.ncwm.com/standards-dev>). This vote to include WIM technology for direct enforcement of weight limits will take place July 17, 2024, at the National Conference on Weights and Measures annual meeting. People should communicate to their state voting officials the value of the option for direct enforcement using WIM prior to the meeting. In this way, officials will recognize the importance of WIM within their jurisdiction. To contact a state voting official, find their information at <https://www.nist.gov/pml/owm/external-resources-weights-and-measures/state-weights-and-measures-directors>.

New York City can provide additional information for further discussions in other areas throughout the U.S. For additional information, email tpandya@dot.nyc.gov. 🇺🇸

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Creative Urban Space Design

by Chris Hoff, PE, Jacobs, ASHE Dallas-Fort Worth Section



When community leaders looked at the Dallas cityscape, they saw a vital but noisy freeway dividing downtown from the adjacent fast-growing uptown district. For decades the busy Woodall Rodgers Freeway, Texas Department of Transportation (TxDOT) Spur 366, served as an east-west link between I-35E and US 75. It was also a barrier between the downtown commercial/arts district and a rejuvenated uptown of neighborhoods, offices and mixed-use developments.

Planners envisioned a “deck park” that would span a below-ground portion of the freeway, converting the roadway into a tunnel-like passage, creating a

safe, walkable open-air space to link the two districts. By creating the park, Dallas hoped to transform part of downtown.

Transformational Thinking

When first tackling the issue of the freeway barrier, community leaders knew it required a creative solution. The goal of the seven-year development effort was to create a design that would transform a highway right-of-way into a multiuse urban park. Along the way, planners confronted complex issues, including basic mobilization. To address these, the Woodall Rodgers Park Foundation (WRPF), established in 2005, encouraged private sector support and funding of the park.

A hybrid design included a bridge, tunnel, building and park, all situated in a limited and congested urban space. Energy-efficient features would help reduce storm runoff and the demand for electrical power and water. The newly enclosed traffic tunnel would need precise clearances, jet fans for ventilation, lighting and high-end fire protection systems.

The project, begun in 2009, required close coordination among many teams, and construction would take place amid the movement of a major metropolitan center. That called for partnership between civic and private sector leaders, and with local and state transportation agencies, resulting

Revitalizes Dallas



in the formation of a \$110 million Public/Private Partnership.

WRPF also called on urban engineering specialists at Jacobs, who conducted an engineering and financial feasibility study and prepared a schematic design for the deck park. Those efforts included park planning, traffic analysis, cost estimates and preliminary concepts for structural and civil components and utility relocations. The team also coordinated development-related meetings and reviews, as the stakeholders in the Public/Private Partnership effort refined and finalized plans for the urban space.

The project team determined that the one element that would

most impact the traveling public also had a significant impact on duration of the construction schedule and cost. Erecting the beams and panels for the park's foundation required closing the Woodall Rodgers Freeway to traffic. TxDOT had to strike a balance between the need for closures and the need to provide continued traffic flow for adjacent businesses, the arts district and commuters. To do this, it used a detailed construction schedule to quantify how the contract duration could be shortened by allowing multiday full freeway closures. TxDOT modified the district's lane-rental procedures to allow for a set number of closures and allowed

the contractor to pay for any additional closures required.

Each box beam in the project was an unusual design that required delivery in a specific order to the project site. A large amount (compared to other TxDOT projects) of electrical systems had to be put in place. Beam installation had to coincide with positioning of the fire emergency systems, so that when the freeway became a "tunnel," these systems were in place to protect drivers. Installation of the systems had to take place without additional traffic interruption.

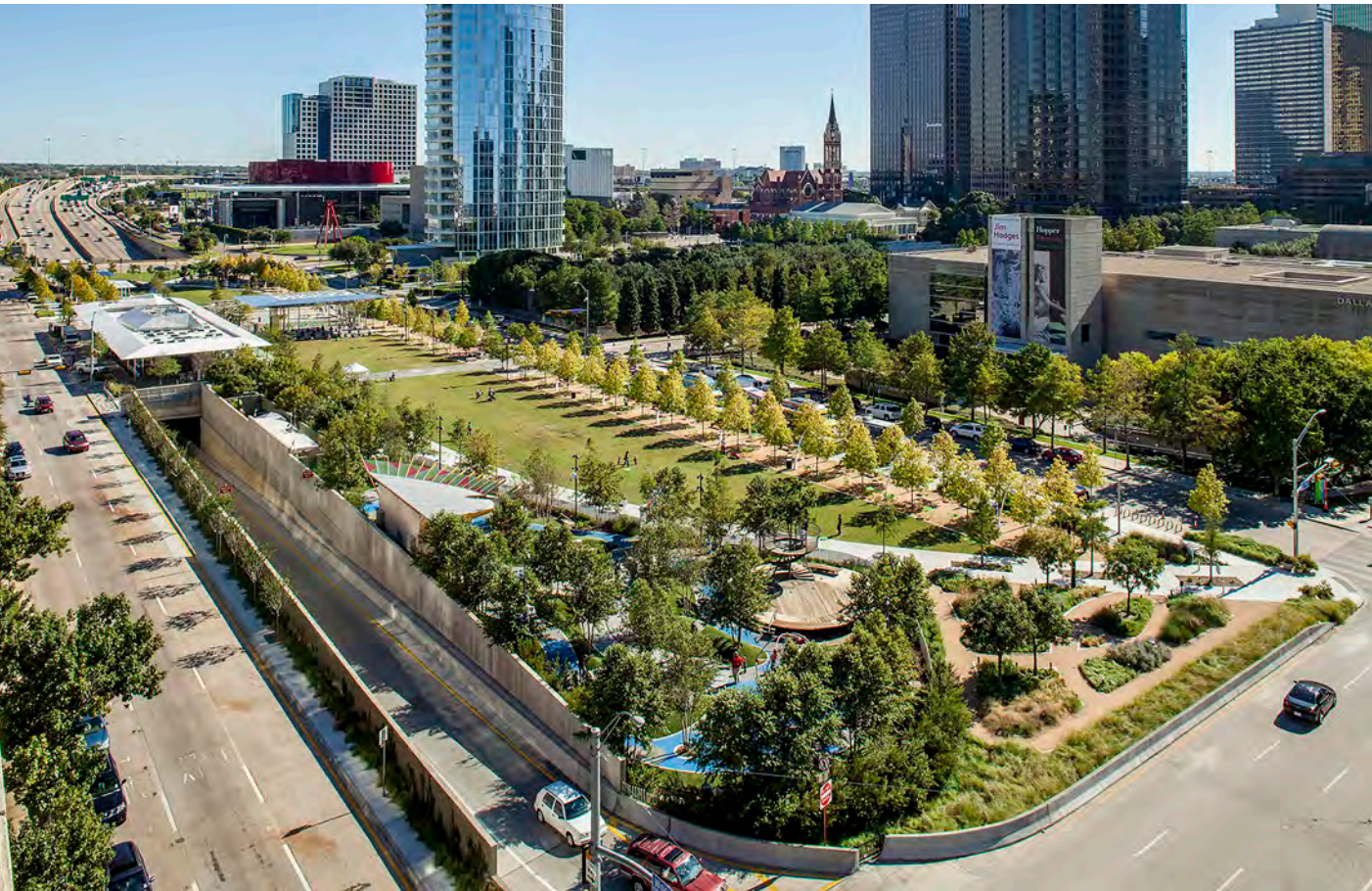
Urban Connections

The five-and-two-tenth-acre Klyde Warren Park, situated above

(continued on page 18)

Creative Urban Space Design Revitalizes Dallas

(continued from page 17)



Klyde Warren Park over Woodall Rodgers Freeway in Dallas, TX

the existing below-ground section of Woodall Rodgers Freeway, covers that corridor for several city blocks. The project included permanently closing one street to create the deck park and rebuilding a key exit ramp to allow better traffic flow. The freeway itself now travels through a safe, well-lit tunnel.

The design left the roadway mostly unaffected, thus avoiding rebuilding costs for new pavement and drainage. Low-profile precast concrete box beams were grouped to balance the clearance below and the street level surface above, forming trenches for trees and utilities between groupings.

The park itself created new space for a lawn and botanical garden, children's playground, dog park and open-air pavilion for concerts and other performances. Since the park's opening in October 2012, an estimated one million-

plus visitors have enjoyed this green space.

The project transformed highway right-of-way into a multimodal environment supporting dense mixed-use development. The frequent use of the Klyde Warren Park is evidence of its success in promoting surrounding community and neighborhood events. It serves as a regional destination, reflecting the character of downtown Dallas as part of a progressive city of the 21st century.

The completion of this project was a result of collaboration between Jacobs, WRPf, the City of Dallas and TxDOT. The conversion of a busy downtown freeway into an open-air space has stimulated tourism and new jobs and increased nearby property values. Best of all, this solution physically reconnected

two of the city's most vibrant central districts.

Building on the success of the first phase of Klyde Warren Park, WRPf is preparing the design for Phase Two expansion. It will extend the existing pedestrian cap/deck park, creating additional space between Pearl Street and west of Akard Street. As with Phase One, it will be funded by the public/private partnership of WRPf, North Central Texas Council of Governments, City of Dallas and TxDOT. The region's Metropolitan Planning Organization, part of the North Central Texas Council of Governments, was awarded \$80 million to help fund projects that seek to reknit communities divided by the construction of major roadways. Klyde Warren Park will receive \$20 million of the award for the Phase Two expansion project. 🇺🇸

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We encourage innovative, educational and informative topics related to all project phases for all transportation modes, including: Planning & Innovation, Environmental, Design and Construction.

Submit Abstracts by 10/31/24 to:
2025asheconference@gmail.com

Name your abstract: 2025ASHE-(yoursur-name)-Topic (Example: 2025ASHE-Smith-Connected_Vehicles)

Each submitted abstract must be in English, fit on one page, and include:

- 1) Topic: General presentation description
- 2) Track: Planning & Innovation, Environmental, Design or Construction
- 3) Presentation Abstract: 250 words maximum
- 4) Contact: Presenter's name, company, address, phone number, email address
- 5) Preferred Duration: 7 mins (Lightning*) ; 20-25 mins (1/2 cr) ; 45-50 mins (1 cr)

**** Submit by email with correct naming convention**

NEW BRIDGE

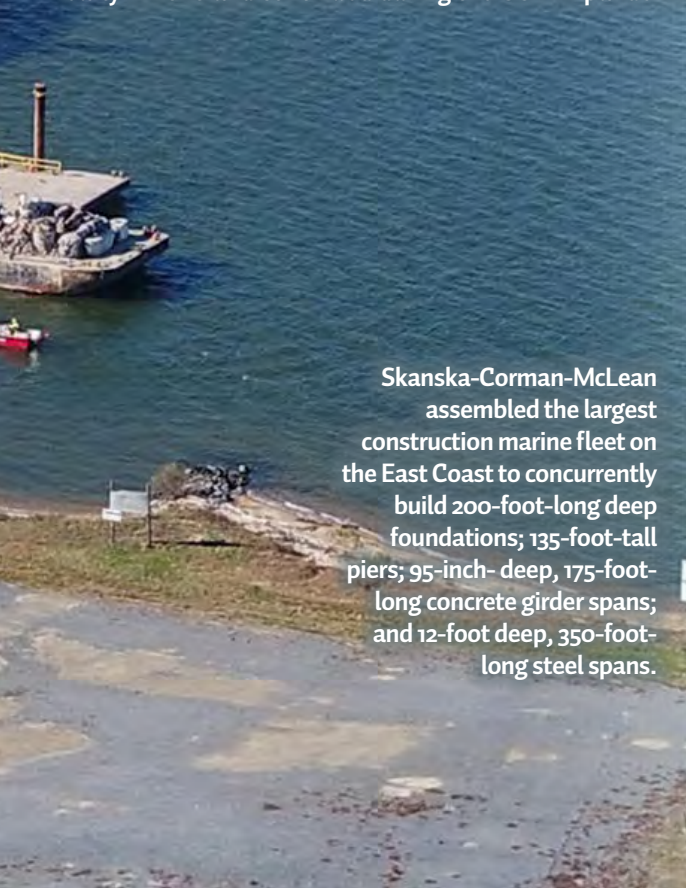
Doubles Capacity, Improves Safety and Emergency Response

by Denila Deliallisi, PE, and Steve Matty, PE, AECOM
ASHE Chesapeake Section

The new four-lane Nice-Middleton Bridge replaced the existing nearly two-mile-long, two-lane bridge that opened in 1940.



Designed and permitted in 11 months, construction began early in 2020 and continued during the COVID pandemic.



Skanska-Corman-McLean assembled the largest construction marine fleet on the East Coast to concurrently build 200-foot-long deep foundations; 135-foot-tall piers; 95-inch-deep, 175-foot-long concrete girder spans; and 12-foot-deep, 350-foot-long steel spans.



The new Governor Harry W. Nice/Senator Thomas “Mac” Middleton Bridge (Nice-Middleton Bridge) brought faster and safer vehicle travel to a key gateway over the Potomac River between Charles County, MD, and King George County, VA. AECOM, serving as lead designer, and its subconsultants partnered with the Skanska-Corman-McLean Joint Venture contractor for this first Design-Build project for Maryland Transportation Authority (MDTA).

After eight decades of reliable service, the original bridge owned by MDTA had become a bottleneck along US 301; four lanes of traffic had to merge into two lanes to cross the bridge, resulting in lengthy queues. Temporary lane closures and flaggers were required on the original bridge during each bridge inspection. That posed a significant safety concern for the inspection team and exacerbated traffic delays for the traveling public.

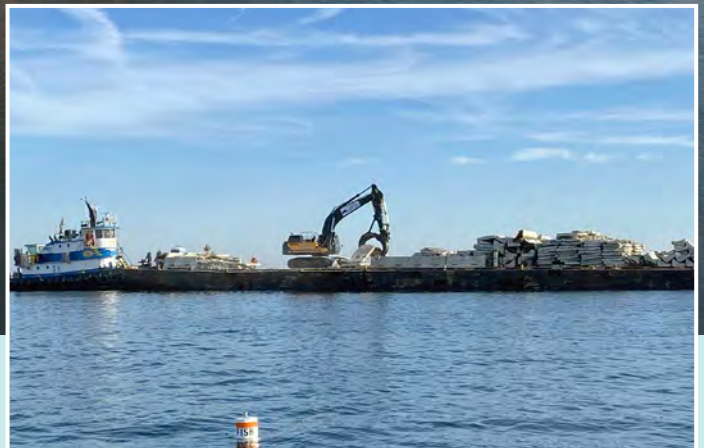
The Nice-Middleton Bridge project replaced the existing two-mile-long, two-lane bridge with a 61-foot-wide, four-lane concrete and steel bridge, alleviating traffic congestion and enhancing safety for inspectors and traveling public. The project included construction of a half-mile of roadway approaches and lane use signals (LUS) through a complex intelligent transportation system (ITS) design. It also included design for the associated landscape, electrical, utility relocation, stormwater management and drainage.

The project provided twice the traffic capacity, with 12-foot-wide lanes and shoulders on each side to improve safety and facilitate access for emergency response, maintenance and wide load vehicles. The addition of a median barrier helps prevent cross-over

(continued on page 22)



The bridge design incorporated cost-effective span lengths that took into account repetitive and fast construction techniques and simplified future maintenance inspection details.



The project included the use of recycled concrete from demolition of the original bridge for building artificial reefs to create fish habitat.

New Bridge Doubles Capacity, Improves Safety and Emergency Response *(continued from page 21)*

vehicular crashes. The new bridge accommodates cyclists with ITS and includes cameras for traffic monitoring and quick emergency response. The bridge LUS ITS design includes contraflow configurations that could safely direct all four lanes of traffic toward Maryland or Virginia in evacuation scenarios.

Work on the project also eliminated lane-shifting safety issues at the former toll booths by replacing them with highway-speed, all-electronic tolling. The benefits include less idling, better fuel efficiency, reduced emissions, decreased congestion and increased driver and employee safety.

The team incorporated sustainable design and practices. These included reusing 18,000 cubic yards of Potomac River sediment delivered to the Weanack Reclamation site. The facility reclaimed undesirable river mud to transform over 100 acres of productive agricultural fields and wildlife habitat. Other measures

included reusing approximately 9,500 tons of the original bridge concrete on an artificial reef designed to create sanctuaries for diverse marine life. It also created newly seeded oyster beds on the 148-acre natural Lower Cedar Point Bar to advance Maryland's clean water goals.

Aesthetically, the bridge has a clean, open appearance, partly due to the consistent span lengths, consistent color and constant depth. The use of haunched girders not only improved the appearance of the bridge but also lowered the overall cost by reducing steel weight, and lightened girder erection.

At the bridge's opening ceremony, then-Governor Larry Hogan commented, "The bridge is graceful in form and useful in function. Providing faster, safer trips and a stronger economy are among the benefits the new bridge will deliver to Marylanders and those who visit our great state." The new bridge opened to traffic almost three months ahead of schedule on October 12, 2022. 🇺🇸



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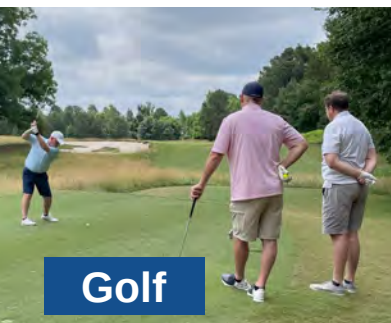
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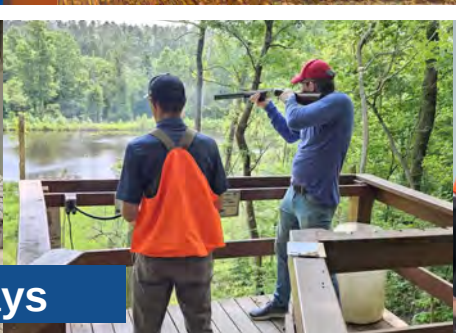
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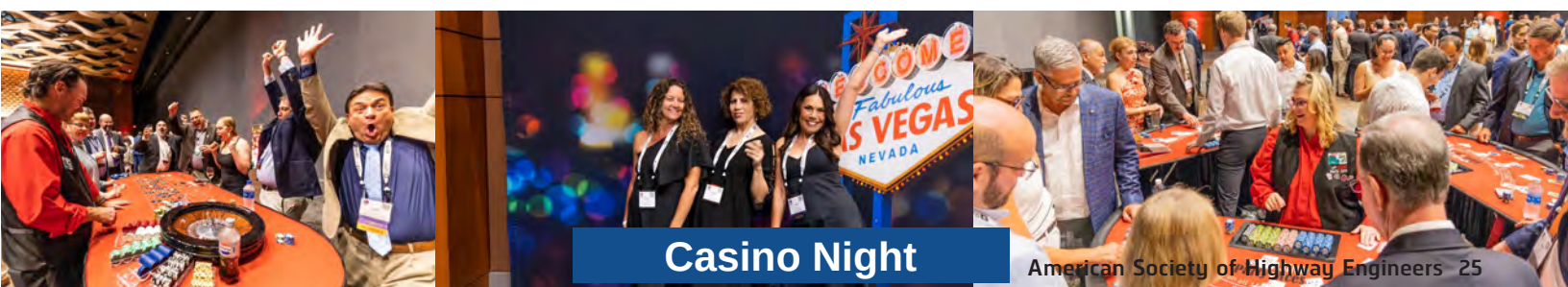
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News From Across ASHE-Miles



French & Parrello Associates Celebrates 50 Years

Wall Township, NJ—French & Parrello Associates (FPA) commemorated its 50th anniversary in March. Founded by four engineers in 1974, FPA has grown to more than 200 employees, many of whom have attended **ASHE Southern New Jersey Section** events. FPA offers comprehensive engineering and consulting services across eight locations along the East Coast.

"This is a moment to reflect on the firm's success, while also focusing on the core values that have facilitated our longevity and growth and will continue guiding us into the future," said President and Chief Executive Officer Steven A. Tardy, PE. "We believe in treating our employees with respect, serving our communities and being responsive to our clients' needs."

Founded by Laurence French, PE, Argo Parrello, PE, James Heller, PE, and Joseph Edwards, PE, FPA gained prominence in geotechnical engineering, including related field and laboratory services, which supplemented its construction engineering offerings.

"It's a testament that FPA has undergone one complete ownership transition from the original founders to the current leadership," said Andrew L. French, PE, Chief Operating Officer and Director of Land Development, a second-generation leader following his father, Laurence French. "Not only does it show the strength of the founders' vision, but it is evidence of FPA's belief in internal growth and development, which identifies leaders with passion, professionalism, technical acumen and provides them with the opportunity to succeed."

A full-service firm, FPA is annually ranked among Engineering New-Record's Top 500 Design Firms, NJBIZ's Top Engineering Firms and the Best Places to Work list. FPA's services include:

- Geo-Environmental: Geotechnical, Environmental, Materials Testing and Construction
- Building Design: Mechanical, Electrical, Plumbing and Structural
- Transportation: Highway and Traffic, Bridges and EV Infrastructure
- Infrastructure: Water Resources, Water/Wastewater, Telecommunications, Solid Waste, and Utilities
- Land Development: Civil/Site, Landscape Architecture, Survey and Geospatial Services

To learn more about FPA and its 50-year history, visit www.fpaengineers.com.



FPA's Executive Vice President and COO Andrew French, PE, and President and CEO Steven Tardy, PE, presented FPA founders Argo Parrello, PE, Jim Heller, PE and Joseph Edwards, PE, with a proclamation commemorating the company's 50th anniversary. Drew French accepted the proclamation in memory of founder Laurence French.

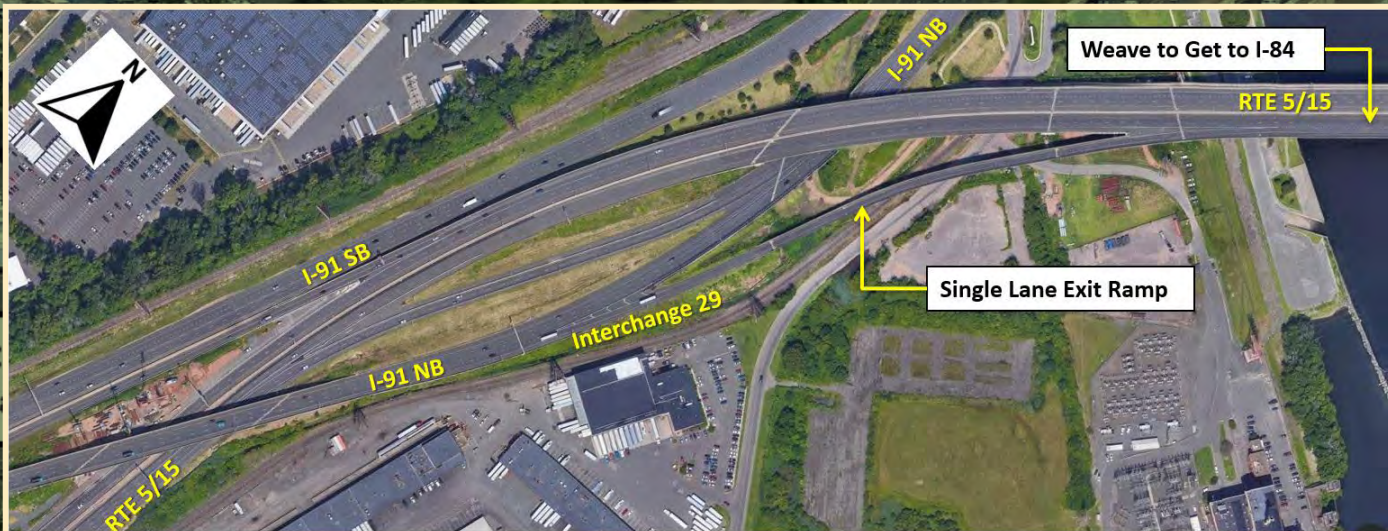


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French & Parrello Associates (FPA) is a full-service engineering and consulting firm providing services for a broad range of projects and clients within the private and public marketplaces. With 50 years of experience, FPA has the staff and expertise necessary to provide a collaborative and comprehensive approach to complex projects. With a reputation of providing practical and creative solutions, FPA's client-focused commitment is at the core of its corporate values and practice.

Discover more at fpaengineers.com





Existing Interchange 29 configuration

INNOVATION

Solves a Knotty Traffic Problem

by Thomas Karis, PE, and Michael Hurtt, PE,
CHA Consulting, Inc., **ASHE Albany Section**

Originally constructed in the 1990s, the connection in Hartford, CT, between I-91 and I-84 eastbound via US 5/SR 15 caused significant congestion for commuters. Interchange 29 connected I-91 northbound with US 5/SR 15, but it was the only connector between I-91 northbound (NB) and I-84 eastbound (EB) and reverse.

The original I-91 NB Interchange 29 had one-lane ramp geometry and traffic weave at US 5/SR 15. This resulted in back-ups, often miles long, on I-91, leading to accidents and delays. In fact, Interchange 29 ramp ranked as one of the top 10 choke points in the United States.

Key to this interchange upgrade was the I-91 NB connection with NB US 5/SR 15. The project, with its design completed in summer 2018, proceeded with construction in spring 2019. It included a new high-speed, two-lane ramp crossing over US 5/SR 15 southbound via a five-span flyover structure. It continued to the Charter Oak Bridge over the Connecticut River to I-84. The proposed improvement strategy also provided improved horizontal and vertical geometry. The resulting geometrics produced a heavily skewed, long-brained crossing over southbound US 5/SR 15.

CHA Consulting, Inc., design team initially considered long span bridges and tunnel-like structures as contenders to address the challenge of the heavily skewed braided crossing. Each of these solutions, however, had its own challenges. Long span bridges meant deeper superstructure



Project location



Example of a steel box straddle beam

Concrete
straddle
beam
example

considerations, but with the already challenging vertical and horizontal geometrics, the consequential ripple effect was untenable. Tunnel-like structures had complications in ventilation, lighting, constructability and other obstacles. It was then that the concepts of constructability, fabrication and innovation came together to forge a solution; a new multi-girder steel straddle bent.

Straddle bents are not new to bridge and highway construction. They are intermediate structural bridge supports that involve a large cross beam supported on its ends by columns or other pier structures. The primary bridge elements are supported on or attached to the straddle bent, akin to a bridge supporting a bridge. The necessity for straddle bents often must allow for heavily skewed grade separated crossings. The length, orientation and material type of the straddle bent is commonly dictated by the skew and width of the crossing roads. Typically, the flatter the skew and the wider the road/bridge cross-section, the longer the "straddle" of the straddle bent.

Straddle bents have traditionally been post-tensioned or pre-stressed concrete beams or hollow steel box shapes. The challenge of fracture criticality and nonredundancy associated with steel straddle bents has been a long-standing industry concern. In 2012, the Federal Highway Administration released policy guidance for fracture-critical elements. The policy included the designation of load path,

internal member and system redundancies to address design requirements for members like straddle bents.

The Interchange 29 ramp bridge straddle bent was based on load path redundancy. The concept involved making the straddle bent function like a multi-girder bridge supporting another bridge. The result was a concept of three parallel I-girders bolted together with diaphragms. It was an idea founded in redundancy; the fracture of any one flange would not lead to collapse of the entire straddle bent.

The team's thinking was that even if the three-beam straddle bent was slightly more expensive than an equivalent steel box shape, the benefits of the load path redundancy and elimination of a fracture-critical designation were well worth any potential cost differential.

That idea generated more cost and constructability opportunities and benefits. The straddle bent beams could be shipped and/or erected in any combination of singular or multiple pieces. This provided flexibility and cost efficiency from the fabricator to the erector. With the three girders tied together with large plate diaphragms, providing access for future inspections was critical. The solution was to space the beams and diaphragms to provide approximately 90-inch by 42-inch "rooms" within the interior girder bays. Small gaps between the flanges allowed for air circulation. The steel grating placed on the top of the bottom flanges

(continued on page 30)

(continued from page 29)

High Steel Structures, LLC (High Steel), said the fabrication was fairly simple. The ease of fabrication translated into cost-effectiveness (about one-third of the cost) in comparison to traditional steel hollow box shape straddle bents. One cost-effectiveness attribute of the triple I-beam solution over steel boxes cited by High Steel were the personal safety requirements (i.e., not a fabricated confined space). This simplified the web to flange welded connections. Other attributes included the preparation and painting processes, internal diaphragm fit ups and internal welding processes.

The triple I-girder saddle bent combined cost-effective design development, load path redundancy and efficiencies in fabrication, shipping and erection. The concept is a flexible one, applicable to all types of typical saddle bent designs, including integral bents. 🇺🇸

Due to formatting, the article refers to RTE 5/15 as US 5/SR 15.



Elevation difference between beams



Ultra-high performance concrete closure pour



Northeast Extreme Tee D beam cross-section



Finished bridge



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AsTheWheelTurns

ASHE Members on the Move!



HNTB's Di Zuzio Elected National President of ASHE

Parsippany, NJ—**Donato Di Zuzio, PMP**, was named **ASHE National President** for the 2024-25 term. Di Zuzio, sales manager for HNTB's New Jersey office, has served in various ASHE committees and board positions at the local, regional and national levels over the past 30 years.

"I am honored to be a part of this long-standing, highly respected organization," Di Zuzio said. "As President, I will continue to advance ASHE's mission to promote safe, efficient and sustainable transportation solutions through education, innovation and fellowship."

Di Zuzio has more than 40 years of experience in the transportation industry, including highway and bridge design, inspection, rehabilitation and construction management expertise. He has managed projects for the New Jersey Department of Transportation, New Jersey Turnpike Authority, North Jersey Transportation Planning Authority, the Port Authority of New York and New Jersey and counties in New Jersey and Pennsylvania. In 2022, he received the Lifetime Achievement Award from ASHE's North Central New Jersey Section and the 2022 ICON Award from NJBIZ, New Jersey's business journal.

Di Zuzio recently served on the executive committee of the New Jersey chapter of the American Council of Engineering Companies and will continue to serve as chair on subcommittees. He also is on the board of directors of the New Jersey Alliance for Action and the advisory board of directors of Wall Township's High School Pre-Engineering Academy.



Laspee Honored by ASCE

Philadelphia, PA—In May, the Philadelphia Section of the American Society of Civil Engineers (ASCE) presented **Harry Laspee** with its Philadelphia Civil Engineer of the Year Award for 2024. The award is the Section's highest honor. Laspee, also a **member of ASHE Delaware Valley Section**, is an Associate Vice President and Senior Engineer in the Transportation Division of Pennoni. He manages the design and contract administration of public works improvement projects for both private and governmental agencies, including bridges, highways, water

distribution systems and sanitary and stormwater conveyance systems. Most recently, he was involved in the quick turnaround needed for protection and maintenance of critical sewer and water infrastructure as part of the I-95 emergency response and restoration of the Cottman Avenue Interchange bridges. Laspee received his Bachelor's degree in Civil Engineering and Construction Technology from Temple University. He has professional engineering licensure in Pennsylvania and New Jersey.



AN INTERSECTION RETROFIT

by Kyle Dorris, PE, HNTB Corporation, ASHE Central Florida Section



- 1) Western diverging diamond interchange crossover, looking west
- 2) Eastern diverging diamond interchange crossover, looking west
- 3) Top view looking west
- 4) Top view looking east



FOR CENTRAL FLORIDA



Traffic alleviation and multimodal safety have long been priorities for transportation initiatives throughout Central Florida. The region's rapid population growth over the past decade strained major roadways, notably the I-4 corridor and its connecting arterial roads. To help accommodate such growth, Florida Department of Transportation (FDOT) in conjunction with Osceola County, in 2021, started construction of a diverging diamond interchange (DDI) on I-4 at CR 532 near Champions Gate. Completed in 2023, the interchange was the first of its kind in the Orlando area.

The project was part of FDOT's I-4 Ultimate project. Further improvements are slated along the I-4 corridor under the I-4 Beyond the Ultimate program.

Many interchanges, including I-4 at CR 532, required enhancements beyond the project limits of the original I-4 Ultimate scope. Osceola County, with support of HNTB Corporation (HNTB), saw the opportunity to implement a low-cost retrofit of this existing interchange to improve operations and safety until future improvements can take place.

The project also focused on increasing mobility in the Champions Gate area, both to and from I-4 and CR 532. The proposed design's cost-effective improvements included preservation of the existing I-4 bridges over CR 532. It also entailed converting the traditional diamond interchange layout to the diverging DDI, using substantial portions of the existing infrastructure.

Ramp widening and intersection reconfigurations at Champions Gate Boulevard and Goodman Road also enhanced safety and capacity. The project added bike lanes and sidewalks along CR 532 to improve connectivity for bicyclists and pedestrians, who now have dedicated routes through the interchange for the first time.

HNTB proposed concepts, using 3D models and renderings, to demonstrate the feasibility and benefits of converting to the DDI interchange. This ensured compatibility and consistency with future interchange improvements

planned under FDOT's Beyond the Ultimate program. The DDI was a result of effective transportation collaboration, focusing on "future proofing" infrastructure and improving mobility for the region.

For more project information, visit I-4 Beyond the Ultimate website at <https://i4beyond.com/project-designs/segment-designs/i-4-and-c-r-532-improvements/> 🇺🇸



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News From Across ASHE-Miles



ASHE Houston Section Scholarship Gala and Awards

ASHE Houston Section's Inaugural Scholarship Gala and Awards Presentation raised more than \$26,000 for its scholarship program, thanks to support from gala sponsors, elected representatives and public officials. The Petroleum Club of Houston was the setting for the event in January.

Texas Transportation Commissioner Steven Alvis gave the keynote address. Stan Harris, then ASHE National President, spoke about the organization's commitment to advancing the transportation field. Reynaldo Guerra, PhD, ENV SP, Chief of Infrastructure, presented a letter of recognition from Lesley Briones, Harris County Precinct Four Commissioner, acknowledging ASHE Houston Section's contributions to the community.

Niki Deskus, PE, MBA, of PGAL, received the 2023 ASHE Houston Section Engineer of the Year Award. The ASHE Houston Section Young Engineer of the Year Award went to Farrah Rawashdeh, EIT, ENV SP, of DEC, a division of Gannett Fleming.

The Project of the Year Award Under \$20 Million went to the Chambers County FM 1409 Roadway Extension Project. DEC was the project's Engineer, and Texas Sterling Construction was Contractor.

The Project of the Year Award Over \$20 Million went to the Montgomery County Rayford Road Improvements Project. The project's Engineer was RPS, a Tetra Tech Company. Contractor was Vulcan Materials Company of Smith & Company.

The Section also honored its Past Presidents, including Ahmed Valdez, PE, AKV Consulting Engineers (2018-19), founder of ASHE Houston Section; Kim Sachtleben, PE, Pape-Dawson Engineers (2019-20); Adam White, PE, Terracon (2020-21); and Gabriel Odreman, PE, PMP, RPS, a Tetra Tech Company (2022-23). Also recognized, but not present, were Alena Mikhaylova, PhD, Geneva Pipe & Precast, Northwest Pipe Company (2021), and Brandon Circle, PE, Elevation Land Solutions (2021-22).

Thanks to the Gala Committee, including Youssaira Belmokadem, PE, Chair; Anfal Fadhil, EIT, Co-chair; Ruben A Calderon, PE; Blair Stocker, PE; Claudia Alanis Harris; Syed Haq, PE; Ahmed Valdez, PE; Nikole Cao, PE; Farrah Rawashdeh, EIT, ENV SP; Niki Deskus, PE, MBA; and Eric Liu, PE, MBA.



Past Presidents of ASHE Houston Section were honored by current leadership, left to right: Youssaira Belmokadem, PE, (Gala Committee Chair); Blair Stocker, PE, (ASHE Houston Section President); Past Presidents Gabriel Odreman, PE, PMP; Adam White, PE; Kim Sachtleben, PE; Ahmed Valdez, PE.



Steven Alvis, Texas Transportation Commissioner, presented the keynote address at the gala.

Rebuilding I-95's

by ASHE Delaware Valley Section



Even during construction, six lanes of traffic continued on I-95 between Amtrak's Northeast Corridor and Tacony Street in Philadelphia.

Section BS1

ASHE Delaware Valley Section
2023 Project of the Year Award
Over \$20 Million

As part of Pennsylvania Department of Transportation's (PennDOT) I-95 Infrastructure Improvement Program, reconstructing the Section BS1 interchange required coordination with adjacent I-95 projects in northeastern Philadelphia. The \$81.1 million project in District 6 widened nearly 4,000 feet of I-95 at the Bridge Street Interchange from relocated Carver Street to Levick Street. Improvements included two bridges and five retaining walls, as well as several local streets and a modernized stormwater network. The Section BS1 construction, awarded in October 2019, was substantially completed by September 2023.

At face value, reconstructing Section BS1 may have looked like a simple project; it was a relatively straight section of interstate road. However, like many engineering projects, when looking at them more closely, the challenges were in the details.

This project was in a dense, urban area, constrained by a major railroad, Amtrak's Northeast Corridor, and a parallel arterial, Tacony Street. As with many Philadelphia streets, numerous utilities and sewers were beneath the surface of the local roads. What was uncommon were the three 60-inch water mains running parallel to I-95 under Tacony Street. These pipes influenced the structural design, construction approach and drainage design for the project. The project team used test holes to verify record plans and locations of the tunnels, utilities and

other underground obstructions that could impact the structural or drainage designs.

The project included complex traffic control, maintaining six lanes of traffic on I-95 and pedestrian and vehicle access on the local roads.

Environmental investigation and management of fill were key elements for the project. As part of this work, the project used a detailed soil management plan involving extensive testing to allow reuse of nonhazardous soils. This approach optimized soil usage and minimized the need for replacement fill. To maximize sustainability, the project also incorporated excess 78-inch pipe from another PennDOT project, preventing over 300 feet of the unused pipe from disposal in the landfill.

The I-95, Section BS1, project featured a stormwater management strategy that treated over 12 acres of impervious area and used several types of facilities. These included a bioinfiltration basin, tree pits with underground retention and manufactured treatment devices (MTD) with and without media filters. By designing the MTD and MTD with media filters in series, it extended the filter life, reducing maintenance costs. Tight physical constraints between Amtrak's Northeast Corridor and Tacony Street, which included the three 60-inch water mains, required innovative techniques to achieve the desired results. *(continued on page 40)*



Completed section of I-95's Section BS1
near Comly Street



I-95's Section BS1 was the first Sector A component to use manufactured treatment devices with water quality filters.



The team used a concrete block pattern on the slope wall.

As part of construction on Levick Street, the project rebuilt the patio and provided paved parking for Lardner's Point Park.

Rebuilding I-95's Section BS1

(continued from page 39)

The design involved disconnecting the I-95 storm sewers from the city's existing combined sewer system and extensive stormwater rerouting. It also entailed the use of large elliptical pipes to maintain cover requirements and conversion to a pipe manifold to avoid existing utilities. An existing combined sewer was converted to a stormwater-only conveyance, reducing sewer overflows to the Delaware River and minimizing flooding. This improved stormwater runoff quality and lessened the strain on the city's aging sewer infrastructure. In turn, it will reduce the environmental impact on this recreational river that empties into Delaware Bay.

The project added form liners to create consistency along I-95's retaining walls. It also included construction of a variable height block slope wall to discourage unauthorized use under I-95's Comly Street Bridge.

The riprap installation and restoration of the shoreline blended the look of the functional living shoreline (previously built) with the work required for the outfall. This benefited both the appearance and function, as Riverfront North Partnership was an active stakeholder that removed trash from the area.

Demonstrating commitment to stakeholders and to enrichment of overall livability, PennDOT incorporated

several social, economic and sustainable enhancements into the project. These included improvements to Lardner's Point Park, a nearby recreational facility, by paving its parking area and installing street lighting. The sewer outfall's design also considered impacts to the park facilities and restoration of the park area. This park, along with the Kensington and Tacony Trail (K & T Trail) provides a social and economic benefit to the surrounding neighborhoods. Through stakeholder coordination, the route for a future trail connecting the adjacent neighborhoods to the K & T Trail was added to the design layout of walls and grading of I-95 Section BS1.

By eliminating lane drops and providing full shoulders on I-95, the project will improve traffic flow on this congested corridor, saving users the costs associated with traffic delays.

As part of the reconstruction of I-95, one of the project's goals was to bring the interstate up to current standards, which included safety upgrades. Full shoulders were provided on I-95, along with improved signage and pavement markings. One improvement beginning in Section BS1, and part of Section BS2's current construction, is relocation of the southbound off-ramp to Bridge Street. In its current configuration, the ramp enters the city street grid on a residential street in front of many houses. In the future, the ramp will turn under I-95 and intersect with Tacony Street and the Delaware Avenue extension. 🇺🇸



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by **ASHE Delaware Valley Section**

2023 Project of the Year Award Under \$20 Million



Based on the findings of the study, extensive improvements would alleviate existing and future congestion at the intersection. Identified improvements included the need for additional through-travel lanes on all approaches. However, the necessary widening was infeasible due to the

**US 30 Business and Ship Road Couplet intersection
(facing west)**



**Ship Road Couplet and trail
near northern project limit
(facing south)**



impact it would have on historic buildings, including St. Mary's Chapel and the Ship Inn. Instead, the plan proposed the Ship Road "roadway couplet," a pair of parallel one-way streets that could carry traffic in opposing directions. Couplets can provide greater capacity for automobiles, particularly in areas with heavy peak directional demand and right-of-way constraints.

Traffic Planning & Design designed the couplet around the Ship Inn and St. Mary's Chapel to balance traffic flow and congestion in the area. This project worked to break up Ship Road into a couplet. In this way, the existing Ship Road became a one-way northbound road, and a new southbound road was constructed approximately 450 feet to the west. The design added greater capacity to the existing signalized intersection by creating a pair of smaller intersections in lieu of a large single intersection. The smaller intersections offered more efficiency and safer travel with less widening due to the north-south approaches being one-way. This resulted in having less conflicting turning movements at each intersection.

Along the new southbound roadway, the project included the addition of a new segment of the Chester Valley Trail: a 12-foot-wide sidepath/trail south of US 30 Bus. This segment was vital for improving safety of the trail crossing that route.

This \$2.9 million project received approval through Pennsylvania Department of Transportation's (PennDOT) Highway Occupancy Permit program. It was constructed partially through a PennDOT

Multimodal Transportation Fund Grant to match the township's contribution to build the northern leg of the southbound portion of the couplet and trail. Private developers financed and built the southern leg of the southbound travel lanes. Construction began in 2022 and included a new traffic signal at the intersection of US 30 Bus. and the southbound Ship Road portion of the couplet. The project also entailed reconfiguration of the existing intersection of northbound Ship Road and US 30 Bus., as well as extending Springdale Drive to southbound Ship Road.

This type of Smart Design not only had minimal impact on the historic buildings at the intersection; it also enhanced mobility, reduced congestion and provided transportation alternatives along the US 30 corridor. A future project will construct a multiuse trail to connect this project with the Exton Train Station, further enhancing the multimodal network of the township.

The project should have significant economic impact on the township. A mixed-use development proposed in the area between the north-south roadways will include a Wawa convenience store, gas station and a 150-unit residential community. Private developers are responsible for all roadway improvements south of US 30, including the Ship Road southbound roadway construction, Springdale Drive extension, the multiuse trail facility and all required roadway modifications at the current US 30/Ship Road intersection. The estimated cost of these

(continued on page 44)



US 30 Business and Ship Road
Couplet intersections
(facing south)

Ship Road Couplet Eases Congestion, Aids Development

(continued from page 43)

improvements for the developers is \$1.5 million. Requiring the township to fund these improvements would have cost far more.

The Ship Road Couplet and trail improvement are part of a larger township-wide vision to provide multimodal links to various modes of transportation throughout West Whiteland. Such trails can have a positive economic impact on communities. This trail facility will connect with The Circuit (Philadelphia's Regional Trail Network) and SEPTA's Regional Rail system, as well as other commercial and residential destinations throughout West Whiteland and beyond.

Several nearby facilities will benefit from this project. The Whiteland Business Park is located just to the east of the project area and accesses both US 30 Bus. and Ship Road. The Springdale Drive extension will connect the business park with areas to the west as well as provide access to the Chester Valley Trail (and eventually the Exton Train Station). SS Philip and James Catholic Church and School are located on the northeast corner of the existing US 30 Bus./Ship Road intersection. The historic Ship Inn is on its northwest corner.

The Chester Valley Trail is a regional one and part of The Circuit's multiuse trail network. This project constructed a 12-foot-wide path along the newly constructed southbound Ship Road alignment that will become part of the Chester Valley Trail. A future project is to create an off-road trail extending from SEPTA's Exton Train station traversing under the US 30 Exton Bypass and connecting with the trail at this project location. It will enhance multimodal mobility throughout the township.

The Chester Valley Trail receives the most use in the county's regional trail system and provides links to nearby commercial and employment centers, community amenities and residential communities. The township's Ship Road Couplet: North Segment project is a first step in connecting the Chester Valley Trail to the historic Philadelphia & Thorndale Branch rail corridor. It will provide a safe, multiuse connection to and from the Chester Valley Trail and the existing and proposed commercial uses at the Lincoln Highway intersection with Ship Road. 

One-of-a-Kind Trail Link

by Audrey Swain, HNTB,
ASHE Dallas-Fort Worth
Section

The long-anticipated Northaven Trail Bridge soars over US 75's eight busy lanes in Dallas, connecting multiple, heavily used walking and biking trails. Before the bridge opened in November 2023, the Northaven Trail on the west side of US 75 and the Cottonwood Creek and White Rock Creek trails on the east side terminated at the roadway. Cyclists and pedestrians could only access the adjacent trails via a poorly lit and often muddy underpass.

Delivering on a community's vision

Working with the Texas Department of Transportation (TxDOT), HNTB served as engineer of record and construction phase services provider on the project. The original network-tied arch concept for the main span evolved in 2017, in collaboration with project stakeholders. The project received funding jointly by TxDOT, the City of Dallas, Dallas County and the Regional Transportation Council at the North Central Texas Council of Governments, with contributions from Friends of Northaven Trail.

The design of the network-tied arch main span utilized cables reminiscent of the spokes on a bike's wheel. The network cable arrangement, a term used when the cables cross one another more than once, also reduces bending in the arch and deck, allowing both to be thin and still resilient in the event of accidental overloads. In this case, the Northaven Trail Bridge uses 64 cables, 32 per side. With a structural weight of 800,000 pounds, the bridge can withstand a pedestrian load

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The Northaven Trail Bridge's arch is now a landmark, serving as a gateway into North Dallas.

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One-of-a-Kind Trail

of approximately one person per square foot of bridge deck, or approximately 445,000 pounds.

Tom Kramer, HNTB project manager, spoke about the plans, specifications and estimates portion of the project: “The final design adhered to some of the early sketches and modeling concepts developed from conversations with the City of Dallas and other stakeholders.” The

bridge’s features created challenges, but the stakeholders’ vision became a reality through collaboration between TxDOT, HNTB and contractor Ragle, Inc.

Unique pedestrian bridge

The site designated for the Northaven Trail Bridge had a one-of-a-kind geometry, requiring the bridge to angle across the eight main lanes and four frontage road lanes of US 75. The reverse tied arch structure gave the bridge a soft, reverse “S” curve and reduced the skew at the piers. As characteristic of tied arches, the bridge deck tied the ends of the arch ribs together like the string in an archery bow.

“With tied arches that ‘string,’ the deck normally must be straight,” said Kira Larson, HNTB project manager of

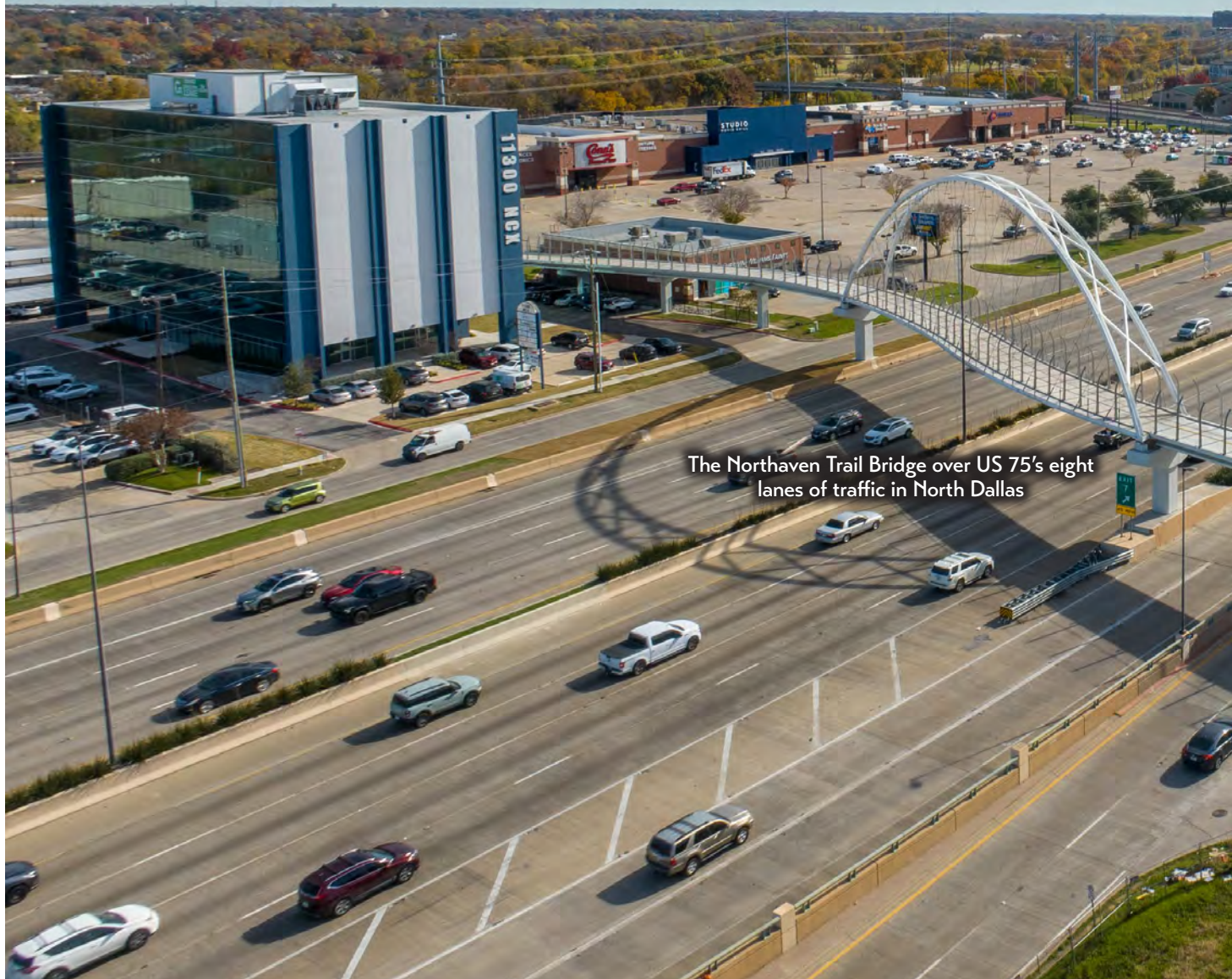
construction phase services. “However, in the Northaven Trail Bridge, we see an S-curve geometry. Within that S-curve are straight post-tensioning strands running through the deck, acting as the tie. It’s a highly innovative way our design team created this signature project for TxDOT.”

The structure is the only known network-tied arch bridge in the world with a doubly curved tie. The bridge also has skewed ends, giving it a complexity not seen anywhere else.

Keeping traffic moving during construction

The structure’s integrity and public safety were TxDOT’s two critical priorities. A key project goal was the delivery of the Northaven Trail Bridge with minimal impact to the traveling public. It required that a frontage road lane, or a lane both northbound and southbound on US 75, remain open throughout construction. Any main-lane closure period was limited to Saturday overnights.

Early in the design process, the team decided to use Accelerated Bridge Construction techniques, allowing building of the bridge off-site and moving it into place. The main span was constructed on timber shoring at a site near



The Northaven Trail Bridge over US 75's eight lanes of traffic in North Dallas

US 75. The lightweight, redundant arch structure allowed safe movement to its final location on self-propelled modular transporters (SPMTs).

Moving the bridge overnight

Moving an entire bridge into place on SPMTs was a first for TxDOT's Dallas district. In the middle of a September night in 2023, the 201-foot-long bridge with its 50-foot-tall arch was driven into place over the highway. SPMTs shouldered the structure at its bearing locations, and lifting gantries guided the bridge to its final bearing locations.

The bridge move took about 20 hours but required only about 14 hours of full closures on the main lanes. During that time, traffic was diverted to the adjacent frontage roads, always leaving a lane in each direction open to drivers during the move. After installation of the bridge, final tie-ins were completed before the span opened to the public.

"Safely rolling the bridge into place pushed the limits of what we've done before," said TxDOT Dallas County Area Engineer Nathan Petter. "It proved we can construct

projects using Accelerated Bridge Construction without impacting traffic. That result of the weekend move was a huge success for the project."

Project completion

The Northaven Trail Bridge has experienced heavy pedestrian and cyclist use since the day it opened. TxDOT also created dedicated parking on the west side of the bridge for use as a trailhead, designed to accommodate food trucks, the start of a race or other community events.

Because the bridge's arch is its most identifiable feature, it has become a landmark that serves as a gateway into North Dallas. TxDOT called the bridge "a regional example of the positive benefits of appropriate location and design aesthetics for future bicycle and pedestrian trails and amenities."

"The public was so vested in this wonderful project," Petter said. "The use we immediately witnessed showcases the project's success." 🗣️



Photo: Andy Ryan, courtesy of HNTB

AMERICAN SOCIETY OF HIGHWAY ENGINEERS

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Northeast Region

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Altoona	192
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Delaware Valley	339
East Penn	128
First State	224
Franklin	115
Harrisburg	417
Long Island	34
Mid-Allegheny	93
New York Metro	101
North Central New Jersey	122
North East Penn	138
Pittsburgh	536
Southern New Jersey	182
Southwest Penn	226
Williamsport	81

Subtotal 3,268

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SECTIONS

Blue Ridge	53
Carolina Piedmont	47
Carolina Triangle	225
Chesapeake	271
Greater Hampton Roads	74
North Central West Virginia	51
Old Dominion	81
Potomac	171
South Carolina	79

Subtotal 1,052

Southeast Region

SECTIONS

Alabama	59
Central Florida	132
Georgia	642
Middle Tennessee	313
Northeast Florida	213
South Florida	17
Tampa Bay	41
Tennessee Valley	123

Subtotal 1,540

Great Lakes Region

SECTIONS

Bluegrass	141
Central Dacotah	74
Central Ohio	204
Circle City	65
Cuyahoga Valley	105
Derby City	89
Lake Erie	236
Northwest Ohio	43
Triko Valley	149

Subtotal 1,106

Welcome Colorado!

Southwest Region

SECTIONS

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Colorado	40
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Houston	101
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National Total 7,373

Professional Status	56%
Government	12%
Consultant	75%
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