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Signage and clankers near a low-clearance railroad bridge in Newark, DE, warn drivers of over height vehicles to find another route. See page 29

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MISSION

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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DIRECTIONS

hen I was still working in the consulting business, fall was always our busiest season, and I suspect that is still the case. Design work is in full swing for many people, while construction projects move at a frenetic pace, trying to reach critical milestones before the holidays and less optimal weather. Despite the busyness, I hope you are finding time to enjoy all that autumn has to offer, whether you're following your favorite college/pro football team, watching your kids play fall sports, camping or attending your local ASHE Section meetings!

As I mentioned in the previous scanner, one of our goals is to strengthen our Regions and expand their role in the organization. An ad-hoc committee, under the leadership of Jim Shea and Nimish Desai, developed a formula for providing significant Region funding in ASHE's 2023-24 budget. While our five active Regions have been doing a great job, they are somewhat constrained by the lack of a substantial revenue source. We believe that this funding will help the Regions grow and function in a way that will support the long-term goals of ASHE.

The Regions are closer to the Sections, both geographically and in terms of personal connections. While the National Board is always available to help the Sections when asked, sometimes it is better to have "boots on the ground." Along with the funding that was provided to the Regions came suggestions from the National Board for possible uses of the funds. These included:

- Initiatives that support ASHE's Strategic Plan
- Supporting Region travel, such as Region Officers traveling to Section meetings or Region Directors traveling from Sections to Region Board meetings
- Subsidizing Region Board member attendance to the National Conference
- Developing and hosting a Region Conference
- Hosting Region membership events
- Supporting new Section growth
- Supporting Section engagement with students and universities • Supporting initiatives from the Sections to enhance exposure to the local Section and grow membership
- Generating funds to assist with seed money for Sections interested in hosting National Conferences
- As we approach the holiday season, I hope that each of you can take time from your busy schedules to enjoy your many blessings, including spending time with friends and family. Thank you for your continued support of ASHE.♥

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New Interchange Eases Traffic to a Safer Flow



ASHE

16 Making New Connections

Meet scanner's New Chair

t is my pleasure to chair the ASHE National scanner Committee. The *scanner* represents projects from a wide cross-section of the nation's transportation industry. From an infrastructure project in a rural community, to a large interconnected international airport in a dense city, our members work on diverse projects throughout America. With the Infrastructure Investment and Jobs Act providing a funding mechanism, more dollars are invested in infrastructure that will propel our economy forward and create a stronger future for generations. We are tasked with not only complex technical challenges but strong leadership as we reinvent solutions and revitalize critical infrastructure to create a stronger network of transportation options. Innovations and improvements in areas like alternative project delivery methods, sustainability, resilience and transportation networks provide opportunities for the highway industry to shape our physical, social and economic future. I am confident that scanner will grow and continue to be a respected publication for its members and the industry by providing knowledge-based content. I hope that all of you will share with us the projects that make a difference to you and what's happening with you in your ASHE Section.

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A Fresh Start for **Cleveland's** Opportunity Corridor, Section 3

by Sean Milroy, PE, PMP, DBIA, Project Manager–Transportation, Michael Baker International, ASHE Lake Erie Section

> **Quadrant and East 59th Street Bridge** Courtesy of Kokosing

leveland, on the shore of Lake Erie, is the second largest city in Ohio. The city's economy relies on diversified sectors, including manufacturing, financial services, healthcare, biomedicals and higher education. It is known for the Cleveland Clinic, Rock and Roll Hall of Fame, Cleveland Museum of Natural History and **Cleveland Orchestra.**

Although Cleveland has continued to prosper, the area between the terminus of I-490 and University Circle became known as the Forgotten Triangle due to its lack of economic activity and investment. Encompassing nearly 1,000 acres on the city's southeast side, the neighborhoods of Cleveland City Council Wards 5 and 6 had been a hub of heavy industry since the 1880s. But population and investment in the area declined. By the early 2000s, it experienced abandonment and neglect. The Ohio Department of Transportation (ODOT) and the City of Cleveland designated this area as an opportunity for neighborhood regeneration. An Opportunity Corridor Steering Committee was formed with representatives from ODOT, the City of Cleveland, Cuyahoga County and Greater Cleveland Partnership. The committee also included officials from the Area Community Development Corporations and Greater Cleveland Regional Transit Authority (GCRTA). Northeast Ohio Regional Sewer District (NEORSD), Northeast Ohio

Areawide Coordinating Agency,

Cleveland, OH



residents, business owners and local stakeholders.

After completing the study, three primary needs were identified:

• Improving system linkage among roads, neighborhoods and businesses in the area

• Enhancing mobility between the interstate system and University Circle

• Supporting planned economic development

The Opportunity Corridor, a new three-mile roadway ran from East 55th Street at I-490 to East 105th Street. The project was split into three sections. Design-build was selected as the project delivery method for Section 3, with Michael Baker International (Michael Baker) serving as the lead designer and Kokosing Construction

(continued on page 8)





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A Fresh Start for Cleveland's Opportunity

Corridor, Section 3 (continued from page 7)

as lead contractor. This section, a new five-lane boulevard facility, featured:

- Two miles of new roadway on new alignment
- Seven signalized intersections
- Seven bridges of various types
- Four groups of retaining walls

 Three Best Management Practices for stormwater treatment

• New sanitary, storm and combined sewers

• Electric, storm and sanitary stubs installed for future development

• A continuous shared-use path along the new boulevard with pedestrian bridge and at-grade connections to neighborhoods and transit facilities

As the project was situated in a densely developed urban area, Michael Baker recommended a top-down construction method versus the more conventional bottom-up option. This method provided such benefits as:

• Ability to construct substructure elements such as abutments and piers from existing grade elevation downwards without prior excavation or the need for extensive amounts of temporary shoring

• Ability to construct retaining walls from existing grade elevation downwards without prior excavation or the need for extensive amounts of temporary shoring

• Allowing for construction of bridges at the ground level, reducing the equipment necessary for erecting and detailing bridge superstructures

• Better overall construction schedule flexibility with disposition of excavated materials

The area consisted of existing rail track, with new track laid as part of the project. The new Norfolk Southern mainline bridge over the Opportunity Corridor required this phased, top-down design approach and shoo-fly relocation of Norfolk Southern to maintain its tracks. Section 1 involved the relocation of Norfolk Southern to the east, while a portion of the new bridge was constructed. Section 2 involved the relocation of Norfolk Southern onto the newly constructed portion of the bridge while the remainder of the bridge was constructed.

The final phase shifted Norfolk Southern to the final location in the center of the bridge. Drilled shafts were used for pier and abutment foundations in conjunction with top-down construction. Due to the relatively long spans and substructure deflection limits, drilled shafts included heavy reinforcement and embedded steel shapes. A concrete facing was Beginning of project: I-490 Courtesy of ODOT/ Tamarack Aerial Services

> installed on the drilled shafts after the embankment below the bridge was excavated to allow for the new roadway beneath.

The East 55th structure was also built via top-down methods, and traffic was maintained with a short re-route along East 55th Street. This single span, 108-foot-long bridge included semi-integral abutments founded on 24-inch closed-end pipe piles. A concrete facing was installed on new piling post excavation. The piling was oriented as a frame to withstand the large overturning moments due to the depth of excavation. Limited right-of-way and poor soil conditions at this location limited more traditional methods such as tie-back foundations or drilled shafts.

The project presented several complexities throughout design and construction. With tightly constrained site conditions, the team used concrete-filled steel tubes in the project's design, completed by Kokosing Construction. The use of this high-capacity, stiff, deep foundation element allowed for construction in complicated site conditions. High axial and lateral structural capacity reduced the number of piles necessary to support substructure elements. Vertical members reduced deep foundation footprint, resulting in less conflict with existing features. Additionally, the continuous shared-use path along the new

Additionally, the continuous shared-use path along the new boulevard required significant coordination with, and adjustments to, utilities, railroads and transit infrastructure. For example, the structures crossing the GCRTA Blue Green line were curved with up to a 57-degree skew. The GCRTA tracks below were also along a curved alignment that, combined with existing utility conflicts, limited



substructure placement. The curvature and skew necessitated a refined superstructure analysis.

Finally, with the proximity of multiple branches of the Kingsbury Run stormwater overflow to the project, the stormwater design addressed removal of large drainage areas from the combined sewer network and required significant coordination with NEORSD.

Completed in late 2021, the Opportunity Corridor enhanced transportation, mobility and connectivity to this area of Cleveland, spurring new economic development, more jobs and a fresh identity for the community. It also improved access to Cleveland's cultural hub, healthcare and educational facilities. The Forgotten Triangle, forgotten no more, created new opportunities for growth throughout the area. 🗮 Graves Road rolling grade minimized earthwork and impacts to adjacent residential properties.

New Interchange Eases Traffic into a Smoother, Safer Flow

design-bid-build project.

by Stephen J. Sewell, PE, ASHE Bluegrass Section, and Daniel P. Ficker, PE, ASHE **Triko Valley Section**



Utility tunnel boring under I-275

Palmer Engineering (Palmer) and Eaton Asphalt were awarded the design-build project in spring 2019. Subcontractors included John R. Jurgensen Company and Haydon Bridge Company. Subconsultants on the project were Burgess & Niple, Geotechnology, Integrated Engineering and Gresham Smith. Work on the new interchange began in September 2019. But the project soon encountered such challenges as the COVID pandemic, political motivation pushing the schedule, right-of-way acquisition and utility relocation.

During the project pursuit phase, the team met each week to brainstorm ideas that would not only meet the intent of the project but also reduce costs. The first idea presented was to convert the diamond interchange with loop ramp to a diverging diamond interchange (DDI), reducing earthwork, paving and bridge width. The DDI would not only reduce construction costs, but it could also provide other benefits. It required only two-phase signals at the interchange, resulting in less wait time for vehicles, especially semi-trucks. The concept also eliminated the left-turn conflicts with through traffic, and the safety benefit for this layout was a key component. The elimination of the loop ramp reduced right-of-way and eliminated a potential roll-over location.

Right-of-Way Acquisition, Utility Relocations and More Challenges

The acquisition of right-of-way was included as part of the design-build process since no acquisition had been completed by KYTC. The typical acquisition process included completing all appraisals prior to finalizing offers to each of the owners, based on an overall land value in the area. With this project and more than 60 parcels to acquire, the team could not wait for all values to be established. They used a hybrid acquisition process to segment the project into units. working to acquire each area and build the compensation book as each segment proceeded. Another challenge involved gaining access to owners' homes to complete the appraisal during the COVID pandemic. Various strategies were used to document the appraisal and also to make in-person offers to the owners. Meetings were shifted to the out-of-doors, and documents were dropped off and reviewed via telephone. Virtual meetings were scheduled with some owners, and each was treated with a unique approach tailored to his or her specific preference.

Northern Kentucky

uring the past few years, the interchange at Graves Road and I-275 in Boone County, KY, had increasing issues with safety and congestion. Traffic continued to grow in the area because of recent changes at Cincinnati/Northern Kentucky International Airport, its associated businesses and industrial facilities. Residential developments north and south of I-275 put additional demand on local roadways. The area also had other land that could be developed for industrial use if access were improved. To enhance mobility and safety, the Kentucky Transportation Cabinet (KYTC) and Boone County Fiscal Court prioritized the Graves Road Interchange Project. However, it required completion more quickly than the traditional

[continued on page 12]



I-275-Graves Road DDI, part of an Alternative Technical Concept, improved capacity and safety at a lower construction cost.

The team's approach to the right-of-way acquisition was crucial for meeting the project schedule. The first offer was made three months after the project was awarded, and right of entry was obtained for the last parcel 18 months later. The team eliminated 20 parcels from the base configuration and reduced impacts to more than 30 parcels through the design-build process.

The difficulty in obtaining materials was also a challenge in completing the project. Finding a way to get plans approved so the supplies could be ordered months ahead of time was critical.

The cost for relocation of utilities for this contract was required to be bid as part of the price component. The team met with utility companies several times during the pursuit and discussed the pricing needed for the bid. As part of this phase, the team kept these changes confidential from the KYTC base configuration, adjusting pricing given by the utility companies to reflect impacts expected to occur. Each of the utilities provided a not-to-exceed cost for the price proposal, and final pricing would occur when the design was complete. The utility relocations were complex due to the limited right-of-way available for each company to locate. Ultimately, a common conduit

under I-275 allowed relocation of eight utilities under the active roadway. This reduced costs when compared with relocating each utility individually.

Completion

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The flexibility of the design-build process was vital. With no right-of-way purchased, the team shifted the alignment to avoid

> Setting bridge beams across I-275

relocations and balance earthwork, while providing a profile that exceeded the minimum standards. The meetings with KYTC for Alternative Technical Concepts allowed for changing the interchange type, structure layout and intersection configurations.

With less traffic on I-275 during the pandemic, workers on the project were exposed to fewer vehicles, which added to their safety and aided in the construction timeline. The new DDI built at I-275 and Graves Road supported safer traffic movements by eliminating left turns made against oncoming traffic. The project added a third lane in both directions on I-275 between Graves Road and SR 237. It improved the intersections of SR 237 with Graves Road and SR 20 with Graves Road. The design also included sidewalks and a multi-use path along Graves Road from SR 20 to SR 237.

The new interchange provided direct access to the industrial area and expanded a sector that could be potentially rezoned for industrial use. Included in the contract was an incentive to open the interchange early and provide access via direct route to I-275, which reduced shipping delays to the industrial area. The design-build procurement enabled construction to be completed three years earlier than the traditional design-bid-build process.♥



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Birmingham, AL

City Walk BHAM: Creating New Connections



he city of Birmingham, AL, experienced significant growth during the steel industry boom. This, in turn, required investments in transportation, including an interstate system running through the heart of downtown. Although the system proved advantageous for commuters, the milelong interstate bridges cut off surrounding neighborhoods from the downtown.

Sixty years later, the replacement of the I-59/I-20 bridges created an opportunity to re-envision the space beneath the interstate, transforming it into an open, accessible and safe public space. The Alabama Department of Transportation (ALDOT) selected Barge Design Solutions, Inc. (Barge), to develop a plan to transform this area.

> (continued on page 18) American Society of Highway Engineers 17

City Walk BHAM **Creating New Connections**

(continued from page 17)

The design team envisioned a public space to bring communities together from both sides of the bridges. It would help reconnect neighborhoods with the adjacent Birmingham Jefferson Convention Complex (BJCC) district downtown. The team worked with ALDOT to design a plan for the 31-acre, 10-block project known as City Walk BHAM. A public engagement process provided direction for the design. It highlighted activities and facilities that the community wanted in these spaces, including:

- walking paths
- · dog park
- · food truck area
- · sports fields
- skate park and roller-skating rink

· beer garden

amphitheater

- playground. • water features
- · pickleball courts · open-air classrooms

The design, construction documents and construction administration followed.

Reflecting Pool Fountain

As work on the design began, the I-59/I-20 bridges were demolished and replaced. Final conditions for the design were dependent upon changing infrastructure in and around the project. Existing utilities, bridge footings, local street network, lighting and stormwater infrastructure had to be considered. The recirculating reflecting-pool fountain, 60 feet in diameter, was a

critical component. However, its location included an existing sanitary sewer line that could not be relocated. Associate Project Manager Janie Mauter, PE, said, "The design team proposed multiple iterations of this entire central fountain space to avoid any impact to the sanitary sewer line while still capturing the intent of a dramatic water feature and surrounding gathering areas. The resulting solution presented a powerful centerpiece at the heart of the project."

Skate Park, Roller-Skating Rink

The 60,000-square-foot skate park and roller-skating rink, the largest in central Alabama, presented its own obstacles for the team. They engaged New Line Skatepark, Inc., to apply specialized methods for concrete placement to achieve high-strength for no-to-minimal joints. The facility was designed to accommodate both large spectator events as well as novice skaters. A pump track, ramps, deep and shallow bowls and other runs contributed to a state-ofthe-art facility.

Pedestrian Safety

To provide a safe pedestrian crossing from City Walk BHAM to the BJCC Legacy Arena outdoor plaza, the project included an Americans with Disabilities Actcompliant raised roadway. It used an inverted crown with a trench drain down the center of Ninth Avenue. Designed without curbs, the plaza and the City Walk BHAM space felt like one large outdoor room, allowing pedestrians to flow freely between them. Removable bollards allowed the entire area to be blocked to vehicular traffic. Traditional silver pipe bollards and custom granite stone bollards fashioned into cubes also ran

parallel to this raised street for added pedestrian safety.

Innovative Wayfinding

The designers turned to corten steel to create wayfinding signs and restroom building outer walls, a tribute to Birmingham's early days of the steel industry. Also spotlighted was Birmingham's history during the Civil Rights Movement. The space along 16th Street North included a gathering space for schools and tour groups when visiting the Civil Rights District located just a stroll away. Special signage offered a history lesson on this part of Birmingham's past.

Making an Impact

City Walk BHAM was a model for using public infrastructure projects as a vehicle to deliver public spaces and reconnect communities. The project demonstrated how the simple act of reconstructing the interstate bridges a few feet higher than their original height reclaimed 10 city blocks to create a public realm for the enjoyment of everyone in the community.

"The placemaking, which has unfolded, is now a leading example of how public infrastructure projects can be viewed through the lens of delivering new public spaces that can bring communities together," said Paul Darr, technical design lead and landscape architect for the project.

To help maintain the space, while also promoting ongoing community engagement and participation, BJCC stepped in as a partner for the project. Well-funded operations and maintenance, intentional programming and ongoing public participation aided in the success of City Walk BHAM.

Since opening in June 2022, this \$35 million project has continued to make an economic impact. City Walk BHAM, the new interstate bridges and new adjacent Protective Stadium and renovated BJCC Legacy Arena represented over \$1 billion in recent investments in this sector of downtown Birmingham. The projects have contributed to new private sector interest, development and investment.

The City Walk BHAM project highlighted the untapped potential of underpass conditions across the country, redefining their role and purpose. For Birmingham, this provided abundant opportunities for the community's future. 🛡

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- Not to exceed 250 words
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- Provide the general topic of the abstract (Example: Bridge)
- Name your abstract as follows: 2024 ASHE Surname one or two words describing the topic
- Submit abstracts to: info@2024conference.ashe.pro



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DEADLINE November 17 2023

MileMarkers News From Across ASHE-Miles

Site Tour of **Brooklyn Bridge Rehabilitation**

The 2023 Summer Site Tour, organized by the ASHE New York Metro Section highlighted the \$260 million rehabilitation project of the Brooklyn Bridge's Arch Blocks and Main Towers (Contract 7–Brooklyn Bridge Rehab). ASHE members got a firsthand opportunity to witness the restoration of this national treasure. The project, spanning four years, encompassed such activities as jet grouting under the approach piers, installation of post-tensioned tie-rods, placement of new concrete footing encasement and infill walls with brick facades. It also entailed complete cleaning of the granite towers and approach masonry, masonry rehabilitation including repointing of grout with historic materials and dutchmen repairs to the 125-yearold granite and limestone blocks. The project involved delicate limestone cleaning, installation of decorative tower lighting, compatible injected fill repairs, as well as incorporation of new ventilation and electrical equipment. The tour was led by Denise Noble-Rauch, PE, Director and Engineer in Chief of New York City Department of Transportation, along with ASHE New York Metro Section's Director of Construction Jeffreu Brugge, PE, and Project Manager/Resident Engineer Bill Ferdinandsen, PE, both of Greenman-Pedersen, Inc.

ASHE Terence D. Connor Award

ASHE New York Metro Section received the Terence D. Conner Award for 2023 at the ASHE National Conference. This award is given annually to the Section with the best record of membership retention. The New York Metro Section membership increased its membership by 26 new members with no dropped members from March 2022 to April 2023. Congratulations to ASHE New York Metro Section's Board members, advisors, committee members, support staff and Region and National Directors.





ASHE

MILE

(MileMarkers continued on page 26)

ASHE Scholarship Totals from 2019 to Date

2020 Totals

2021 Totals

2022 Totals

2019 Totals

2023 Totals



<u>Totals</u> **Great Lakes** \$106,200 Mid-Atlantic \$189,677 Northeast \$903,358 Southwest \$71,000 Southeast \$111,030

ASHE Regions Grand Total \$1,381,265

Thank You!

| Great Lakes Region | | | | | |
|-----------------------------|-----------------------------|---------------------------|---------------------------|----------------------------|---------------------|
| Bluegrass | \$ 0.00 | \$ 0.00 | \$ 1,000.00 | \$ 1,000.00 | \$ 1,000.00 |
| Central Dacotah | \$ 1,000.00 | \$ 0.00 | \$ 0.00 | \$ 3,000.00 | \$ 3,000.00 |
| Central Ohio | \$ 7,500.00 | \$ 7,500.00 | \$ 7,500.00 | \$ 5,000.00 | \$ 5,000.00 |
| Circle City | N/A | N/A | N/A | N/A | N/A |
| Cuyahoga Valley | \$ 3,000.00 | \$ 3,000.00 | \$ 3,000.00 | \$ 3,000.00 | \$ 3,000.00 |
| Derby City | \$ 0.00 | \$ 0.00 | \$ 1,500.00 | \$ 1,200.00 | \$ 1,500.00 |
| Lake Erie | \$ 1,500.00 | \$ 3,000.00 | \$ 3,000.00 | \$ 2,500.00 | \$ 4,500.00 |
| Northwest Ohio | \$ 1,500.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 |
| Triko Valley | \$ 2,500.00 | \$ 6,500.00 | \$ 6,500.00 | \$ 6,500.00 | \$ 6,500.00 |
| TOTAL | \$ 17,000.00 | <u>\$ 20,000.00</u> | <u>\$ 22,500.00</u> | <u>\$ 22,200.00</u> | <u>\$ 24,500.00</u> |
| Mid-Atlantic Region | | | | | |
| Blue Ridge | \$ 3,500.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 | \$ 5,000.00 |
| Carolina Piedmont | \$ 2,500.00 | \$ 2,500.00 | \$ 1,250.00 | \$ 0.00 | \$ 0.00 |
| Carolina Triangle | \$ 8,000.00 | \$ 8,000.00 | \$ 8,000.00 | \$ 8,000.00 | \$ 8,000.00 |
| Chesapeake | \$ 12,000.00 | \$ 0.00 | \$ 20,000.00 | \$ 13,000.00 | \$ 12,000.00 |
| Greater Hampton Roads | \$ 4,000.00 | \$ 4,000.00 | \$ 4,000.00 | \$ 4,000.00 | \$ 3,227.00 |
| North Central West Virginia | \$ 5,500.00 | \$ 6,000.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 |
| Old Dominion | \$ 4,000.00 | \$ 4,200.00 | \$ 4,000.00 | \$ 4,000.00 | \$ 2,000.00 |
| Potomac | \$ 6,000.00 | \$ 6,000.00 | \$ 6,000.00 | \$ 8,000.00 | \$ 3,000.00 |
| South Carolina | N/A | N/A | N/A | \$ 0.00 | \$ 0.00 |
| TOTAL | \$ 45,500.00 | <u>\$ 30,700.00</u> | <u>\$ 43,250.00</u> | <u>\$ 37,000.00</u> | <u>\$ 33,227.00</u> |
| Northeast Region | | | | | |
| Albany | \$ 500.00 | \$ 3,000.00 | \$ 1,000.00 | \$ 3,000.00 | \$ 1,500.00 |
| Altoona | \$ 3,000.00 | \$ 4,500.00 | \$ 0.00 | \$ 4,500.00 | \$ 4,500.00 |
| Central New York | \$ 500.00 | \$ 1,000.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 |
| Clearfield | \$ 6,000.00 | \$ 5,500.00 | \$ 5,500.00 | \$ 5,500.00 | \$ 7,000.00 |
| Delaware Valley | \$ 18,500.00 | \$ 12,000.00 | \$ 12,000.00 | \$ 11,250.00 | \$ 4,750.00 |
| East Penn | \$ 9,000.00 | \$ 12,000.00 | \$ 20,000.00 | \$ 20,000.00 | \$ 20,000.00 |
| First State | \$ 10,500.00 | \$ 15,000.00 | \$ 15,000.00 | \$ 15,000.00 | \$ 23,000.00 |
| Franklin | \$ 6,000.00 | \$ 6,000.00 | \$ 10,000.00 | \$ 10,000.00 | \$ 10,500.00 |
| Harrisburg | \$ 23,000.00 | \$ 24,000.00 | \$ 27,000.00 | \$ 26,000.00 | \$ 17,000.00 |
| Long Island | \$ 0.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 |
| Mid-Allegheny | \$ 1,500.00 | \$ 1,500.00 | \$ 0.00 | \$ 1,500.00 | \$ 1,500.00 |
| New York Metro | \$ 14,500.00 | \$ 0.00 | \$ 25,000.00 | \$ 33,000.00 | \$ 33,500.00 |
| North Central New Jersey | \$ 15,000.00 | \$ 15,000.00 | \$ 8,000.00 | \$ 15,000.00 | \$ 15,000.00 |
| North East Penn | \$ 15,420.00 | \$ 70,000.00 | \$ 20,000.00 | \$ 20,000.00 | \$ 20,000.00 |
| Pittsburgn | \$ 2,500.00 | \$ 4,000.00 | \$ 2,500.00 | \$ 0.00 | \$ 0.00 |
| Southern New Jersey | \$ 7,500.00 | \$ 11,000.00 | \$ 12,000.00 | \$ 19,500.00 | \$ 20,000.00 |
| Southwest Penn | \$ 10,000.00 \$ 1,502.00 | \$ 8,000.00 ¢ 1,609.00 | \$ 13,000.00 ¢ 1949.00 | \$ 13,500.00 ¢ 2,057.00 | \$ 11,000.00 |
| Total | \$ 1,502.00 | \$ 1,090.00 | \$ 1,000.00 | \$ 2,057.00 | \$ 2,313.00 |
| <u>IOIAL</u> | <u> </u> | <u> </u> | <u>\$172,000.00</u> | <u>\$199,607.00</u> | <u>\$191,303.0</u> |
| Control Toxos | NI/A | NI/A | NI/A | ¢ 0.00 | ¢ 10.000.00 |
| Dallas-Fort Worth | 0.00 | N/A | N/A | \$ 0.00 \$ 0.00 | \$ 0.00 |
| | 0.00 | N/A | N/A | \$ 0.00 | \$ 1,000,00 |
| Phoenix Sonoran | \$ 18 500 00 | | \$ 9,500,00 | \$ 10,000,00 | \$ 4,000.00 |
| | \$ 18,500.00 | \$ 9,000.00 | \$ 9,500.00 | \$ 10,000.00 | \$ 24 000 00 |
| Southoast Pagion | <u> </u> | <u> </u> | <u> </u> | <u>\$ 10,000.00</u> | <u>\$2</u> 7,000.00 |
| Alabama | NI/A | NI/A | NI/A | \$ 2,050,00 | \$ 0.00 |
| Central Florida | \$ 0.00 | | 00 00A 2 | \$ <u>600.00</u> | \$ 0.00 |
| Georgia | | \$ 600.00 \$ 600.00 | | | |
| Middle Tennessee | \$ 5,000.00 | \$ 5,000.00 | \$ 5,000.00 | \$ 5,000,00 | \$ 7,000.00 |
| Northeast Florida | \$ 10,055,00 | \$ 11 500 00 | \$ 0.00 | \$ 19 <u>494</u> 70 | \$ 7 130.00 |
| South Florida | \$ 0.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 |
| Tampa Bay | \$ 2,000,00 | 0.00 | \$ 0.00 | \$ 0.00 | \$ 0.00 |
| Tennessee Valley | μ,000.00 N/Δ | N/A | \$ 0.00 | \$ 0.00 | \$ 0.00 |
| TOTAL | \$ 23,055.00 | \$ 23,100.00 | \$ 11,600.00 | \$ 33,144.70 | \$ 20,130.00 |
| | <u> </u> | <u>+; · • • · • •</u> | <u> </u> | <u></u> | <u>+ ,</u> |

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American Society of Highway Engineers 23

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Strengthening Operations and Safety Along Metro Atlanta's Backbone

by Scott Dubord, PE, and Wendy Dyson, AICP, **ASHE Georgia Section**

A vertice of the section of the two-mile section of two section of two sections the two-mile section of two sections the two-mile sections the two-mile sections the two sections the

The project's concept was extracted from a larger managed lane project studied along I-75. It faced multiple design and environmental challenges, including shallow rock, ongoing water and sewer upgrades by local municipalities and an active business community. Atkins North America, Inc., was contracted to navigate the challenges and complete concept development, preliminary engineering and final design.

Meeting the Challenges

In addition to staging and constructing this project along one of Atlanta's busiest corridors, it had to be designed to not preclude future managed lanes along I-75. It also had to avoid impacts to the existing system to system I-75 at I-285 interchange. To mitigate impacts to traffic along the I-285 corridor, the team proposed using the existing end spans of the four I-285 bridges over I-75 for the relocated I-75 northbound to I-285 westbound ramp.

The existing span was filled with soil and slope paving, which was removed. Tieback walls were designed so that they did not impact the structural integrity of the From a view *looking north* toward I-285, completed construction of a CD roadway improved safety and operations.

> I-75's new northbound collector-distributor (CD) road, Frontage Road and Forest Parkway Interchange, *looking south* toward SR 331/ Forest Parkway

bridge's end bents while providing the necessary span width to accommodate the two-lane loop ramp alignment. The solution eliminated potential impacts to the existing I-285 bridges and the traveling public while maintaining the existing loop ramp connection. This, in turn, avoided the need for a costly steel flyover structure.

Use of New Applications

Shallow rock and poor soils required the use of innovative ground improvement solutions. Deep undercutting was not feasible due to high groundwater and the proximity of the wall alignment to the existing roadway. Instead, a compacted aggregate pier system or an H-pile supported load transfer platform was proposed. Depending on the wall height, one of these solutions could provide the required safety factor for the walls. Willmer Engineering performed extensive analyses/design calculations to demonstrate the effectiveness of the ground improvement system. This was one of the first uses of compacted aggregate piers on a nonalternative delivery GDOT project. Their use on this project provided a solution that further reduced costs.

Engaging with Business Owners and the Public

The project also included improvements to the frontage road located east of I-75, which was lined with multiple businesses. One of these was the Georgia State Farmers Market (a National Register of Historic Places eligible resource). Public outreach and engagement were tailored to fit the needs of business owners, in addition to drivers. A project newsletter was developed to reach the business community in the corridor, an outreach commended by the Federal Highway Administration. The project's design team also collaborated with Clayton County and the City of Forest Park to avoid impacting ongoing water and sewer line upgrades within the project limits.

(continued on page 26)

Markers News From Across ASHE-Miles



ENGINEERING | PLANNING | DESIGN | TECHNOLOGY









TRANSPORTATION SOLUTIONS BUILDING BETTER COMMUNITIES



Celebrating Women in Leadership

In April, the ASHE New York Metro Section celebrated "Women in Leadership," featuring a panel of professional leaders in the New York metropolitan area. Facilitated by Rhonda Cardone, Director of Marketing, Dewberry, the panelists included Lisette Camilo, Chief Administrative Officer, Metropolitan

Transportation Authority; Charlette Hamamgian, Deputy Comptroller, Contracts and Procurement, Office of the Comptroller of the City of New York; Elisa Velasquez, Deputy Chief Financial Officer and Deputy Commissioner, New York City Department of Environmental Protection; Tiffany-Ann Taylor, Vice President for Transportation, Regional Plan Association; and moderator Hope Kaufman, Associate Vice President, Dewberry.

Strengthening Operations and Safety Along Metro Atlanta's Backbone

(continued from page 25)

Benefits of the Project

GDOT received competitive A + B Construction Bids, which demonstrated a comprehensive bid package with few ambiguities. The construction project totaled more than \$78 million and reached substantial completion in September 2021.

Today, the weave between SR 331/ Forest Parkway and I-285 occurs on a lower speed CD facility. The friction that occurred on northbound I-75, impacting its operations and safety, is now on a stand-alone CD, substantially improving conditions on I-75.

The existing two-lane loop ramp was realigned and coated with a high-friction surface to also improve safety. The reduction in truck speed from the CD to the loop ramp reduced the likelihood of trucks overturning. The CD also provided better deceleration length, allowing for improved reaction time.

Through construction of a braided ramp, the CD system alleviated existing weave issues on this northbound stretch of I-75 in Atlanta, substantially upgrading operations and enhancing safety for travelers. ▼



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by Matt Buckley, PE. PTOE. Whitman, Requardt and Associates, LLP, ASHE **First State** Section

or years, vehicle strikes plagued a low-clearance railroad bridge on Casho Mill Road in Newark, DE. With over 70 reported crashes since 2005, the high-volume, state-maintained roadway was the bridge struck most often in Delaware, earning the monikers Smasho Mill Road or Crasho Mill Road. It even spawned a social media parody page called the Casho Mill River and Bay Authority, with over 1,600 followers. Each strike triggered an emergency response across several agencies, impacting travelers and local residents. Sometimes hitting the bridge caused personal injuries and property damage. In 2014, when the bridge had an increase in strikes, the City of Newark's police department and public works officials approached Delaware's Department of Transportation (DelDOT), asking for better deterrents.

TRICK TREAT KABOOM

With a bridge clearance of only eight feet, seven inches, several preventive measures were implemented. DelDOT installed over two dozen emphatic warning signs, upgraded overhead warning beacons and conducted public outreach. Focused

Delivering a better world

The Casho Mill Road Clankers: Stop Now Dr. ... Ka BNDM

ASHE North East Region **2023 Project** of the Year Under \$20 Million

A local city resident expressed appreciation for the clankers as part of a homemade Halloween display.

(continued on page 30)

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The Casho Mill Road Clankers: Stop Now or...*H*ABOOM!

(continued from page 29)

outreach was conducted to truck rental companies, based on a pattern of strikes by rented box trucks. These strikes were due, in part, to rising demand for delivery services and an increased number of inexperienced truck drivers.

Ultimately, the stepwise improvements produced minimal change, and over height crashes continued.

In 2019 the bridge owner, CSX Transportation (CSX), requested that DelDOT close the underpass to vehicular traffic. DelDOT, city leaders and state/local elected officials opposed the closure. They raised concerns that the move would create disruptions for multiple communities, including indirect travel routes and interstate traffic flow for rural Maryland and Pennsylvania. In response, CSX agreed to have DelDOT engineers begin a design to mitigate the issue in the short term while evaluating long-term solutions. To further support DelDOT's short-term strategy, Delaware's General Assembly issued a directive to pursue the design and installation of an overhead physical deterrent system.



A regulatory sign at the tunnel entrance indicated the consequence for over height vehicles: *Kaboom*!



About three weeks after installation, the clankers' "catch of the day" was an over height boat.

Over the next two years, the design team from Whitman, Requardt and Associates, LLP (WRA), designed this deterrent for over height vehicles. It was used in conjunction with a dynamic warning system (stop beacons/flashers). The solution consisted of heavy-duty plastic spheres, called clankers because of the noise they made if struck. These hung from a steel mast arm spanning the lane approaching the bridge. The clankers were set at the bridge/tunnel height, serving as a final warning beyond several vehicle turnouts and diversion routes. If struck, the vehicle was too tall to pass under the bridge, which prompted the driver to turn around.

Construction and installation were completed in August 2022. Post-installation adjustments based on impact testing and material choices helped reduce the likelihood of projectiles causing injury or property damage. To reduce unforeseen challenges, the installation underwent several upgrades. No Trespassing signs were posted after someone was photographed climbing on and swinging from the clankers. Lateral chain supports and chain sleeves reduced the tethering/ wrapping effect from strikes or vandalism. Retroreflective bands and strips made the clankers more conspicuous at night. One year later, there have been no reported strikes. However, there have been a handful of deterrence events captured on both DelDOT's traffic monitoring cameras, as well as by citizens posting events on social media.

The project earned multiple awards, including the Governor's Team Excellence Champions Award. It also received attention from the community, based on the nature of the design and its ongoing success. The clankers have taken on a life of their own, developing a following that generated clanker-themed apparel, holiday decorations, memes and recognition at community events.



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Regions and Sections Northeast Region

| SECTIONS | |
|--------------------------|-------|
| Albany | 85 |
| Altoona | 186 |
| Central New York | 50 |
| Clearfield | 191 |
| Delaware Valley | 340 |
| East Penn | 118 |
| First State | 212 |
| Franklin | 129 |
| Harrisburg | 423 |
| Long Island | 47 |
| Mid-Allegheny | 125 |
| New York Metro | 162 |
| North Central New Jersey | 133 |
| North East Penn | 134 |
| Pittsburgh | 549 |
| Southern New Jersey | 173 |
| Southwest Penn | 227 |
| Williamsport | 78 |
| Subtotal | 3,362 |

Mid-Atlantic Region

| Subtotal 1 | 1 044 |
|-----------------------------|-------|
| South Carolina | 120 |
| Potomac | 158 |
| Old Dominion | 78 |
| North Central West Virginia | 51 |
| Greater Hampton Roads | |
| Chesapeake | 253 |
| Carolina Triangle | 202 |
| Carolina Piedmont | 46 |
| Blue Ridge | 57 |
| SECTIONS | |

Southeast Region

| DEUTIONS | |
|-------------------|-------|
| Alabama | 55 |
| Central Florida | 119 |
| Georgia | 600 |
| Middle Tennessee | 312 |
| Northeast Florida | 205 |
| South Florida | 12 |
| Tampa Bay | 42 |
| Tennessee Valley | 115 |
| Subtotal | 1.460 |

Great Lakes Region

| Subtotal | 1.049 |
|-----------------|-------|
| Triko Valley | 151 |
| Northwest Ohio | 45 |
| Lake Erie | 224 |
| Derby City | 86 |
| Cuyahoga Valley | 112 |
| Circle City | 46 |
| Central Ohio | 205 |
| Central Dacotah | 83 |
| Bluegrass | 97 |
| SECTIONS | |

Southwest Region

| Subtotal | 341 |
|-------------------|-----|
| Phoenix Sonoran | 147 |
| Houston | 72 |
| Dallas-Fort Worth | 45 |
| Central Texas | 77 |
| SECTIONS | |

| National Total | 7,256 |
|---------------------|-------|
| Professional Status | 56% |
| Government | 12% |

| Oovernment | 12/0 |
|------------|------|
| Consultant | 75% |
| Contractor | 5% |
| Other | 8% |

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