

PRESIDENT'S MESSAGE

As my term as your President comes to a close, I find myself more grateful than I can easily put into words.

Serving the ASCE National Capital (Section) and its more than 2,800 members has been one of the great honors of my career. When I stepped into this role, I hoped to leave the Section a little stronger than I found it. Whether I have succeeded is for you to judge, but I can say with certainty that I gave it everything I had.

This year, we launched our inaugural State of Infrastructure Summit, convened conversations on the future of our profession from AI in transportation to regional resilience, and planted the seeds for new initiatives that I hope will grow long after my term ends. None of it was mine alone. Every bit of it was the work of volunteers who give their time simply because they care, and I am humbled by all of you.

To our board, our committee leaders, and our members, thank you. Thank you for your trust, your energy, and your willingness to show up again and again for this community.



Leadership, I have come to believe, is not about the seat you hold. It is about the people you lift and the foundation you leave behind. I am confident our Section is in good hands, and I cannot wait to see where it goes next.

With gratitude,
Shofiq Ahmed, P.E., PTOE, RSP1
President, ASCE NCS

**JOIN US for the 2026
DC QUALITY INITIATIVE
(DCQI) CONFERENCE on
THURSDAY, OCTOBER 22,
at the Westin Washington,
DC Downtown!**

DCQI brings together transportation agencies, engineers, contractors, consultants, and industry leaders from across the Washington metropolitan region for a full day of agency updates, technical education, innovative project solutions, and industry networking.

Attendees will hear directly from regional agencies about upcoming programs and project opportunities, while technical sessions will highlight the ideas, technologies, and practices shaping transportation infrastructure throughout the region.

**Thursday, October 22, 2026 • The
Westin Washington, DC Downtown**
Learn more and register at dcqi.org

A Milestone for Our Section: The Inaugural State of Infrastructure Summit

By: Shofiq Ahmed, P.E., PTOE, RSP1, President, ASCE NCS

On August 6, 2026, the ASCE National Capital Section held its first-ever State of Infrastructure Summit, and it exceeded every expectation we had.

Fifteen distinguished leaders joined us across six sessions, offering a candid look at the state of our region, from regional growth and federal investment to transportation, water, structures, transit, and the frontier of innovation and artificial intelligence.

Attendees earned up to six professional development hours, but the real value was harder to measure: honest conversation, sharper



questions, and the kind of connections that only happen when the people who plan, fund, and build this region share the same room.

The response has been humbling. Members and guests alike told us the day was substantive, well-organized, and unlike anything our Section has offered before. That feedback belongs to everyone who made it possible.

None of this happened alone. Our speakers gave their time and their candor. Our sponsors invested in the profession and stood behind us. And a dedicated team of volunteers and board members carried this Summit from an idea into reality, often on nights and weekends. To every one of them, thank you.

This Summit was never meant to be a single event. It was meant to begin a tradition, one that belongs to this Section and continues for years to come. We are proud of what we built together, and we are only getting started.

We look forward to welcoming you back next year.

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Geophysics and Subsurface Utility Engineering (SUE) — How to Find, Map, and Manage What You Want to Hit or Miss Before Digging, Drilling, Or Building

By: Randall Booker, MS, P.E., Geotechnical Project Engineer at A.G.E.S., Inc.

The ASCE National Capital Section's Reston Branch welcomed members and guests on September 16, 2026, for a hybrid lunch meeting featuring a presentation on "Geophysics and Subsurface Utility Engineering (SUE) – How to Find, Map, and Manage What You Want to Hit or Miss Before Digging, Drilling, or Building." The program was presented by **Felicia Kegel Bechtel, MSc, PG**, Senior Geophysical Advisor and Special Projects at RETTEW.

The meeting attracted 25 attendees, with 11 participating in person and 14 joining virtually.

Drawing on more than 30 years of experience in surface, marine, and borehole geophysics, Felicia introduced attendees to the applied science of geophysics and its use in engineering, environmental, energy, and subsurface utility applications. She explained how geophysical techniques can help project teams locate and characterize subsurface features before construction, excavation, drilling, or remediation begins.

Using real-world project examples, Felicia discussed a range of investigation methods, including seismic, microgravity, electromagnetic, magnetic, borehole logging, resistivity, and ground-penetrating radar surveys. Applications range from evaluating dam structural integrity and detecting leaks to mapping sinkholes and fractures, profiling bedrock, locating underground tanks and drums, delineating contaminant plumes, and supporting seismic site classification.

A key takeaway from the presentation was the value of investing in subsurface investigation early and selecting the appropriate method for the specific site and project. Better information about existing underground conditions can help project teams identify risks earlier, reduce utility conflicts and redesign, and potentially avoid costly change orders, construction delays, and other unexpected conditions.

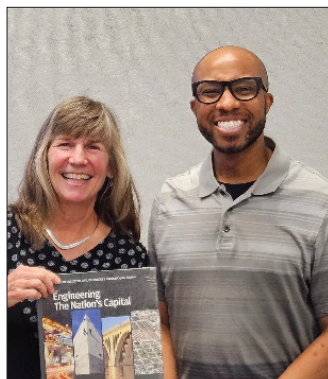
Felicia brought extensive technical and project management experience to the discussion, having worked across local, state, federal, commercial, and industrial markets. She previously served as RETTEW's Director of Geophysics and, before joining RETTEW, spent 25 years as President of Enviroscon, Inc. She holds a bachelor's degree in geology

from Bryn Mawr College and a master's degree in geology from Brown University. She also volunteers her time to introduce young people, particularly young women, to careers in mathematics and science.

The program provided Reston Branch members and guests



with a practical look at how geophysics and SUE can help engineers better understand what lies beneath the surface before breaking ground. It reinforced the importance of thoughtful early investigation and informed decision-making in managing project risk and delivering safer, more efficient, and more successful projects.



OPEN BOARD POSITIONS

with ASCE NCS Reston Branch

The Reston Branch is currently seeking individuals interested in serving on the Board for the 2026-2027 program year. Be a part of the group that puts together great technical meetings and networking opportunities! Participating with the Board is a great chance to meet professionals in our local community and to learn more about the civil engineering work that drives our area. We currently have three (3) voting board positions open, two (2) for the At-Large Director and one (1) for the Secretary.

If you would like to be considered for the At-Large Director and Secretary position, please provide a Statement of Intent (a brief paragraph describing your interest in the position) and Qualifications (a brief bio or resume) to ASCE Reston Branch, **Vicky Yu**, at this email address: vyu@atcs.com.

GEO-INSTITUTE OPEN POSITIONS

By: Sharon Hartley, P.E., Vice President of Engineering at ICOP

The NCS Geo-Institute (G-I) is looking for members who would like to become more involved. You do not need to have previously served on a committee or the Board—we especially encourage members who haven't been involved before to consider joining us.

We currently have opportunities in the following areas:

Communications Committee – Help us strengthen communications with our membership and promote G-I programs and activities. We are specifically looking for volunteers to help with our [website](#) and [newsletter](#).

Sponsorship Committee – Help coordinate our annual sponsors by collecting sponsor logos and slides, keeping sponsorship materials up to date, and ensuring our sponsors receive the recognition included with their sponsorship. This is also a great opportunity for someone interested in becoming more involved with G-I leadership in the future.

Scholarship Committee – Help us support the next generation of geotechnical engineers through our scholarship program. Volunteers will assist with outreach, reviewing applications, and the scholarship selection process.

NEW – Inaugural Awards Committee – We are excited to announce that we are developing an [inaugural awards program to be presented at our end-of-year banquet](#), and we want our members to help create it! We are looking for volunteers to help shape the program from the beginning, including developing award categories and criteria, soliciting nominations, reviewing submissions, and helping us recognize the people and accomplishments that make our local geotechnical community exceptional.

Whether you have a lot of time to give or just want to help with a specific initiative, volunteering is a great way to meet others in the industry, expand your professional network, and have a voice in G-I's programs and activities.

Interested? Please email skhartley@icopgroup.com and let us know whether you are interested in sponsorship, communications, scholarships, or our new Awards Committee.

We are looking forward to a great 2026–2027 year and hope to see many new faces getting involved!

The ASCE National Capital Section and the Institution of Civil Engineers (ICE) US Mid-Atlantic South Region Networking Event

By: Alan McDonald, P.E., M.ASCE Vice President, ASCE-NCS, Construction Department Manager at MWAA

The ASCE-NCS and ICE US Mid-Atlantic South Region hosted a joint networking event at The Liberty Tavern in Arlington, Virginia, on Wednesday, September 23, 2026.

Founded in the United Kingdom, ICE is one of the world's longstanding professional organizations for civil engineers, with a broad international membership and a smaller but active and enthusiastic community here in the United States. The joint happy hour brought together members of both organizations for an informal evening of conversation, networking, and professional fellowship.

The event provided an opportunity to build connections across organizational and geographic boundaries while reinforcing the shared mission to support and advance the civil engineering profession. By creating opportunities for members of different professional communities to meet, exchange ideas, and learn from one another, ASCE-NCS and ICE are helping strengthen the profession as a whole.

ASCE-NCS looks forward to continuing its collaboration with ICE and to creating more opportunities for civil engineers throughout the region to connect across organizations.



Geo-Institute 2026 Dulles Plane Pull

By: Sandarva Sharma, PhD, P.E., Geotechnical Project Engineer at A.G.E.S., Inc.

The NCS G-I Chapter Supports Special Olympics Virginia at the Dulles Plane Pull. We'll admit it: nothing on our usual project scope prepared us for hauling an 82-ton aircraft across pavement. And yet, on August 22, 2026, that's precisely what we signed up for. The ASCE National Capital Section – Geo-Institute proudly participated in the Special Olympics Virginia Plane Pull, held at Washington Dulles International Airport. Our team joined 66 other teams from across the region for the event's signature challenge: pulling an 82-ton FedEx Airbus A320 12 feet. The event brought together the local business and engineering community for a shared cause, raising a combined total of \$512,000 to support year-round training and health programs for more than 23,000 Special Olympics Virginia athletes. Our team contributed \$2,500 to this total, thanks to the generosity and dedication of our members and their families. We are pleased to share that our team was also recognized with the Lightest Team trophy, a fitting highlight to a memorable day of teamwork and community engagement. We extend our sincere gratitude to everyone who participated, volunteered, and donated in support of this meaningful cause. A full recap of the event is available on our LinkedIn page, [@ASCE Geo-Institute National Capital Chapter](#).



Beneath the Lincoln Memorial: Transforming Space Into Experience

Danielle C. Gittens, P.E., CCM, Owner at Brewington Management Co.

On September 15, 2026, the ASCE National Capital Section held its September section meeting at Le Méridien Arlington, featuring a fascinating presentation titled "Beneath the Lincoln Memorial: Transforming Space Into Experience." The presentation offered attendees a behind-the-scenes look at the engineering, architectural, and historic preservation challenges involved in transforming the previously inaccessible space beneath one of America's most iconic monuments into an immersive visitor experience.

The presentation was delivered by **Tim Smith, P.E.**, Director of Land Development at VHB; **Megan Tormey, AIA, LEED AP BD+C**, Senior Associate and Senior Architect at Quinn Evans; and **Kirk Mettam, P.E.**, Senior Vice President at TYLin. Together, they highlighted the collaboration required to modernize the Lincoln Memorial's visitor facilities while preserving its historic character.

This event was generously sponsored by Procon, who served as the owners representative on the project.

Discovering the Structure Beneath the Memorial

One of the most intriguing aspects of the presentation was the history and complexity of the Lincoln Memorial's underground structure, known as the Undercroft. Hidden beneath the statuary chamber, the space contains massive concrete columns, arches, and foundations that support the monument above.

The presenters explained how the Memorial was constructed on land that had been reclaimed from the Potomac River. Its foundations extend through layers of fill, marsh deposits, and clay to reach competent bedrock. Historical records revealed that portions of the surrounding

terrace experienced significant settlement, including differential movement of up to seven inches, requiring underpinning and structural repairs as early as 1921.

These historical conditions created unique challenges for the modern project team, particularly because some original construction records were incomplete or conflicting.

Transforming a Historic Space

The project transformed portions of the Undercroft into an expanded museum and visitor experience, incorporating new exhibits, an immersive audiovisual theater, relocated retail space, improved security screening, and an additional elevator to enhance accessibility and operational reliability.

A central theme of the presentation was the importance of being good stewards of the Memorial. The design team sought to preserve the original concrete columns, arches, and historic materials while introducing modern building systems and visitor amenities.

Rather than concealing the historic structure, the design celebrates it. Large glass walls provide views into the Undercroft, allowing visitors to appreciate



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Sustainable Growth: Restoring Infrastructure Without Losing the Landscape

Article by: Naveen Kothapalli, Vice Chair, Sustainability Committee, ASCE NCS

How the Glover Archbold Park Sanitary Sewer Rehabilitation Project demonstrates that infrastructure renewal and environmental stewardship can move forward together

A walking trail through Glover Archbold Park can make environmental preservation look effortless. Mature trees line the path, water moves through the landscape, and visitors experience the park as a natural space. Beneath that landscape, however, critical infrastructure requires continual investment and rehabilitation.

The Glover Archbold Park Sanitary Sewer Rehabilitation Project in Washington, D.C., demonstrates how infrastructure renewal can be approached with environmental stewardship at the center of construction planning.

The project required rehabilitation of essential sewer infrastructure within a sensitive park environment. Because construction activities can disturb soil, affect vegetation, increase erosion, and introduce sediment into nearby waterways, environmental protection was an important part of the project approach.

This is where sustainable growth becomes more than a concept. It means improving infrastructure while protecting the natural and community resources that surround it.

Sustainability Beyond the Infrastructure

Sustainable infrastructure is often discussed in terms of the asset itself and its service life, reliability, efficiency, and resilience. However, sustainability also depends on how an infrastructure project interacts with its surrounding environment.

At Glover Archbold Park, construction activities were accompanied by Low Impact Development (LID) practices and erosion and sedimentation control measures designed to reduce impacts to the surrounding landscape.

Measures included super silt fences, filter socks, straw bale dikes, slope stabilization, controlled construction access, tree protection, rock outlet protection, dewatering systems, sewer bypass operations, and sandbag diversion.

Individually, these measures may appear relatively small. Collectively, they demonstrate a fundamental principle of sustainable construction: Protecting the environment is achieved through many deliberate decisions made throughout the construction process.

The objective was not to eliminate construction impacts, an unrealistic expectation for any infrastructure project, but to identify, manage, and reduce those impacts while completing essential infrastructure improvements.

Protecting What Already Exists

One of the most important aspects of sustainability is recognizing the value of existing resources.

Mature trees, natural drainage patterns, established vegetation, streams, and public trails can take decades to develop. Protecting these resources during construction can therefore be just as important as creating new infrastructure.

Tree protection measures were implemented near construction limits and access areas, including protection of trees along construction access paths. These efforts helped minimize unnecessary disturbance to existing vegetation and preserve the character of the park.

File Pictures- LID Practices during construction

Sustainable development is not only about what we build; it is also about what we preserve.

For infrastructure projects located within public parks, this principle becomes especially important. The community should continue to benefit from the landscape after construction is complete.

From Construction Site Back to Community Space

During construction, even environmentally responsible projects can temporarily transform a natural setting. Equipment, access routes, staging areas, erosion-control measures, and disturbed soil can make a park look very different from its normal condition.

The long-term objective, however, is restoration.

The restored walking trail provides a visible example of how infrastructure rehabilitation and public-space preservation can coexist. While the sewer infrastructure serves an essential function below ground, the landscape above continues to provide opportunities for recreation, walking, and connection with nature.

The transformation is particularly visible when viewed across the project photographs. Images captured during construction documents are the environmental controls, access routes, and active work within the park. Later photographs show the restored trail during the fall season, when the surrounding trees and landscape returned to their natural character and the path was framed by vibrant autumn colors.



Together, these images tell an important sustainability story: construction is temporary, but the community and environmental value of the landscape can endure.

A successful infrastructure project should not be judged only by whether the asset was rehabilitated. It should also consider what remains for the community and environment once construction is complete.

A functioning sewer system is one part of the outcome. Preserved vegetation, protected waterways, restored disturbed areas, and continued public access are also part of the project's broader sustainability story.

Sustainability Requires Continuous Attention

Sustainability does not end when an erosion-control measure is installed.

Environmental protection measures require inspection, maintenance, and adjustment throughout construction. Construction entrances may require cleaning, filter socks may need to be repositioned, staging areas may require mulching or seeding, and accumulated sediment may need to be removed from control measures.



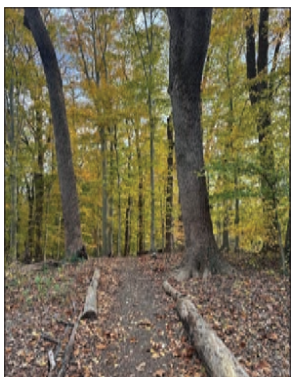
These activities demonstrate an important lesson:

Sustainability is a process, not a one-time decision.

Environmental performance depends on continued attention from project owners, designers, contractors, environmental professionals, regulators, and other stakeholders.

The project also provides an opportunity to learn from areas where environmental controls can be strengthened. Observations regarding tree-protection coverage, for example, highlight the importance of coordination and consistent implementation of environmental requirements.

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SUSTAINABLE GROWTH

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Sustainable construction does not mean claiming that every impact has been eliminated. Instead, it means continually asking:

What can we protect? What can we reduce?
What can we restore? And how can we do it better on the next project?



A Broader Definition of Progress

The Glover Archbold Park project offers a practical perspective on sustainable growth.

Progress is not simply more construction or a larger physical footprint. Progress can mean rehabilitating aging infrastructure while reducing environmental disturbance, protecting mature trees, controlling sediment, restoring disturbed areas, and maintaining public access to valuable open space.

As communities grow and aging infrastructure requires continued investment, these principles will become increasingly important.

The infrastructure beneath our communities and the landscapes above them are both valuable systems. Sustainable development recognizes that these systems do not have to compete. With thoughtful planning, appropriate low impact development and best management practices, effective construction controls, and continued environmental stewardship, infrastructure renewal can support both community needs and environmental protection. The project photographs provide a simple visual representation of that possibility: from an active construction site with temporary environmental controls to a restored trail surrounded by the natural beauty of the fall season.

Pictures in File—Trail Path After Restoration

The infrastructure was improved. The landscape was protected. And the community can continue to experience the park.

That is a meaningful vision of sustainable growth: not choosing between development and preservation but finding ways for both to move forward together.

Project Credits

Landowner: National Park Service (NPS)
Asset Owner: DC Water
Design Lead: Brown and Caldwell
Site Civil Designer: Wave Civil
Construction Contractor: Spiniello
Photo Credits: Naveen Kothapalli

ASCE Virginia Infrastructure Report Card

By: Victor I. Crawford, P.E., F.ASCE, Co-Chair, Virginia Report Card Committee

The ASCE VA Infrastructure Report Card was released on August 25, 2026, to members of the press at the Capitol Bell Tower in Richmond, Virginia. **Mr. Donnel** from the City of Richmond and **Mr. Roadcap** from the VA Department of Drinking Water made presentations. **Mr. O'Neil**, ASCE CEO, made a presentation along with **Vic Crawford** and **John Harman**, co-chairs.

After presentations, the press asked questions and interviewed Mr. Donnel.

Supporting the event were members of the ASCE Headquarters (HQ) staff, **Bill Bersing**, **Chris Lynch**, **Kyle Hogan**, and **Darem Williams**. Copies of the report card were distributed to the attendees. ASCE HQ issued a press release on the importance of the report card.



Beneath the Lincoln Memorial

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the scale of the concrete columns and arches. An immersive audiovisual experience uses projections to bring the Memorial's history to life.

Engineering and Construction Challenges

The presenters discussed several significant engineering and construction challenges, including groundwater infiltration, high humidity, structural modifications, limited construction access, and the need to maintain visitor access to an active national landmark.

One particularly interesting challenge involved the underground environment. Humidity monitoring documented extended periods of relative humidity exceeding 95 percent. These conditions required the design team to create what they described as a "building within a building," using specialized materials, environmental controls, and carefully coordinated mechanical systems.

The project also incorporated electrically heated glazing to prevent condensation while maintaining clear views into the historic Undercroft.

Structural modifications required extensive investigation of existing foundations, careful evaluation of load paths, temporary shoring, selective demolition, and concrete repairs. The contractor employed a bottom-up demolition approach in portions of the terrace to minimize the need for additional wall bracing.

Working within the constraints of an active national monument required extensive coordination among the National Park Service, engineers, architects, specialty consultants, and contractors. Temporary access routes, utilities, construction staging, and protection of the historic structure were critical considerations throughout construction.

Preserving History While Improving Visitor Experience

The presentation demonstrated how thoughtful engineering and architectural design can create new opportunities for public engagement without compromising historic resources.

The complete improvements allow visitors to experience a part of the Lincoln Memorial that was previously largely hidden from public view. The exposed structural elements, interpretive exhibits, and immersive technology offer a new perspective on both the Memorial's history and the engineering achievements behind its construction.

Attendees also learned an interesting fact about this Washington, D.C., landmark: the Lincoln Memorial is open to the public 24 hours a day, seven days a week! For those who have only visited during daylight hours, this offers an opportunity to experience the monument in an entirely different setting.



The September section meeting provided a compelling example of how civil engineering, architecture, construction management, and historic preservation can work together to protect a national treasure while enhancing its accessibility and educational value for future generations.

Establishing a Shear Load Transfer Mechanism in Shallow Concrete Pier Caps Using 3D Finite Element Analysis

Presented at the NCS SEI March Meeting by Soroush Fakhri-Yazdi, P.E. and Amir Gheitasi, PhD, P.E.

Bridge pier caps are often evaluated using traditional sectional methods or Strut-and-Tie Models (STM). While these approaches are well-established and code-compliant, they do not always fully capture the three-dimensional load-transfer mechanisms that develop within complex reinforced concrete structures. This challenge became apparent during the evaluation of a series of shallow concrete pier caps as part of a bridge assessment program.

As part of a bridge inspection, rehabilitation, and load rating effort, our team was tasked with evaluating approximately 80 shallow pier caps supporting bridge approach spans. Initial Load and Resistance Factor Ratings (LRFR) performed using conventional methods produced unexpectedly low rating factors, particularly in the cantilever overhang regions. Strut-and-Tie analyses were constrained by AASHTO LRFD requirements governing strut geometry and reinforcement development, while sectional methods improved the results but still did not satisfactorily demonstrate adequate shear capacity. These findings raised an important question: Were the low-rating factors indicative of actual structural deficiencies, or were they a consequence of the limitations inherent in the analytical methods used?

To better understand the structural behavior, the project team developed a comprehensive three-dimensional finite element (FE) modeling framework. The concrete pier cap was modeled using solid elements, while longitudinal reinforcement and stirrups were represented explicitly using beam elements. Development length effects were incorporated into the model to better represent force transfer within the member. Spring-supported boundary conditions were used to simulate column flexibility, and loads were distributed through bearing plates to realistically replicate field conditions.

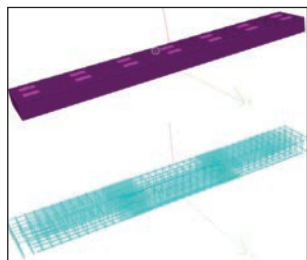


Figure 1. Three-dimensional finite element model and reinforcement configuration

One of the most interesting aspects of the study was the treatment of concrete cracking. Because many finite element programs used in bridge engineering employ linear-elastic formulations, cracks do not automatically develop when tensile stresses exceed the concrete cracking strength. To better represent the behavior of reinforced concrete, an iterative crack-modeling process was developed. The

pier cap was first analyzed in its gross, uncracked condition, after which concrete elements exceeding the tensile cracking limit were progressively removed, and the model reanalyzed. This iterative process simulated the progression of cracking and allowed the internal stress field to evolve as the model was refined. The procedure was repeated until a stable stress distribution and consistent load path were achieved.

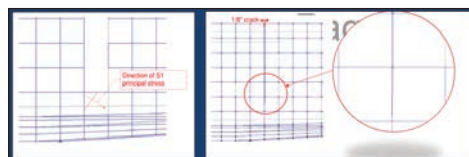


Figure 2. Crack simulation methodology used to evaluate load transfer within the pier cap.

As cracking progressed, the analysis revealed a clear redistribution of forces and the emergence of a viable load-transfer mechanism. Tensile forces shifted from the cracked concrete to the reinforcement, while compressive stress developed through the concrete between the bearing regions and the supporting columns. The top longitudinal reinforcement served as the primary tension tie, and the resulting stress field clearly identified the compression struts responsible for shear transfer. These load paths closely mirrored the idealized behavior assumed by STMs, confirming the underlying structural mechanics and illustrating the value of three-dimensional FE analysis for directly visualizing stress flow and force redistribution within reinforced concrete members.

To better represent the distributed cracking that occurs in reinforced concrete members, additional cracks were introduced into the model rather than relying on a single discrete crack. As cracking became more distributed, the concrete exhibited the expected softening behavior, resulting in lower tensile stress concentrations and a more realistic redistribution of internal forces. The refined analysis demonstrated that load transfer was carried by a broader region of the member, whereas some localized stress concentrations observed in simpler models were found to be numerical artifacts arising from idealized crack assumptions. Ultimately, the three-crack model provided a practical balance between analytical rigor and modeling efficiency.

One of the most significant findings of the study was the identification and visualization of a viable shear load-transfer mechanism within the shallow pier cap. Principal compression stress contours clearly showed diagonal compression struts extending from the bearing regions toward the supporting columns, while the top reinforcement provided the tension tie force necessary to complete the load path. Together, these components formed a complete force-transfer mechanism consistent with

reinforced concrete theory and the principles underlying Strut-and-Tie design. The observed behavior demonstrated that, despite the shallow geometry of the pier cap, loads could be effectively transferred through a combination of compression struts and reinforcement ties.

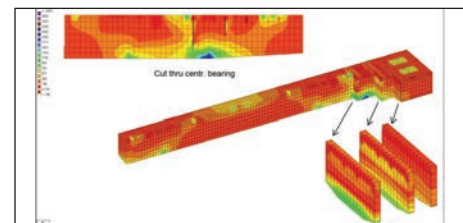


Figure 3. Principal compression stress contours illustrating the diagonal compression struts and tension-tie mechanism responsible for shear load transfer within the shallow pier cap.

While the FE model provided a detailed representation of structural behavior, a methodology was still needed to evaluate capacity within the framework of the AASHTO LRFD load-rating process. To establish this connection, the stress fields and load paths identified in the analysis were evaluated using the same resistance factors and stress limits traditionally applied in STM design. Compression stresses in nodal zones and pseudo-struts were checked against applicable concrete strength limits, while reinforcement stresses were evaluated against factored steel stress limits. The analysis demonstrated that all critical stress checks were satisfied, providing a rational and code-consistent basis for assessing structural capacity and load rating performance.

The study also highlighted the importance of engineering judgment when interpreting FE results. Localized stress concentrations near crack tips were found to be highly dependent on the idealized representation of discrete cracks and did not necessarily reflect actual structural behavior. Distinguishing physically meaningful stress patterns from numerical artifacts is essential when using advanced analytical tools. By focusing on global load-transfer mechanisms rather than isolated peak stresses, the analysis provided a more realistic representation of structural behavior while maintaining consistency with the intent of AASHTO LRFD provisions.

Ultimately, this study demonstrated how advanced three-dimensional FE analysis can complement traditional design, evaluation, and load-rating methodologies. By combining detailed modeling with rational crack simulation techniques, engineers can gain a clearer understanding of load paths, force redistribution, and structural behavior in reinforced concrete members. When paired with sound engineering judgment and appropriate code-based checks, these analytical tools provide a practical framework for evaluating disturbed regions where conventional methods may not fully capture the underlying mechanics. They offer valuable insight into structural force-transfer mechanisms and help engineers make more informed assessment decisions.

SafeTransit AI: Operationalizing Peer-Reviewed Spatial-Temporal Models for Bus Safety

By: Jeetesh Suresh Tripathi and Sanskrit Singh | WSP USA

Bus crashes remain a serious safety problem for transit agencies. From 2008 to 2021, National Transit Database (NTD) records show 7,298 crashes between transit buses and people, including pedestrians and cyclists, 537 of them fatal (15% of all transit fatalities) and 7,329 resulting in injuries. Transit agencies have historically managed this risk reactively, responding after incidents occur rather than anticipating where and when they are likely to happen. A peer-reviewed study published in Transportation Research Record (2026) established that combining spatial and temporal statistical models on data agencies already collect, onboard video events, collision records, and built-environment attributes, can identify measurable leading indicators of bus collision risk. SafeTransit AI is a decision-support platform built to operationalize that published methodology into an interactive risk-intelligence tool for transit safety managers.

Underlying Research

The study analyzed nearly 600 NTD-reportable bus collisions and roughly 580,000 onboard video-triggered driver behavior events across a major metropolitan bus network from 2020 to 2023. An autoregressive integrated moving average with exogenous variables (ARIMAX) (3,0,3) time-series model tested whether daily video-event volume leads the daily collision rate, finding a statistically significant exogenous coefficient of 0.08 ($p < 0.01$, $n = 1,461$ daily observations). A Geographically Weighted Regression (GWR) model, run with an adaptive exponential kernel across 1,609 Census block groups, tested whether seven operator behaviors correlate with collision rates differently by location. GWR explained 52.9% of the spatial variation in collision rate (mean local $R^2 = 0.529$) versus 35.1% for a non-spatial OLS baseline, a roughly 51% improvement, confirming that behavior-collision relationships are not uniform across a service area.

From Research to Platform

SafeTransit AI translates these two validated models into an operational pipeline: data ingestion, feature engineering, model scoring, and spatial visualization. The platform maps GWR coefficients by behavior and census block group, so a safety manager can see, for example, that pedestrian and cyclist interaction events (the study's strongest and most widespread predictor, with localized coefficients as high as 0.47) carry different weights on a downtown corridor than in a suburban transition zone. The ARIMAX leading-indicator signal is surfaced as a short-term forecast, giving supervisors a practical window to dispatch proactively rather than review after the fact. A risk-intervention layer then maps each statistically significant behavior, such as posted speed violations, late responses to hazards, unbelted operators, or incomplete stops, to a corresponding operational response (infrastructure review, targeted training, or policy and enforcement adjustments), matched to where that behavior actually drives risk rather than applying a single agency-wide policy.

Why Spatial Targeting Matters

The published research found that some behaviors, including incomplete stops and failure to maintain a safety buffer, showed opposite correlations with collision rates in different neighborhoods, reflecting local context such as road design, speed environment, and signal density. This is the core justification for a spatially aware tool: a one-size-fits-all safety policy is measurably less effective than location-specific interventions built on where a given behavior actually elevates risk.

A Transferable, Reproducible Framework

SafeTransit AI is currently a demonstration platform using protected sample data, built to behave like real bus safety data while exposing no private or proprietary operational information, so the methodology can be evaluated openly. Its value is not tied to any single agency. The authors note that aggregate video events may not be strictly exogenous, since near-miss behaviors that trigger recordings can also precede reportable collisions, and that block-group-level findings should not be read as conclusions about individual operators. Because so many U.S. transit agencies already operate similar onboard video systems, the underlying modeling framework, and by extension the platform built on it, is intended to be reproducible without new instrumentation; applied to a different service area, the same approach would surface that area's own leading indicators rather than assuming this Metropolitan area study's specific findings transfer directly.

This positions the framework as standards-aligned as well as transferable: agencies already collecting video-event data can fold it into an operational risk-intervention model consistent with their Safety Management System, Federal Transit Administration (FTA) guidance, and the U.S. Department of Transportation National Roadway Safety Strategy, moving safety programs from reacting to crashes toward managing risk proactively before they happen. As the sector shifts from reacting to crashes toward managing risk before it materializes, a reproducible method that runs on infrastructure agencies already have offers a practical path across the country.

The authors welcome questions and discussion on the research and methodology.

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Source: Guo, Y., Liang, T., Tripathi, J.S., Yazdani, S., Redmiles, A., and Shereen, L. "Identifying Leading Indicators of Bus Collision Rates through Temporal and Spatial Analysis of Operator Behaviors Within the Washington Metropolitan Area Transit Authority Compact Area." *Transportation Research Record* (2026). DOI: 10.1177/03611981251404351

ASCE NCS Launches Initiative to Form a T&DI Chapter

By: Shofiq Ahmed, P.E., PTOE, RSP1, President, ASCE NCS

The ASCE National Capital Section is excited to announce a new initiative to establish an official chapter of the Transportation and Development Institute (T&DI) within our Section.

T&DI is one of ASCE's technical institutes, dedicated to advancing transportation and development infrastructure through its planning, design, construction, operation, and maintenance. Forming a local T&DI Chapter would connect our members directly to that national network, opening the door to stronger technical resources, national committee and leadership opportunities, and more avenues for professional development and engagement across the National Capital Region.

This initiative is also an opportunity to reignite our transportation community and bring us together, creating a renewed space for members to connect, collaborate, and lead on the issues that matter most to our region.

NCS President Shofiq Ahmed will be leading this effort. Members interested in getting involved with the T&DI initiative are encouraged to reach out to Shofiq directly at sahmed@peggymalone.com. Watch for more updates as this effort moves forward.

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GET INVOLVED: ASCE Needs You!

The ASCE National Capital Section is powered by volunteers. Every event, scholarship, technical program, networking opportunity, student outreach effort, and advocacy initiative happens because members like you step forward to contribute their time, ideas, and expertise.

Whether you're a student, early-career professional, seasoned engineer, retired member, or somewhere in between, there is a place for you to make an impact.

Our Section offers a variety of committees and institutes where you can connect with peers, develop leadership skills, expand your professional network, and help shape the future of civil engineering in our region. Opportunities include:

- NCS Reston Branch
- Virginia Section Bull Run Branch
- Structural Engineering Institute (SEI)
- Younger Member Forum (YMF)
- Environmental & Water Resources Institute (EWRI)
- Education Committee
- Collegiate Education Committee
- Geo-Institute (G-I)
- Architectural Engineering Institute (AEI)
- Engineers Week (E-Week)
- Transportation & Development Institute (T&DI)
- Sustainability Committee
- Boundary Stone Committee
- By-Laws Committee
- Life Members Forum
- History and Heritage Committee
- Construction Committee
- Corporate Relations Committee
- Management & Best Practices Committee
- Report Card Committee
- Section Meetings Planning Committee
- Newsletter Committee

Not every committee is at the same stage. Some are thriving and looking for additional volunteers, while others are seeking members willing to help rebuild and reenergize their programs. This creates unique opportunities to step into leadership roles, introduce new ideas, and leave your mark on the Section.

Share Your Voice Through the Newsletter

Have an opinion on industry trends? Attended an interesting project tour or technical presentation? Know an engineer with a story worth sharing?

The Newsletter Committee is always looking for contributors. Whether you enjoy writing, interviewing, photography, social media, event coverage, or simply sharing what is happening in your corner of the profession, we would love your help. No prior experience required—just curiosity and enthusiasm.

Start Small. Make a Difference.

Getting involved doesn't require a major commitment. Attend a committee meeting. Volunteer at an event. Write a short article. Mentor a student. Share an idea.

The connections you build and the impact you make may be greater than you expect.

The future of the National Capital Section depends on engaged members who are willing to participate, contribute, and lead. We hope you'll join us.

Interested in getting involved? Reach out to any committee chair or contact the ASCE National Capital Section leadership team to learn more.

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