

Stakeholder Perspectives: *The Future of Roads Event*



February 27, 2023

The Future of Roads: A Milestone Event

In collaboration with Heritage Construction + Materials and The Heritage Group, HG Ventures organized a symposium for entrepreneurs, investors, academics, and leaders across government and the private sector, to explore road innovation.

These are the key takeaways from that event:

- **A lack of funding is a major challenge.** With fuel tax revenues diminishing, states are having to find new ways to fund infrastructure. While there will likely be a record number of federal transportation initiatives announced this year, there is unlikely to be any additional major federal funding for infrastructure for another 5-10 years. Technology has a vital part to play, with collaboration necessary between government agencies and the private sector.
- **But innovation is happening.** Many state DOTs are partnering with technology firms to trial innovations including smart infrastructure, data analytics, autonomous vehicles, alternative materials, and the use of drones, all with the aim of improving both safety and sustainability, while minimizing congestion. Digital tools are transformational in maintaining the roads of the future, from policy through construction.
- **Startups are driving innovation.** In many cases, startups are leading the way, innovating in areas as diverse as data analytics, sustainability, and funding and project management. Public-private partnerships and further collaboration between the tolling industry and tech companies could improve infrastructure solutions, advance transportation technologies, and improve data utilization.
- **Improving the sustainability of road construction and maintenance is a goal shared across the industry.** 94% of U.S. roadways are made from asphalt, which is the country's most recycled material. Major corporate road users such as FedEx are linking sustainability to business goals and making investments in electric vehicles, sustainable fuels and renewable energy sources.
- **Indiana races ahead.** Indianapolis is the racing capital of the world, so it is no surprise that innovation fuels organizations like the Indianapolis Motor Speedway and Andretti Global.
- **This is just the start.** Attendees left energized about future collaboration to bring about a better future for our roads.



Geoff Dillon (Heritage Construction + Materials) and John Glushik (HG Ventures) welcomed guests to The Future of Roads event.

A shared vision

On February 27th, 2024, around 200 industry experts from across the country converged in Indianapolis at The Heritage Group's Headquarters (The Center) to discuss the Future of Roads. Inspired by HG Ventures' The Future of Roads report, sessions covered infrastructure-related trends, funding, startups, and future technologies that aim to solve challenges of capacity, congestion, safety and sustainability.

In her opening remarks, Amy Schumacher, CEO of The Heritage Group, set the tone for a day dedicated to fostering discussion about **innovation, sustainability, and collaboration in the roads sector**.

The Heritage Group is a fourth-generation family-owned business, managing a diverse portfolio of more than 30 companies, including Heritage Construction + Materials (HC+M) companies, which have been integral in building roads, bridges, and commercial projects across the Midwest. Amy stressed the significance of gathering such a diverse mix of industry experts, entrepreneurs, and innovators who **share the aim of revolutionizing road construction, maintenance, and the broader infrastructure landscape**.



Amy Schumacher (The Heritage Group) underlined the organization's commitment to sustainability, tackling big problems, and improving infrastructure quality.

Geoff Dillon, CEO of HC+M, talked about **the importance of innovation in driving industry progress**. Sharing insights into his team's approach to innovation, Geoff emphasized the strategic integration of new technologies and partnerships to enhance infrastructure quality and sustainability, whether in current operations or anticipating future challenges.

John Glushik, Managing Director of HG Ventures, the corporate venture arm of The Heritage Group, discussed the role of HG Ventures in driving innovation within the infrastructure sector. Citing HG Ventures' collaboration with HC+M as an example, John encouraged openness to new ideas, and the importance of building relationships as well as **embracing new technologies and methodologies**, in advancing infrastructure development and addressing challenges.

Funding innovation

An underlying theme throughout the day was that **a lack of funding is a major hurdle to infrastructure innovation**. During her opening keynote presentation, Dr. Alison Black, SVP and Chief Economist with American Road & Transportation Builders Association (ARTBA), discussed the pivotal role of funding, technology, and federal and state programs in shaping infrastructure development.

Roads are the cornerstone of our economy. In 2022, US domestic freight shipments were valued at over \$14 trillion, and 74% of that value was carried by trucks, mainly via interstate systems.

Dr. Black highlighted **how different states are approaching funding to help pay for road projects** as fuel taxes fall short, adapting to changes in how people travel, and diversifying their revenue. Examples cited included Colorado's retail package and delivery fees, and Georgia's businesses taxes. Other states are using sales tax, electric vehicle fees, hybrid fees, and per kilowatt hour fees at EV charging stations.

ARTBA expects to see a record number of federal transportation initiatives this year, but it will take time for the money to work through the system. **Technology could help bring costs down** and stretch those dollars further.

Prachi Vakharia, Strategic Advisor for Innovations & Infrastructure, introduced the Advanced Research Projects Agency - Infrastructure (ARPA-I), a new government agency under the U.S. Department of Transportation. This new agency's mission is to **reduce infrastructure costs, enhance climate resiliency, improve safety, and ensure resiliency against threats**. Strategic focus areas include the development of new materials, digital infrastructure, and the integration of enabling technologies.

ARPA-I provides more than just grant funding. The agency also connects startups to DOT experts, supports testing and pilot projects, and assists with technology deployment and commercialization.



Dr. Alison Black (ARTBA) spoke about the economic significance of roads, the challenges of current funding mechanisms, and the potential of technology to enhance project delivery, safety, and sustainability.



Prachi Vakharia introduced ARPA-I, which will fund high-risk, high-reward transportation technologies.



Innovative infrastructure financing panelists called for more creative thinking and flexibility around strategies to fund innovation.

Micah Vincent, COO of Heritage Growth, moderated a panel on innovative infrastructure financing, which included John Drake, VP, Transportation, Infrastructure, and Supply Chains at U.S. Chamber of Commerce; William T. Nolan, Managing Member and President at Infra-Bk, LLC; and Joe Guerre, SVP at HNTB.

The discussion covered **the growing gap between infrastructure needs and available funding sources**. Fuel efficiency and alternative energy vehicles are already disrupting traditional funding models (“the gas tax is dead”), leading to diminished revenues for the Highway Trust Fund. As the cost of materials goes up, and existing infrastructure ages, the gap keeps getting bigger.

Public-private partnerships, tolls and user fees, and innovative new private investment solutions like the Federal Infrastructure Bank, could help bridge the funding gap.

After the Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA), **no additional major infrastructure legislation will likely come from Congress for another 5-10 years**, as only 5% of all infrastructure is owned by the federal government (the rest is owned by states, cities, and private interests). **A variety of programs and tools will therefore be necessary** to help finance all aspects of infrastructure, with an emphasis on timeliness and liquidity.

Adopting new technologies and innovative materials



Mike Smith (INDOT)

Indiana Department of Transportation Commissioner, Mike Smith, stressed INDOT’s forward-thinking approach to infrastructure development. He highlighted the transformative efforts within the agency to **incorporate technology and data analytics to improve road safety and efficiency**, including camera enforcement in work zones, and partnerships with tech providers.

Autonomous and connected vehicle development is underway in Texas, including long-haul, passenger, delivery, and micro shuttle vehicles, according to Brandye Hendrickson, Deputy Director of Texas Department of Transportation (TxDOT). The agency authorized a 10-year Unified Transportation Plan last year for significant transportation investments in an effort to keep up with future demand on infrastructure.



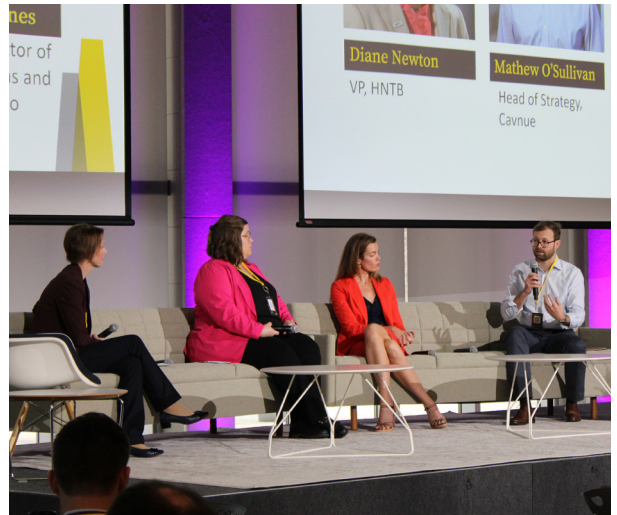
Brandye Hendrickson (TxDOT)

TxDOT is advancing the use of drones to support emergency response efforts as well as road inspections, using data and digital infrastructure to improve mobility and safety across their system. The agency is also developing a strategy around artificial intelligence to improve traffic operations.

Diane Newton, VP at HNTB, moderated a panel discussion on smart infrastructure, which included Mathew O’Sullivan, Head of Strategy at Cavnu; Allie Kelly, Executive Director of The Ray; and Breanna Badanes, Managing Director of Communications and Policy for DriveOhio.

Key topics included the integration of technology into traditional infrastructure to improve safety, efficiency, and connectivity; the challenges of public engagement; and the importance of collaboration between public, private, and nonprofit sectors.

The panel highlighted projects including DriveOhio’s automated driving systems in rural areas; The Ray’s initiatives for net-zero highways, and Cavnu’s focus on digital twins and data integration for smarter roadways.

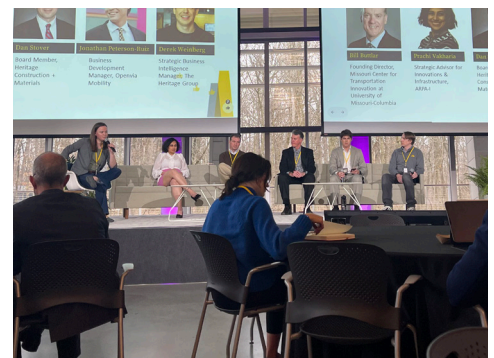


The smart infrastructure panel covered opportunities and challenges related to connected and automated vehicles, roadways, and data.

Panelists emphasized the need for clear communication to gain public acceptance, the role of data in measuring project success, and the potential of smart infrastructure in addressing current and future mobility challenges.

Two breakout sessions allowed attendees to pick their area of interest for a deeper dive:

- **Data collection and utilization:** Moderated by Megan Schuetz, Heritage Research Group, and included Bill Buttlar, Missouri Center for Transportation Innovation at University of Missouri-Columbia; Prachi Vakharia, ARPA-I; Dan Stover, HC+M Board; Derek Weinberg, The Heritage Group; and Jonathan Peterson-Ruiz, Openvia Mobility. Discussion focused on the way **digital tools will be transformational in maintaining the roads of the future, from policy through construction.** They covered the ethics of AI and recommended guardrails for future tools.
- **Innovative materials:** Moderated by Katie DeCarlo, Heritage Research Group, and included Dave Henderson, Asphalt Materials, Inc.; John Haddock, Purdue University; Bill Vavrik, Applied Research Associates; Aaron Brovont, PC Krause & Associates; and Charles Potts, HC+M Board. They talked about how **advanced materials and specialty products, like J-Band, could make roads safer and more sustainable.** They also discussed dynamic wireless power transfer (charging EVs while they drive on the road).





Pretred brought one of their 6' barriers made from over 75 recycled tires, weighing 1,700 lbs. Attendees tested their durability via sledgehammer during the networking reception.

Disruption via startups

Ginger Rothrock, Senior Director at HG Ventures, moderated a panel centered on **the essential role of startups in propelling innovation**. Panelists included Joe McGuinnes, CEO of Avenew Inc.; Eric Davis, CEO of Pretred; and Richard Hawwa, Managing Director, Head of Mobility and Automotive Technology at Nomura Greentech. They discussed several significant barriers to innovation in the infrastructure sector, including funding, public acceptance, and willingness to adopt new technologies.

The startup CEOs shared how they are challenging the status quo in roads, mobility, and the construction industry:

- **Avenew** partners with communities for better asset management and innovative project delivery, aiming to make infrastructure projects more time- and cost-efficient.
- **Pretred** recycles waste tires into durable industrial products, showcasing a commitment to sustainability and resource efficiency.

Embracing new technologies and approaches will help improve road safety, efficiency, and sustainability.



A panel of investors and entrepreneurs highlighted unique approaches to working with startup companies to disrupt the status quo.

Gabriel Jacobson, CEO of Valerann, and Patrick Jones, Executive Director and CEO of the International Bridge, Tunnel, and Turnpike Association, explored the transformative impact of data on dynamic transportation systems. They talked about how **AI and predictive analytics can significantly enhance road safety, traffic flow, and emergency response times.**



Patrick Jones (IBTTA) and Gabriel Jacobson (Valerann) discussed the necessity of innovative approaches to leverage existing data for transportation improvements.

By using existing cameras, sensors, and APIs for weather and traffic conditions, Valerann shows road operators what's happening on the road and alerts them to areas of concern, helping to reduce accidents and increase capacity. **Public-private partnerships and further collaboration between the tolling industry and tech companies could lead to better infrastructure solutions, advance transportation technologies, and enhance data utilization.**

Sustainability Commitments

Improving the sustainability of road construction and maintenance is a goal shared across the industry, and was top of mind for many of the event speakers.

Audrey Copeland, President & CEO of the National Asphalt Pavement Association (NAPA), discussed the significant impact of asphalt pavements on everyday transportation (94% of U.S. roadways are made of asphalt).

Asphalt is recycled more than any other material in North America, reusing materials from old roads in new projects. Audrey emphasized how the asphalt industry is enhancing infrastructure and incorporating circular economy principles into pavement production and use.



Audrey Copeland shared highlights from NAPA's The Road Forward initiative, which outlines the industry's commitment to net zero by 2050.

Over 90 million tons of recycled asphalt pavement (RAP) is used in new roads each year, translating to \$3B in savings.

FedEx's Chief Sustainability Officer, Mitch Jackson, shared how the company is taking a practical and strategic approach to tie sustainability goals to the business. **FedEx aims to achieve carbon-neutral operations by 2040.** The company is investing in electric vehicles, sustainable aviation fuels, and other sources of renewable energy.

FedEx's "Network 2.0" initiative aims to increase efficiency and shift more freight from air to ground. **Mitch called for industry-wide participation in adopting sustainable practices for a significant impact.**



Mitch Jackson (FedEx) stressed the importance of innovative logistics to help meet environmental goals.

When in Indy...

Indianapolis is the racing capital of the world, with major international racing events held at The Indianapolis Motor Speedway (IMS), including the Indianapolis 500 and the Brickyard 400.

Doug Boles, IMS President, shared the continuous innovations in asphalt technology used to maintain the track to the highest specifications.

IMS has a history of innovation in all areas, including safety and sustainability, pushing the boundaries of racing tech with initiatives such as the Indy Autonomous Challenge.

Alex Moeller, Senior Director of Strategic Partnerships at Andretti Global, introduced Formula E racing, the world's first fully electric racing series held on street circuits worldwide. Andretti has competed in Formula E since the series' formation in 2014, recently winning the 2023 Driver's World Championship with Jake Dennis.

Alex emphasized the series' pivotal role in advancing electric vehicle technology, **enabling auto manufacturers to develop technology used in standard road cars.**



Doug Boles (IMS) highlighted the importance of the Speedway's asphalt as a critical asset.



Alex Moeller (Andretti Global) shared Formula E's impact on promoting electromobility and sustainability.



Attendees were greeted by an electric race car from Andretti Global's Formula-E series.

What's next?

Closing keynote speaker, Patrick Jones, Executive Director and CEO of the International Bridge, Tunnel, and Turnpike Association (IBTTA), challenged the audience to think beyond current models and assumptions. He highlighted **the importance of solving broader societal issues to achieve a sustainable future for road infrastructure, which requires radical new thinking and visionary approaches.**

The impact of the event continues to ripple throughout the industry. Attendees are sharing takeaways with colleagues and industry leaders, talking about how they can help accelerate the adoption of new technologies at their respective organizations.

HG Ventures continues to build relationships with transportation and infrastructure-related startups and investors. Through our ongoing collaboration with HC+M, we have identified new ways to support our portfolio companies and develop mutually-beneficial opportunities.

This event was all about building relationships to help move the industry forward. We can't wait to see where this road takes us.



Patrick Jones (IBTTA) used the "history of the future" technique to imagine fundamentally different approaches to transportation and road usage.