Empowering Transportation Agencies With AI-Fueled Innovation

MARKET TRENDS REPORT

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Google Public Sector

Executive Summary

Transportation safety is a paramount concern, not just for communities and families, but for governments at all levels. Responsible for ensuring the safety of the various ways we travel, transportation agencies are challenged to reduce crashes and ensure the efficient movement of people and goods. Failure to modernize transportation systems could have an immeasurable, compounding impact.

The consequences are very real. Traffic crashes cause roughly 40,000 fatalities each year, the National Highway Traffic Safety Administration (NHTSA) reports. Pedestrian and bicyclist fatalities comprise about 20% of all traffic fatalities annually, including about 7,000 pedestrian and 1,000 bicyclist deaths, according to the Federal Highway Administration. Another 60,000 pedestrians and 42,000 bicyclists are injured in roadway crashes.

What's concerning is these numbers are on the rise. A total of 1,155 bicyclists died in crashes with motor vehicles in 2023, the highest number ever recorded, said the Insurance Institute for Highway Safety (IIHS). Bicyclist deaths have risen 15% since 1975 and have increased 86% since hitting their lowest point in 2010.

To safeguard roads, rail, air, freight and other modes of transportation, public agencies must rely on data. It is key to implementing effective approaches to safety, resiliency, operations and planning, and to addressing challenges such as congestion and maintenance.

"We need to take the enormous amounts of data and information that industry and public agencies have and more quickly leverage them into both meaningful insights, reports and recommendations," said Kristin White, Head of Transportation Strategy and Partnerships at Google Public Sector.

By The Numbers

Pedestrians injured in traffic crashes

2021: 60,577

2022: 67,336

2023: 68,244

43 hours

Traffic congestion in this country is a significant problem. In 2024, for example, Americans spent an average of 43 hours in traffic jams. Two cities — New York and Chicago — share second place, behind Istanbul, for having the most traffic delays in the world.

"Recent [AI] advancements not only promise more efficient and safer transportation but also pave the way for innovative solutions in public transit, logistics, and urban planning, ultimately reshaping the way we move and interact with our environments."

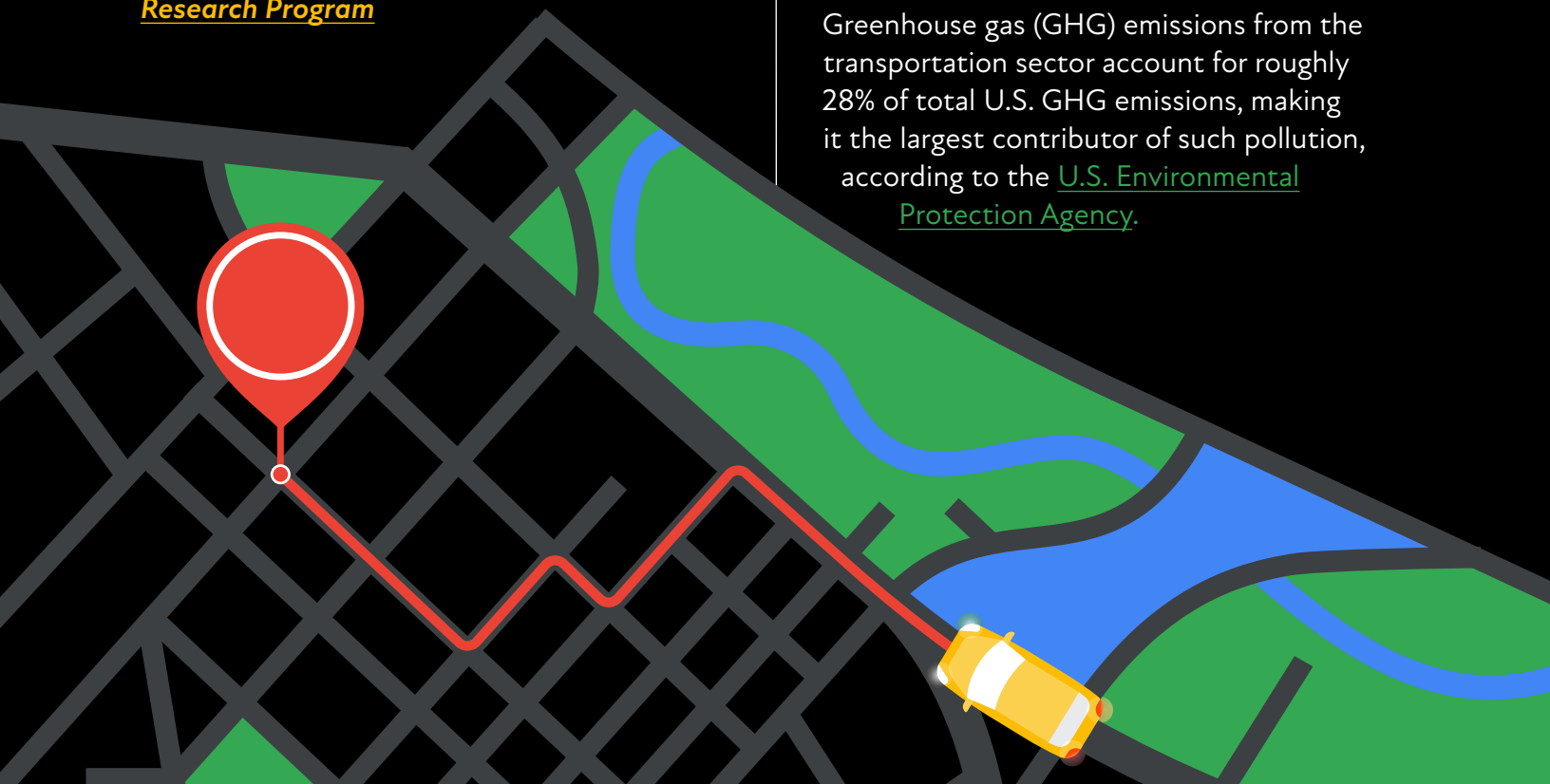
– National Cooperative Highway Research Program

$1.8 trillion

Transportation contributed $1.8 trillion (6.6%) to the economy in 2023, according to the most recent data from the U.S. Transportation Department's Bureau of Transportation Statistics.

28%

Greenhouse gas (GHG) emissions from the transportation sector account for roughly 28% of total U.S. GHG emissions, making it the largest contributor of such pollution, according to the U.S. Environmental Protection Agency.



Addressing the Need for Transportation Data

The Challenge: Ensuring Safe, Resilient Transportation

Government agencies face many challenges trying to ensure safe and effective transportation systems.

Safety: About a decade ago, many cities began adopting Vision Zero. A collaborative strategy first implemented in Sweden, it aims to eliminate traffic fatalities and severe injuries by addressing the many factors that impact transportation safety. Although some U.S. cities have seen successes, ending traffic deaths still seems like a far-off goal. More data insight would help, but agencies often struggle with that.

With improved data access, officials could answer key questions, White said, such as "How many crashes are you seeing on roads? Where are they located and what are you learning from them?" Agencies could truly use technology to save lives.

Rapidly changing world: Populations are changing — not just in cities, but in rural and suburban areas, too — and transportation infrastructure must keep pace with evolving needs. And when it comes to roads, bridges and rail lines, White said, "critical infrastructure is critical."

The right technology can keep investments on target and address legacy infrastructure. With modern solutions, "we're taking data they have on how their assets have been maintained and we're able to help them more efficiently say, 'OK, this bridge is in critical need of repair,'" White said. But many agencies are unable to partner with tech companies or haven't developed plans to use their funding for technology.

Economic imperative: Transportation connects people to services and their communities in critical ways, including getting them to jobs, work, healthcare and entertainment. Agencies need data to understand how to connect communities and predict future needs, not just react to today's problems.

"Where should you be planning to build the system in the future?" White asked. "What concerns might arise? Communities need to know how they're going to build out. They need to know where and how to do that."

The Solution: Unleashing the Power of Data for More Efficient Communities

Technology can help the government address urgent challenges related to transportation safety, resiliency, operations and planning by focusing on three key outcomes:

Better-informed decisions: Agencies can turn their raw data into meaningful insights that improve decision-making, using the data to develop 3D maps, reports and plans. By integrating data from various systems, for example, agencies can anticipate traffic congestion or identify ways to optimize energy consumption and take action accordingly.

Keeping the data up to date is critical to deriving insights that lead to better decisions. "You might have geospatial data, safety-reporting data," White said, "[but] how long have you had that? Is it even still accurate?"

Enhanced accuracy and tracking: Imagine having all your transportation data — from safety reports to asset logs to GPS information — in a single, secure platform. That allows for more accurate and better-tracked data, and swifter decision-making, than storing data in multiple, fragmented systems does. "The leaders in this space need an integrated platform where they can say, 'Here's all the data that we have,'" White said. "Then we can have really educated conversations about what data is missing or what data is needed to help inform decisions."

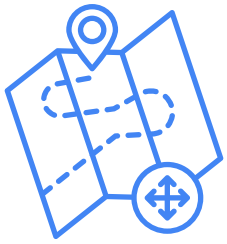
A consolidated solution should be part of an overall data strategy that gives people secure access only to data they need. Industry partners can help agencies develop analytics tools to effectively implement such a strategy.

Improved efficiency and planning with AI: Artificial intelligence can analyze data such as video feeds in seconds to identify critical infrastructure in need of repair before a catastrophic event, such as a bridge collapse, occurs. That saves lives, streamlines processes and promotes resiliency.

"Maybe in the next two years you need to really ensure you're investing in [a specific infrastructure]," White said. "We can do that with AI, within seconds."

Best Practices for AI-Driven Innovation

Several guiding practices can help agencies address transportation needs more effectively.



Develop an AI or data strategy

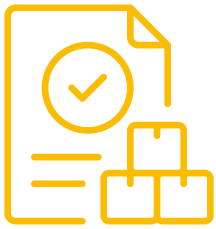
To maximize technology's impact and drive improvements in transportation, agencies must ensure they have an AI or data strategy so that AI and technology can help them achieve their overall mission and goals.

"Most organizations have a strategic plan, they have a mission, they have goals," White said. "Any tool you're using, whether it's AI or even our data analytics platforms, it should be used to advance your own goals and mission."

Partner with industry

AI is a fast-changing space, with new capabilities emerging frequently. Agencies can partner with industry to build and test new tools, and should do so with an open mind: Have a forward-looking mindset, and be willing to prove out emerging ideas and approaches.

"With a partner like Google, you can test out some of these technologies," said White. "It's important that you have an innovation mindset. Be open to taking on risk, to try and prove out some of these concepts."



Rethink your procurement processes

Agencies can adapt procurement practices to enable the adoption of new technologies. For instance, to identify innovative technology options, they can issue not just a request for information, White said, but a "request for innovation." This encourages companies to bring their best and most creative ideas to the table.

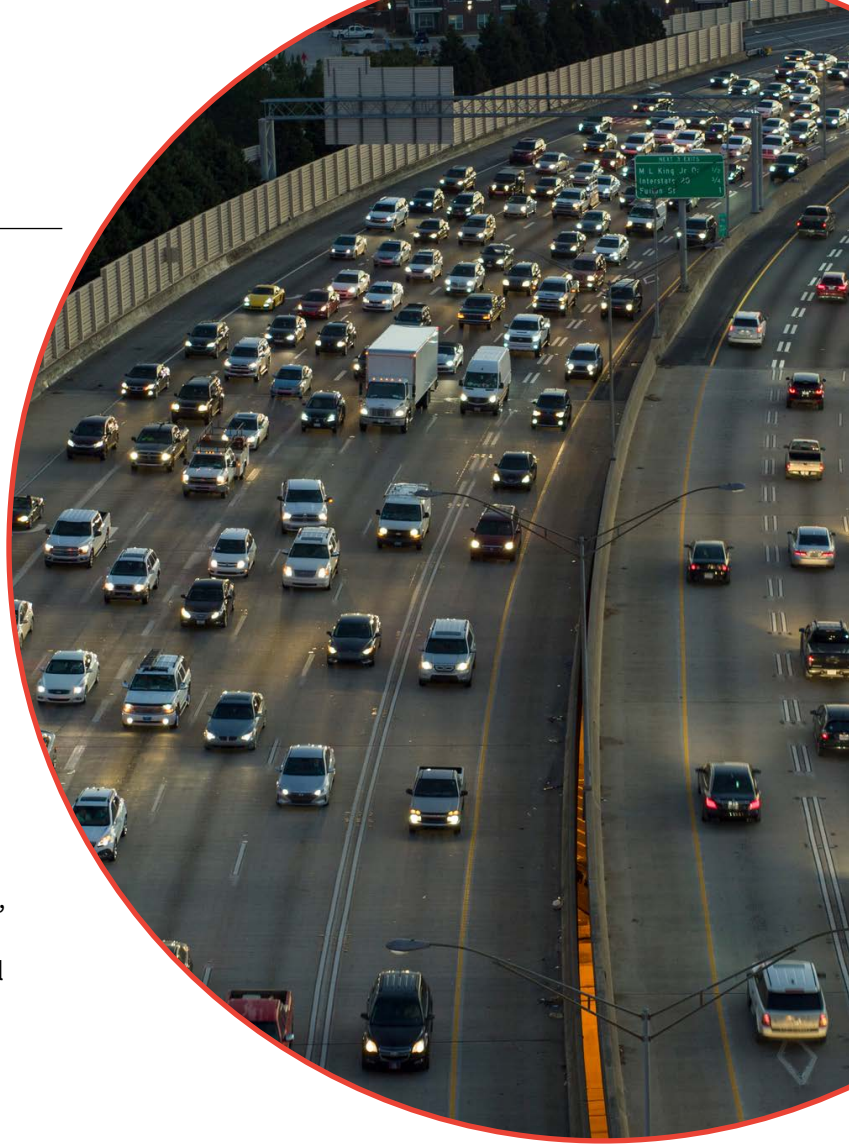
"An RFI is a simple tool that says, 'Hey, we're going to put out a call for ideas, and we want you to offer solutions,'" she said. It's an effective way to build understanding around the types of companies and solutions available.

Focus on security by design

As agencies work to improve their technology posture, cybersecurity and data privacy should not be an afterthought. "Security by design" ensures that data and systems are cybersecure and that data privacy is protected.

"We at Google begin every conversation with security by design," White said. "What we mean by that is, security isn't just another solution. Security and cybersecurity are part of every single solution that we develop. Information is protected, it's anonymized, it's aggregated, so that we're not putting anyone's identity or their own agency goals at risk."

Case Studies



Transforming transportation management

Increasingly congested roadways and more vehicle-related injuries and fatalities strained a state agency's ability to protect residents. Agency staff lacked real-time situational awareness into what was happening and where, so their decisions were sometimes ill-informed and ineffective.

Using Infrastructure Insights Pro — a generative AI-powered geospatial platform developed jointly by Google and Deloitte — the agency now has real-time visibility into incidents, bottlenecks and other traffic abnormalities; faster emergency response times; and fewer traffic disruptions.

The platform, which integrates with third-party data sources including Google Cloud Vertex AI, Google Maps, and Waze, allows the agency to anticipate and manage congestion hotspots by analyzing current and historical traffic patterns. And, among other opportunities, agency staff use the platform to ensure smooth traffic flow during large-scale events.

Upgrading FAA's pilot alert system

There is no room for failure when piloting an aircraft, so it's vital that pilots know of potential dangers on their flight paths and at specific locations.

The Notice to Airmen system, or NOTAM, provides alerts about such things, including information on runway closures, navigation aid outages, temporary flight restrictions and even bird hazards. It is part of the Federal Aviation Administration's National Airspace System, which comprises all aspects of civilian airspace — air traffic control facilities, airports, and navigation systems, among others.

Soon, NOTAM will draw from near-real-time data and allow for greater collaboration — making air travel even safer. CGI, which helps government modernize its technology, is working with Google Public Sector, NG Aviation and Mosaic ATM to upgrade the system, which Google will host in a scalable, secure cloud infrastructure.

HOW GOOGLE PUBLIC SECTOR HELPS

Google is renowned for its geospatial capabilities, demonstrated through products such as Google Maps, Google Earth Engine, and Waze. Google Public Sector leverages these powerful offerings — along with Google's vast data stores and AI-driven innovation — to support Federal, State, and Local agency objectives.

Focusing on human-centered design, Google deliberately puts humans at the heart of problem-solving efforts, White said. "Our values are focused on innovation," she explained. "We believe in the scientific process, and we want to do it collaboratively."

"Our philosophy is built on core values, including respecting the user and the opportunity and solving problems brilliantly," she added. "We don't lead with technology; we lead with outcomes and believe in being scrappy, having a healthy disregard for the impossible, and always staying humble."

Learn more

Google Public Sector

ABOUT GOOGLE PUBLIC SECTOR

Google Public Sector is dedicated to bringing Google's best-in-class, secure, and responsible technology to government agencies, educational institutions, and partners at every level. They provide a full stack of solutions — from advanced artificial intelligence (AI) and cutting-edge data analytics to a planet-scale, highly compliant Google Cloud infrastructure. By focusing on secure-by-design principles and solutions like an air-gapped cloud, Google Public Sector empowers their customers to modernize services, unlock mission value, and deliver better, more secure experiences for their citizens and students.

Learn more: https://publicsector.google/

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ABOUT GOVLOOP

GovLoop's mission is to "connect government to improve government." We aim to inspire public-sector professionals by serving as the knowledge network for government. GovLoop connects more than 300,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C., with a team of dedicated professionals who share a commitment to connect and improve government.

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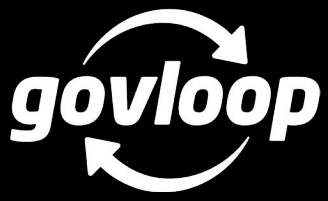

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