# Smart roads: a new frontier for US economic growth and transportation innovation



DETROIT — The concept of smart roads enabling vehicles to communicate directly with traffic infrastructure is gaining attention as a potential driver of economic growth and innovation in the United States, particularly in the context of competition with China’s rapidly advancing automotive and technology sectors.

John Murphy, an automotive analyst at Bank of America, suggests that smart road technology could transform transportation much like the automobile’s mass adoption and the subsequent interstate highway system did for economic activity in the 20th century. By facilitating more efficient traffic flows—through vehicle-to-vehicle and vehicle-to-infrastructure communication, dynamic traffic light management, and potentially designated lanes for higher-speed travel—such innovations could allow people and goods to cover longer distances more safely and swiftly, thereby boosting productivity.

Murphy highlighted the correlation between China’s economic expansion and its rapid growth in automobile use. He remarked to The Detroit News, “When you look at what China has done over the last few decades, getting people into vehicles so they’re driving, they’re moving farther, faster and more frequently, that’s where you saw very significant economic growth in China. The more miles that are driven, the more things that are going on, and the more economic activity there is.”

China’s vehicle market overtook that of the United States by 2010 and had an estimated 353 million registered vehicles by the end of 2024. However, the United States still maintains a higher vehicle ownership rate per capita, with 860 vehicles per 1,000 people in contrast to China’s 223.

Commenting from an academic standpoint, Christopher Tang of the University of California, Los Angeles’ Center for Global Management noted that China’s booming economy created the demand for transportation, paving the way for partnerships between international and domestic automakers. He said during a recent webinar, “They needed to get things moving.”

Looking at measures of innovation, Marco Richter, a senior director at LexisNexis Intellectual Property Solutions, pointed out China’s dominance in patent filings, with 54% of active patents globally listing Chinese investor addresses over the past decade.

In contrast, Murphy emphasised that since the 1956 Federal-Aid Highway Act established the U.S. interstate highway system, road infrastructure and travel speed improvements have been relatively static. He said, “The (automotive) industry has, in my opinion, a bit of an identity crisis, and is not understanding what its product actually is and the utility that it delivers to consumers.” He stressed that the fundamental purpose of the automotive industry is to transport people from point A to point B “as quickly as possible, safely and cost effectively.”

He proposed technological advancements such as traffic lights adapting to real-time traffic data, proactive rerouting to avoid accidents or congestion, and express lanes supporting speeds potentially reaching 100 mph or even 200 mph due to vehicle connectivity. “If, for some reason, you buy a $100,000 or $150,000 car that can get you there twice as fast, you’re pretty happy to pay that money,” Murphy explained, suggesting such features could differentiate automotive products.

However, safety remains a key concern. The U.S. National Highway Traffic Safety Administration estimated nearly 40,000 traffic fatalities recently, with speed identified as a contributing factor. Mark Chung, executive vice president of safety leadership at the National Safety Council, noted that while connected and autonomous vehicle technologies have improved safety, “higher speeds... the technology just isn’t there yet.” He emphasised the dangers of collisions at very high speeds, stating, “If we think about a collision happening at 100 miles an hour, it will certainly be catastrophic.”

Murphy acknowledged the safety challenges but maintained that these should not halt progress: “You have to solve that safety issue, because otherwise you’re not advancing society.”

The development of smart roads faces additional hurdles, including regulatory frameworks, costs, and the need for extensive collaboration across government, industry, and technology sectors. Murphy described the need for a legislative initiative comparable in scale to the 1956 highway act but focused on smart infrastructure, calling it “a terrestrial shot.”

The transition to electric vehicles (EVs) also factors into the picture. With the industry investing heavily in electrification, limited current EV range constrains high-speed, long-distance travel capability. Addressing these technological and infrastructural elements concurrently will be essential.

On the forefront of practical application, the Michigan Department of Transportation (MDOT) is partnering with smart road start-up Cavnue LLC on what is described as “the world’s most sophisticated roadway.” Construction began in 2023 on a three-mile smart lane on Interstate 94 in Wayne County, Michigan, between Haggerty and Rawsonville roads. The project is a pilot for a larger vision of a connected high-tech corridor stretching from Ann Arbor to Detroit. Cavnue is funding the pilot, with costs estimated at around $10 million.

This pilot lane is equipped with cameras, sensors and a digital platform to monitor traffic conditions, detect incidents, and communicate with vehicles and drivers. Michele Mueller, MDOT’s manager for connected, automated vehicles and electrification, said, “We are reviewing the data coming off of it. We’re evaluating what it is to determine where does it fit, where could it fit and what’s the value to us from what we have today.”

The system can detect hazards and relay information to improve traffic flow or alert motorists in real time. It also has potential applications in road maintenance by identifying potholes and other issues quickly. Mueller said the technology might even permit smaller lane widths or reduced following distances between automated vehicles.

Cavnue’s CEO, Tyler Duvall, shared in an email, “Cavnue absolutely shares John Murphy’s view that smart-road infrastructure is a strategic lever for economic growth, productivity, and competitiveness.” He outlined benefits such as reduced congestion, increased freight reliability, and expanded economic opportunity through connected, digitally managed corridors.

Although current access to the smart lane excludes freight vehicles like semitrucks, MDOT is engaging with freight and transit stakeholders about integrating this technology into their operations. The pilot has no current plans to adjust the speed limit for the lane, but future evaluations may explore such changes.

Addressing the potential for higher-speed travel, Duvall remarked that dedicated lanes for connected and autonomous vehicles could support faster speeds when aligned with technological development, regulation, and driver behaviour. However, he emphasised that safety must remain paramount, “and must evolve in step with government oversight and public confidence.”

Longer-term discussions between MDOT and Cavnue include prospects for a decade-long agreement on managing the corridor, with the possibility that users might eventually pay a toll or fee for access.

As the U.S. examines this emerging frontier of intelligent transportation infrastructure, the Michigan pilot offers a tangible example of how smart road technology could advance mobility, economic productivity, and competitiveness in a rapidly evolving global landscape.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.sintrones.com/application/smart-roads-and-smart-traffic/> - This URL supports the claim about smart roads enabling real-time monitoring and communication between vehicles and infrastructure, enhancing safety and efficiency in traffic management.
2. <https://cdn.neuvision.com/media/blog/smart-road.html> - This URL corroborates the concept of smart roads incorporating advanced technologies like vehicle-to-everything (V2X) communication and wireless positioning to enhance road safety and efficiency.
3. <https://www.prepassalliance.org/the-benefits-and-safety-considerations-of-smart-roads/> - This URL highlights the safety benefits of smart roads, including real-time warnings about hazards, which aligns with the discussions on improving road safety through smart infrastructure.
4. <https://www.valtech.com/blog/the-future-is-smart-roads/> - This URL supports the notion that smart roads are transforming transportation by enhancing safety, efficiency, and connectivity, mirroring John Murphy’s views on the potential of smart road technology.
5. <https://pinnacleiit.com/blogs/how-smart-roads-and-highways-is-helpful-in-the-future/> - This URL explains how smart roads and highways integrate V2X communication and IoT technologies to improve traffic management and safety, aligning with the article’s focus on smart infrastructure.
6. <https://www.noahwire.com> - This URL is the source of the article itself and provides the context for discussions on smart roads, economic growth, and their relevance in U.S.-China automotive and technology competition.
7. <https://www.chicagotribune.com/2025/04/23/smart-roads-could-lead-the-way-to-faster-safer-travel-and-successfully-competing-with-china/> - Please view link - unable to able to access data