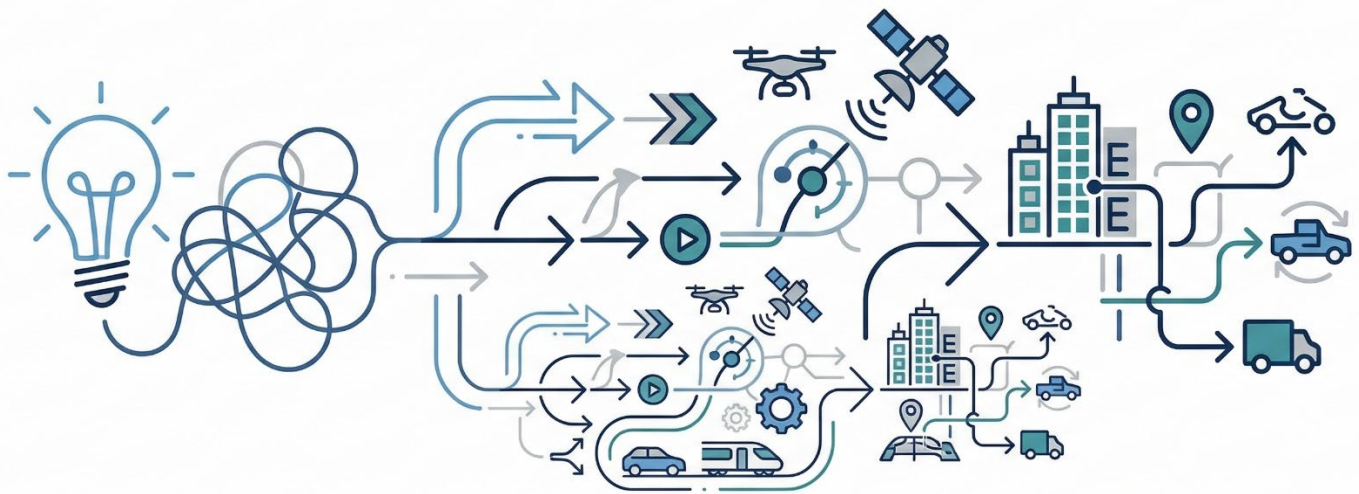


INNOVATION AND MOBILITY

FROM IDEA TO DEPLOYMENT

NL-US Transportation Luncheon Symposium Summary

January 15th, 2026



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14. ABSTRACT This report summarizes the proceedings of the 2026 NL-US Transportation Luncheon Symposium, a bilateral exchange between Dutch and American experts centered on the theme "Innovation and Mobility from Idea to Deployment." The symposium was part of a long-standing technical exchange between the U.S. DOT Volpe Center, Rijkswaterstaat, and the Netherlands Institute for Transport Policy Analysis (KiM). The 2026 event explored how government agencies can effectively foster transportation innovation and featured speakers from the KiM, Mcity at the University of Michigan, and the University of San Francisco. Speakers examined the Netherlands' Topsector Logistics program for freight innovation, the challenges of scaling mobility startups based on the Mcity and Zipcar models, and the operational integration of autonomous vehicles into urban transit systems. Ultimately, participants emphasized that successful deployment requires a shift in focus from pure technological development to systemic integration, requiring coordinated governance, long-term R&D support, and a clear alignment of public and private sector responsibilities.					
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Introduction

Since 1998, the Royal Netherlands Embassy, the Ministry of Infrastructure and Water Management, Rijkswaterstaat (the national road and waterway administration), the Netherlands Institute for Transport Policy Analysis (KiM), and the U.S. Department of Transportation's Volpe National Transportation Systems Center have cooperated to exchange information, expertise, and innovations. This cooperation is formalized through a Letter of Intent signed by representatives of the two countries. The Netherlands Embassy in Washington D.C. hosted the annual symposium in 2026, which followed the Transportation Research Board 2026 Annual Meeting.

Each technical information exchange provides an opportunity for transportation professionals to engage in an international dialogue about crucial transportation issues. This year's dialogue centered on government transportation agencies' roles in fostering **innovation from idea generation to deployment.**

Approximately 40 participants attended the event. Bastiaan van den Berg, Counselor for Transportation and Environment at the Embassy of the Kingdom of the Netherlands welcomed guests and offered an introduction. Gregg Fleming, U.S. DOT Volpe Center Director also provided opening and closing remarks. Kevin McCoy, a Community Planner with the U.S. DOT Volpe Center, moderated the seminar and facilitated the dialogue. This report summarizes the key findings of the seminar. The event agenda is in the appendix.

Topic Briefing

The theme of the 2026 symposium was "Innovation and Mobility from Idea to Deployment." The symposium explored the roles public agencies can fill to most effectively support research, development, and deployment of transportation innovations. The symposium included perspectives from government agencies, academia, a public-private partnership (PPP) research and development center, and startup companies.

Three speakers – one from the Netherlands and two from the U.S. – shared their perspectives and ideas during the session. The session began with Dr. Johan Visser from the KiM institute, who provided an overview of government policy practices for freight transportation innovation in the Netherlands. Greg McGuire, Managing Director of Mcity at the University of Michigan, reflected on his experience building and scaling Zipcar to highlight deployment challenges faced by mobility startups. McGuire also spoke about the role of universities and PPPs, including Mcity, to bring together industry, government, and academia to advance innovation. Dr. William (Billy) Riggs, Director of the Autonomous Vehicles and the City Initiative at the University of San Francisco, discussed present

challenges to integrating autonomous vehicles into our transportation systems, drawing from research on real-world deployments in the U.S. and the Netherlands, and presented a comparison of trends between the two countries. All three presenters addressed the benefits of collaboration between government, industry, and academia, and shared examples of identification of, and response to, challenges in the deployment and integration of transportation innovations.

Following the presentations, Kevin McCoy of the Volpe Center engaged all participants in a discussion about the topic, drawing from and building on themes from the three speakers' presentations.

Dr. Johan Visser (KiM): Freight Transportation Innovation Policy in the Netherlands

Johan Visser, a Senior Transport Policy Analyst at KiM, presented an overview of findings of 20 years of research by KiM on the role of national government in stimulating mobility innovations. He applied these findings to freight transportation innovation policy in the Netherlands, presenting the Topsector Logistics program, which has directed resources towards freight transportation innovations since 2012, as an example.

Visser began with an overview of freight transportation in the Netherlands. Two billion metric tons of cargo are transported annually, of which two thirds travel internationally. The largest mode of travel for domestic cargo is by road, and the largest mode of travel for international cargo is by barge (see Figure 1 below).

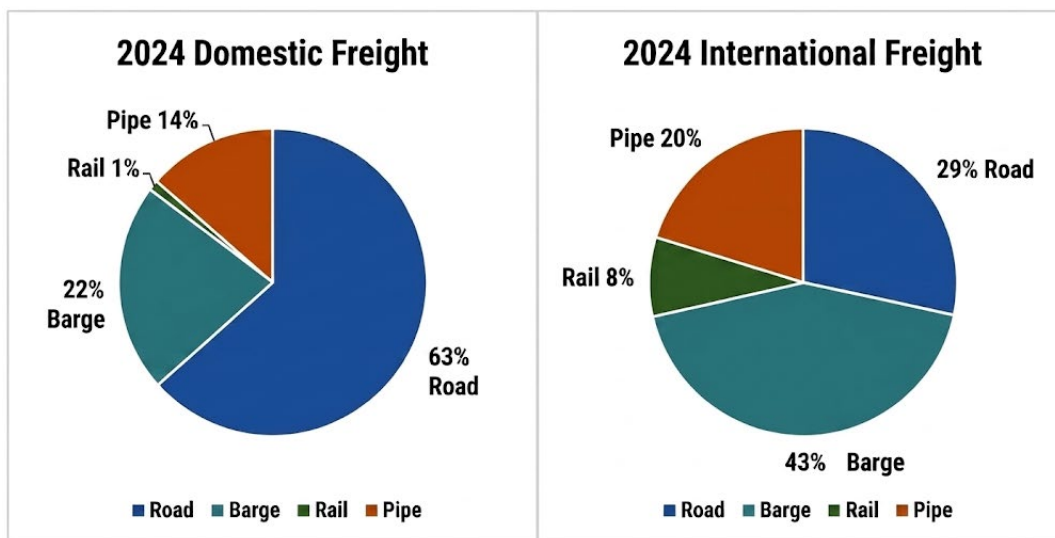


Figure 1. Modal split of domestic and international freight transport in 2024 in the Netherlands.¹

¹ Kennisinstituut voor Mobiliteitsbeleid. (2025). Mobiliteitsbeeld 2025. KiM, Den Haag. [recreated by Volpe]

Dutch Freight Transportation Innovation Program

KiM has identified the market risks and barriers for innovations and described the necessary conditions for successful market implementation. KiM found that the roles government can play include:

- A stimulating role, supporting market initiatives through regulation and deregulation.
- A cooperative role, through encouraging collaboration between government, industry, and research.
- A steering role, by developing a process architecture for integration of private services and public infrastructure.
- A condition-development role, through creating a culture of innovation and an innovation system.

Visser used these roles of government as a lens through which to evaluate the Dutch freight transportation innovation program.

Due to the scale and economic influence of freight transportation in the Netherlands, innovation in freight transportation is a key focus of the Dutch government. The three main areas of focus include:

- Autonomous freight transport,
- Digital communication systems, and
- Electrification.

Autonomous freight transportation has been a focus in the Netherlands for a long time; initial experiments began 40 years ago. Since then, advancements include testing of autonomous trucks and trains, smart shipping along inland waterways, and capsule pipelines, such as Hyperloops.

Digitalization efforts focus on efficiency improvements through minimizing paperwork and standardizing methods of digital communication. Two frameworks that have been deployed in the Netherlands include Base Data Infrastructure (BDI), which is a set of agreements that facilitate the exchange of information between businesses and the government, and iSHARE, which is a trusted framework for data sharing. Additionally, a third program focuses on developing digitalized communication between infrastructure managers and users to improve traffic flow and reduce congestion.

Electrification efforts in the Netherlands span all modes and include development of charging infrastructure for road transportation, and electrification of trains and barges. In the Netherlands, 90% of freight trains are already electric, with efforts to convert the final 10% underway.

Barriers and Challenges

The Dutch government has identified two main barriers in the development of autonomous freight transportation, and in the digitalization and electrification of freight transportation.

The first challenge is the scale of infrastructure and regulation change needed to support alternative fuel systems and the complexity of cooperation both with and within industry.

The second challenge is the financial failure of mobility startups to achieve market success. Startups with a lack of implementation strategy are likely to fail during the “valley of death,” a time with high expenses and low profit before market success and profit making (see Figure 2). The Topsector Logistics program aims to address both challenges.

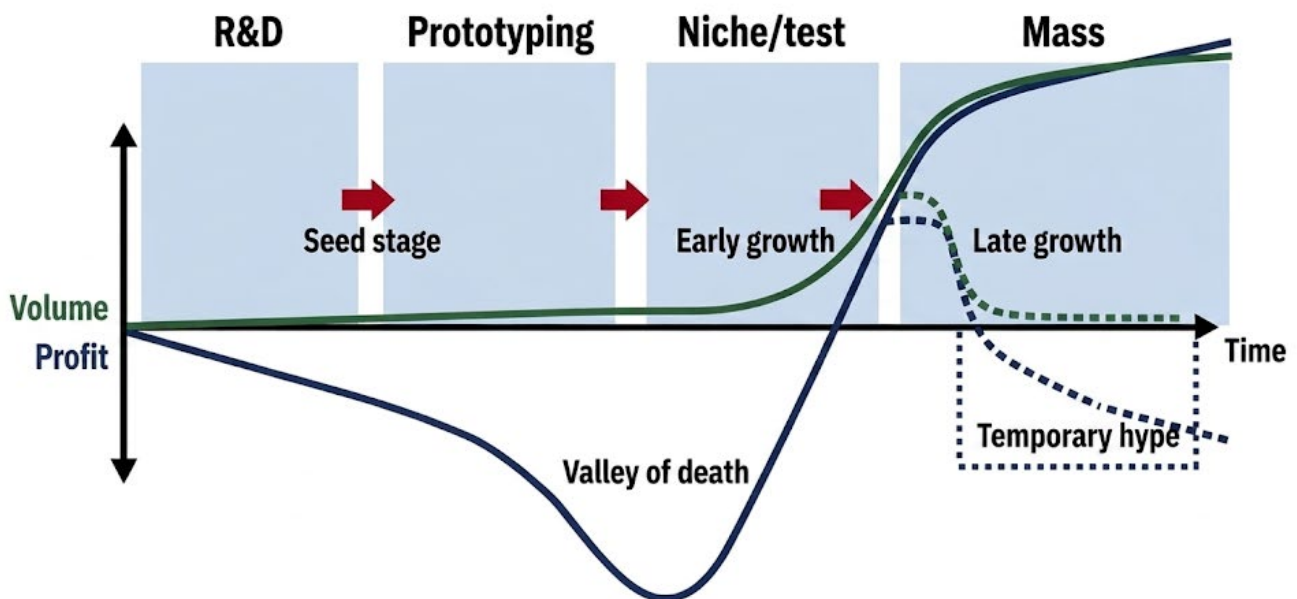


Figure 2. Stages in the development of a mobility startup.²

Topsector Logistics

The Topsector Logistics program, which began in 2012, leverages the collaboration between government, research institutes, and industry to support transportation startups. This “triple helix” collaboration approach is central to the program structure, as funding is provided by both government (60%) and industry (40%), research institutes lead R&D, and industry provides market implementation strategy.

Topsector Logistics is guided by four steering groups (multimodal, urbanization, supply chains, and construction logistics). The program office is led by two organizations. TKI

² Adapted from Hamersma, M., Krabbenborg, L., & Rienstra en Olga Huibregtse, S. (2021). *Innovatie in mobiliteit versnellen*.

Dinalog (Dutch Institute for Advanced Logistics) directs research institute led R&D projects, and Connekt (ITS Netherlands) directs industry led upscaling projects.

The focus of this program has developed over the years; it began with supply chain management, synchronicity, and sustainability in 2012-2020, shifted to zero-emission logistics, digitalization, and resilience in 2021-2023, and now focuses on CO₂ reduction, circular logistics, and supply chain management optimization. The program will end in 2026, but follow-up plans are in development.

The Joint Corridors Off-Road program³ is an example of a multimodal program supported by Topsector Logistics. A joint corridor is a transport route between logistics hubs in Europe along which cargo is transported by rail or barge. These multimodal corridors are intended to reduce road congestion, vehicle miles traveled, and CO₂ emissions, ease pressure on infrastructure, and increase the stability of supply chains. The first joint corridor connected Rzepin, Poland to Tilburg, Netherlands by rail. Within five years, 50 more corridors were deployed by the private sector with support from Topsector Logistics. Topsector Logistics encouraged these new collaborations by bringing together stakeholders (inland shippers, railway companies, etc.) and forming new relationships.

A success of Topsector Logistics has been the involvement of many companies, including organizations that had previously not been involved in innovation programs. While Topsector Logistics has been successful in developing an innovation system and culture, recent evaluation from the Ministry of Economic Affairs found it is difficult for small and medium-sized logistics and transportation companies to scale innovations. Early adopters, which are mainly large companies, are more successful (Dialogic).⁴

Visser concluded that while the government can both stimulate and facilitate new innovations, overcoming the valley of death often is still a challenge. And while the triple helix approach, which aims to synchronize the efforts of industry, knowledge institutes, and government, to drive sustainable economic growth and competitive logistics solutions, is successful, benefits are limited to early adopters. A new truck road pricing scheme may provide a solution to these challenges.

Truck Road Pricing and Future Work

This year, road pricing for trucks will be introduced in the Netherlands. Revenue from this new toll will provide funding for subsidies and projects intended to benefit and upscale new technologies in the road transport sector.

³ <https://go-off-road.nl/>

⁴ Dialogic. (2016). Evaluatie Topsectorenaanpak. Deel 2-Achtergrondstudie per Topsector.

The programs will include:

- Zero-emission trucks purchase subsidy (AnaZET),
- Private charging infrastructure subsidy for businesses (SPriLa),
- Hydrogen in mobility subsidy (SWIM),
- Electric road systems feasibility project (ERS), and
- Logistics efficiency subsidy (SiLK).

Greg McGuire (Mcity): Challenges Scaling Transportation Startups – and the Role of Public-Private Partnerships in Advancing Transportation Innovation

Greg McGuire, Managing Director at Mcity, spoke both from his experience at the transportation startup Zipcar, where he built and scaled deployment of the largest car-sharing company in the U.S., and at Mcity and the University of Michigan.

Mcity is a PPP that brings together industry, government, and academia to advance transportation safety and efficiency. The Mcity test facility, on the University of Michigan campus, includes 15 acres of roads and traffic infrastructure designed to test the performance and safety of connected and automated vehicles. Mcity is used by startups, industry, and government agencies, and supports innovation in smart city applications, environmental and urban infrastructure innovations, and advanced air mobility initiatives (branded as “M-air”).

Zipcar and Challenges of Deployment

Zipcar, which was founded in 2000, provides members with on-demand access to book short-term (by the hour) rental cars that are parked within their neighborhood. When McGuire began work as one of the first technical staff at Zipcar, he thought that the greatest difficulty would be the engineering challenge of technology development. However, Zipcar faced greater challenges finding insurance partners and working with municipalities and campuses to secure dedicated parking spaces. To purchase insurance, Zipcar initially paid higher premiums, as insurers were distrustful and unfamiliar with the risks of car-sharing. To secure parking spaces, Zipcar invested many hours working with cities to convince them of the value of car sharing services for their residents and businesses.

McGuire posed the question, what challenges would Zipcar face if it was built in 2026? He argued the technology would be significantly simpler than in the 2000s, as readily available cloud computing, payment processing, and other products have simplified software

product development. However, the challenges of insurance and parking would be the same. The story of Zipcar emphasizes that deployment of mobility innovations is held back not just by technical hurdles, but also by challenges of limited resources and the integration of new technologies within the existing physical and social systems. While innovators are often well-positioned to solve technical challenges, they are often less prepared to overcome system integration hurdles and build support from government agencies and adjacent industries. McGuire argued that government agencies are uniquely positioned to help innovators overcome systems integration and societal acceptance challenges.

Encouraging Mobility Innovations

Bringing together academic researchers and private sector companies, Mcity provides an environment to tackle the challenges faced by mobility hard tech and infrastructure innovations. For example, the Mcity autonomous vehicle (AV) test facility is used by startups and more established companies active in AV development, and insights from university research are used to develop safety assessment frameworks for AV evaluation and deployment. In addition to the physical AV test facility, Mcity hosts a free open-source digital twin of the Mcity test facility. Digital twins allow for testing of autonomous vehicles in a virtual world before real world testing. By providing faster, safer, and less expensive testing, the Mcity digital twin lowers the barrier of entry for AV innovators.

The collaboration between the public and private sectors means that Mcity research and testing can be used to provide government with assurance and direction ahead of widespread adoption of AVs and other new technologies. Additionally, the university environment both fosters international collaboration, and provides a place for scientific and social analysis of new technologies and critique of industry.

Lessons Learned

Reflecting on the mission and success of Mcity, McGuire presented methods for government to encourage mobility innovation. The first is investment in STEM education. McGuire pointed out that the average age of an innovator in the United States is 46, much older than the stereotype that innovators are all young college dropouts.⁵ STEM education encourages younger people to be entrepreneurial, which increases participation in science and technology research and start-ups later, accelerating the pace of innovation.

⁵ Ufuk Akcigit and Nathan Goldschlag. (2023). *Measuring the Characteristics and Employment Dynamics of US Inventors*. Becker Friedman Institute for Economics at the University of Chicago. <https://bfi.uchicago.edu/wp-content/uploads/2023/05/Measuring-the-Characteristics-and-Employment-Dynamics-of-U.S.-Inventors-1.pdf>

The second method is for government to provide seed funding, particularly for capital-intensive efforts with long-term transformative potential, but which lack potential for near-term return on investment. Infrastructure innovations are more likely to have less potential for near-term return on investment compared to software innovations because hardware and real-world infrastructure development requires larger upfront investments.

McGuire presented the U.S. Department of Transportation’s Advanced Research Projects Agency for Infrastructure (ARPA-I) as a compelling example of an existing government innovation program. The ARPA model, pioneered by the Defense Advanced Research Projects Agency (DARPA), includes identification of potential breakthroughs, quick testing, and large R&D investments in promising projects. McGuire argued that the ARPA model is well-suited for transportation innovation and should receive increased attention and resources. Additionally, long-term support for R&D is crucial, as innovators may run out of funds just as they are on the precipice of success. McGuire criticized pilot projects that do not include a plan for scaling, as projects may be terminated just as the project begins to show results. This is particularly problematic in transportation, as people who have begun to use and rely on new technology have it taken away. The ARPA model avoids this issue by seeking to make quick decisions and move on if milestones are not met and to scale investments along with success, directing funding to the most promising ideas in a performance-based approach.



Figure 3. Aerial view of the Mcity autonomous vehicle testing facility.⁶

⁶ Joseph Xu. <https://news.engin.umich.edu/2024/12/mcity-unveils-digital-twin-making-its-physical-av-testing-facility-available-for-free-in-the-virtual-world/#&gid=27db87d0&pid=real-mcity>

Dr. William Riggs (USF): Integrating Autonomous Vehicles into Cities to Support Public Goals

Dr. William (Billy) Riggs, Professor at the University of San Francisco School of Management, and the Director of the Autonomous Vehicles and the City Initiative, presented on the status of AV integration into the existing transportation system, and research on how AVs can help address societal goals. His presentation referenced work done through the Autonomous Vehicles and the City Initiative, which brings together philanthropy, the private sector, and the public sector to imagine the future of mobility in the era of autonomous vehicles and innovation. He also discussed his past work with Rijkswaterstaat and the KiM institute on AVs and transportation innovation.

Deployment to Integration

Riggs argued that integration of autonomous vehicles into our transportation system isn't primarily limited by technology but is instead held back by governance and operational readiness. To illustrate this point, Riggs compared the experiences of two prominent AV developers: Cruise and Waymo. While Cruise found success in rapid integration and ambitions to scale quickly, the company ultimately suffered due to lacking incident response maturity, government relations, and integration at scale. Cruise ceased operations in October 2023 and its parent company, General Motors, ultimately shut Cruise down in 2025. Waymo, a division of Alphabet, is currently progressing towards operational maturity. Waymo found success through stepwise scaling, documenting safety, development of strong incident and service protocols, and government engagement. In February 2026, Waymo announced its goal to reach one million paid weekly trips in the United States by the end of 2026.⁷

Beyond operational readiness, Riggs has found that widespread adoption of AVs is highly dependent on the quality of the rider experience, which is ultimately shaped by trust, emotional comfort, and behavioral fluency. He argued that AV pilots rarely fail due to average performance; they fail because of rare events, institutional response, and public perception.

⁷ Burnett, S. (2026, February 12). *Waymo's metric for 2026 success: one million weekly rides*. Automotive World. <https://www.automotiveworld.com/news/waymos-metric-for-2026-success-one-million-weekly-rides/>



Figure 4. Robotaxis must integrate into existing transportation systems to reach operational maturity.⁸

Public Transit Integration

Riggs argued that an important role for academic researchers is to study how technological developments impact societal goals.

An example of a transportation technology with a negative impact is the rapid rise of ride hailing services in the United States in the early 2010s. During this time, Uber and Lyft expanded quickly with minimal or no coordination with local or state governments. This rapid growth raised concerns about impacts on traffic congestion and pollution. In many cities, including San Francisco, transit agencies and local government were concerned that ride hailing services, which were initially heavily subsidized, would erode public transit ridership and starve public transit services of operating revenue.

Riggs argued that through studying early real-world deployments of AVs, academic researchers can help shape policies and operational strategies that ease the integration of new technologies into existing transportation systems while limiting disruption of societal goals. Working with both Cruise and Waymo, Riggs developed research to better understand how individuals integrate AVs with public transit. This research began with Cruise rider experience studies in 2020-2023, which found that 56% of Cruise robotaxi rides were substituted from rideshare, and that 76% of trips in Cruise robotaxis would have been taken anyway.

⁸ Tada Images - stock.adobe.com

Starting in 2022, Riggs’ research expanded to Waymo through their transit credit program. If users took a Waymo to a transit station, they would receive credit to their Waymo account for a future ride. Results of this study showed that after 69% of rides, riders transferred to public transit. Additionally, 50% of rides were substituted from rideshare, a similar result to the Cruise study, and 38% of the rides were substituted from public transit, most replacing transit routes that had a low frequency of service. Additionally, riders who took advantage of this program were not just “tech bros,” 31% of riders didn’t own a car, and 48% had annual incomes under \$100,000. The results of this research showed that there is potential for public transit agencies and AV “robotaxi” companies to work together to serve the public’s mobility needs.

Comparing the United States and Europe

Riggs concluded by presenting trends he has observed from his work in the Netherlands and European Union. He argued that while the United States optimizes for speed, iteration, and market deployment and Europe prioritizes coordination and regulatory rigor, both markets fail to address the systems integration challenges. Autonomous systems do not operate in isolation; to succeed and become embedded into cities they must function seamlessly with existing road networks, parking systems, curb management, operational protocols, emergency response, data infrastructure, and public expectations.

Autonomous deployments have rarely failed because of average performance; instead, rare events, breakdowns in institutional response, and gaps in operational coordination expose the underlying fragility of autonomous systems. These moments of failure define public trust and determine whether technology advances or stalls. Riggs explained that deployment should be understood not as a product milestone, but as an operating model—one that requires alignment across public agencies, private operators, and physical infrastructure.

Riggs argued that these system level failures often arise because there is no single actor who has clear ownership over a component of a system. In Europe, policy frameworks are relatively aligned, but markets are fragmented across jurisdictions, operators, and funding structures, making it difficult to scale and replicate solutions. In the United States, markets are more fluid and enable rapid deployment, but governance is highly fragmented, with inconsistent regulatory authority and limited institutional coordination.

Ultimately, Riggs argued that both the U.S. and Europe should shift their focus from innovation to integration. The next phase of automation will not be won by better technology alone, but by the ability to coordinate systems—governance, infrastructure, operations, and data—into products that function in practice.

Discussion Key Themes

Following the presentations, the organizers facilitated a group discussion among the attendees. Dr. Simeon Calvert, associate professor of Smart & Automated Driving at TU Delft, initiated the conversation with observations and questions in response to the three presenters. Kevin McCoy facilitated the conversation, asking how government, innovators, and academics can work together to advance transportation innovations.

The discussion centered on two key themes:

1. Importance of identifying responsibility and authority of government agencies, and
2. Alternative models to fund innovation.

Identifying Roles and Authority of Government Agencies

In the U.S., transportation innovation deployment and testing often varies by jurisdiction. Participants commented that it is important to identify the role of local agencies and stakeholders when deploying innovations. For example, District DOT (DDOT) in Washington, D.C., uniquely serves as both a city and state DOT (with equivalent regulatory authority, unlike most other city DOTs in the U.S.). Innovators working to deploy in D.C. should understand that DDOT holds responsibility to decide where the city should regulate, invest in, and incentivize mobility innovations. In comparison, the City of Orlando, Florida, has limited opportunities to provide funding and does not have the same regulatory authorities as D.C., but works to establish relationships with innovators and provide support and stability through local policy assurance and collaboration.

In contrast, Europe has taken a more deliberate and proactive approach with mobility innovations, particularly as it relates to automated vehicles. Early regulations of AVs were developed during the COVID-19 pandemic prior to initial deployments. Therefore, those looking to deploy in Europe must understand and work within existing regulations. Additionally, companies looking to deploy and expand production in the future should think about future supply and infrastructure needs, including the need for partnerships with producers and government to achieve their goals.

Alternative Models of Funding Transportation Innovations

Discussion participants noted that transportation technologies often have interconnected physical and digital components; therefore, it is important to fund both physical and digital technology development. Additionally, the cost and cost structure of physical and digital technology is often different, with many digital technologies using subscription-based models. When possible, subscription models should be leveraged to guarantee access to the latest technology, creating opportunity to more easily keep up with technological

developments. Digital technologies are often easier and less expensive to develop, test, and deploy at scale due to the wide availability and maturity of cloud-based computing and internet-based distribution systems.

In contrast, hardware innovations often require the development of new physical infrastructure and production capacity which can take many years to develop and at much higher costs. Participants noted that because of this disparity, hardware and physical innovations are often not a natural fit for venture capital funding and may require government support over longer periods of time.

Because transportation innovations increasingly require both physical and digital technologies, participants discussed that government procurement models should account for purchase of paired physical and digital technologies and should consider who will have access to the technology. One attendee raised concern that government agencies may need additional funding sources, beyond traditional gas tax and vehicle registration fee revenues, to provide the public with access to the latest transportation technology. However, government agencies face a challenge with the perception that the public sector shouldn't charge for services such as road usage fees. The new road pricing approach for trucks in the Netherlands⁹ may be an example of how governments can raise revenues to support transportation innovation.

Participants suggested that to overcome the “valley of death,” the period in the technology development lifecycle when an innovation has shown initial promise but has not yet been developed into a commercially viable and scalable product, innovators must prioritize cost-efficiency. Technologies are more likely to achieve market success if they can demonstrate a positive cost benefit analysis. Public agencies have limited financial resources, and even very promising innovations may fail to scale and achieve wide deployment unless they are cost-competitive when compared with current industry standard approaches.

⁹ Rijkswaterstaat. (n.d.). *Legislation*. Vrachtwagenheffingsbeleid.
<https://www.vrachtwagenheffingsbeleid.nl/english/legislation>

Appendix - Agenda

- 11:30am Registration and walk-in lunch
- 12:00pm Welcome by Bastiaan van den Berg (NL Embassy)
Introduction of moderator (Kevin McCoy, Volpe)
- 12:05pm Opening remarks:
- Gregg Fleming (Volpe Center)
 - Serge van Dam (KiM)
- 12:15pm Presentations:
- Dr. Johan Visser
 - Greg McGuire
 - Dr. William (Billy) Riggs
- 1:15pm Facilitated discussion with all participants moderated by Kevin McCoy
First response by Dr. Simeon Calvert (TU Delft)
- 1:55pm Observations and conclusions by Gregg Fleming and Bastiaan van den Berg
- 2:00pm Post-event networking