



The Great Mobility Shift

The next era of automotive
transformation

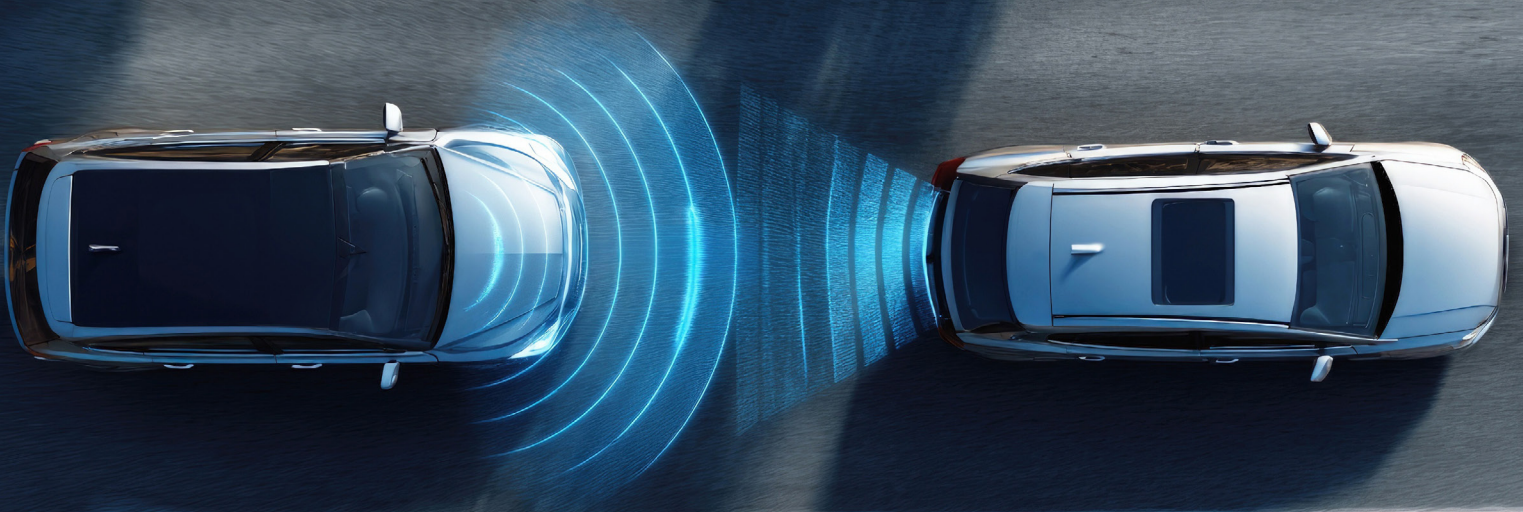




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Foreword

Mobility is entering a new era. One defined by rapid change that is redefining transportation and the way we move. Yet, the pace, scale, and direction of the road ahead remain uncertain.

To bring clarity to this evolving landscape, we conducted first-person interviews with leading subject matter experts from across the globe, including academics, technologists, entrepreneurs, OEM representatives, and practitioners shaping mobility today. The full list of contributors can be found at the end of this whitepaper. These conversations spanned disciplines and geographies, from North America, Europe, Asia, and beyond, offering global perspectives on the factors redefining how people and goods move.

Grounded in these insights, our research identified four defining mobility trends poised to shape the decade ahead:

**Autonomous
vehicles**

**Alternative
energy**

**AI and
connectivity**

**Embedded and on-
demand mobility**



This body of work explores both the current state of these trends as well as where industry experts expect them to be by 2035. It also examines the conditions required to reach their full potential, from infrastructure and regulation to business models and public trust. While this whitepaper draws on a broad range of expert perspectives, it represents the current expectations of contributors and should not be considered exhaustive or definitive.

Element not only understands where the industry is headed, we're actively driving it forward. The launch of the [Innovation Lab](#) within Element Mobility marks the next step in shaping the future of how industries move and connect. Designed to test and scale transformative technologies like robotics, drones, AI, and beyond, the Innovation Lab will leverage Element's industry leadership through strategic collaborations to bring the future of fleets to life.

The Great Mobility Shift: The Next Era of Automotive Transformation embodies this vision. It highlights Element's role not as an observer of change, but as one of the catalysts for it, helping our clients and partners anticipate what's next and harness the power of innovation to move their businesses, and the world, forward.

Above all, it reflects the perspectives of those who are shaping the industry from within. We invite you to explore this work, reflect on its insights, and share your own perspectives. Because the road ahead is not predetermined. It will be shaped by us.

“We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run.”

- Roy Amara, Scientist, 1978

Introduction

When we talk about the changing state of mobility, it would be unwise to violate Amara’s Law and dramatically underestimate the change that will occur between now and 2035. By even the most conservative estimation, the next 10 years will shape the future of mobility more profoundly than the last fifty. Ownership models are shifting toward subscription, sharing, and on-demand access. Vehicles are becoming platforms that are data-rich, connected, and powered by alternative energy.

And yet, precisely what the future of mobility holds remains a mystery. We can see where the trends are heading: autonomous vehicles (AVs), alternative energy, AI-and-connectivity, but we can’t offer any guarantees of where these trends will ultimately land.

Why?

Take, for instance, film studio executive Darryl F. Zanuck’s 1946 prediction about the emerging technology of television when he said, “Television won’t last because people will soon get tired of staring at a plywood box every night.”

The simple fact is that the history of technological advancement is littered with similarly inaccurate predictions. How does that happen?

The answer lies in a two-word encapsulation of why some technology breaks through to mass adoption and others do not: **tipping points**.





The anatomy of a tipping point

Let's take a look at two emerging technologies that have seen different adoption trajectories. Cell phones in the 1980s and '90s and the Concorde supersonic passenger jet in the late 20th century.

Even the biggest technophobe could tell you that one has become a necessary part of everyday life, while the other, despite being a functioning and highly advanced technology, remains a historical footnote.

If we assume the failure of the Concorde lies in engineering shortcomings, that would be incorrect. In fact, Concorde first entered service in 1976¹ and successfully flew passengers at twice the speed of sound for nearly three decades. The aircraft was viable and 20 jets were built².

But it never reached its full potential. Why? Tickets were prohibitively expensive, environmental and noise concerns were constant, and the number of viable routes was limited. The roadblocks to adoption had little to do with engineering and everything to do with cost, accessibility, and public acceptance.

That's similar to where cell phones were in the early 1990s. The technology existed but coverage was limited, devices were bulky, and calling plans were expensive.

It wasn't until the turn of the millennium that multiple factors came together to create a historical tipping point: (1) The cost of the phones and calling plans fell significantly, (2) carriers invested heavily in infrastructure, extending coverage range, and (3) social expectations changed as being reachable became a norm for work, emergencies, and socializing.

Concorde, on the other hand, never crossed that threshold. It remained technically viable but socially and economically out of reach.

¹ [Concorde | Summary, History, & Facts | Britannica](#)

² [What Happened to the Concordes? | National Air and Space Museum](#)

Mobility in 2035

So, will autonomous vehicles be commonplace in society by 2035 like cell phones? Or will they remain a dream of the future that, like the Concorde, never quite reach mass adoption?

Answering those questions is the driving purpose behind **The Great Mobility Shift: The Next Era of Automotive Transformation.**

This whitepaper explores the forces, technologies, potential barriers, and converging conditions that will define mobility over the next five to ten years. It will focus on four key mobility trends:

**Autonomous
vehicles**

**Alternative
energy**

**AI and
connectivity**

**Embedded and on-
demand mobility**

Our goal is to track the paths these technologies are already on and see where they might collide to spark change. Think of it less as crystal-ball gazing and more like reading the road signs on a highway. To help us on this journey, we conducted exclusive interviews with leading researchers, technology and mobility experts, academics, and tech entrepreneurs. These insights provided the foundation to help us sort out what's truly on the horizon, what's almost inevitable, and what might stay stuck in the "someday" category.

Because the next 10 years won't just transform how we move, they'll redefine how we think of mobility itself.



The global mobility space today

Before looking at where the mobility space will likely be in 2035, it is important to take a snapshot of where we are today. Our four main trends, autonomous driving, alternative energy, AI and connectivity, and embedded and on-demand mobility have all showed promise in various places around the world.

Region	Autonomous Vehicles	Alternative Energy	AI and Connectivity	Embedded / On-demand Mobility
North America (CAN/MX/U.S.)	By mid-2025, Waymo surpassed 100 million fully autonomous miles. ³ AVs are operational but limited to select cities.	Electric vehicles (EVs) represented an average of ~8% of new car sales in 2024, though national shares vary. ^{4 5 6} Infrastructure gaps and cultural resistance remain barriers.	Early pilots of vehicle-to-everything (V2X) in select U.S. cities. Connectivity fragmented by region. ⁷	MaaS offerings remain sparse. The business case is fragile outside dense metros. ⁸
China	AV market size was U.S. \$17.23 billion in 2024 and expected to grow to U.S. \$170.57 billion by 2033 due in part to strong government support for automation. ⁹	Shenzhen is fully electrified in public transport. ¹⁰ Nationally, ~50% of new cars are EVs. ¹¹	Wuxi was among the first Chinese cities to deploy a city-scale C-V2X pilot and remains a core national demonstration area with Vehicle-Road-Cloud integration infrastructure. ¹²	Super-apps and MaaS ecosystems are scaling. There is strong integration with policy and payments.
Europe	AV testing is ongoing. Fragmented regulation slows scale. ¹³	Norway leads globally. 88.9% of new passenger cars in 2024 were EVs. EU average ~20%. ¹⁴	Select V2X pilots are taking place. ¹⁵ Adoption varies widely across countries. ¹⁶	Europe is widely regarded as the birthplace of MaaS (e.g., Whim in Finland). ¹⁷ MaaS market value is expected to reach U.S. \$40.1 billion by 2030 but still largely in pilots. Integration challenges persist. ¹⁸

³ Alphabet's Waymo picks up speed as Tesla robotaxi service expands | Reuters

⁴ Electric Vehicle Sales Jump Higher in Q4, Pushing U.S. Sales to a Record 1.3 Million - Cox Automotive Inc.

⁵ Global EV Sales Report 2024

⁶ Mexico EV Sales Report: It Turns Out, Official Data Has Been Underreporting Sales, and Mexico's EV Market Is Further Ahead than We Expected! - CleanTechnica

⁷ <https://www.itskrs.its.dot.gov/briefings/executive-briefing/vehicle-everything-v2x-technology>

⁸ https://n-catt.org/wp-content/uploads/2020/12/MaaS_Final_WhitePaper.pdf

⁹ <https://www.globenewswire.com/news-release/2025/01/30/3017843/28124/en/China-Forecasts-Strong-Growth-in-Autonomous-Vehicle-Market-with-Expected-Valuation-of-US-170-57-Billion-by-2033.html>

¹⁰ https://changing-transport.org/wp-content/uploads/2022_Promoting_Chinas_Transition_Towards_Sustainable_Transport_Integration.pdf

¹¹ <https://iea.blob.core.windows.net/assets/7ea38b60-3033-42a6-9589-71134f4229f4/GlobalEVOutlook2025.pdf>

¹² <https://5gaa.org/content/uploads/2025/02/5gaa-tr-wi-v2x-china-sop-ii-v1.5-clean-0221.pdf>

¹³ EU slows down on AI regulation amid growing divide | Okeone

¹⁴ <https://iea.blob.core.windows.net/assets/7ea38b60-3033-42a6-9589-71134f4229f4/GlobalEVOutlook2025.pdf>

¹⁵ <https://www.vector.com/int/en/know-how/v2x/v2x-worldwide-status-and-outlook-2025/>

¹⁶ <https://evboosters.com/ev-charging-news/government-policy-and-regulations-shaping-the-future-of-v2x/>

¹⁷ <https://futuremobilityfinland.fi/cases/maas-global-mobility-as-a-service/>

¹⁸ Mobility as a Service Market Size, Share, Analysis, Report, 2030

Region	Autonomous Vehicles	Alternative Energy	AI and Connectivity	Embedded / On-demand Mobility
India	Early-stage AV pilots are emerging. Regulations are challenging. ¹⁹	~2% EV sales ²⁰ , but booming e-scooter and e-bike market with >60% annual growth projected through 2030. ²¹	Connected vehicles market size reached U.S. \$6.49 billion in 2024 and is expected to reach U.S. \$ 27.20 billion by 2033. ²²	Shared and subscription mobility expanding in cities. There is high growth potential. ²³
Africa	Limited AV activity.	EV penetration <1% continent-wide. ²⁴	Connectivity infrastructure uneven.	In Rwanda and Ghana, Zipline has pioneered drone logistics for healthcare, delivering essential supplies to remote clinics in a fraction of time required by road transport. ²⁵
South America	AV testing is minimal.	Brazil leads with ethanol-hybrid EVs. ²⁶ The regional EV share ~5–6%, with Colombia/ Costa Rica reaching 10–15%. ²⁷	Connectivity is slower to scale because of infrastructure gaps.	Shared mobility adoption is limited. Cost sensitivity remains a barrier. ²⁸
Australia and New Zealand	AV freight corridor pilot studies underway in Australia. ²⁹	Auckland has a target to fully electrify the public bus fleet by 2035, with around a third of its 1,350 buses expected to be electric by mid-2026. ³⁰	Australia is advancing its connected V2X infrastructure through trials and regulatory standardization. ³¹	MaaS and subscription pilots are in early phases. Potential in tourism and urban transport. ³²

¹⁹ <https://www.engineeringmix.com/india-av-regulatory-challenges/>

²⁰ <https://iea.blob.core.windows.net/assets/7ea38b60-3033-42a6-9589-71134f4229f4/GlobalEVOutlook2025.pdf>

²¹ The electric two wheeler market in Asia takes off | McKinsey

²² <https://www.imarcgroup.com/india-connected-vehicles-market>

²³ <https://www.psmarketresearch.com/press-release/india-shared-mobility-market>

²⁴ Trends in electric car markets – Global EV Outlook 2025 – Analysis - IEA

²⁵ <https://www.zipline.com/blog/taking-flight-against-malaria-how-rwanda-and-zipline-are-changing-the-story>

²⁶ Advanced BioFuels USA – Brazil Favours Ethanol Cars as 2022 Flex-Fuel Vehicles Continue to Overshadow EVs

²⁷ Trends in electric car markets – Global EV Outlook 2025 – Analysis - IEA

²⁸ <https://betterbikeshare.org/wp-content/uploads/2024/07/shared-mobility-sustainable-transport-future-latin-american-cities.pdf>

²⁹ <https://www.ntc.gov.au/transport-reform/automated-vehicle-program>

³⁰ <https://at.govt.nz/about-us/news-events/media-centre/2025-media-releases/new-fleet-of-electric-buses-begin-service-in-west-auckland-set-new-benchmark-for-australasia>

³¹ <https://imoveaustralia.com/wp-content/uploads/2024/08/20240513-Project-1-066-DITRDCA-A-Comparative-Assessment-of-C-ITS-Technologies-1.pdf>

³² <https://imoveaustralia.com/wp-content/uploads/2024/05/Mobility-as-a-Service-Research-summary-conclusions-and-action-recommendations.pdf>

The 2035 vision: What will mobility look like?

Let's fast forward to 2035. In this section, we map out our best view of the road ahead across four key trends: the rise of autonomous movement, the dominance of alternative energy, the intelligence layer that connects and optimizes fleets, and the embedding of mobility directly into daily life through on-demand access. Together, these themes paint a picture of a world where cars can drive themselves, sustainable energy powers the majority of new vehicles, AI manages fleets in real time, and mobility is woven seamlessly into how we live, work, and travel.

Of course, how this future unfolds will depend on more than just technology. It will be shaped by policy, infrastructure, economics, culture, and above all, trust. These are not predictions set in stone, but the most informed signals of where mobility is headed and what it could look like when it arrives.

Autonomous vehicles

It's hard to consider what mobility will look like in the future and not imagine a driverless vehicle. To see what that might look like, we can turn to existing Advanced Driver Assistance Systems (ADAS) technologies already in use. Driver-assisted features such as collision avoidance, automatic braking, and lane-centering set the stage for future adoption.

"ADAS is a stepping stone on the path to full autonomy," said Avninder Buttar, Senior Vice President and Head of Electrification at Element. "The sensors, cameras, and technology that go into making ADAS effective and safe lay the groundwork for more advanced autonomy use cases."

Here are some potential growth areas for autonomous vehicles (AVs) within the next decade.

Robotaxis

Robotaxis are emerging as the first practical, commercial use case for autonomous vehicles. All indications are that this will only grow in the next 10 years. The global robotaxi market size was valued at U.S. \$1.71 billion in 2022 and is projected to reach a value of \$118.61 billion by the year 2031.³³ One industry projection sees robotaxi fleets operating at scale in anywhere from 40 to 80 cities globally by 2035.³⁴ This is up from just six cities in 2024. The expectation is these deployments will be concentrated mainly in the U.S. and China.

³³ [global robotaxi market](#)

³⁴ [Autonomous Vehicles: Timelines and Roadmap ahead, World Economic Forum 2025](#)



One industry projection sees robotaxi fleets operating at scale in anywhere from 40 to 80 cities globally by 2035. This is up from just six cities in 2024.

Professor David Levinson is a Foundation Professor in Transport Engineering at the University of Sydney. He believes a key demographic for robotaxis will be apartment building residents. “People who live in apartment buildings will be the market for robotaxis mainly because they don’t want the hassle of parking,” he said. “If a taxi can pick you up in a minute, and the price is lower than owning a car, why wouldn’t you?”

Long-haul trucking

While the future of robotaxis looks bright, it may not be the area of the biggest commercial breakthrough for autonomous vehicles. Though still in very early pilot stages, autonomous vehicles for convoy-style long-haul trucking are expected to see early widespread adoption, mainly because of the strong business case.

A study by the Iowa State University Institute for Transportation found that creating AV corridors along highways for long-haul trucks could reduce operating costs by 57%.³⁵

“The appeal of autonomous trucks is they can run overnight at no added cost. This will not only reduce labour costs but will also help to solve congestion issues,” said Dr. Dulsha Kularatna-Abeywardana, Senior Lecturer in Electrical and Electronic Engineering at the University of Auckland.

U.S.-based Aurora is currently leading the effort to develop autonomous technology specifically for freight and long-haul trucking. They acquired Uber’s self-driving truck division and, according to a company press release, have completed more than 1,200 miles of highway travel without a driver.³⁶

In September 2025, Gatik, a player in autonomous freight for regional logistics networks, announced a partnership with Loblaw Companies Limited, Canada’s largest retailer, to equip trucks with Gatik’s sensor suite. Autonomous long-haul trucking will likely be rolled out gradually, beginning with hub-to-hub routes which ensures the trucks only need to travel on highways and not through dense urban centres.

Shauna Brail, Professor and Director at the Institute for Management & Innovation, University of Toronto, believes the ease of navigating highways will play a huge role in the adoption timeline of autonomous trucking. “Automated trucks are likely to scale up faster because highways are simpler to navigate,” she said. “There are no traffic lights, cyclists, or pedestrians, removing many of the unknowns that make urban autonomous driving so complex.”

One projection suggests that around 29-30% of new mid-distance hub-to-hub trucks in the U.S. and about 26% in Europe are expected to be autonomous by 2035.³⁷



Creating AV corridors along highways for long-haul trucks could reduce operating costs by 57%.

³⁵ Autonomous Truck Corridors: Concept and Implementation Plan white paper

³⁶ Aurora Begins Commercial Driverless Trucking in Texas, Ushering in a New Era of Freight :: Aurora Innovation, Inc. (AUR)

³⁷ Autonomous Vehicles: Timelines and Roadmap ahead, World Economic Forum 2025

Personal use

Currently, fewer than 1% of personal vehicles globally are considered Level 3 (described as eyes-off, hands-off driving) or above and that number has been estimated to only reach 3% by 2035.³⁸ A higher estimation sees the global market share for Level 4 autonomous personal cars to be about 7.5% of new sales by 2035, but still far from breaking into the mainstream.³⁹

“Self-driving works well in controlled domains, but we’re not at the hockey-stick curve for personal adoption. AVs won’t replace the steering wheel anytime soon,” said Dr. Sven Beiker, Managing Director of Silicon Valley Mobility.

Aerial drones

Not all of the key mobility modes may be on the road in 2035. Speculation has swirled for years that drones could replace a large section of road-based delivery fleets.

Looking ahead, the global market share for aerial drones is expected to grow from U.S. \$73.19 billion in 2024 to \$130.61 billion in 2035 with North America having the largest regional market share.⁴⁰

“Drones are often overlooked, but they’re inherently electric, and offer possibilities well beyond delivery,” said Dr. Sheldon Williamson, Professor of Electrical, Computer and Software Engineering at Ontario Tech University.

There is a common denominator with the successful rollouts for major retailers in the United States (Amazon and Walmart) and medical supply delivery use case in Africa. They exist outside of a densely populated urban area.

“In dense urban settings, drone delivery is far less practical,” said Prof. Shauna Brail. “The successes so far have been in low-density areas with space to land, not in cities where every coffee or grocery order would fill the sky.”



“Self-driving works well in controlled domains, but we’re not at the hockey-stick curve for personal adoption. AVs won’t replace the steering wheel anytime soon.”
Dr. Sven Beiker

³⁸ The Emerging Risks of Level 3 Autonomous Vehicles

³⁹ Autonomous Vehicles: Timelines and Roadmap ahead, World Economic Forum 2025

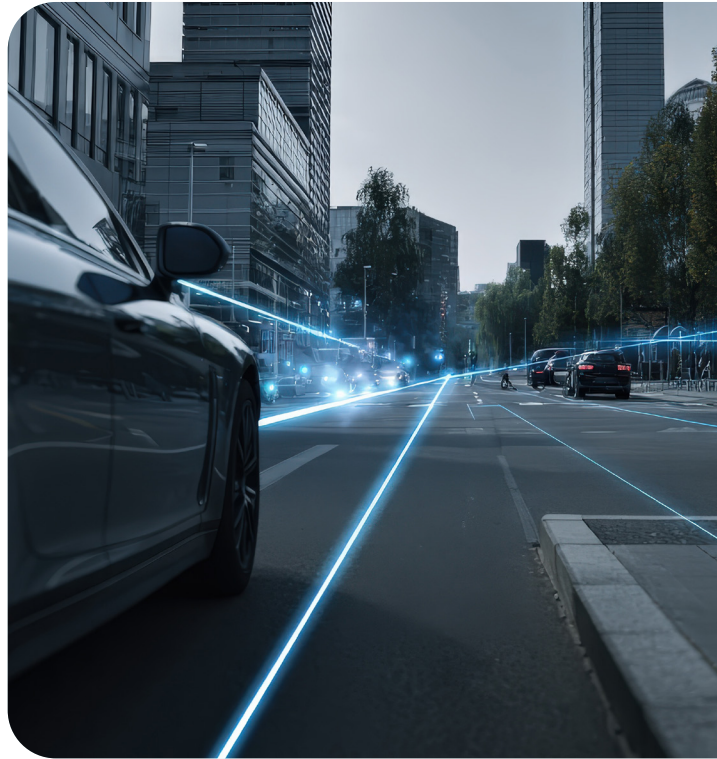
⁴⁰ Drones Market Overview Size, Share, Trend, Growth, Report 2035

Unlocking automation: The technology that matters most

When you're behind the wheel, you're constantly pulling in information. Your eyes scan the road, your ears pick up the sirens in the distance, and your brain weighs when to brake, merge, or accelerate. Autonomous vehicles aren't so different, they just swap biology for technology. To drive safely, they need to sense their surroundings, know where they are, and make smart decisions on the fly. Here are three core technologies that make that possible:

Sensor fusion: The “eyes and ears”

Just like you use sight and sound together to get a complete picture of the road, AVs rely on multiple sensors such as LiDAR (a detection system which works on the principle of radar, but uses light from a laser), radar, cameras, and ultrasonics. Each has strengths and weaknesses: cameras give rich detail, radar cuts through fog, LiDAR builds precise 3D maps, etc. Sensor fusion combines them into one clear, reliable view. Without it, the vehicle would be like a driver trying to steer with one eye closed and earplugs in.



SLAM (Simultaneous Localization and Mapping): The “sense of place”

As a driver, you're checking road signs, glancing at landmarks, and adjusting when you hit a detour. SLAM lets AVs do the same. By constantly mapping the environment while tracking its own position within that map, the vehicle knows not just what's around it but also where it is. That's how it adapts when the GPS falters or when construction shifts the lane lines overnight.

AI decision engines: The “brain”

Finally, sensing and knowing your location doesn't mean much without judgment. You process traffic lights, predict what that cyclist might do, and choose whether to stop, yield, or go. AVs rely on AI decision engines to do the same by digesting sensor data, predicting the behaviour of others, and selecting the safest maneuver in real time. Unlike old rule-based systems (“if X, then Y”), these AI models learn patterns and nuance, more like an experienced driver who can anticipate the flow of traffic instead of just reacting to it.

Together, these systems turn raw data into something familiar: situational awareness and informed choices, the very things human drivers have always relied on.

Alternative energy sources

The future of alternative energy sources looks very different depending on where in the world you live. In Norway, EV adoption has already reached levels that other regions may struggle to match, even by 2035. Parts of South America, on the other hand, are making significant advances in biofuels.

Starting with electrification, here is a global snapshot of the leaders in new EV sales.

Region	EV Share of New Car Sales (2025) ⁴¹	
Norway (benchmark)		89%
China		50%
Europe (EU average)		20%
Colombia / Costa Rica (LatAm leader)		10-15%
Thailand (ASEAN leader)		13%
Australia and New Zealand		9%
North America (CAN/MX/U.S.)		8%
Brazil (LATAM leader)		6%
Latin America (avg)		5%
India		2%
Southeast Asia (ASEAN avg)		<1%
Africa (continent-wide avg)		<1%

These regional disparities highlight that the path to electrification is not uniform. Rather it is shaped by policy, infrastructure, consumer culture, and resource availability. We'll explore all the converging forces that will impact the shift to electric mobility.

⁴¹ Trends in electric car markets – Global EV Outlook 2025 – Analysis - IEA

Battery innovation: The next wave

Lithium-ion, today's battery industry standard, will continue to power most EVs in the near term, but the mix won't look the same by 2035. Sodium-ion and potassium-ion batteries are on track to move from small pilots to full-scale production, offering lower costs, stronger performance in cold weather, and less dependence on scarce minerals.⁴² Industry heavyweights like CATL and BYD are already laying the groundwork, with plans to bring these chemistries into mass-market vehicles within the next five years.⁴³

As Dr. Sheldon Williamson observed, "In terms of battery technology, something other than lithium will dominate 10 to 15 years from now."

Solid-state batteries (using solid electrolytes instead of liquid to deliver higher energy density and improved safety) represent another potential contender to enter commercial vehicles in meaningful volumes by the early 2030s. Offering up to twice the energy density of today's lithium-ion cells and the promise of near-instant charging, they could finally put range anxiety to rest for both consumers and fleets.

Element's team in Australia and New Zealand have seen first-hand where clients have indicated they are waiting for solid-state batteries out of concern that transitioning to full EVs will collapse the grid. This perception is likely to vary region to region as similar concerns have not been prevalent in North America, according to that team.

Redox flow batteries are rechargeable electrochemical systems that store energy in liquid electrolytes contained in external tanks. They're still in the experimental stage for transport but may find a niche in high-demand use cases like buses, trucks, and depot-based fleets, where liquid electrolytes enable quick refueling and consistent performance over heavy-duty cycles.

Charging in 2035: Fast, wireless, and everywhere

Range anxiety and charging inconvenience have long been obstacles to EV adoption. Emerging wireless charging technologies, both static and dynamic, could help remove those barriers entirely.

Static wireless charging allows a vehicle to park over a pad, much like placing a phone on a wireless dock.⁴⁴



Offering up to twice the energy density of today's lithium-ion cells and the promise of near-instant charging, solid state batteries could finally put range anxiety to rest for both consumers and fleets.

⁴² World's biggest battery maker flags first commercial sodium battery packs by end of year

⁴³ China's CATL launches new sodium-ion battery brand | Reuters

⁴⁴ The Rise of Wireless Charging in EV Infrastructure

Dynamic wireless charging takes it further, embedding coils in the roadway to transmit power while driving. Beyond convenience, both approaches could enable automated charging which is essential for autonomous fleets and robotaxis that need to refuel without human intervention.

Of the two, static wireless charging is closest to mainstream use. Standards are in place such as SAE J2954, finalized in 2020, and early deployments are underway.⁴⁵ By 2035, wireless pads in garages, bus stops, and public parking lots could be available in high-convenience settings.⁴⁶

Dynamic charging remains further off, with pilot projects in Sweden, China, the U.S., and South Korea exploring feasibility. Sweden, for example, is exploring electrifying hundreds of kilometres of highways by 2040.⁴⁷ But cost and integration challenges mean widespread rollout is unlikely before then.

Meanwhile, fast charging continues to expand rapidly. By 2024, the global network reached two million chargers, with ultra-fast units (150 kW+) growing more than 50% in a single year and now comprising nearly 10% of the total.

Grid integration and smart energy

Perhaps the most underappreciated change in the future will be how deeply EVs are woven into the energy system. By 2030, EVs are projected to consume approximately 780 terawatt-hours (TWh) annually, four times 2024 levels.⁴⁸

Yet they won't just be consumers of electricity; they will also be able to distribute energy back to the grid. Vehicle-to-grid (V2G) technology, still at pilot stage today, is expected to grow in market share from \$5.87 billion in 2025 to approximately \$65.6 billion by 2035.⁴⁹

Jean Donnadieu is Head of Global Corporate Leasing at Nissan GHQ Japan. He points out that V2G capability is now becoming standard for new generations of EVs.

“EVs for next generations could develop vehicle-to-grid” he said.

“Major OEMs may look to equip new EV generations with this capability.”

There could soon be a world where millions of EVs plugged in overnight will act as distributed storage, stabilizing renewable-heavy grids. Supercapacitors and hybrid energy storage systems will give fleets new options to shave peak demand, particularly in stop-and-go applications like buses and garbage trucks.



Vehicle-to-grid (V2G) technology is expected to grow in market share from \$5.87 billion in 2025 to approximately \$65.6 billion by 2035.

⁴⁵ [The Rise of Wireless Charging in EV Infrastructure](#)

⁴⁶ [Wireless Charging for Electric Vehicle Market Size \[2033\]](#)

⁴⁷ [Sweden is building the world's first permanent electrified road for EVs to charge while driving | Euronews](#)

⁴⁸ [Outlook for energy demand – Global EV Outlook 2025 – Analysis - IEA](#)

⁴⁹ [Vehicle-to-Grid Technology Market Size & Forecast to 2035 | Industry Growth Report](#)

Hydrogen and biofuels: Niche but necessary

While battery electric vehicles will dominate light-duty mobility, hydrogen and biofuels will maintain important niches by 2035. Hydrogen fuel cells are already proving attractive for heavy-duty trucks, long-haul buses, and possibly even regional aviation. It poses infrastructure challenges, but China, Japan, and parts of Europe are building toward hydrogen corridors that could see meaningful adoption within a decade.

Biofuels, meanwhile, will likely persist as a transitional solution, especially in aviation and markets with abundant agricultural feedstock. As Dr. David Levinson noted, “Brazil’s been using sugar ethanol for ages, and the U.S. uses corn ethanol instead of sugar.” Their role in road transport may shrink as EV adoption accelerates, but they will remain part of the energy mix in hard-to-electrify sectors.

One such hard-to-electrify sector could be the rural areas of Mexico. Rafael Leyva, an environmental engineer in Mexico, believes that in the near term, biofuels may emerge as the preferred sustainable energy option in these areas.

“Electrification may not be easily achievable in the rural areas of the country where charging infrastructure would be sparse,” he said. “But with access to biomethane from nearby farms, biofuels may stand out as the better option.”

By 2035, there will be an interconnected system of batteries, chargers, grids, and fuels—an ecosystem where fleets are active participants, not just consumers.



With access to biomethane from nearby farms, biofuels may stand out as the better option.

Artificial intelligence and connectivity

Artificial intelligence and connectivity are quickly becoming the hidden operating system of mobility. Most vehicles today are only lightly connected through navigation, telematics, or basic driver-assistance, while fleets lean on GPS tracking and rule-based dispatching. AI will enhance what software has been able to achieve to date in optimizing routes, enhancing safety, and predicting maintenance needs, though adoption remains fragmented and uneven across regions.

“Connectivity is about more than data—it’s about insight and action,” said Kimberly Clark, Vice President, Connected Mobility at Element. “When AI and telematics work together, they transform real-time information into intelligent, automated experiences that help fleets operate with greater safety, efficiency, and confidence.”

By 2035, AI and connectivity are expected to turn mobility into a continuously learning, predictive network. Vehicles, infrastructure, and users won’t just share data, they’ll collaborate in real time.



The edge computing transformation

If cloud computing is like sending every decision to a distant headquarters for approval, edge computing is like giving your frontline team the authority to act on the spot. For vehicles, that means processing massive volumes of data right inside the car. Whether it’s braking for a hazard, rerouting around traffic, or adjusting battery performance, it can all be done without waiting for instructions from a server halfway across the country. By moving intelligence to the “edge,” closer to where the action happens, mobility systems become faster, safer, and more reliable.

By 2035, mobility systems will be defined by intelligence at the edge. According to S&P Global, between 2024 and 2030 the average vehicle’s compute capacity, measured in kDMIPS (for control logic) and TOPS (for AI tasks) is expected to triple and nearly quintuple, respectively.⁵⁰ This leap enables a new generation of vehicles designed from the ground up with modular, updatable software platforms, not just more software atop static systems.

Fleet orchestration will be powered by AI “decision engines” capable of balancing cost, emissions, and safety across thousands of vehicles simultaneously. Gartner projects that one-third of enterprise applications will feature agentic AI by 2028, with at least 15% of day-to-day work decisions made autonomously.⁵¹ By 2035, dispatching, maintenance scheduling, and even insurance risk assessments may run on AI-first platforms, with human oversight limited to exception handling.

By 2035, dispatching, maintenance scheduling, and even insurance risk assessments may run on AI-first platforms, with human oversight limited to exception handling.

⁵⁰ Automotive computing: The new competitive advantage for OEMs | S&P Global

⁵¹ How Intelligent Agents in AI Can Work Alone | Gartner

Sean McGee, V.P. Product-Platform for Samsara, a San Francisco-based technology company focused on physical operations, has been building AI agents into its Connected Operations Platform to streamline fleet operators' maintenance processes.

“Fleets today are overwhelmed by the amount of data and information flowing into their systems. Our AI agents can sort through thousands of fault codes and tell the mechanic which ones matter and how to fix them,” he said. “Instead of spending hours researching, they can ask the AI agent what it will cost to repair and follow step-by-step guidance on how to get the asset back in use as quickly as possible.”

Digital twins and predictive platforms

Think of a digital twin as a living simulation that mirrors how an asset performs, degrades, and reacts under different conditions. It is a virtual replica of a physical system, from an individual battery cell to an entire vehicle fleet, continuously updated by real-world sensor data.

Today, experimental digital twins are being developed for EV batteries, motors, and drivetrains. By feeding real-time data into advanced models, engineers can predict failures before they occur, optimize charging strategies, and even reduce the number of sensors and wires needed onboard.

“Eventually we’ll create a digital twin of every component. That’s the level of precision and predictive control we’re moving toward,” said Dr. Sheldon Williamson.

By 2035, digital twins are expected to be foundational to fleet operations. Instead of relying on scheduled maintenance or reactive repairs, AI-driven twins will continuously forecast the health of every component. This means fleets will know down to the week when a battery module will lose efficiency or when a motor bearing is likely to fail.



Eventually we'll create a digital twin of every component. That's the level of precision and predictive control we're moving toward.

V2X: Beyond the vehicle

Vehicle-to-everything (V2X) communication is still in its early stages today, visible mainly through the pilot program in China⁵² as well as others in Europe and select U.S. cities.

By 2035, V2X technologies are expected to play a much larger role in mobility, though adoption will remain uneven across markets and vehicle fleets. FutureBridge estimates that 50–60 million C-V2X vehicles could be on the road by 2035.⁵³

Newer vehicles will increasingly be able to communicate not just with each other (V2V), but also with infrastructure (V2I), cloud services (V2N), and, in pilot programs, with vulnerable road users via smartphones or connected devices (V2P). While legacy vehicles and non-connected pedestrians will remain outside the system, even partial deployment can deliver real benefits.

“V2X capability for real-time communication between vehicles, surrounding infrastructure and users has a wealth of benefits for fleets and the broader mobility ecosystem,” said Evelyne Roy, Element’s Chief Data and Analytics Officer. “The value that will be created from data being generated from this level of connectivity will transform how insights are derived and decisions are made.”

The implications are far-reaching:

- **Safety beyond line of sight:** Vehicles will “see” around corners, through fog, or over hills by sharing position and speed data with each other and with infrastructure. This goes well beyond today’s camera and radar capabilities.
- **Coordinated traffic management:** Adaptive systems such as the Sydney Coordinated Adaptive Traffic System (SCATS) and the U.K.’s Split Cycle Offset Optimization Technique (SCOOT) have been in use for decades to optimize signals in response to real-time traffic.⁵⁴ What V2X adds is the ability to share expected signal timings directly with vehicles and navigation systems, an approach already standard in parts of China. This opens the door to new possibilities, such as trucks or fleets adjusting speed to align with planned green phases.
- **Multimodal coordination:** V2X will extend beyond cars and trucks. Drones, buses, delivery robots, and rail will all share information in a unified system, allowing for seamless transfers across transport modes.



50–60 million C-V2X vehicles could be on the road by 2035.

⁵² Wuxi to host internet of vehicles pilot area

⁵³ Vehicle-to-Everything (V2X) – A reality Towards Fully Autonomous Driving - FutureBridge

⁵⁴ Chapter 1 - Balancing Safety and Capacity in an Adaptive Signal Control System – Phase 1, October 2010 - FHWA-HRT-10-038

Embedded and on-demand mobility

The first wave of innovation in digital mobility gave us Mobility-as-a-Service (MaaS). Yet despite promising pilots, MaaS has struggled to scale globally. Operators are fragmented, regulations vary by city, and customer adoption is inconsistent.

It's estimated that by 2035, mobility will likely evolve into something different: Mobility-as-a-Feature (MaaF). Instead of being a standalone service, mobility will be embedded seamlessly into other industries and experiences.

Sampo Hietanen, the originator of the MaaS concept, explained it this way: “The logic will shift. You won't buy a fleet anymore, you'll just want the job done. Not as a standalone service, but a utility inside other business models.”

By 2035, MaaF is expected to become increasingly integrated into the fabric of everyday transactions, such as:



Real estate:

Apartment leases could include mobility credits, bundled access to shared EVs, or on-demand shuttles as part of the package. Parking will be optional, not assumed.



Healthcare:

Hospitals and insurers will embed patient and employee mobility into service offerings, ensuring seamless trips to appointments or facilities.



Retail and tourism:

Concerts, hotels, and events will package transportation directly into tickets or reservations, guaranteeing customers door-to-door service without separate planning.

Modularity and multipurpose vehicles

Modular vehicle design will further support MaaF. By 2035, vehicles will be built to shift roles across the day, serving as a delivery van in the morning, a shared commuter shuttle in the afternoon, and a family vehicle in the evening. This multipurpose efficiency will reduce the total number of vehicles needed, while increasing utilization rates.

Shift from ownership to flexible access

Ownership may no longer be the default. According to Deloitte's 2025 Global Automotive Consumer Study, 56% of young adults (18–34) in China and 44% in the U.S. are interested in giving up vehicle ownership for a subscription.⁵⁵ By 2035, flexible access is expected to be mainstream across markets, with vehicles and fleets treated more like utilities than assets.

“People, especially businesses, will stop buying vehicles and start buying transport as a service,” said Dr. Dulsha Kularatna-Abeywardana.

The bigger impact

Embedded mobility has the potential to fundamentally change how people and organizations value transportation. Rather than being a distinct purchase or burden, mobility could be a fluid, background function, much like Wi-Fi today.

For cities, the rise of embedded and on-demand mobility could translate into less reliance on private car ownership. Better integration of modes means a commuter could use a single app to seamlessly combine metro, bikeshare, and an on-demand shuttle, rather than defaulting to driving.

For businesses, it opens new revenue streams and strengthens customer loyalty.

If MaaS was just the beginning, then MaaSF represents the next logical step. The idea of mobility not as an app you open, but as a capability you expect, always there, always included, always optimized.



56% of young adults (18–34) in China and 44% in the U.S. are interested in giving up vehicle ownership for a subscription.

⁵⁵ 2025 Global Automotive Consumer Study | Deloitte Global

From pilots to mainstream: What stands in the way?

Even as alternative energy, automation, AI-driven connectivity, and new mobility models gain momentum, widespread adoption is by no means guaranteed. These technologies promise efficiency, sustainability, and safer roads, but they also raise questions about the feasibility of reaching their full potential. Below we explore the most significant risks and barriers that could slow progress.

1. Autonomous vehicles: Trust, regulation, and cost

The biggest hurdle for autonomous vehicles (AVs) is not technology, it's people. Despite evidence that AVs already outperform humans on safety, public perception remains skeptical.

In the U.S., only 13% of drivers say they would trust riding in a self-driving vehicle, up from 9% the previous year.⁵⁶

There appears to be a double standard when it comes to the public's tolerance for risk, with a near zero tolerance for AV related accidents.

“We're more comfortable accepting our own mistakes than a third party's, even if the third party is 10 times safer,” said Kobi Eisenberg, President of Element Mobility and Autofleet.

One of the most effective ways to build trust is by demonstrating the current clear and measurable safety benefits from existing ADAS technologies. For example, one Insurance Institute for Highway Safety (IIHS) study found that equipping vehicles with automatic emergency braking (AEB) reduced rear-end crashes by 50% and rear-end crashes that caused injuries by 56%.⁵⁷

When fleets and consumers begin to see these kinds of baseline safety gains, the leap toward advanced driver-automation becomes less about “trusting the unknown” and more about building upon already demonstrated capabilities.

Regulatory fragmentation compounds the issue. In North America, municipalities oversee streets, provinces and states regulate licensing and liability, and federal agencies set safety standards. This layered system slows progress.

“Infrastructure is local, vehicles are global, and policy isn't aligned,” said Dr. Sven Beiker.

Without harmonization, every city risks becoming its own pilot zone, with costly adaptations for AV fleets.



In the U.S., only 13% of drivers say they would trust riding in a self-driving vehicle, up from 9% the previous year.

⁵⁶ AAA: Fear in Self-Driving Vehicles Persists | AAA Newsroom

⁵⁷ Front crash prevention slashes police-reported rear-end crashes

The lack of clear, unified regulations is cited as the number one bottleneck to AV adoption with about 60% of AV industry leaders saying regulatory delay is the greatest hurdle.⁵⁸

“Road markings, sign readability, V2X protocols, none of it is standardized. Every city is different, and AVs can’t generalize easily,” said Prof. David Levinson.

Carlos Mir, Latin American Project Coordinator for Electric Mobility at United Nations Environment Programme Finance Initiative (UNEP FI), believes that Mexico is currently working towards electrification over autonomous vehicles.

“I don’t see Mexico betting on autonomous vehicles in the short term,” he said. “For now, the government is focused on building the legal framework and strategies for electrification such as national charging roadmaps and efficiency standards. Autonomy is simply not on the map yet.”

The warm-weather bias factor should not be overlooked. The successful rollouts of robotaxis have all been, to date, contained in warm weather climates like California, Nevada, or Arizona. Two Canadian researchers, Professor Krzysztof Czarnecki (University of Waterloo) and Steven Waslander (University of Toronto) found that AV tests in snowy and icy conditions turned into “a calamity on wheels” with the safety driver needing to frequently intervene.⁵⁹ In the winter of 2022-23 Waymo conducted extensive cold weather testing to train its AI to handle winter phenomena like snowstorms, black ice, and salt-covered roads. As of mid-2025, Waymo admits their system is “not yet validated” for fully driverless operation in snow.⁶⁰

Cost is a limiting factor. Full AV stacks (LiDAR, radar, cameras, GPUs) can add \$10,000–\$20,000 to a vehicle.⁶¹ That makes sense for robotaxi fleets but is unrealistic for everyday car buyers.

“Waymo is running, but it’s not cheaper than UberX,” said Dr. Sven Beiker.

According to a detailed comparative study of rideshare prices, Lyft offered the lowest average price at \$14.44, Uber followed at \$15.58, and Waymo’s came in at \$20.43.⁶²



Full AV stacks (LiDAR, radar, cameras, GPUs) can add \$10,000–\$20,000 to a vehicle.

⁵⁸ The autonomous vehicle industry moving forward | McKinsey

⁵⁹ <https://www.wired.com/story/snow-ice-pose-vexing-obstacle-self-driving-cars/>

⁶⁰ Waymo readies its robotaxis for winter weather | Smart Cities Dive

⁶¹ <https://qz.com/924212/what-it-really-costs-to-turn-a-car-into-a-self-driving-vehicle/>

⁶² Waymo rides cost more than Uber or Lyft -- and people are paying anyway | TechCrunch

2. Alternative energy: Grid stress, battery challenges, and equity

Electrification has already crossed the tipping point in China and parts of Europe, but the U.S. and Canada lag behind. The most pressing barrier is grid capacity. EVs consumed approximately 180 TWh globally in 2024, more than Argentina's annual electricity use.⁶³ In the U.S., the grid may require up to \$100 billion in upgrades by 2035 to accommodate EV demand.⁶⁴

Dr. Sheldon Williamson warned, "If everyone starts charging at the same time, the transformers won't be able to handle it."

Battery technology is also a sticking point. Current lithium-ion packs degrade over time and raise recycling challenges. A study by Geotab found that factors such as frequent DC fast charging, temperature, and states of charge (SOC) contribute to faster battery wear.⁶⁵ Alternatives such as sodium-ion and potassium-ion batteries are promising as they are cheaper, more sustainable, and more resilient in cold climates, but still face scaling and density hurdles.

Equity is another risk. In the U.S., the average new EV cost approximately \$55,500 in late 2024 versus \$49,700 for the average new ICE vehicle.⁶⁶ This represents a 12% premium to purchase an EV. For fleets, high upfront EV costs can be offset by lower operating expenses, but for individuals the price gap remains wide. Without affordable EV options and widespread charging innovations, electrification risks deepening social divides.

This is one of the reasons why Element Senior Vice President of Strategic Advisory and Analytics, Steve Jastrow believes cost may be a factor in more fleets turning to hybrids. "Hybrids offer a great best of both worlds scenario," he explained. "They get some of the benefit of fuel economy without necessarily redefining how businesses are set up in terms of charging infrastructure."



In the U.S., the grid may require up to \$100 billion in upgrades by 2035 to accommodate EV demand.

⁶³ Outlook for energy demand – Global EV Outlook 2025 – Analysis - IEA

⁶⁴ The Time Is Now for Federal Investment in Grid Modernization | ITIF

⁶⁵ EV Batteries Outlast Expectations: Here's The Proof

⁶⁶ Electric vs Gas Cars: True Cost of Ownership Guide

3. AI and connectivity: Integration, privacy, and cybersecurity

AI and connectivity promise to shift fleets from reactive to predictive, but the path isn't straightforward. The first hurdle is integration. Installing AI-enabled telematics can cost two to three times more than GPS-only systems, and aligning them with legacy platforms often takes months. As Dr. Sheldon Williamson notes, "Most of the cost isn't in buying AI, it's in making it work with what you already have."

Once deployed, new risks emerge. Connected fleets generate massive volumes of sensitive data, from driver behaviour to real-time video feeds, making them prime cyber targets. According to the 2025 Upstream Security Automotive & Smart Mobility Cybersecurity Report, in 2024, 60% of automotive/smart mobility cybersecurity incidents affected thousands to millions of mobility assets, including connected vehicles, EV chargers, apps, and IoT devices.⁶⁷

Another unresolved issue is regulatory lag around AI in safety-critical decision-making. The EU has begun classifying driver-monitoring AI as 'high risk,' requiring audits to ensure it performs reliably and transparently.⁶⁸ In North America, no comparable framework exists, leaving operators uncertain about who is accountable if an algorithm influences a driver's behaviour, or worse, contributes to an accident.

Finally, usability remains a risk. Many fleet teams lack data science skills, leading to under-utilization of AI platforms. "What you want is insight, not just information, and that's still a gap in many AI platforms today," said Sampo Hietanen.

Without intuitive design and interoperability across platforms, ROI will remain elusive.



⁶⁷ Upstream's 2025 Global Automotive Cybersecurity Report

⁶⁸ High-level summary of the AI Act | EU Artificial Intelligence Act

4. Embedded and shared mobility: Fragile business models

Mobility-as-a-Service (MaaS) and its evolution into embedded mobility hold great promise, but the business case is fragile. The pricing of bundled mobility subscriptions or multimodal trips isn't always attractive compared to private car ownership. In some developed markets, cost concerns are a notable barrier to shared mobility adoption. For example, surveys identify high fares or subscription prices as a top issue for would-be users in places like Hong Kong and Singapore.⁶⁹

The challenge is twofold: unit economics and integration. Subscription vehicle models face high customer acquisition costs and struggle to scale profitably outside dense urban markets. Embedding mobility into real estate, retail, or healthcare packages may offer a path forward. Still, integration across multiple modes and platforms is complex, requiring policy alignment and data-sharing agreements.

“The technology behind MaaS is improving, but the bigger challenges remain institutional,” said Dr. Susan Shaheen, a UC Berkeley professor and leading researcher on sustainable transportation and innovative mobility. “For these systems to scale, cities should determine how shared options fit into the urban landscape, ensure providers have access to streets and rights-of-way, and develop business models that support financially sustainable services.”

Finally, public acceptance matters. Drones, for instance, offer efficient last-mile delivery but face concerns around privacy, airspace regulation, and noise. Without careful integration into community planning, the backlash could mirror early AV resistance.



⁶⁹ 8 Shared Mobility Statistics and Facts (2025)

The ripple effect: What change means for fleets, corporate leaders, OEMs, and policy makers

The continuously evolving mobility landscape is not a single storyline. It plays out differently depending on who serves as the central character. All relevant stakeholders will see both opportunities and challenges as automation, alternative energy, AI, and embedded mobility move from theory to reality. The following breakdown explores how these shifts affect each major stakeholder group.

Fleets and operators

1. From operators to data strategists

As electrification, automation, and AI reshape the industry, fleet managers are now expected to act as data strategists, overseeing connected vehicles and digital systems that make real-time decisions about routing, charging, maintenance, and even accident response. The shift to EVs and advanced tech means fleet leaders must focus not only on logistics, but also on servicing, driver behaviour, and leveraging data to improve safety and efficiency.

To thrive in this new reality, operators need fluency in data analytics, AI platforms, and energy management, as well as the ability to interpret predictive maintenance alerts, understand grid demand for EV charging, and ensure cybersecurity.

2. Operational complexity around electrification

Charging logistics can now account for up to 15% of EV's total cost of ownership.⁷⁰ Downtime is often tied not to the vehicles themselves but to charger queues or faults. This requires managers to forecast energy availability and build in redundancy, something very different from planning around fuel stops.

3. The rise of mobility ecosystems

Fleets will no longer be just “owned assets.” Instead, they are shifting toward shared, modular, and service-based models. Operators will increasingly oversee partnerships across real estate, utilities, and mobility providers, blending multiple services into a live operations model.



Charging logistics can now account for up to 15% of EVs' total cost of ownership.

⁷⁰ Total Cost of Ownership of Light Commercial Electrical Vehicles in City Logistics

Corporate leaders

1. Cost and utilization advantages

Automation builds on today's GPS-enabled routing to push fleet efficiency even further. While GPS has long allowed fleets to adjust routes and schedules in real time, the next generation of automation integrates these tools with AI, vehicle-to-infrastructure (V2I) data, and predictive analytics. Instead of simply reacting to congestion or a blocked road, fleets will anticipate demand surges, weather disruptions, and even charging needs before they happen. Vehicles that can operate longer hours without drivers, paired with these predictive capabilities, enable more intensive utilization of assets and open the door to true 24/7 service models. The result isn't just cost savings, but an expanded capacity to deliver services around the clock with fewer idle resources.

These technologies can also reduce fatigue-related risks, support safer operations, and create opportunities for workers to transition into higher-skilled roles such as overseeing automated systems, managing data platforms, or coordinating multi-modal networks. The challenge for leaders will be to balance operational gains with thoughtful workforce planning, ensuring that the benefits of automation extend not just to the bottom line, but also to the people and communities who depend on mobility.

2. Sustainability and disclosure pressure

Electrification can materially reduce Scope 1 emissions and, in certain cases, influence Scope 3⁷¹ categories such as upstream fuel supply. With regulatory frameworks like California's Climate Corporate Data Accountability Act (SB 253), Climate-Related Financial Risk Act (SB 261), and the European Union's Corporate Sustainability Reporting Directive (CSRD), carbon disclosure has become a formal compliance requirement and a key data point for fleet, finance, and sustainability functions.

3. Embedded mobility reshaping business models

Today, most embedded pilots operate in isolation such as one hotel chain offering shuttle credits or one insurer testing mobility vouchers. The long-term opportunity lies in cross-sector interoperability. A retail chain could, for example, subsidize the cost of a customer's scooter ride to the store, much like validating parking today. Or perhaps local governments could enable that same rider to use a single account or transit pass to access buses, trains, and micromobility services with one payment. For corporate leaders and strategists, improved user experience needs to be at the forefront of any business model changes.



71 Scope 1 emissions: Direct emissions from sources a company owns or controls (e.g., fuel burned by company vehicles, emissions from on-site facilities). Scope 3 emissions: Indirect emissions across the value chain (e.g., those from suppliers, business travel, employee commuting, and customer use of products).

OEMs and technology providers

1. Interoperability and liability

For automakers and tech providers, the challenge is building systems that are hardware/software agnostic, while also navigating AI ethics and liability models that are still in flux.

2. Turning wheels into watts

As electric fleets scale, OEMs and mobility providers are extending their role beyond the vehicle itself into energy management. Many are building charging networks, experimenting with vehicle-to-grid integration, and offering bundled “energy-as-a-service” models that help fleets manage costs and sustainability goals. In this shift, the vehicle is no longer just a mode of transport, it becomes an active node in the energy ecosystem.

3. Modular and multipurpose design

The shift to modular fleets will demand vehicles that can serve different purposes across a 24-hour cycle. A vehicle could be a delivery van by day and passenger shuttle by night. Tech providers that design for modularity and seamless integration into broader ecosystems will have an advantage.



Policy makers and government

1. Defining the rules of autonomy

Regulators must align across municipal, provincial, and federal levels to create operational design domains (ODDs), safety standards, and liability frameworks. As Prof. Shauna Brail stressed, “We need multi-scalar governance: local, provincial, and federal alignment on what AVs are allowed to do.”

2. Enabling electrification through policy

Governments play a catalytic role by harmonizing energy and transport policies. They must not only fund public charging but also streamline permitting and grid tie-ins to avoid rollout delays.

3. Managing embedded mobility integration

As mobility is woven into housing, tourism, and healthcare, governments will need to regulate beyond “transportation silos.” This includes zoning rules for shared fleets, taxation of embedded mobility in services, and new safety oversight mechanisms.

Mobility on the edge of transformation

As we look ahead to what the future of mobility may hold, the four pillars occupy very different points on the adoption curve.

Alternative energy



EVs are already widely embraced in several markets and among certain demographics. Costs are falling, charging is getting faster and easier, and social expectations are shifting. With battery prices dropping and EV costs reaching parity with internal combustion engine vehicles, EVs are on a steep adoption curve. By 2035, electrification is poised to dominate new vehicle sales in several major markets, projected to reach 55% for light duty vehicles.⁷²

AI and connectivity



Here, the trajectory is somewhere in between. The enablers are already mainstream—predictive analytics, AI dashcams and digital twins are delivering value today. Yet the true tipping point will come when platforms integrate seamlessly across fleets, infrastructure, and ecosystems. Once that integration arrives, AI will become the invisible operating system of mobility, much like the role of broadband in the internet era.

Autonomous vehicles



Autonomous vehicles are advancing, but their trajectory remains behind that of EVs. Early deployments of robotaxis and long-haul trucking pilots are showing promising results, particularly in controlled environments where the economics, weather conditions, and infrastructure align. Yet widespread adoption faces steep challenges: fragmented regulation across jurisdictions, lack of standardized safety benchmarks, and persistent public hesitation.

For private ownership especially, high costs and unclear liability frameworks mean that mass uptake may take more time. The business case for commercial deployment is strong (reduced labour costs, improved safety, and higher utilization) but until regulatory harmonization and consumer trust catch up, autonomy is likely to scale only in select markets and use cases rather than universally.

Embedded mobility



Mobility-as-a-Feature is at an early adoption stage, with business models still fragile. But its logic is powerful: consumers and businesses increasingly expect mobility to be bundled into other services. If cost, integration, and policy hurdles are addressed, MaaS could become as natural as having Wi-Fi included in an office lease.

The lesson from past adoption cycles is clear: success depends less on the brilliance of technology than on the convergence of cost, infrastructure, trust, and cultural expectations. For fleets, corporate leaders, policymakers, and OEMs, the question is not if but when and how to align strategy to meet these tipping points.

The next decade will determine whether we look back at 2035 as the moment mobility technologies became essential like the cell phone or another generation's Concorde.

⁷² Outlook for electric mobility – Global EV Outlook 2024 – Analysis – IEA

Thank you to all our contributors



Dr. Sven Beiker

Dr. Sven Beiker has spent three decades focused on the future of mobility and automotive safety during a career spanning BMW Group, McKinsey & Company and Stanford University. Today, Sven is the Managing Director of Silicon Valley Mobility, a consulting and advisory firm he founded in 2017, specializing in technical diligence, product roadmaps, and partnership strategies for mobility ventures. He also holds lecturer appointments at the Stanford Business School as well as the University in Borås, Sweden and serves on the advisory board of several startups and associations.



Prof. Shauna Brail

Shauna Brail is a professor at the Institute for Management & Innovation and holds a cross-appointment at the Munk School of Global Affairs and Public Policy, University of Toronto. As an economic geographer and urban planner, Brail's research focuses on the transformation of cities in response to economic, social, cultural and technological change. She is co-editor of the book *Urban Mobility: How the iPhone, Covid and Climate Changed Everything*.



Avninder Buttar

Avninder Buttar is the Senior Vice President and Head of Electrification at Element Fleet Management. He leads Element's global Electrification Strategy and Connected Fleet offering. He supports clients in the transformation of their fleets from ICE vehicles to EVs, as well as plan for the future of mobility. Avninder's background in consulting, engineering and analytics, combined with his dynamic product and strategy expertise, have resulted in a proven track record of leading successful, transformative change.



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Kimberly Clark is Vice President, Connected Mobility at Element Fleet Management. She is a client-driven strategist with more than 20 years of experience in fleet management, financial services, and product innovation. At Element Fleet Management, she leads Connected Solutions product and sales support, drawing on deep expertise in telematics, product management, and B2B consultative sales. Prior to this role, she held leadership positions at leading companies in fleet management and financial services, where she spearheaded multi-million-dollar initiatives across telematics, safety, and technology platforms.



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Kobi Eisenberg is the President of Element Mobility and Autofleet. He leads Element's technology roadmap and product suite to deliver best-in-class digital solutions for its clients. Kobi also oversees Autofleet, Element's subsidiary, driving its mission to provide a leading fleet optimization platform that enhances efficiency and innovation in the mobility sector. He co-founded Autofleet, the leading optimization platform for fleets and mobility operators, that today serves clients in a wide variety of mobility verticals, in over 20 countries and across five continents. Before co-founding Autofleet, Kobi led product tech teams in other fast-growing startups as well as established corporations.



Sampo Hietanen

Sampo Hietanen is a CEO, entrepreneur and globally sought-after thought leader, who invented the groundbreaking concept of MaaS, which is set to revolutionize the 10 trillion-euro transport sector. His background is in civil engineering. Before founding MaaS Global he headed international businesses in the field.



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Professor David Levinson joined the University of Sydney from the University of Minnesota in 2017 as Foundation Professor in Transport Engineering. He conducts research on Accessibility, Transport Economics, Transport Network Evolution, and Transport and Land Use Interaction. He is the Founding Editor of the Journal of Transport and Land Use and of Findings. He has authored several books including: The Transportation Experience, Planning for Place and Plexus, The 30-Minute City, A Political Economy of Access, Elements of Access, and The End of Traffic and the Future of Access.



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Carlos Mir

Carlos Mir is an economist with a master's degree in public finance and a career of almost 15 years in the structuring of transport projects, focused on obtaining public and multilateral resources. Currently, he serves as coordinator of the Drive Electric Campaign for the country, within the Climate Initiative of Mexico (ICM), leading the construction of strategic alliances with governments, the private sector, and civil society. Its work focuses on promoting a national transport electrification strategy that is technically sound, financially viable and politically feasible, helping Mexico to consolidate itself as a key player in the transition to emission-free mobility.



Sean McGee

Sean McGee is the VP of Product Management for Samsara's Platform. Sean joined Samsara 7 years ago and has served in various roles over this time, including helping to build Samsara's Telematics business. Prior to joining Samsara, Sean held positions at various technology companies and was a management consultant at Bain & Company. Sean holds B.S. and M.S. degrees in Electrical Engineering from the Georgia Institute of Technology and an MBA from Harvard Business School.



Evelyne Roy

Evelyne Roy is Element Fleet Management's Chief Data and Analytics Officer, leading the company's enterprise data strategy and advanced analytics agenda. With more than two decades of experience transforming data into actionable intelligence, Evelyne is focused on driving innovation, operational efficiency, and client value through predictive and AI-powered insights. Her leadership is helping shape Element's evolution into a data-driven mobility company, where analytics is core to every decision and customer experience.



Dr. Susan Shaheen

Dr. Susan Shaheen is a Professor of Civil and Environmental Engineering at the University of California, Berkeley and a globally recognized expert in sustainable and future mobility. She co-directs the Transportation Sustainability Research Center and leads the UC ITS Resilient and Innovative Mobility Initiative, with research spanning sustainable transportation, shared mobility, behavioral dynamics, and advanced air mobility. Her leadership in transportation policy and innovation includes service with the Transportation Research Board, California Air Resources Board, and U.S. Department of Transportation.



Dr. Sheldon S. Williamson

Dr. Sheldon S. Williamson is a Professor in the Department of Electrical, Computer and Software Engineering at Ontario Tech University in Oshawa, Ontario, where he also holds the prestigious NSERC Canada Research Chair in Electric Energy Storage Systems for Transportation Electrification. Dr. Williamson's research focuses on advanced power electronics, electric energy storage systems, motor drives, wireless and fast charging technologies, and smart electric vehicle integration within autonomous and renewable energy systems. He is the Director of the Smart Transportation Electrification and Energy Research (STEER) lab and is an IEEE Fellow recognized for his contributions to electric transportation technology.



About Element Fleet Management

Element Fleet Management (TSX: EFN) is the largest publicly traded pure-play automotive fleet manager in the world. As a Purpose-driven company, we provide a full range of sustainable and intelligent mobility solutions to optimize and enhance fleet performance for our clients across North America, Australia, and New Zealand.

Our services address every aspect of our clients' fleet requirements, from vehicle acquisition, maintenance, route optimization, risk management, and remarketing, to advising on decarbonization efforts, integration of electric vehicles and managing the complexity of gradual fleet electrification. Clients benefit from Element's expertise as one of the largest fleet solutions providers in its markets, offering economies of scale and insight used to reduce operating costs and enhance efficiency and performance. At Element, we maximize our clients' fleet so they can focus on growing their business.

To learn more, visit elementfleet.com