



Future of Mobility 2040

Scenario Report

This scenario report is one of two key outcomes of the **Future of Mobility 2040 initiative**. During this 12 week long futures thinking exploration, Futurice together with 8 partners focused on envisioning different scenarios for the future of mobility in 2040 based on extensive trend research with a specific focus on Europe and North America.

We collaborated across different industries and public sectors, such as city governance, finance & insurance, automotive, energy, people flow, individual transport and academia, e.g. Jobrad, Baloise, Agrola, LUT University and the City of Helsinki.

The goal of this undertaking has been to **explore a range of potential futures** and identify key drivers and uncertainties that could shape the future of mobility in these regions and identify opportunities and risks for the organizations involved.

By considering a range of possible futures, we hope to better understand the potential impacts and implications of different choices and strategic actions taken today. The end result of this ambitious mission is a set of detailed, **written scenarios that describe potential states of mobility in 2040**, along with accompanying visualizations and supporting materials.

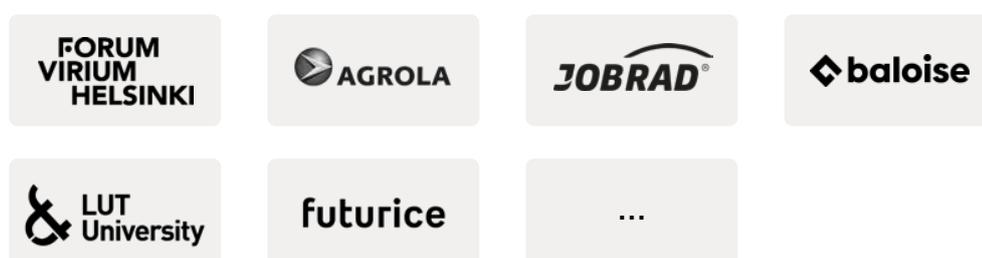


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How will people move around in 2040?

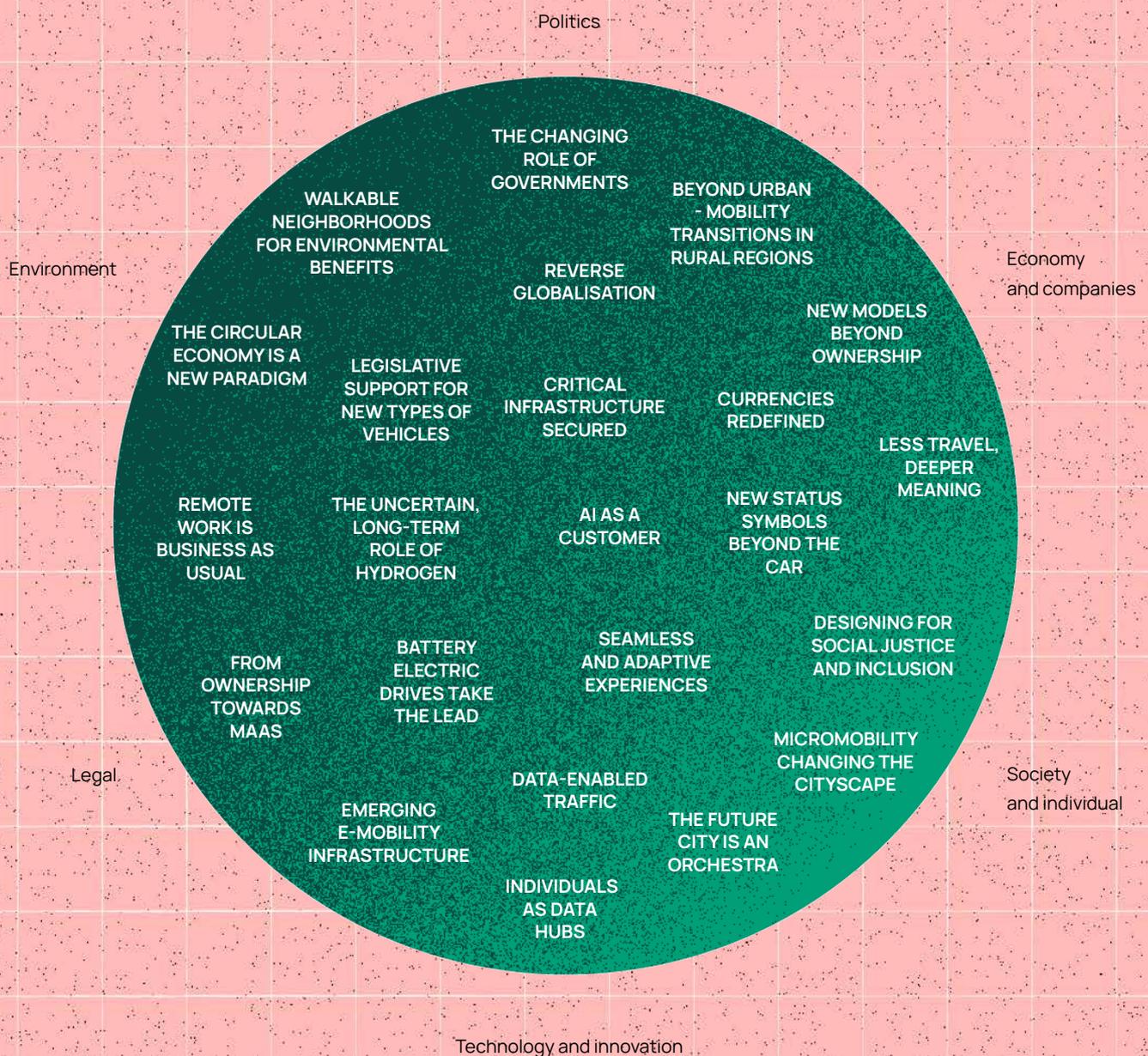
In the following pages, we look at four potential futures and their impact on mobility. We'll also explore a selection of trends relevant to understanding how this world we investigate was formulated. Our perspective in these scenarios focuses on Western Europe and, to a lesser degree, North America.

Of the four scenarios presented, one is a baseline, business-as-usual scenario, and three should be seen as specific archetypes of different potential futures of mobility in 2040.

Future of mobility trends

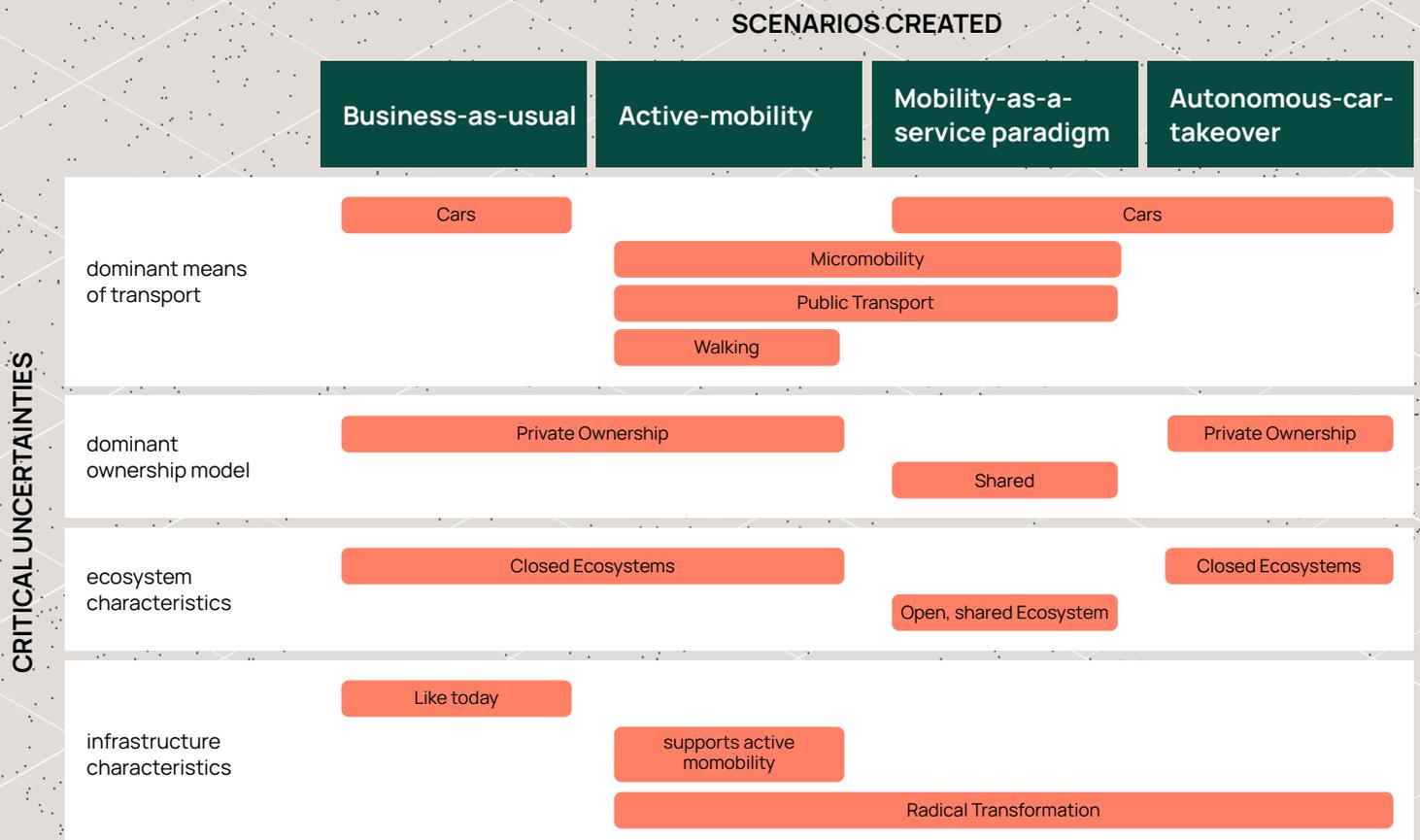
Overview of Trends shaping the future of urban Passenger Mobility in 2040

The following diagram provides an overview of the trends identified during the research phase. They have served as a basis to synthesize the so-called critical uncertainties which were used to create the various scenarios. A detailed overview of all the trends can be found in the separate trend report.



Critical uncertainties as a means to deal with open futures

Four critical uncertainty factors provide the guiding structure for creating the scenarios. These factors both have a significant impact on the future of mobility and are most uncertain. The factors were identified during the trend research and cover the following areas:



Discovered opportunity areas

1. Repurposing parking spaces and mobility-related infrastructure, previously automotive-focused lanes within the city for social or other non-car-centric use cases (e.g., housing or elastic usage).

3. Intermodal commuting thanks to seamlessly synchronized transportation services.

5. Mobility hubs to replace gas stations and become nodes within a decentralized mobility system, focusing on e-charging, changing modes of transportation, exchanging goods, and social interaction.

7. Connecting remote areas with greater frequency.

9. Collecting and providing mobility data for better planning, steering and orchestration.

2. Mobilizing functions previously tied to a specific location, e.g., autonomous vehicles turning cars into “3rd homes” or vaccination buses, etc.

4. Public transportation could become the backbone of future transportation systems in a hubs and spokes setup.

6. Increased quality of life (and air) within inner cities while increasing the accessibility to transportation of previously underserved user groups.

8. Creating services for decentralized cities with dedicated centers.

10. Alternative means of payment through data and exchange of value.

Generation names and descriptions

In these scenarios, we have used a common classification based on social sciences, where people are divided into different social generations. These archetypes serve as the base for our main characters in the scenario stories. Shared social and individual experiences characterize age groups, and we acknowledge that these generational descriptions are highly generalized.

Generation X, the Slackers

People born between 1965 and 1980 were children during a time of shifting social values: increased divorce rates and maternal participation in the workforce. Gen X spent their youth in the 1980s and 1990s when MTV was founded, and children returned from school to empty homes and reduced adult supervision. They are sometimes called the latchkey generation and have been categorized as slackers, cynical and disaffected. They were the first children to have access to personal computers at home and school.

Gen X
born
1965 - 1980

Gen Y

born

1981 - 1996

Generation Y, the Millennials

People born between 1981 and 1996, are described as the first global generation that grew up in the internet age. These so-called digital natives are generally marked by elevated usage of the internet, mobile devices, and social media. In their working life, Millennials have suffered from economic disruption, unemployment, and the impact of major pandemics. Psychologist Jean Twenge calls millennials Generation Me, attributing them with traits like confidence and tolerance but also a sense of entitlement and narcissism. In general, millennials are considered to be influenced by advertising and being sensitive to transparency, and prefer experiences to things.

Generation Z, iGen

People born between 1997 and 2010 are considered more ecological and ethical as consumers than older generations. They have innate digital capabilities and grew up in an age where teenage social media stars started having commercial power. These so-called zoomers are ready to rebuild society from the ground up. They also drive their ideas regarding diversity, inclusivity, and ethical consumption. Generation Z is incredibly collaborative – they manage their interaction preferably privately through snapping, memes, and private conversations. For them, services are tailored to the mobile-first approach, and transparency and sustainable consumption are central to everything. Other significant factors in their lives are the changing narratives of adulthood and gender neutrality in social discourse.

Gen Z

born

1997 - 2010

Gen Alpha

born

2010 - 2025

Generation Alpha

People born around 2010-2025 (no consensus yet exists about the birth years) are a generation born entirely in the 21st century, where children's entertainment has been dominated by electronic technology, social media, and networks, as well as streaming services. However, the degree to which technology is a natural extension of their lives has produced increasing numbers of allergies, obesity and health problems such as nearsightedness arising from screen time. Gen Alpha lived through the Covid-19 pandemic as young children, many spending more time at home away from daycare. By the time children born in 2020 reach adulthood, the world will have the highest proportion of people over 60. They will also experience the results of climate change and live with more extreme weather conditions than preceding generations.

Generation Beta, the Artificials

People born from 2025 onwards. The children of Generation Alpha, also called the Artificials, are born in a world where artificial intelligence is an integral part of life, from entertainment to transport, communication, and beyond. Data-driven products and services have made transhumanism gradually popular as the machine-to-human connection gained popularity. While the artificials redefine human identity by combining the digital and physical in their bodies, the world they know is defined by non-material consumption due to limited resources and climate change.

Gen Beta

born

2025 onwards



visual created with midjourney.com

BASELINE SCENARIO

Business-as-usual

In this scenario, the mobility sector continues to develop at the same pace as today and as a continuation of the present.

Transportation demand has increased in line with population growth (>15 percent), but people travel largely as they do in 2022. Private cars account for much of the traffic volume, while more buses and other vehicles are on the road. As a result, greenhouse gas emissions have led to an increased global temperature of about 2 degrees celsius on average, resulting in more intense weather extremes throughout the seasons. In the summer, peak temperatures within the cities are more than 3 degrees higher than elsewhere, leading to an increasing number of heat deaths and water shortages during certain periods.

The air quality in urban areas in western Europe has deteriorated due to fine particles and emissions. Mortality rates have increased significantly, as have energy costs, decreasing the overall GDP of most states. As the population grows, cities manage their transportation systems much as they did in 2022, just with denser streets and more people on trains and buses. In the summer months, many people are temporarily unable to go out on the street and prefer to stay indoors in any air-conditioned room or vehicle. This leads to an additional increase in energy consumption and overall temperature rise in the city as a result of the rebound effect. To avoid a total collapse of the inner-city traffic system, isolated driving bans for logistics during rush hour and special public transport routes are implemented. There is little improvement in technology, pricing, or policy which leads to autonomous vehicles level 4 (AV) being only applied to buses for public transport in the countryside. Seamless mobility services are still a small, niche phenomenon, limited to specific areas and service providers since the integration into holistic data platforms failed.

Shared mobility concepts haven't made it into the mass market beyond the realm of micromobility services since only a few business models have proven viable for vehicle OEMs. Most companies that depend on the global supply of goods or materials desperately try to create more national and resilient systems. Existing global supply chains are regularly disrupted by the effects of climate change on specific regions, failing supplies of special materials or components and, therefore, higher costs and prices for consumers.

Story

Though discussion surrounding the need for new mobility paradigms has been lively since the 2020s, no major changes have taken place in the intervening years. As the population grew, more people continued to move into the city. The increased volumes of passengers and goods pushed the urban transport systems to their limits.

Shared mobility solutions failed to replace psychological ownership and automotive OEMs didn't transform their business models. They still generate a significant share of their income from selling cars to people.

Mehmet Trauter, a 31-year-old cook, lives on the outskirts of a big city. He works as a chef at a high-end vegan restaurant in the city center - a job that is fulfilling but also quite demanding. Mehmet uses public transport to get to work. It's unreliable, often delayed or canceled completely. He usually uses an app to rent an e-scooter to get to the closest train station in the morning. He takes an earlier train at the station just to be on the safe side. He is crowded in with other passengers in the overloaded compartments, especially during the morning rush hour.

From time to time, he also has to buy a few goods from wholesalers to replenish the stock because not everything can be delivered. In these cases, he rents a small van. There's no other way. While this is easy to do via an app, the journey is unpleasant and he's often stuck in traffic in the inner city. The car's navigation system suggests alternative routes to bypass traffic jams, but it won't save much time since the routes lead him out of the city and back again on the other side in lengthy detours. In any case, delivering goods in the early morning is forbidden since the streets' limited capacity is restricted and primarily reserved for passenger travel. Still, there's no way the city can track this. He has also tried renting a cargo bike for a while but cannot maneuver the large bike between all the other vehicles, especially on streets without bike lanes.

He usually tries to buy goods from local vendors in his neighborhood, but the smaller shops regularly run out of certain products during the summer months when global supply chains are cut off due to hurricanes or other extreme weather conditions. So Mehmet has long focused on cooking using domestic ingredients, but even these seem to get scarce within some periods. Then he's forced to buy the goods from the big, corporate vendors in the inner city, which costs a lot more, and he has to forward these costs to the customers in his restaurant. It's no surprise; people are used to seeing prices fluctuate throughout the year – especially for food and energy.



visual created with midjourney.com

Scenario Prototype

As the city is forced to take drastic measures to manage the flow of traffic through the city, private cars are not allowed to drive through certain areas during rush hour. The prototype shows a message on the head-up display of a future car informing the driver that he is not allowed to turn right.

Sometimes when he's not working, he visits his grandmother, who lives nearby, just a few bus stops away. Mehmet usually rents a scooter or bike for the journey to her nursing home, but during winter or if it rains, he takes the bus. He doesn't need to buy a specific ticket for each ride. His user account on the bus company's app on his smartphone is debited based on when he gets on and off the bus. It's a new feature implemented by government officials this year, of which they are proud. Tourists, who used to have a hard time figuring out the correct ticket to buy, were the primary target user group.

Mehmet worries about his grandmother, especially during the summer when it can get as warm as 37 degrees outside. The nurses seem to have a hard time trying to explain to the elderly that they must not leave the house anymore as their bodies would not be able to cope with the heat. It's obviously tough for the elderly to realize how drastically climate conditions have changed over the last 20 years.

Trends related to this scenario

Data-enabled traffic

In the future, data and algorithm-based processes combined with 5G connections can improve urban planning and traffic coordination.

Reversed globalization

In the wake of global pandemics, resource scarcities and new wars, key supply chains are partially collapsing and being transformed.

BEV taking the lead

Battery electric vehicles (BEVs) will most likely be the standard in new sales of non-combustion engine vehicles.



visual created with midjourney.com

SCENARIO 1

Active-mobility

In this scenario, the mobility sector is adjusting to cities redesigning their infrastructure.

The reimagined cities are a collection of connected villages. Each has a hub for multiple modes of transportation – from public transport to shared micro- & mini-mobility providers that move people between them.

The amount of cars was massively reduced and the cityscape is dominated by a variety of micro- & mini- mobility vehicles , primarily different types of bikes and e-bikes.

A new category has also been introduced: Mini-mobility includes a variety of three- to four-wheeled vehicles that can carry up to four people. These hybrid vehicles between a bicycle and a car have been around for a while, but have now become an integral part of the urban landscape.

People travel actively around e.g. by cycling, including between the suburbs and city centers. Walking & cycling has become the mainstream way to move around. Half of the trips under 2 km are made by bike. Matters related to e.g. e-bike infrastructure and investments are agreed on at the EU level. Local, regional, and national cycle route networks were built, including new bridges, underpasses and bike stations.

The repurposed city centers have become areas for walkable and micromobility experiences. People are willing to use such modes of mobility even for longer distances in the park-like environment because it feels good. The experience is designed so that desirable services are always nearby. In the context of long-distance travel, active-mobility options are also rewarded with discounts.

The village-style centers attract different types of citizens depending on their location, services, brand and standards of living: some focus on showrooming luxury brands and offer premium shopping services; others are built around the idea of attracting people who share the same lifestyle such as art and culture. The next trendy neighborhood might be established based on non-commercial values such as being cozy, containing the right “tribe”, or on very specific features such as embracing silence.

The shift in the mindset and values arises from the post-pandemic times. Lives were being unsettled in many ways, and feelings of insecurity rose in countries with both high and low human development indexes. Based on research by the United Nations Development Programme (UNDP), a new “uncertainty complex” never seen before in human history emerged. As a result of the planetary pressure regarding climate change and biodiversity loss, to name a few, the social fabric began to change. As the insecurity among people grew, they were more willing to change

their preferences to protect the world – something the highly ecologically conscious Generation Z was already predisposed towards anyway.

The path towards active-mobility -centric cities was paved in the body politic and among the citizens: a combination of strong political will and intense civic pressure accelerated the change. Different programs to support sustainable transportation were created both on a national level and within cities.

Cycling was recognized as one of the most promising transport methods, spurring cities to create strategies for encouraging half the population to switch from using cars to bicycles. Cities have programs to increase active-mobility activities among citizens and use them to reduce the carbon emissions of mobility. As a result of the programs, new bike lanes are being built, and former car lanes, not used railways, and tracks are transformed into biking lanes and pedestrian zones forming a safe mobility infrastructure.

At the same time, new real estate development projects strongly emphasize the bike as the main means of transport. The city sets goals to guide its inhabitants to their destinations without getting lost and without interruptions by cars. An extreme example is, for example, transforming motorways with several driving lanes into bicycle lanes with minimal space for cars. Polarization and heated discussions are overruled by the urgent need to stop climate change and drive a change in common mobility behaviors.

Active-mobility cities might bring people back to the centers, as they offer an opportunity to build enjoyable new services and experiences around the city within walking distance and repurpose the meaning of a center as a “place”.

Emphasis is on local trade and services. With limited transportation volume, local production of goods and shorter delivery times are favored. And when the focus is on smart and working neighborhoods with all services produced nearby, local communities become powerful entities. In order for this scenario

to happen, there needs to be a strong push to change the city's infrastructure and investments.

When Generation Z entered the labor market, their values were highly adapted to all consumerism. Cars were no longer seen as a sign of luxury, nor was owning things as meaningful as for their parents. Instead, a concern for the environment had a significant impact on life choices. Their children, the young adults, could no longer afford cars – especially not the expensive BEVs. Ecological and well-designed e-bikes, subscribed, leased, or bought, became an excellent extension of personality for young people in urban cities.

Story

If we look beyond the cities that were originally walkable – designed to match natural landscapes in relatively small areas centuries ago – the current development towards increased walkability started in the mid-2010s. It was a part of the national, regional and city programs aimed at increasing the number of trips conducted by cycling and walking. This development had many drivers. Climate goals were set high due to an urgency to mitigate climate change and risks. However, the ambitious EU-level, national and city-specific goals demanded a drastic change in citizen behavior. The high-level plan was executed differently depending on the city and its infrastructure. Due to the rising demand for green transportation, MaaS did not break into the mainstream; instead, various types of micro- and mini- mobility vehicles, mostly privately owned rather than shared, took a dominant position in urban areas.

Our character David, 78, enjoys walking and cycling. He is retired but likes to stay active on a daily basis. David lives in a village-like area only 15 minutes from the city center. He does not have to leave

his neighborhood that often, since all the necessary shops and services are located nearby. The neighborhood also has a lot of nature, a small beach, and little parks.



Scenario Prototype

In this scenario, advanced underground mobility hubs focused on any type of privately owned bicycle or X-Cycle are offering different services for the owners. The prototype shows the inside of such a hub with a screen giving an overview of the services across four different floors.

David has friends and relatives who live out in the suburban areas. Luckily, the connected public and private transportation services run via hubs between the city center and the suburban connecting areas very smoothly. His friends can travel to meet him, and when they do, he tends to make appointments close to the hubs so that his friends don't need to walk much, other than hop on automated buses or trams. However he uses his e-bike for approx 80% of his ways and keeps it usually in the community bike hub which is 5 min walking from his flat. As it is financially quite expensive he decided to purchase it via a lease plan, which includes the regular maintenance in the community bike hub.

David has lived in the neighborhood most of his late adult life and retirement. He leaves home at noon, heads to a terrace to have a morning coffee and chat with a couple of friends who usually have the same routine. After a while, he heads to an art center that offers different classes for various types of students. Education is cheap since the center receives tax money to support its work. To meet his friend Mike today he navigates to the relatively new biking lane built on top of some old railway tracks. He likes slow moments, and painting is quite meditative.

The active lifestyle helps him to be still in good shape, but sometimes he does wonder how it will be when walking becomes harder. Then again, almost all services are available in digital format, too, so he could basically just stay home and get everything delivered. In emergencies, such as sickness, etc., vehicles are allowed to drive and pick up people. David has relatives further away on the other side of the city. He usually takes fast, smooth, and convenient public transportation when he visits them.

Trends related to this scenario

Designing for social justice and inclusion

Cities are designed to serve different travel patterns with accessibility in mind.

New status symbols beyond the car

For years, owning a car was considered a sign of wealth, but immaterial assets will replace cars as status symbols.

Micromobility changing the cityscape

Cities adapt to the needs of new modes of transportation via wider sidewalks and cycle paths while removing street parking spaces for individual vehicles.

Legislative support for new vehicle types

Government agencies play a critical role in helping regulate the mobility transition around data privacy, safeguarding both the public space and autonomous vehicles.



visual created with midjourney.com

SCENARIO 2

Mobility-as-a-service paradigm

In this scenario, private and public organizations collaborate to build an open ecosystem and seamless public transport overrides private car ownership and micromobility.

New vehicles are popular among citizens. In a Mobility-as-a-Service and Automated Mobility-as-a-Service model, transportation modes and their combinations are highly personalized. Mobility packages might include weekend rental cars, weekday bus tickets, or vertical take off and landing (VTOL) flights for the wealthy. Packaging is based on different parameters and preferences, such as lifestyle or health and wellness choices. Personalization goes beyond pricing models. In addition to vehicles designed for moving people around, urban areas are populated with purpose-built automated vehicles,

which provide services on wheels for the people. People can hop in and out and consume services while traveling from location to location, like back in the old days when there were library cars, stores on wheels and restaurant cars on trains.

The MaaS paradigm has been adopted in mid-size and big cities with populations large enough to make services commercially profitable. The success of the services also depends on local networks providing real-time access to purchasing subscriptions and providing ticketing systems. In a highly connected world, we might witness new collaborations and partnerships in areas that would benefit from shared ecosystems based on, for example, travelers' needs. When our city-dwellers are on their outdoor adventures, non-terrestrial networks (e.g., satellites) come into play for all services outside the city centers. Since the emphasis is on shared mobility, private cars pay the city a fee to access the infrastructure.

Story

Mobility start-ups, innovation enthusiasts and early adopters were the primary driving forces behind the events that enabled this scenario. At some point, one forerunner had an idea to connect public and private transportation and came up with a service combining all parts of travel and commuting under one roof. The idea gained popularity among ecosystem players, and together, they pushed out the first test version of a ubiquitous MaaS service and ecosystem. The Netflix of transportation gained popularity and acted as a forerunner for similar collaborations in other bigger cities that wanted to develop their transportation systems toward seamless customer experiences.

Active lobbying from start-up founders and the push from the ecosystem resulted in the first law enabling mobility-as-a-service and its requisite payments. It opened the doors to expand the ecosystem. Later, it became a standard in several cities. The first generation of MaaS travelers were curious testers and an excellent source of validation.

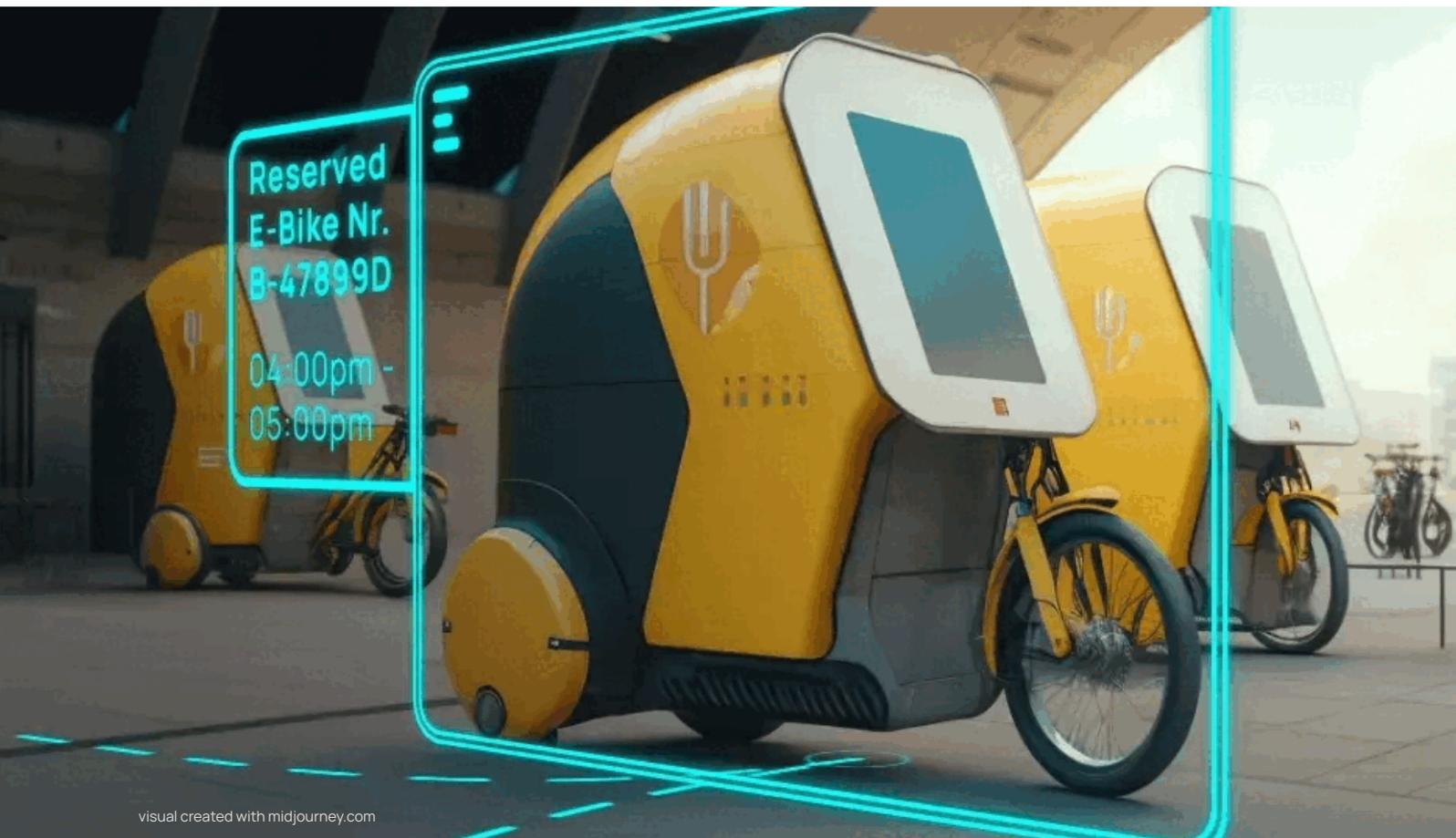
After the experimental phase, it took a while before the service found a wider audience. When Generation Z became a majority in the workforce, their openness towards the sharing economy helped MaaS take off. When it became clear that surviving climate change required a sharp reduction in the number of private cars, MaaS became mainstream. At some point, new ecosystem partners from outside the traditional transportation ecosystem joined, too: cafes and restaurants that used to operate at petrol and public transport stations saw significant opportunities in establishing moving cafes. After all, it was not that far from the initial idea of a restaurant car on a train. The new order-to-go services became a huge hit. Commuters jumped into shared rides buying their americano coffees on the go, and soon these concepts were developed further by operators from a variety of fields ranging from retail to experiences.

Robyn is a nurse who works for a private healthcare company in the city center. Aion is her 11-year-old daughter. Robyn has been a single parent for the last six years. They commute to work, hobbies, and leisure activities all over the city and are active MaaS users.

Although the new services on wheels are popular, nursing still requires people to visit hospitals. The so-called ambulance vehicle remains expensive to move around, and sharing rides with other sick people did not gain traction when tested in the city labs.

Robyn rises in the morning, wakes Aion, and prepares breakfast for both. Preparing anything is optional, as the home AI orders the needed groceries when it sees the fridge or closet getting low on staple items. Robyn values slow cooking and micro-moments for the sake of doing things she feels matter. She drinks her usual morning smoothie and chitchats with Aion about her upcoming day before they leave home.

When Robyn goes to work, she hops into the restaurant vehicle to enjoy some coffee while sharing a ride to the clinic. For half of the day, she meets patients at the clinic. For the other half, she does remote consulting, partially from home later in the evening. Most basic illnesses can be diagnosed and treated remotely, but due to the variety of skill levels necessary to operate digital technologies, it became clear that not all patients can use digital services, and many still value contact with a human nurse.



visual created with midjourney.com

Scenario Prototype

The Prototype for this scenario shows a mobility service which guides the user through the city via a visual augmented reality interface across different rentable modes of transport. The image shows the perspective of the user getting to a futuristic cargo bike station where the system already has reserved one electric cargo-bike. Through lines on the floor the user is being navigated to the next destination where he again switches to another mode of transport.

Before heading home, Robyn places a new grocery order, usually delivered to her place by AV. Today, however, the grocery order is brought to the hair salon car, which stops by her place in the evening for a haircut appointment for Robyn and Aion. Some services are bundled and packaged to match the different needs

of health-conscious consumers. Robyn still remembers when people argued about AI as a driver and if cars are allowed to drive without human intervention, but the massive advertisement campaigns that touted AI as a safe driver compared to a human slowly influenced people to change their minds and accept the service.

Aion has a module school day coming up, which means first spending some time in the science lab at the local science center and then commuting via the city center for afternoon classes in creative thinking at the art museum. Finally, after school, they commute to gymnastics class held together at the local sports center, featuring built-in metaverse add-ons via 6G networks. Aion likes using the latest model e-skateboards, a hybrid offspring of the e-scooters and old skateboards and hoverboards. Aion was born in the age of AI. For her, having assistants in all areas of life is natural. It sounds odd when her mom sometimes talks about the times of transition when people were still mostly driving themselves and AI was mostly hidden algorithms operating in the background of services. For Aion, avatars and artificial friends are a normal part of the communication between humans and machines.

Trends related to this scenario

Individuals as data hubs

The idea of digital sovereignty has become a guiding principle across Europe. Privacy threats have grown exponentially along with a value of personal data.

New models beyond ownership

Customers are accustomed to and prefer convenient, flexible, cost-effective services that are accessible online.

From ownership to MaaS

The transport system is shifting from private vehicle ownership to usage models built around sharing and mobility-as-a-service (MaaS).

The future city is an orchestra

Electrified mobility is one of the biggest changes we face in the coming years. It will also make sound an integral part of all design.

Seamless and adaptive experiences

Data collection and platform integrations enable a seamless synchronization of different transport modes.

Data-enabled traffic

Combining processes based on data and algorithms with 5G and 6G connections can improve urban planning and traffic coordination.

AI as a customer

Passengers can get comfortable and enjoy the trip while artificial intelligence (AI) takes care of driving and paying for any necessary services and fees.

The changing role of government

Cities have to become proactive stakeholders in open ecosystems that comprise both private and public sector actors.

Currencies redefined

Money is replaced by and supplemented with new types of currencies, such as attention, trust or digital currencies.



visual created with midjourney.com

SCENARIO 3

Autonomous-car-takeover

This scenario describes a car maker's dream environment where an advanced charging infrastructure has led to automotive companies governing the mobility sector and the software market for automotive OEMs has gone through the roof in Europe.

Advanced AI and related legislative regulations have enabled the nascent development of a market for private autonomous vehicles. At the same time, The European Hydrogen Backbone initiative, a hydrogen pipeline system, was established, and multiple gigafactories for batteries were built in several EU countries. This, combined with OEMs investing in the expansion of charging station networks in both public and private spaces, has enabled alternative propulsion technologies (e.g., BEVs and hydrogen fuel cell vehicles)

to take the lead. ICE vehicles were no longer manufactured after 2030, but they still make up a significant part of the overall mobility stock. The application of AI, not just within the car but the whole production and manufacturing process, has enabled automotive OEMs to reduce costs and increase profits, enabling them to maintain their powerful position within transportation systems.

Story

The onboard computer boots with a light buzz. It's Monday, Oct. 4, 2040, at 7:23 a.m., and Nina – user ID 28947385 – will soon want to drive to work. A check of the battery level results in 100%. The home station also appears fully charged. The system started charging the vehicle automatically at 3 am when it detected a relatively low electricity price.

Omega version 4.7 already has the seats preheated before Nina arrives, as a relatively low outside temperature of 11 degrees was reported. It can already sense Nina coming down the stairs of the apartment building into the garage via the signal from her smartphone. Because Omega sees another appointment on Nina's calendar this morning titled "Take Titus to kindergarten," the onboard AI calculates the fastest route there before navigating to Nina's office.

Even before the garage door opens, Omega can locate another, smaller human through the thin wall next to Nina's body via the radar and opens its two doors, which slowly slide to the side. "Drive us to school," Nina says. Thanks to the calendar entry, Omega understands what she means. On the way, Nina checks her first appointments this morning at work and makes a few notes to prepare, while Titus sits in the back seat and draws. Omega calmly and gently navigates the two through the hustle and bustle of the city.

AUTONOMOUS UNPARK

I won't need my autonomous car from:

Pick me up here:

10:00am — 8:00pm



Your AV makes money while not used!



TAXI MODE



PACKAGING SUPPLIER MODE



ANIMAL TRANSPORT MODE



ADVERTISING MODE



AUTO - ENERGY TRADE

Revenue Forecast 0,00€

Green Credits Forecast 00

visual created with midjourney.com

Scenario Prototype

"Autonomous UNPARK" is a fictional service application for autonomous cars. It offers potential new revenue streams for the car owner by allowing the car to perform various services when not in use. The car can transport people or animals, deliver goods, display advertising or provide electrical energy. Before leaving the car, the owner can choose which services the car will perform in his absence. Based on the duration and selected modes, the application can provide a rough revenue forecast. In addition, green credits (bonus tokens for discounts) are offered according to the environmental impact of the owner's choice.

Outside noise penetrates the interior in a very muffled way. In front of the school, there are many vehicles of parents who like to bring their children personally. Omega calls up a database of all available parking spaces in the area and scans them for availability. After it has found and saved one, the sliding doors open and Nina bids Titus farewell. An older man in a manual Audi, who had seen but not gotten the parking spot, looks glumly at Nina and her vehicle. Omega's automatic booking had been faster than the gentleman's manual parking abilities. Nina gestures to him that she'll be gone in a minute and checks the predicted drive time to the office. When this turns out to be quite long, due to a traffic jam on several main roads, she chooses the alternative option "subway" and books a ticket. It is not far from the nearby station. Before she gets on,

she tells Omega to make his way to the office and park in the designated employee parking space. The subway is cramped and stuffy. The windows are fogged up and everyone is standing close together.

BEV cars have become the central mode of transportation and are still mostly owned privately and not shared. The introduction of autonomous vehicles for the mass market was a major game changer. It led to the emergence of entirely new service ecosystems around vehicles since the AVs can collect and share much more data than their predecessors in 2020, while customers can perform much more activities while driving than they do today.

Even public infrastructure has become partially privatized as automotive OEMs have started to collectively invest in its expansion. The infrastructure has been equipped with smart technology, so communication between individual vehicles (V2V) or between vehicles and different types of infrastructures and other assets (V2X) is widespread. As a result, many payments happen automatically and silently in the background since it's possible to track wherever the car is going and at what speed – though only the newest models can use this asset. It has led to significant differences in how people of different social statuses move through the cities. Autonomous vehicles in 2040 are still considered a luxury for the wealthy, and people with less income have to rely on stagnating public transport. While the first phase of connected vehicles was accompanied by some hiccups – like lack of connection coverage, compatibility, and hacking attacks – the industry overcame these issues. The EU's car2car consortium played a major role setting data and communication protocols standards.

Trends related to this scenario

Emerging e-mobility infrastructure

A rapid expansion of charging infrastructure is needed to enable the switch from fossil fuels cars to electrically powered cars.

Critical infrastructure security

Smart, connected infrastructure requires increased security and protecting critical systems from malicious actors.

Currencies redefined

Money is replaced by and supplemented with new types of currencies, such as attention, trust or digital currencies.

Reversed globalization

In the wake of global pandemics, resource scarcities and new wars, key supply chains are partially collapsing and being transformed.

AI as a customer

Passengers can get comfortable and enjoy the trip while artificial intelligence (AI) takes care of driving and paying for any necessary services and fees.

The future city is an orchestra

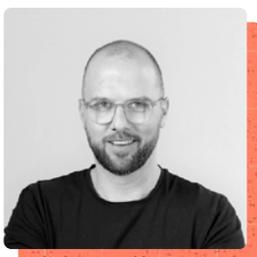
Electrified mobility is one of the biggest changes we face in the coming years. It will also make sound an integral part of all design.

Data-enabled traffic

Combining processes based on data and algorithms with 5G and 6G connections can improve urban planning and traffic coordination.

We look forward to partnering up with you!

If you want to know more about the Future of Mobility 2040 project or would like to collaborate with us on any other subject, always feel free to reach out to us.



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The Future of Mobility 2040

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