FORESIGHT
SCENARIOS

100

INTERCITY AND REGIONAL MOBILITY ACROSS EUROPE BY 2040

Embrace future intercity and regional mobility.
Anticipate its impact on different modes of transport.

500km

Powered by

ALSTOM MICHELIN STELLANTIS TotalEnergies MOVIN'ON

- **BRUNO BOURDON**
  Foresight Director, MOVIN'ON
  bruno.bourdon_ext@michelin.com

- **JULIANA BUELVAS CEBALLOS**
  Strategy Foresight Innovation Leader, ALSTOM
  juliana.buelvas@alstomgroup.com

- **ROBERT THAI**
  Innovation Manager, ALSTOM
  robert.thai@alstomgroup.com

- **ANGÉLIQUE BRUNON**
  Energy Market Analyst Manager, TotalEnergies
  angelique.brunon@totalenergies.com

- **GÉRALDINE PINOL**
  Head of Open Innovation and Business Acceleration, TotalEnergies
  geraldine.pinol@totalenergies.com

- **PIERRE-EDOUARD SOREL**
  Vertical Director People Mobility, MOVIN'ON

- **ANNE BARDOT**
  Trends and Foresight Director, STELLANTIS
  anne.bardot@stellantis.com

- **XIN YE**
  Foresight Manager, MICHELIN
  xin.ye@michelin.com

We extend our sincere thanks to our partners and experts for their valuable insights, which enabled us to imagine and refine the different scenarios.

- **JÉRÔME POYET**
  Railway Engineer - ADEME

- **RÉGIS CADOT**
  Strategic Innovation & Foresight - ALSTOM

- **PHILIPPE VEYRUNES**
  Transport Infrastructure solutions manager - ALSTOM

- **ANDREA PAPU CARRONE**
  Transport Analyst & Modeller - ITF

- **JEAN-MARC BOUCHERET**
  Public Transport Sustainable Mobility Manager - IVECO BUS

- **SANDRINE HOLLER**
  Program Director - SAFRAN

- **LEONARD NOEL DU PAYRAT**
  Marketing Strategy Leader – SAFRAN

- **JACQUES PORTALIER**
  Automotive Industry Project Manager - THE SHIFT PROJECT

- **CHRISTOPHE PICCO**
  Project Director - THALES AVIONICS

- **AURÉLIEN BIGO**
  Researcher on the Energy Transition in Transport

- **ANNE DE BORTOLI**
  Adjunct Professor at UQAM (University of Quebec at Montreal); Researcher at POLYTECHNIQUE MONTREAL

- **JEAN-PIERRE ORFEUIL**
  Emeritus Professor – Paris School of Urban Planning, Gustave Eiffel University

CONTRASTED, QUANTIFIED AND QUALIFIED SCENARIOS

In 2024, as part of a Movin'On Community of Interest, led by Alstom, Michelin, Stellantis, and TotalEnergies, 4 contrasted foresight scenarios, both qualified and quantified, were imagined to explore in a cross-sectorial and specific way, the possible futures of passenger mobility over short and long-distance (100 to 500km) in Western Europe. These scenarios aim to anticipate the large-scale transformations that will shape this strategic segment between now and 2040.

SCOPE OF WORK

Geographical area

WESTERN EUROPE

Travel distance

Types of mobility

WHAT FOLLOWS IS BOTH A FRAMEWORK FOR THINKING TOGETHER AND A TOOL FOR ACTING TOGETHER—TO MEET THE CHALLENGES OF TOMORROW'S MOBILITY WITH COHERENCE, IMAGINATION, AND PURPOSE.

Mobility is undergoing profound transformation—driven by climate imperatives, technological advances, changing user expectations and shifting regulatory frameworks. In such a complex and uncertain context, anticipating long-term change is not a luxury; it's a necessity. And it cannot be done in isolation.

Movin'On, the global ecosystem for sustainable mobility, brings together a wide range of actors—businesses, public institutions, cities, academics and NGOs—committed to building more sustainable, inclusive and resilient mobility systems. Within Movin'On, various Communities of Interest serve as collaborative platforms where members engage in concrete, forward-looking work.

The foresight initiative presented in this document stems from one such community, focused on intercity and regional mobility. It brings together stakeholders from Alstom, Michelin, Stellantis, TotalEnergies and others, united by the conviction that only an ecosystem-based approach can provide the strategic clarity needed to act effectively.

Through expert interviews, collaborative workshops and cross-sector dialogue, the group developed a set of plausible, contrasting future scenarios—not to predict the future, but to help prepare for it. These scenarios are designed to support public and private decision-makers in navigating uncertainty, identifying risks and opportunities, and aligning short-term actions with long-term ambitions.

What follows is both a framework for thinking together and a tool for acting together—to meet the challenges of tomorrow's mobility with coherence, imagination, and purpose.

BRUNO BOURDON
MOVIN'ON

The transformation of the mobility sector is no longer a distant possibility, it is a present and accelerating reality. Markets are evolving, new behaviours are emerging, and the relationship between passengers and their modes of transport is being redefined.

This 2040 scenario exercise is designed to inspire all mobility stakeholders. It underscores multimodality as a cornerstone of a resilient and efficient transport system, while also addressing the challenges and opportunities that lie ahead for innovation. Strategically, these scenarios serve as powerful tools to stress-test corporate strategies and assess the resilience of product and service portfolios.

Ultimately, they act as a mirror, reflecting the consequences of our choices and encouraging us, as citizens and users of Europe's mobility networks, to shape a future that balances the needs of people and the planet.

JULIANA BUELVAS CEBALLOS
ALSTOM

THESE SCENARIOS ACT AS A MIRROR, REFLECTING THE CONSEQUENCES OF OUR CHOICES AND ENCOURAGING US TO SHAPE A FUTURE THAT BALANCES THE NEEDS OF PEOPLE AND THE PLANET.

100km

CURRENT LANDSCAPE OF 100–500 KM MOBILITY

It is characterised by an overwhelming dominance of cars (72% modal share), but with strong disparities depending on the availability of alternatives. This car use is for leisure mobility, in a very broad sense of the term: mobility for personal reasons (visiting relatives, making purchases, going to medical appointments, etc.). At the same time it is distinct from:

- Short-distance mobility: daily, professional and largely constrained mobility.

- Long-distance mobility: holiday or opportunity-driven mobility, which has surged with the arrival of low-cost air travel, offering large segments of the population the opportunity to explore other countries.

Between the two, 100–500 km mobility is what we could call an arbitrated mobility, whose cost has risen and is increasingly dominated by the wealthiest. As a result, we can now see that people make trade-offs either by limiting their trips or by choosing the most economical options (often the car rather than the train).

600km

FORESIGHT SCENARIOS SUMMARY

To project the structural evolution of mobility volumes, we use a method adopted by the General Secretariat for Ecological Planning, based on two main drivers: demographic growth (1/3) and GDP growth (2/3). This distribution reflects observed dynamics, where population growth mechanically increases travel demand, while economic activity has a stronger influence on transport needs.
The approach aligns with Kaya-type identities, which decompose major physical consumption drivers based on sociodemographic variables.
On this basis, the evolution of modal shares was assessed by factoring in the expected impact of 20 distinct criteria (grouped into five categories: regulatory context, accessibility, service offer, expectations and needs, and external factors) on each mode under consideration.

1 THE SHARED MOBILITY REVOLUTION

In a fragmented world, Europe rediscovers the strength of collective levers to preserve cohesion and adapt to its declining global role.

		2024	HOW WILL MOBILITY EVOLVE IN 2040?
Demographic growth (CAGR 24-40)		0.04%	-0.05%
Economic growth (CAGR 24-40)		0.8%	0.8%
Global volume of mobility		100	8.2%
Mobility system			A low-cost revolution reshapes 100-500 km mobility, with carpooling, car-sharing and coach modes becoming the new norm.
Modal shares	Car	72%	74% ↗ +2
	Train	19%	20% ↗ +1
	Coach	2%	4% ↗ +2
	Air	5%	1% ↘ -4
	Others	2%	1% ↘ -1
Volume of mobility per revenue quartile		Q1 : 12% Q2 : 18% Q3 : 27% Q4 : 43%	Q1 ↗ Q2 ↗↗ Q3 ↗ Q4 =

2 THE GREAT DIVIDE

Faced with systemic crisis, European societies retreat inward, abandoning decarbonation goals and collective ambitions, as each nation prioritizes short-term survival and national self-interest.

-0.5%

-1%

3 THE NEW GREEN

Triggered by climate disasters and rising pollution, Europe enters an era of accelerated innovation and collective behavioral change.

-0.1%

-0.4%

4 ON THE ROAD AGAIN

Amid economic uncertainty, Europe enters a phase of pragmatic reinvention, propelled by flexible alliances, local experiments and intense innovation.

0.1%

1.3%

HOW WILL MOBILITY EVOLVE IN 2040?

-11.7%

Caught between a failed electric transition and soaring fossil fuel prices, mobility becomes prohibitively expensive, deepening the divide between a privileged few and a majority forced to rely on degraded, makeshift solutions.

63%	↘ -9
25%	↗ +6
4%	↗ +2
5%	=
3%	↗ +1

Q1 ↘ | Q2 ↘↘ | Q3 ↘ | Q4 ↗↗

-4,4%

A personal carbon quota system financially incentivizes citizens to shift towards shared, low-emission mobility, making modal change both visible and socially accepted.

70%	↘ -2
22%	↗ +3
5%	↗ +3
0%	↘ -5
3%	↗ +1

Q1 = | Q2 ↘ | Q3 ↘ | Q4 =

14.8%

Against all odds, the car enters a new golden age, reinventing itself faster than rail or air, while MaaS services enhance its dominance through tailored, door-to-door and value-added solutions.

75%	↗ +3
16%	↘ -3
4%	↗ +2
3%	↘ -2
2%	=

Q1 = | Q2 ↗ | Q3 ↗ | Q4 ↗

SCENARIO 1

THE SHARED MOBILITY REVOLUTION

THE SHARED MOBILITY JOURNEY

Evolution between 2024 and 2040:

Mobility Growth
+8.2% in Global Volume

Demographic growth (CAGR)
-0.05%

Economic growth (CAGR)
+0.8%

In a fragmented world, Europe rediscovers the strength of collective levers to preserve cohesion and adapt to its declining global role. A low-cost revolution reshapes 100-500 km mobility, with carpooling, car-sharing and coach modes becoming the new norm.

Context

Political
Europe is strengthening itself on collective levers, in a context of global systemic crises and decline of multilateralism.

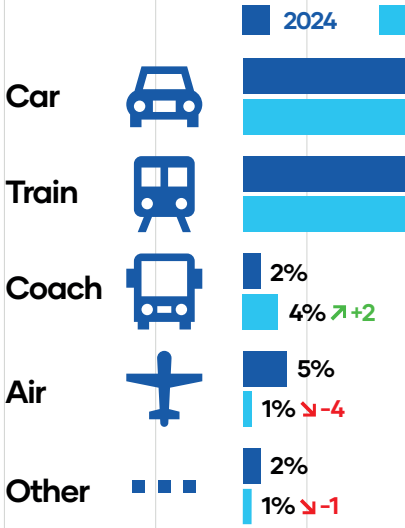
Economic
European states struggle to preserve some modest economic growth, favoring PPP models to support low-cost and shared mobility solutions.

Social
Lifestyle changes in societies: disengagement from the professional sphere, valuing free time Major social developments in Western Europe (4-day week, bi-residential, dispersion of couples and families...)

Technological
Shared data, MaaS, new apps for sharing.

Environmental
Global impact from climate changes forces the road transport sector to massively electrify.

Legal
European framework for mobility data-sharing.



Evolution of mobility volume by revenue quartile

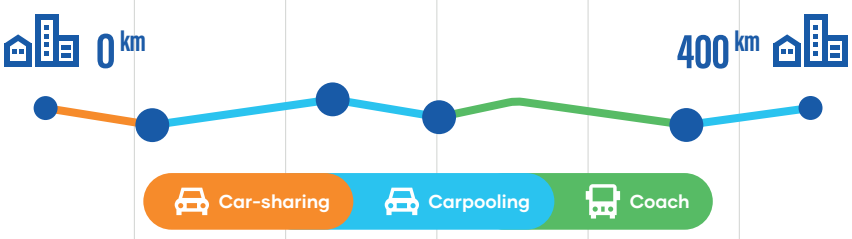
Source: Extrapolation based on data from the study: "ART, Le transport de voyageurs en France, État des lieux des mobilités courte et longue distance ; 2022-12"

4 connections in multimodal hubs and relay stations (payments with app)

400 km

6h (door to door)

€70 (€0.17 / km)



WHILE THE FIRST QUARTER OF THE 21ST CENTURY SAW A SIGNIFICANT INCREASE IN LONG-DISTANCE MOBILITY, THIS SCENARIO EXPLORES THE POSSIBILITY OF A SIMILAR REVOLUTION IN MEDIUM-DISTANCE MOBILITY.

Against the backdrop of systemic crises and growing protectionism, Europe is aging and losing influence on a global scale, facing economic stagnation. In an alternative approach, Europe reinforces social and collective levers, focusing on the well being of the individual and promoting a 4-day week.

Europeans are gradually choosing **low-cost mobility**. Attitudes are shifting to the point where solo driving, long taken for granted, comes to be seen as an anomaly from 2030 onwards. Carpooling develops significantly, facilitated by the evolution of cars (larger models to easily transport 5 to 7 passengers), but above all the tremendous growth of **instant carpooling**. Practically, travelers can easily reach their destination by hopping from one car to another at designated areas (usually former petrol stations converted into carpooling hubs). Dedicated apps seamlessly connect drivers and passengers and, for a modest fee, everyone benefits.

Car is now seen as a practical but highly expensive means of transport, when used by a single owner. Encouraged by public authorities, **car-sharing** is developing in many forms, so much so that, by 2035, no less than 30% of vehicles on the road are shared.

Digital technologies already existing in the 2020s, especially application for passenger modal share, have gained in fluidity and are better integrated through IoT connectivity.

If railway stations had redesigned the face of our Western cities in the 19th century, we are now seeing, in the 21st century, an increasing number of modern coach stations emerging in major European cities, along with high-capacity trains and suburban trains increasingly serving regional and intercity routes. They aggregate and connect multiple forms of mobility, mainly via road. **Coach transport** is experiencing significant growth. It is indeed a cheap alternative to the train, especially since it has dedicated lanes on motorways, and is proving to be faster and safer.

Finally, by supporting citizens' aspirations for accessible mobility, European states have succeeded in preserving the social pact that has been the foundation of their prosperity since the end of the Second World War. Despite high levels of debt, they have achieved this by creating multiple public/private partnerships. In 2040, the total volume of mobility has increased by more than 8% (in pkm), primarily benefiting the first 3 quartiles of revenue. Another positive aspect of this scenario is the reduction in pollution and CO_2 emissions, thanks to modal shifts and higher load factors, which, in addition to electrification and efficiency gains, manage to offset the overall growth in travel. Although modal shares have changed insignificantly (except for the coach, which has doubled its share), we can still speak of a **genuine revolution** in mobility, as the conversion to shared and low-cost modes has completely reconfigured the way mobility had been envisaged until now.

SHARED MOBILITY REVOLUTION INNOVATIONS

LARGE DEPLOYMENT OF MULTIMODAL HUBS

These hubs offer convenient access to multiple transport modes and rely on large-scale infrastructure deployment (relay stations, car-sharing spots, multimodal hubs).

INSTANT CARPOOLING BECOMES VERY POPULAR

Instant carpooling enables seamless journeys by allowing passengers to swiftly switch cars and, through mobile apps, quickly connect with others on similar routes.

DEPLOYMENT OF CAR-SHARING STATIONS

Car-sharing stations transform intercity travel, offering shared vehicles on demand and reducing private car ownership.

DYNAMIC CHARGING ON HIGHWAYS

Highways are now equipped with embedded wireless charging technology, allowing electric coaches to charge while driving.

OPTIMIZED HIGH-CAPACITY MODULAR TRAINS

The emergence of high capcacity double-deck trains for regional and intercity segments will significatly reduce the ticket cost per passenger.

SCENARIO 1 - THE SHARED MOBILITY REVOLUTION

Deployment of car-sharing stations (cities, but also villages)

Continuous decline of the solo usage of private cars. Vehicles evolve to become more spacious and facilitate shuttle/carpooling use

Solo driving in big cities becomes an aberration

Car-sharing: 1 out of 10 cars

Emergence of high capcacity double-deck trains for regional and intercity segments.

2024 2025 2026 2027 2028 2029 **2030** 2031

Social unrest in many European countries

Geopolitical instability leading to Global Economic Crisis

EU sets up the Carpooling pass for all young Europeans (annual budget of 150€)

Increasing climate crises on a global scale (heat waves, floods, forest fires, etc.), impacting international trade

Work from home, at least once a week: All 35%, France 33%, Spain 43%, UK 50%

Agreement in France for the adoption of the 4-day week. European countries follow shortly.

20% of the adult population split between two residences (vs. 14% today)

Global Minerals crisis and destabilization of the electricity industry

Car-sharing: 3 out of 10 cars (critical mass that allows free floating in many regions)

Multiplication of relay stations (former service stations) that allow the efficient development of medium-distance carpooling

Dedicated lines on motorways for coaches

Instant carpooling becomes popular, especially for medium-distance trips

SOCIAL GREEN DEAL: Private public partnerships regarding the sharing of data between operators to enable the adoption and dissemination of low-cost green business models

We are in 2040, the shared mobility revolution has extended to the 100-500 km segment, thus contributing to give mobility back to the first 3 income quartiles.

2032 2033 2034 **2035** 2036 2037 2038 2039 **2040**

Most European Governments encourage manufacturers to design vehicles for ride-sharing, carpooling, car-sharing...

Widening climate adaptation gap between wealthy and poor regions.

Work from home, at least once a week: Europe : 60%

Political Environmental Innovations
Economic Social

SCENARIO 2

THE GREAT DIVIDE

THE GREAT DIVIDE JOURNEY

Evolution between 2024 and 2040:

Mobility Growth

-11.7% in Global Volume

Demographic growth (CAGR)

-0.5%

Economic growth (CAGR)

-1%

Faced with systemic crisis, European societies retreat inward, abandoning decarbonation goals and collective ambitions, as each nation prioritizes short-term survival and national self-interest. Caught between a failed electric transition and soaring fossil fuel prices, mobility becomes prohibitively expensive, deepening the divide between a privileged few and a majority forced to rely on degraded, makeshift solutions

Context

Political

Gradual loss of influence of the EU as countries increasingly withdraw to preserve their national interest

Economic

Permanent crisis; soaring oil and electricity costs. Sharp decline in overall demand for mobility

Social

High inequalities amongst social groups. A society fragmented between the wealthiest (who live in gated communities and benefit from exclusive mobility options and the more modest

Technological

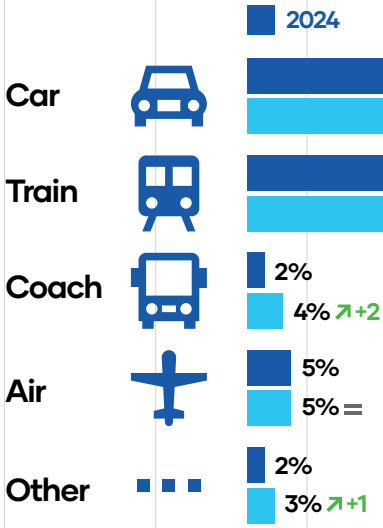
Electric mobility by air (eVTOL) available only for the affluent customers

Environmental

Abandonment of energy transition targets

Legal

Energy transition legal frameworks replaced by regulations driven by national protectionism



Evolution of mobility volume by revenue quartile

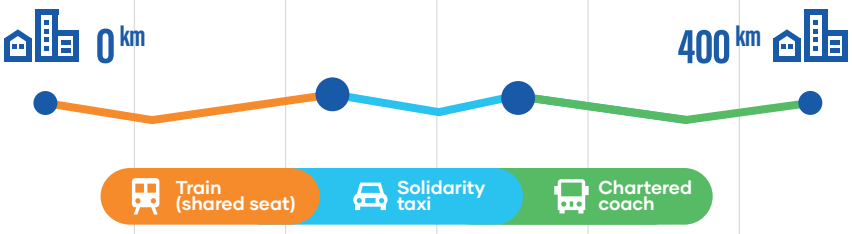
Source: Extrapolation based on data from the study: "ART, Le transport de voyageurs en France, État des lieux des mobilités courte et longue distance ; 2022-12"

2 connections (combination of ad hoc solutions)

400 km

8h (door to door)

€160 (€0.40 / km)



IF NOT ENTIRELY BLEAK, THIS SCENARIO IS NONETHELESS DARK GREY, AS IT IS MARKED BY A PRONOUNCED DECLINE OF EUROPE, ECONOMIC REGRESSION, AND THE ABANDONMENT OF DECARBONIZATION GOALS.

European societies, marked by economic decline and ageing populations, are plagued by a lack of trust and fragment. Confronted with their governments' inability to plan for the long term and foster a unifying vision of the future, citizens increasingly turn to populist and nationalist leaders, drawn by promises of restoring order and safeguarding national identity. These priorities lean increasingly towards withdrawal: the withdrawal of nation-states into their territories, the withdrawal of societies to conservative values, and the withdrawal of the wealthiest into "gated communities", far removed from the masses severely suffering the effects of systemic economic crises. In 2032, the unemployment rate in the EU will reach 10%, at a time when no major industrial projects remain and Europe, increasingly uncompetitive, suffers acutely from the dual competition from the US and China. While exports decline, the domestic market, which has long been a vector of European economic stability, shrinks at the end of the 2020s.

In this context of economic stagnation and **gradual breakdown**, Germany is the first to deal the hardest blow to the European idea by officially renouncing its carbon neutrality objectives by 2050 in 2033, and other countries follow in its wake. These previous decarbonised objectives became unrealistic, especially for the transport sector where no transition has been seriously undertaken. Due to a lack of sufficient volumes, the cost of battery-powered vehicles has remained at prohibitive levels for citizens, particularly since the endemic economic crisis has led governments to stop all subsidy policies. Worse, faced with the fall in tax revenues, it was necessary to tax charging electricity on the same level as **petrol**, the price of which exploded in 2028 to reach €10 per litre!

As we can see, the question was not which mobility (thermal or electric), would prevail since both found themselves at an impasse. Excessively expensive compared to 2025 levels, individual mobility in the 100–500 segment has quickly become the prerogative of the wealthiest who can enjoy the comfort of luxurious shuttles or their comfortable electric cars. The speed of e-VTOLs must also be taken into account, and small regional electric planes that will appear around 2040. This "above-ground" mobility, which allows individuals to never leave their personal spheres, contrasts sharply with that of the majority's mobility, which has deteriorated sharply over the years.

In the absence of renewal, the car fleet has gradually taken on a **"Havana"** character, with vehicles being tinkered with and repaired continuously, their lifespan now reaching 25, or even 30 years!! Due to a lack of means to acquire new vehicles, households and professionals alike rely on informal networks of garages, the recovery of spare parts, or even artisanal 3D printing to extend their car's lifespan. Against a backdrop of a marked decline in mobility (of 12% overall), low-tech solutions are increasingly being developed, such as **high-capacity push-pull trains**, **car charters** (successful as soon as the required number of passengers is reached) or **solidarity taxis** (vehicles that are both electric and mechanical, propelled by the force of 8 or 10 people pedalling with conviction). These various developments explain a significant change in modal shares, with a marked decline in the use of cars in favour of trains and coaches (for the majority) but also air travel (for the minority).

In 2040, European societies are profoundly fractured between a minority that lives in comfortable self-isolation and a highly precarious majority, with mobility disruptions who are forced to rely on solidarity and resourcefulness. A **universal income** has been put in place; it has the double advantage of morally exonerating the elites of their secession and of preventing the masses from sinking into misery and revolt. But in the end, and in the space of only fifteen years, European societies have reached significant levels of inequality.

Ironically, if the situation is economically and socially very complicated, it is not catastrophic from an **ecological perspective**. The strong transversal decline in mobility, the constrained use of shared modes has allowed a significant reduction in carbon impacts, especially since the wealthiest, the only ones to have seen their mobility develop, have switched to low-emission transport modes.

THE GREAT DIVIDE INNOVATIONS

HAVANIZATION OF THE AUTOMOTIVE MARKET

People keep their vehicles in use far beyond their intended lifespan, extending the automotive market (ICE) by refurbishing/retrofitting cars to run for 25-30 years.

RISE OF HIGH-CAPACITY PUSH-PULL TRAINS

These adaptable wagons will cater to both high-capacity standing and high-comfort seating. Bi-mode locomotives will enable seamless traction adaptation to local energy sources.

DEVELOPMENT OF CHARTERED COACHES

This model will enable people to rent coaches affordably while benefiting from a shared, medium-distance mobility solution.

ELECTRIC REGIONAL AIRCRAFT FOR SUSTAINABLE TRAVEL

Small regional electric aircraft will offer sustainable, 500 km flights, providing an eco-friendly alternative for short regional travel.

SOLIDARITY TAXIS ARE ON THE RISE

Solidarity taxis will offer an affordable, community-driven alternative to ride-hailing, operating on a non-profit or cooperative model focused on accessibility and social impact.

SCENARIO 2 - THE GREAT DIVIDE

Sharp increase in the cost of mobility. BEVs: low volumes, no more purchase subsidies; ICEs: Soaring oil prices

"Havanization" of the automotive market (extending the lifespan of cars to 25-30 years)

E-mobility is growing far more slowly than expected

2024 2025 2026 2027 2028 2029 **2030** 2031

Gini index map (Europe +/- 30-35 vs. Brazil : +50)

Europe's ageing societies plagued by a lack of trust

The "gated communities" model is developing in Europe

Populist government in the majority of European countries

Prioritizing national identity over economic prosperity

France sovereign rating: A > BBB (S&P)

Unemployment rate in the EU reaches 10%

Rise of high-capacity push-pull trains.

Solidarity taxis are on the rise in many cities

Creation of "Charter a Coach" company

eVTOLs: the implementation of an intercity network (up to 150 km)

An increasing number of shuttle services

2032 2033 2034 **2035** 2036 2037 2038 2039 **2040**

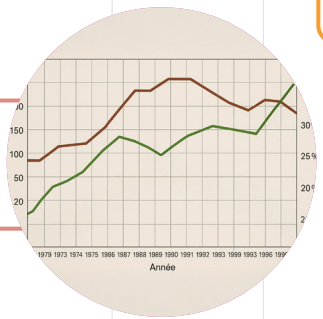
Germany renounces carbon neutrality by 2050

Domino effect: each country decides to set its own targets

Sharp reduction in investment in the energy transition

Gini index in Europe reaches 40

France: tax on electricity catches up with the one on fuel



Implementation of a universal basic income in most countries

France sovereign rating is downgraded to B+

Political Environmental Innovations
Economic Social

SCENARIO 3

THE NEW GREEN

THE NEW GREEN JOURNEY

Evolution between 2024 and 2040:

Mobility Growth

-4.4% in Global Volume

Demographic growth (CAGR)

-0.1%

Economic growth (CAGR)

-0.4%

Triggered by climate disasters and rising pollution, Europe enters an era of accelerated innovation and collective behavioral change. A personal carbon quota system financially incentivizes citizens to shift towards shared, low-emission mobility, making modal change both visible and socially accepted.

Context

Political

The EU is regaining a real convergence of views and action.

Economic

Relative economic stagnation despite ongoing innovation and efficiency gains.

Social

Society of frugality and sharing.

Technological

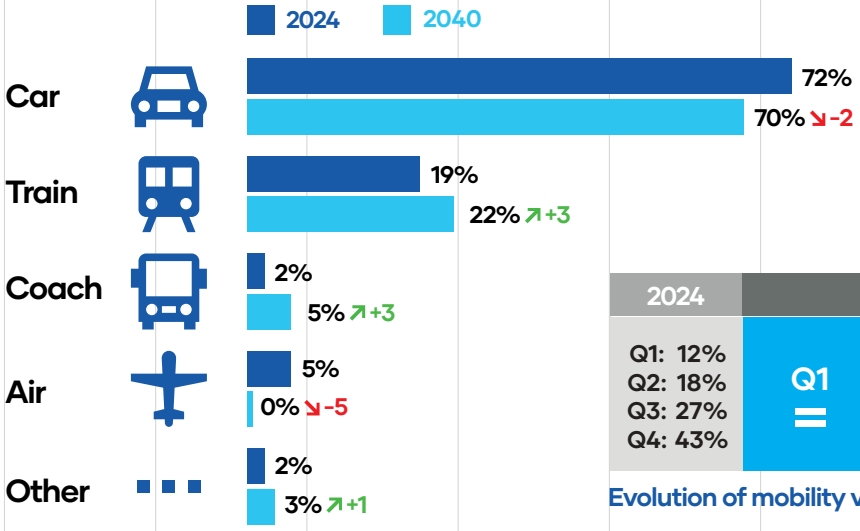
Significant investments made to provide H2 and battery technology for coaches. Dual electric mode trains (overhead wires & battery) to enhance railway infrastructure MaaS, micro-cars, SDV.

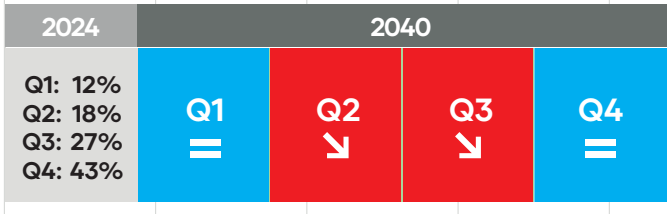
Environmental

Adaptation of the transport sector to meet the objectives of the green deal following a hard environmental crisis (fast-paced sea level rise, air pollution, pandemic...).

Legal

EU mobility passport is introduced in 2035 with tax exemption for car sharing and other alternative actions to reduce carbon footprint impact. Flights between 100 and 500 km have been banned.





Evolution of mobility volume by revenue quartile

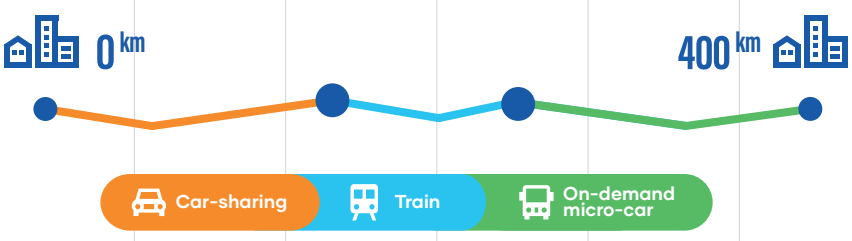
Source: Extrapolation based on data from the study: "ART, Le transport de voyageurs en France, État des lieux des mobilités courte et longue distance ; 2022-12"

2 connections in multimodal hubs and relay stations

400 km

5h (door to door)

€120 (€0.30 / km)



IN A WORLD SHAKEN BY CRISIS, THIS SCENARIO EXPLORES THE VOLUNTARY, COLLECTIVE AND COORDINATED DECISION TO IMPLEMENT MOBILITY QUOTAS WITHIN THE EU.

Among other crises, in 2026 we witness the collapse of part of the Antarctic ice sheet. This causes rapid sea level rise and floods in Jakarta, Miami and some Pacific islands, but also the displacement of millions of people, who have become de facto climate refugees, causing high political tensions.

The cumulative consequences of these many extreme weather events and the acute impact of climate change brings a new level of awareness worldwide. This context carries a double meaning for Europeans. On the one hand, it heightens the awareness of a common destiny between nation-states that had until now hesitated between the enhancement of a common market and the persistence of economic and fiscal competition. On the other hand, it reveals the strenghtening need to change lifestyles and reducing the pollution generated by economic activities. Civil society is mobilizing and many **citizen movements** are advocating for a drastic and immediate reduction in the use of fossil fuels, and oil in particular.

In this context, and with the support of public opinion, European countries decide to accelerate the production of carbon-free electricity, the consolidation of a European battery industry, and a **very high-speed rail network**. This network plans to connect 39 destinations across Europe, via a 22,000 km route. Other significant advances emerge at the turn of the 2030s with the installation of ultra-fast high-power charging stations on major motorways, creating a network that allows individual cars to be recharged in just a few minutes, including a set of cryogenic stations for refuelling trucks' liquid H2 (stored at -253°C).

However, the most significant evolution, within this scenario, lies in the collective choice to set up a **mobility passport** for all EU citizens. The idea emerges as early as 2028, gradually takes shape and, through various phases of consultations, awareness campaigns, tests and trials, is adopted across the continent in 2035. Hotly and passionately debated between defenders of freedom of movement and critics of irresponsible polluters, the idea raises many controversies. What is at first unthinkable, passes in a few years into the stage of the conceivable, then acceptable, then reasonable, in people's minds.

Part of the success of the mobility relies on the incentives linked to the mobility passport in the form of ticket's discounts and reduced taxation. For every given citizen, all trips are converted into CO2 emissions in their personal account. Target thresholds, initially not very restrictive are set according to each individual's situation and various bonuses and benefits (discounts on transport tickets, ease of access, premium services) are offered to those who make the effort to reduce solo driving, to favour public transport over private cars, or trains over planes. In just a few years, much like what happened with cigarettes, standards have changed and it has become socially unacceptable to continue to use a combustion vehicle, or even a heavy and massive electric vehicle when you are driving solo.

This movement, which originates in large cities, spreads rapidly throughout the countryside, especially as alternatives rapidly emerge with the development of car-sharing, carpooling, and even intermediate vehicles whose increasing autonomy makes them relevant outside urban areas. They are also economically more interesting for people than owning a private car. The latter experience considerable success, since their modular design makes it easy to manufacture them around **open-source platforms** in micro-factories and in small runs. This is a real revolution in the automotive industry, where assembly line production requires standardizing high-volume production to be profitable.

As a result, mobility becomes a consumable like any other, the cost and impact of which everyone is aware of. The benefit of owning one or more cars is less and less obvious. The limitation of road lines accepting polluting vehicles, makes them "slow vehicles" stuck in long queues with a limiting travel speed of 90 km/h.

Other transportation modes are undergoing a notable evolution, in particular **air travel**, which will be permanently **banned for flights of less than 500 km** from 2038. Conversely, river transport on electric shuttles booms in the mid-2030s. In 2040, the volume of overall mobility decreases slightly (-4 points) and the evolution of modal shares benefits rail and coach (+3 pts each).

In 2040, after fifteen years marked by global crises and the Europeans taking control of their **climate destiny**, the sky has become clearer: pollution in major European cities has been greatly reduced; fewer respiratory diseases are reported, but also less noise and congestion. Europe is back on track to achieve carbon neutrality by 2050 and is beginning to gain a certain economic competitiveness. Even if the implementation of mobility quotas has been the subject of strong social tensions, Europe has been able to find a new course that is leading a world transformation towards decarbonisation.

THE NEW GREEN INNOVATIONS

EU'S RAIL RENAISSANCE: A FUTURE FOR INTERCITY CONNECTIVITY

A wide, smart and connected high-speed railway network will serve as the backbone of intercity travel across Europe.

RISE OF OPEN-SOURCE VEHICLES AND MICRO-FACTORIES

Open-source vehicle platforms will transform mobility, enabling communities, startups, and individuals to design and build their own vehicles.

CARBON FOOTPRINT TRACKING WITH MOBILITY PASSPORTS

Individual emissions monitoring systems and carbon market allowances (such as a green mobility passport) will become common tools.

ULTRA-FAST CHARGING: THE KEY TO SEAMLESS ELECTRIC MOBILITY

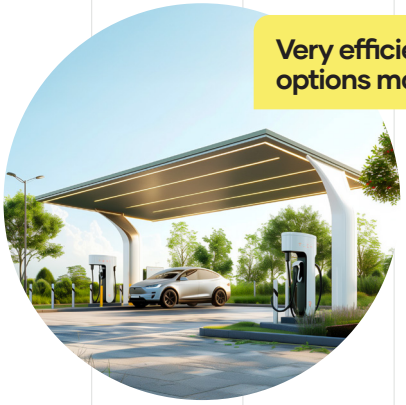
Ultra-fast charging will transform electric mobility, removing range anxiety and making EV charging as quick as refueling gas vehicles.

ECO-FRIENDLY MICRO-VEHICLES FOR THE FUTURE

By 2040, vehicles designed to have the lowest carbon footprint, such as micro-cars, will become more widespread.

SCENARIO 3 - THE NEW GREEN

Viable liquid H2 solution for coaches



Very efficient fast charging options made available

Concerted EU investment in railway infrastructure, allowing rail to be the backbone of main intercity corridors

Car-sharing helps reduce the individual impact of combustion engines under mobility quotas

EU invests heavily in electrification, reaching 50% green electricity (focus on energy storage solutions and critical raw materials)

2024 2025 2026 2027 2028 2029 **2030** 2031

2026: Soaring oil prices, following a crisis in the Middle East (destabilization of Iran, Saudi Arabia, etc.) and embargo

The EU Green Pass opens a period of intense innovation and accelerated behavioural change

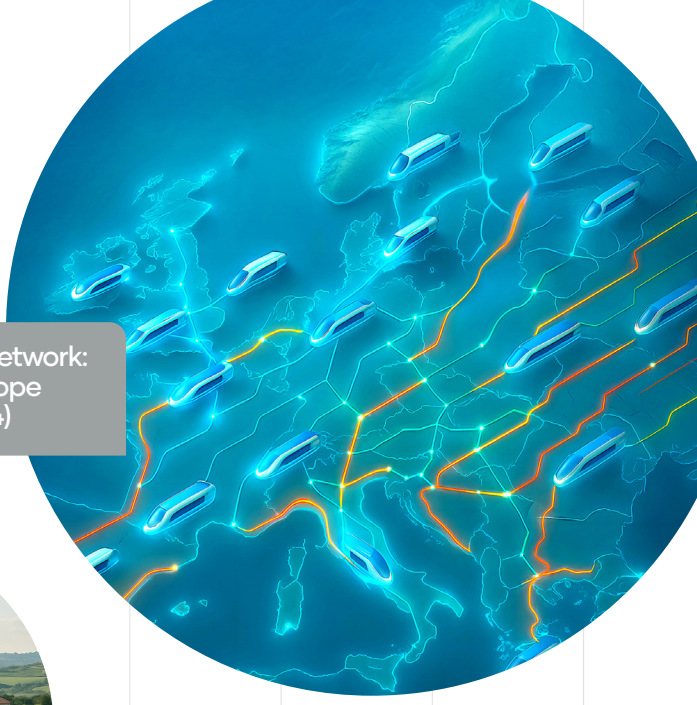
2026: Climate crisis in Antarctica: collapse of sea ice and submersion of many coastal regions around the world

2028: EU decides to set up individual carbon allowances by 2035+ with a coordinated innovation agenda

2027: Air pollution pandemic > Urgency to improve air quality

Citizen forums pushing the decarbonisation idea and contributing to its dissemination in the public space

Open-source platforms for open-source vehicles developed in micro-factories



High Speed rail network: 25 000 km in Europe (vs. 11 000 in 2024)

Vehicles designed to have the lowest possible carbon footprint

Aviation is banned for short trips (under 500km)

H2 and E-boats: development of maritime and river transport

Strong economic incentives to adopt carbon-free mobility

New Business Model for EVs, allowing citizens to avoid car ownership

2032 2033 2034 **2035** 2036 2037 2038 2039 **2040**

Creation of a carbon allowance market for citizens and companies

Europe's increased attractiveness and environmental leadership

Period of stabilization of European economies vs. exogenous shocks

Consultations, planning, legislation, outreach, testing and phased implementation

2035: Final adoption of the EU Green Pass

Significant impacts in major European cities: improvement of quality of life (air, noise, congestion, etc.), reduction of respiratory diseases

Individual emissions monitoring systems & allowance management platform

Political Environmental Innovations
Economic Social

SCENARIO 4

ON THE ROAD AGAIN

ON THE ROAD AGAIN JOURNEY

Evolution between 2024 and 2040:

Mobility Growth
+14.8% in Global Volume

Demographic growth (CAGR)
+0.1%

Economic growth (CAGR)
+1.3%

Amid economic uncertainty, Europe enters a phase of pragmatic reinvention, propelled by flexible alliances, local experiments and intense innovation. Against all odds, the car enters a new golden age, reinventing itself faster than rail or air, while MaaS services enhance its dominance through tailored, door-to-door and value-added solutions.

Context

Political
On the brink of implosion, the EU reforms itself by adopting more flexible operations (with various levels of engagement and integration). Regional experimentation strategies multiply, with uneven success

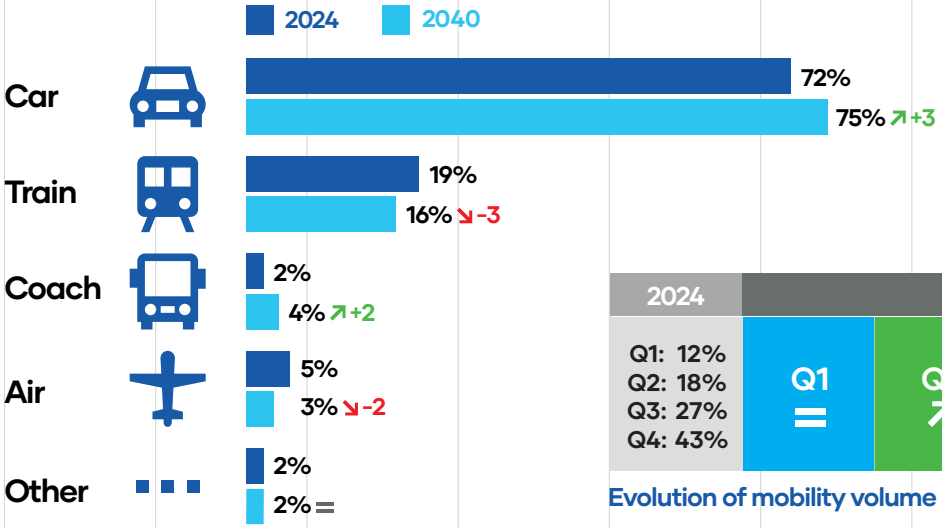
Economic
Unstable global economy renders protectionism vs. free trade debates ineffective. Minimal public infrastructure investment shifts leadership in the transport sector to private initiatives

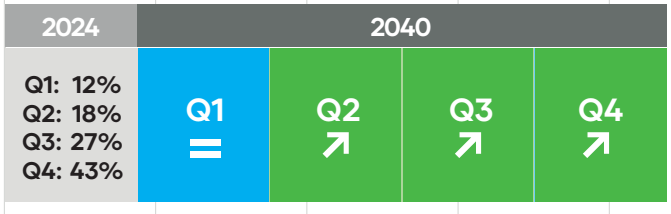
Social
No significant change as attachment to the car is reinforced by digital nomadism

Technological
MaaS convoys of semi-automated vehicles, liquid H2 for coaches, and electric regional aircrafts (20-seat capacity)

Environmental
Despite progress in electrification, transition goals are not being met

Legal
A digital Green Act promotes data sharing and the development of connected mobility





Evolution of mobility volume by revenue quartile

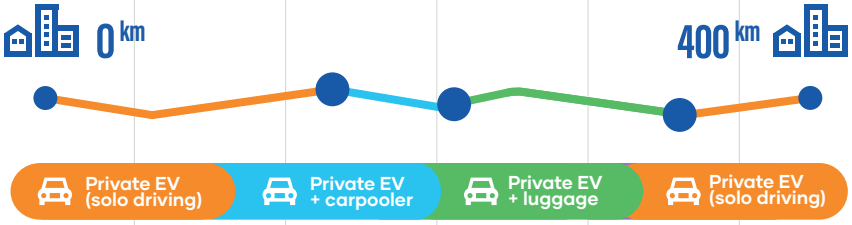
Source: Extrapolation based on data from the study: "ART, Le transport de voyageurs en France, État des lieux des mobilités courte et longue distance ; 2022-12"

No connections

400 km

5 to 6h (door to door)

€100 (-€15 incentive) (€0,25 / km)



THIS SCENARIO POSTULATES, AGAINST ALL ODDS, A NEW GOLDEN AGE OF THE CAR AND MORE BROADLY OF THE ROAD.

Thanks to its high flexibility and its ability to comfortably transport passengers and luggage without breaking loads, the car has regained a centrality in mobility systems. However, this centrality is gradually called into question during the first two decades of the 21st century. It must be said that the end of the sale of new combustion cars by 2035 and the difficult transition to electric (expensive, heavy and insufficiently autonomous cars) give potential buyers the feeling of reaching a dead end. However, in just a few years, and thanks to short innovation cycles, the automotive industry profoundly reinvents itself and creates conditions for renewal.

This owes a great deal to the political and economic context. The last few years of the 2020s saw the appearance of growing tensions between various European countries, particularly in terms of trade policy and energy transition. Divisions only widen between states that are subject to fierce competition from the United States and China, and that are failing to find the right balance between protectionism and free trade. Finally, on the verge of implosion, the EU demonstrates pragmatism by promoting variable geometry alliances and ad hoc public-private partnerships. By granting greater autonomy to **regional ecosystems** and by supporting their initiatives, rather than setting a rigid regulatory course, Europe encourages the emergence of new competitiveness clusters.

The automotive sector is able to make the most of this new situation, mainly around two axes:

- **The connected vehicle:** SDV (software defined vehicle) technologies make it possible to design vehicles that are increasingly better connected with their environment, infrastructure (V2I) and other vehicles (V2V), which results in significant progress in terms of safety but also comfort and quality of life. The possibility of switching to automatic pilot enables the development of motorway platooning towards the end of the 2030s.

- **The modularity** intrinsic to electric vehicles (and consisting of an assembly of blocks that are much easier to arrange than for a combustion vehicle) encourages a greater diversification of forms and uses. For instance, small electric vehicles (M0 weighing around 800 kg with 4 seats) and motorhomes offering their users the same level of comfort as a detached house. These "Smart RVs" (recreational vehicles) set off a tremendous craze among seniors, but also families because they give them autonomy and freedom, thus reviving the literal promise of the "mobile-home".

More broadly, the automobile has managed to develop a remarkable potential for integration with other modes of transport, and the most striking example here comes from the emergence of mobility operators capable of offering **tailored MaaS solutions** – like the YouGo application which provides and guarantees its users the best intermodal option, in terms of both time and cost, for any given journey. When travellers enters their travel dates and destination they are offered different options (combining public transport segments and carpooling solutions). A baggage handling service from the point of departure to the place of arrival (similar to air travel with connections) is added to these new offers. At the wheel of increasingly versatile vehicles, motorists are offered new sources of income with the possibility of easily taking passengers and/or luggage on board.

This scenario, understandably, is a sign of **strong growth** in mobility (+14.8% in 15 years), mainly captured by road transport. Indeed, rail sees little investment in infrastructure in this scenario, while air transport concentrates all its efforts on mobility beyond 500 km. These two sectors observe their modal shares decline. However, even if car fleets are being replaced gradually, the transformation is not fast enough to cope with the overall increase on mobility demand, and most of the European carbon neutrality objectives are not met.

ON THE ROAD AGAIN INNOVATIONS

YOUGO: YOUR AI-POWERED TRAVEL ASSISTANT

YouGo will revolutionize travel planning with an AI-powered assistant, ensuring the best time/price options for every trip.

SEAMLESS TRAVEL: HYBRID VEHICLES TRANSFORM LUGGAGE HANDLING

Door-to-door luggage services will become standard, enhancing convenience and efficiency for travelers.

DEPLOYMENT OF SEMI-AUTOMATED PLATOONING

Platooning involving convoys of semi-automated vehicles will be widely adopted, enabled by Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) technologies.

LIVING ANYWHERE: THE RISE OF SMART RVS

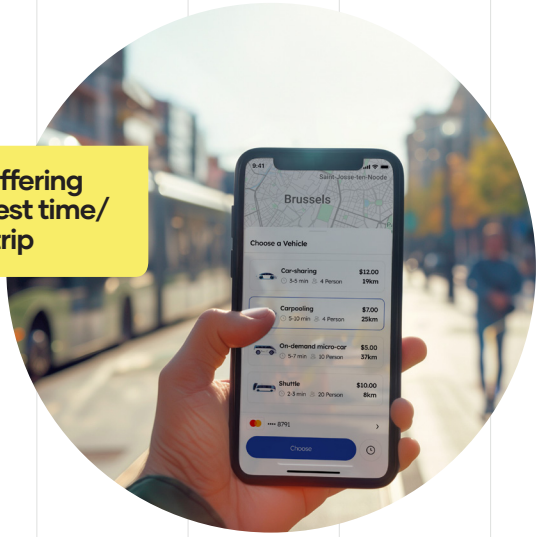
Smart RVs will offer flexibility and comfort, allowing travelers to explore without sacrificing home-like amenities.

EXPANDING COACH SERVICES WITH H2 COMBUSTION ENGINES

Coach services will increasingly rely on hydrogen-powered combustion engines, providing a cleaner and more sustainable alternative to traditional fuel sources.

SCENARIO 4 - ON THE ROAD AGAIN

Development of "light electric motorcars"



YouGo app capable of offering and guaranteeing the best time/ price option for a given trip

Rapid diffusion of Smart RVs, new generation motorhomes, halfway between cars and houses

Strong and continuous improvement of safety and living onboard thanks to V2V and V2I technologies.

2024 2025 2026 2027 2028 2029 **2030** 2031

Increased difficulties arise functioning within the EU due to the lack of alignment of the main Member States

Variable-geopolitical coalitions within the EU: the EU of Defense is not the EU of Energy, nor the EU of Immigration...

Development of bilateral alliances and "à la carte" coalitions in a very fragmented world

Coaches faces numerous failures due to risky technological choices: hydrogen, dynamic vs. static charging, battery types

A very unstable global economic context makes the opposition between protectionism and free trade ineffective

Massive investments to support EU Green technology

The EU encourages innovative ad hoc partnerships to catch up on the energy transition

Development of MaaS and the emergence of mobility operators (offering intermodal mobility solutions)

Cars are more than ever at the heart of the mid-range mobility system. On highways, platooning of connected automated cars is now is now widespread

Versatile cars that can easily turn into passenger shuttles or luggage conveyors

Innovation in the railway sector focuses on train designs for higher capacity, with the suburban concept extended up to 500 km.

Development of integrated luggage handling services

Expansion of electric regional aircrafts (Q4)

2032 2033 2034 **2035** 2036 2037 2038 2039 **2040**

On the brink of implosion, the EU manages to reform itself by adopting a more flexible way of operating (e.g., different levels of engagement and integration)

Regional experimentation strategies are multiplying with uneven success

Fast charging: significant advances in electric vehicle and coach charging technologies

Political Environmental Innovations
Economic Legal

A METHODOLOGY ROOTED IN MORPHOLOGICAL SCENARIO ANALYSIS

This methodology was developed and applied within a Community of Interest led by Alstom, Michelin, Stellantis, and TotalEnergies.

A structured approach to exploring divergent futures

Rather than aiming to predict the future, morphological scenario analysis provides a framework for systematically reflecting on multiple plausible, contrasting, and coherent futures. It does so by combining different hypotheses across key variables.

These scenarios help map out a range of potential futures and support the construction of narrative, visual, and quantitative scenarios.
The aim is to provide actionable insights for strategic decision-making.

This approach is particularly well-suited to intercity and regional mobility—complex ecosystems influenced by diverse and evolving dynamics, including regulatory, economic, social, technological, environmental, and legal factors.

A collective and iterative process

Through a combination of seminars, workshops, and expert input, this methodology fosters shared visioning and the development of mobility scenarios that are grounded in real-world conditions.

The model has the potential to serve as a valuable reference for other communities addressing mobility challenges in different geographical and policy context.

STEPS IN THE PROCESS

1 COLLABORATIVE FRAMEWORK AND SCOPE DEFINITON

The analysis targeted the mobility of people on journeys of 100 to 500 km in Western Europe by 2040.

2 EXPLORATION AND DEVELOPMENT OF TRANSITION PATHWAYS

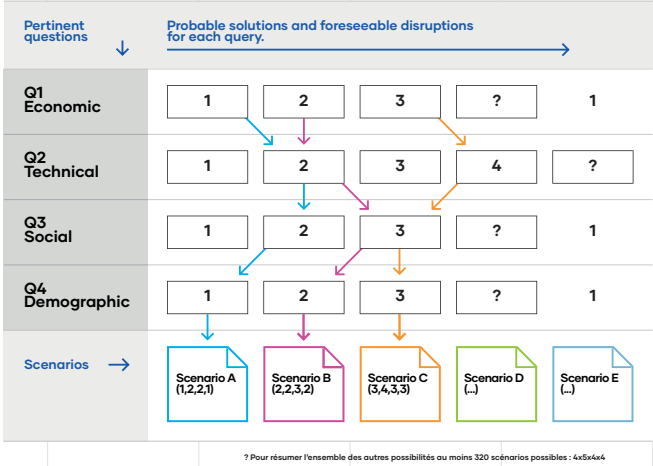
A collective fresco was created to identify overarching trends (demography, climate, energy, land use, etc.) and possible disruptions. These elements have made it possible to lay the foundations of a potential timeline scenario, enriched with key events.

3 IDENTIFICATION OF STRUCTURING VARIABLES

The determining dimensions of the system have been defined: regulation, energy, technologies, infrastructure, lifestyles, social acceptability, economic models, etc. For each of them, several contrasting hypotheses have been formulated (for example: centralised vs. experimental regulation, disruptive innovation vs. technological stagnation, etc.).

4 CONSTRUCTION OF THE MORPHOLOGICAL MATRIX

The hypotheses were cross-referenced in a morphological matrix to identify plausible and coherent combinations. This work was carried out during a collaborative workshop, guided by the principles of collective intelligence.



? Pour résumer l'ensemble des autres possibilités au moins 320 scénarios possibles : 4x5x4x4

5 THE ELABORATION OF CONSTRASTING SCENARIOS

Four robust scenarios emerged from the morphological analysis, each based on a combination of specific hypotheses:

- **The shared mobility revolution**
- **The Great Divide**
- **The New Green**
- **On the Road Again**

6 TESTING AND QUANTIFICATION

These scenarios were then tested and refined through narration, which makes it possible to verify the relevance and internal coherence of the proposed scenarios.

MOVIN'ON
Sustainable mobility for societal good

WORKING TOGETHER TO ACCELERATE THE DEPLOYMENT OF SUSTAINABLE MOBILITY SOLUTIONS

We are a non-profit do-tank led by businesses committed to sustainable mobility for societal good.

We cover the entire mobility value chain and every mode of transport for goods and people.

We provide a trusted framework for public and private decision- makers to work together to develop and deploy mobility solutions that are environmentally friendly, equitable and conducive to sustainable economic growth.

Together, we are developing shared visions, proposing regulations and experimenting with solutions and business models.
We are harnessing the energy needed to deploy and showcase our actions.

Joing Movin'on members commited to sustainable mobility.
To find out more, visit ***movinonconnect.com***

accenture · Capgemini · CGI · ENGIE · MACIF · MICHELIN · SOLVAY

THE ADECCO GROUP · Allianz · ALSTOM · BrestPort · Brittany Ferries · CMA CGM · DunKerque Port · EY · FORUM OCEANO · GEODIS

KANTAR · Microsoft · Mobivia · orange · SNCF · STELLANTIS · THALES · TotalEnergies