



Guidance for infrastructure and investment policies

Maxime Hachette, Alain L'Hostis

► To cite this version:

Maxime Hachette, Alain L'Hostis. Guidance for infrastructure and investment policies. Université gustave eiffel; LVMT. 2022, pp.44. hal-03834118

HAL Id: hal-03834118

<https://hal.science/hal-03834118>

Submitted on 28 Nov 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Guidance for infrastructure and investment policies

Work Package:	WP 5
Deliverable:	5.2
Due date:	31 August 2022
Submission date:	16 September 2022
Responsible Partner:	Gustave Eiffel University
Version:	Final
Author:	Maxime Hachette, Alain L'Hostis
Deliverable Type:	R
Dissemination Level:	PU



This project has received funding from the European Union's Horizon 2020 research and innovation program under the grant agreement No. 101007019

Contents

1	Report structure	4
2	Introduction	5
3	Section 1: Dimensions that could be converted into policy objectives while being aligned with the public interest	9
3.1	Behavioural change	9
3.2	Connectivity / accessibility to everywhere	10
3.3	Accessibility of everyone to the transport / mobility system	11
3.4	Calming the city	11
3.5	Reliable, modern, comfortable and safe transport equipment and infrastructure	12
3.6	People centred transport and public space	12
3.7	Mobility as a human experience: the need for seamlessness	13
3.8	Reduction of individual mobility needs	14
4	Section 2: Guidance on transport infrastructure related policies	16
4.1	General recommendation for infrastructure policies	16
4.2	General recommendations for infrastructure investments	20
5	Section 3: Assessment methods	25
5.1	Cost-benefit analysis (CBA)	25
5.2	MultiCriteria Analysis (MCA)	26
5.3	Public interest and assessment methods	27
5.4	Need for new assessment methods ?	29
6	Section 4: Policy strategy for the future of European transport	30
6.1	Converging towards common objectives and standards	31
6.2	Consolidation legal framework	31
6.3	Continuous effort of communication, education and democracy	31
6.4	Provision of strong alternatives	32
7	Section 5: Existing EU laws that should be modified	32
7.1	European laws that frame mobility	32
7.2	Laws that should evolve	33
8	Ways forward and conclusion	36
9	Attachments	37
10	Illustration table	43



Executive summary

This report describes how REBALANCE proposes to re-shape the current mobility culture towards a new culture that better meets the expectations and inherent values of the European population while addressing the environmental, energy, social and economic challenges it may face. The objective of this report is to lay out a policy guidance for the development of future transport infrastructure-related policies and investment on a European scale. It is primarily grounded on the alternative vision of the mobility of the future previously developed in REBALANCE. Guidance covers assessment methods and notably proposes improvements of the Cost-Benefit Analysis commonly used in transport project assessment, both ex-ante and ex-post. Furthermore, the aim is to provide an initial response to the following questions: How can the various dimensions of the proposed alternative vision of REBALANCE translate into policy objectives? What existing EU laws should be modified in order to effectively pursue these policy objectives?

Within the framework of the project REBALANCE, a debate has proven necessary. The project involved thinkers and experts who sparked key points for a debate about the terms and means of a transformation of European culture and practice of mobility. Should we express our revolt against a system that has run out of steam and bang our fists on the table, or even overturn it, in order to finally create the sensitivity needed to take the radical measures that are sometimes necessary to initiate a radical change in paradigms, or should we be more reasonable and try to make things evolve in a smoother way? Answering this question fairly seems to be a risky gamble. While revolutionising the current paradigms is urgent, it could lead to a complete impasse in the political dialogue and lead to arguments of utopianism.

We therefore opted to express our side as activist and revolutionary scientists through a Manifesto. Through this deliverable, we have opted for the soft way and tried to propose practical, immediately applicable measures, some of which are already initiated.



1 REPORT STRUCTURE

The report is structured in five sections, preceded by an introduction and followed by a set of concluding remarks:

- **Introduction** describes the REBALANCE project, reminds the vision of the mobility of the future as illustrated in deliverable D4.3: "The alternative mobility vision".
- **Section 1:** Based on the alternative vision of the mobility of the future, this section discusses the dimensions that can be translated into policy objectives while being aligned with the with the concept of public interest as largely discussed in D3.3: "Current Values behind the politics of Mobility: Critical Review" and D5.1: "New concepts for regulatory policies". These are targets, that politicians can announce, justify and measure.
- **Section 2:** Guidance on transport infrastructure related policies. This section details how transport infrastructures are functional to reach the vision of future mobility while meeting the stated policy objectives.
- **Section 3:** Assessment methods. This section starts from the review of the methods currently used to evaluate mobility projects carried out in D3.3: "Current Values behind the politics of Mobility: Critical Review". The aim is to go further and take into account several additional dimensions and to develop a broader view for more holistic analyses.
- **Section 4:** Policy strategy for the future of European transport. The objective here is firstly to develop a global strategy to support European populations in the transition to a new mobility culture that departs from current and past paradigms. Furthermore, the aim is to concretise the implementation of the mobility policies and infrastructures detailed in the previous sections.
- **Section 5:** Existing EU laws that should be modified. This section is mainly based on D3.3: "Current Values behind the politics of Mobility: Critical Review" and on D5.1: "New concepts for regulatory policies", and general inputs. The intention is to create a European legislative framework that achieves the desired objectives by enabling the adoption of the necessary policies that are aligned with the public interest and that help to establish a new mobility culture.
- **Way forward and conclusions:** summarises the previous 5 sections, presents a summary table and paves the way towards new approaches.



2 INTRODUCTION

REBALANCE is an H2020 project founded on the observation that the present and past mobility culture, particularly in Europe, has led to unsustainable patterns with significant negative social and environmental effects. The purpose of REBALANCE is to suggest, through a critical analysis of the current culture of mobility as well as the needs and expectations of the future, a new culture of mobility that would enable a paradigm shift towards increased sustainability.

At this stage, REBALANCE has reached two main milestones, through the investigation of the current mobility culture (WP3) and the envisioning of the future mobility culture that better meets the needs and expectations of the citizens of the European countries (WP4). These raise some fundamental challenges: what are the dimensions, the observed cultural values changes, the new ideas, the REBALANCE vision inputs, that could translate into policy objectives? Which transport infrastructure should be encouraged? How should we improve the actual assessment methods? Which policy strategy for the future of European transport should be adopted? What existing EU laws should be modified in order to allow setting these policy objectives?

In this deliverable D5.2: "Guidance for infrastructure and investment policies" we rely on the findings from the previous phases of the project, and more specifically (although not exclusively) on deliverables D3.3: "Current Values behind the politics of mobility: Critical Review", D4.3: "The alternative mobility vision" and D5.1: "New concepts for regulatory policies". The work on the deliverable is part of WP5 (Politics and poetry) whose aim is to transform the expectations and hopes of the European populations in terms of mobility into real policies.

To address the stated objectives, we will first briefly recall the REBALANCE vision of the mobility culture of the future, then translate it into measurable policy objectives, then into recommendations for investment in specified infrastructure, and finally into methods for evaluating policies and infrastructure. We will then develop a holistic strategy for changing the current mobility culture and the implementation of a new one. To conclude, we will suggest a revision of existing European legislation to enable and facilitate this paradigm shift.

Figure 1 illustrates the structure of this deliverable (blue boxes, S1 to S5) and the links with other deliverables and outputs of the REBALANCE project.



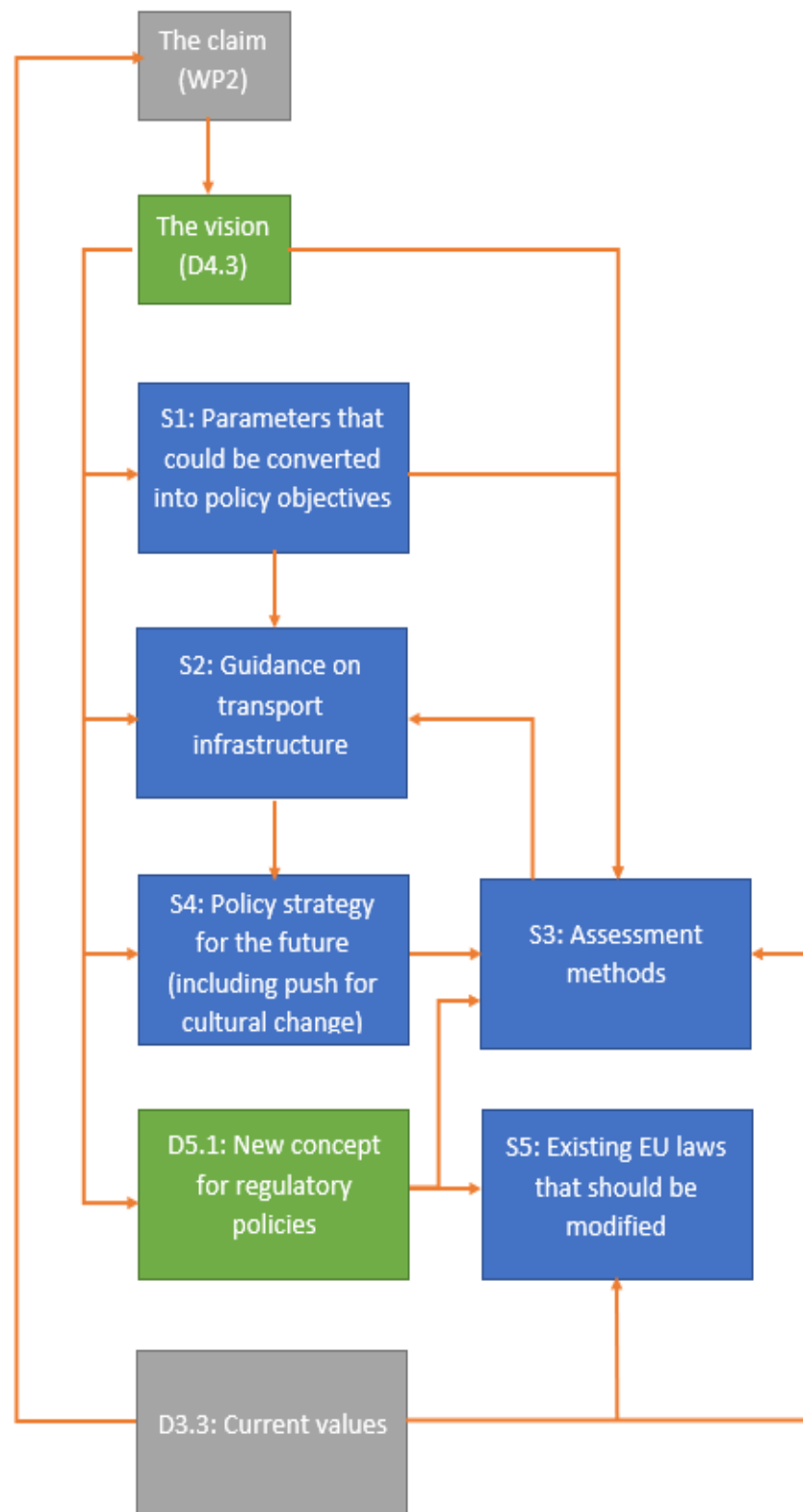


Figure 1: Structure of D5.2 and links with other deliverables / findings

As previously mentioned, the main starting point for this deliverable is the outcome of WP₄ (the needs and hopes of the future), which investigated the needs and aspirations of European populations in terms of mobility. In this context, 4 scenarios emerged in D_{4.2}: “Alternative narratives for the future of transport in Europe”, by combining 2 principal dimensions, *type of society* and *power and politics* (Figure 2):

- **Scenario A: Hercules (the myth of strength)**, where a rigid society is guided by hard powers.
- **Scenario B: Themis (the myth of justice)**, where soft powers prevail in handling the rigidity of society.
- **Scenario C: Gaia (the myth of interconnections)**, where a fluid society is kept afloat by recurring to soft policy instruments.
- **Scenario D: Hermes (the myth of speed)**, where command-and-control policies keep a fluid society in check.

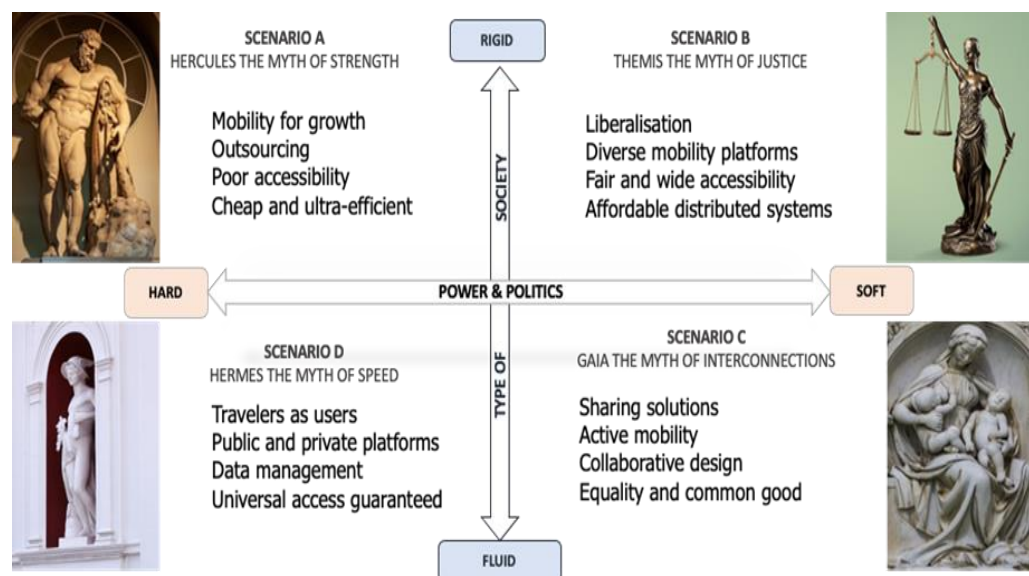


Figure 2: The REBALANCE scenarios

A restricted group of high-level experts and stakeholders were invited to comment and flesh out the scenarios, and rank their *likelihood* in an unchanged policy framework. Afterwards, a visionary survey was disseminated on a larger scale in different European countries where respondents were asked to vote on different aspects, and rank the scenarios in terms of their *desirability*. The vision adopted by REBALANCE considers both probable and desired scenarios.

Ultimately, the vision dimensions for rebalancing mobility cultures by 2050 are articulated around two main levels (detailed in D4.3). The first level is based on five cornerstones that support the overarching objective of imagining a new transport paradigm that restores culture to its rightful place in the policymaking process:

- **Nº 1:** Cultural change
- **Nº 2:** Modernity and mobility
- **Nº 3:** Critical revisitation of speed and efficiency
- **Nº 4:** Technology preventing place detachment and time alienation
- **Nº 5:** Mobility justice

The second level of the vision involves a range of secondary values and desires that rely on the five pillars outlined above, and how these (may) guide policies and measurements. The components of this level help to shape the "mobility turn" to generate a long-term cultural change in the way we understand mobility and how to make personal, business and political decisions:

- **Nº 6:** Mobility involves human experiences (people-centred mobility policies / cultural change)
- **Nº 7:** The social value and political relevance of public health benefits (active mobility / modernity and mobility)
- **Nº 8:** The public interest of a given transport policy cannot be fully assessed by applying a conventional Cost-Benefit Analysis, that assumes social benefits mostly related to saving times (Speed and efficiency / new human geography / meaningful travel time)
- **Nº 9:** We risk living in a time of more radical dyschronicity (Technology may produce more place detachment and time alienation / sound -visual mobility / New transport technologies should assure affordability)
- **Nº 10:** Mobility justice by having human-centred systems (favouring customised mobility / user-friendly and safe transport / hospitality and conviviality / proximity)

The question is now how to translate this vision of future mobility into policy objectives and infrastructure investments? What methods of project assessment should be adopted and what European legislation should evolve in order to reach these targets?



3 SECTION 1: DIMENSIONS THAT COULD BE CONVERTED INTO POLICY OBJECTIVES WHILE BEING ALIGNED WITH THE PUBLIC INTEREST

Falling within the realm of the public interest, achieving mobility that corresponds to the aspirations of the European peoples requires a real political determination. It belongs to the politicians to bring clarity and to try to find the right balance between the scientific evidence and other dimensions like the expectations of the populations and the respect of the rules of democracy and human rights. Against this backdrop, we propose in this section a basic, non-exhaustive, set of policy objectives for politicians to contribute to the achievement of Europeans' expectations. The formulation of these targets is meant to facilitate their dissemination to the larger audience while offering politicians a way to monitor progress through measurable and communicative indicators.

Based on D4.3 "The alternative mobility vision", REBALANCE talks and discussions and scientific outcomes, the priority policy objectives are presented below.

3.1 Behavioural change

The cult of image, power and efficiency and the emergence of Europe as one of the main temples of consumption have marked the daily life of Europeans since the industrial revolution and particularly after the Second World War. Among the consequences that were quickly observed were the proliferation of polluting means of transport over those that were more sober and the congestion of public space. This culture, symbolised mainly by the United States of America and by Europe, was taken as an ideal and an example of success and wealth by most countries. The problem with behaviour is not about the values themselves, but about how we express them - by building big streets and big cars. Image, power and efficiency may remain important for travel behaviour choices (we are probably witnessing a shift towards other values such as transcendence or collectivism), but we should consider whether it is necessary to satisfy them with highly polluting means of transport and their infrastructure. Could not the continuity and reliability of transport also reflect image (power) and efficiency? An environmental degradation unprecedented in the history of the planet, followed these new habits (at that time). The warning bells were then rung repeatedly, with ever stronger echoes, by experts. A profound general cultural change and a change of habits (individual or collective) in particular is now a necessity of which Europe and its populations are increasingly aware. Fortunately, the change of habits has now begun. More and more Europeans, especially young people, are fully aware of this need and are demanding it.

Setting behavioural change as a (measurable) policy objective is crucial since it can assume several dimensions: it enables politicians to express a necessity for behavioural change, to identify behavioural trends, to make both individuals and groups more responsible for achieving goals related to public interest, welfare, and to promote the development of a culture of sustainability and well-being of all people in the society, to make both individuals and groups more responsible for reaching public interest objectives. One of the main advantages of pushing for a change in mobility behaviour is the fact that it is possible to monitor and evaluate the importance of these changes using simple and widely used indicators. The fact that mobility



behaviour changes can be witnessed in a simple way, enables politicians to express their ideas in a clear, reliable and controllable way. However, only behavioural outcomes are easy to assess, although not, for instance, the reasons for the change in behaviour.

- Can be mobilised mainly for vision dimensions N°: 1, 2, 3, 6 and 10.

3.2 Connectivity / accessibility to everywhere

This objective of connectivity and accessibility to everywhere may reflect a political will for spatial equity, which may take many forms, whether virtual or physical. Namely, digitisation and access to various services without the need to travel, or the interconnectivity of mobility and transport networks to facilitate the transition from one mode to another and to avoid spatial disconnections. Ensuring connectivity and accessibility of every individual or company to anywhere is also synonymous with decentralisation, equity and spatial efficiency. This could be achieved by 2 main policies carried out in tandem: extending / connecting networks to each other and rethinking the distribution of resources. The goal is bringing demand and supply locations closer together. The evolution of the efforts to reach this goal can also be evaluated, measured and communicated in a simple way e.g. network size (distance), number of connections between networks, maps showing network extensions, saved time...

Decentralisation policies involve rethinking the distribution of amenities, particularly public services, in a more homogenous manner across the territory. This would both facilitate daily life and reduce travel distances, the obligation to go to/through the city centre and thus the pressure on the latter. In particular, the pressure generated by constrained activities.

In addition to the more or less strong centralities, whatever the urban form of a city (or of a larger area), more or less pronounced socio-spatial segregation remains almost inevitable. This is due not only to the design of the city itself, but also, among other things, to its history, the land value and the preferences of the dwellers. Inequalities which exist and are inherent can be reduced, attenuated and blurred by ensuring access from any point 'A' to any point 'B' in the territory with greater ease. In this case the various mobility networks, their continuity, imbrications and interconnectivity have a strategical role to play.

Nowadays, digital technology is becoming more and more important in everyone's daily life. An increasing number of activities are carried out without the need to travel. They can be performed from anywhere. Other needs can be delivered by ordering them via the internet without the need to physically move. The digital/internet network and its infrastructure (especially fibre optics), could in this regard be assimilated to a virtual mobility network. It is then worthy of the same interest, if not more, than traditional physical mobility networks.

Spatial efficiency is considered here as the most efficient and rational use of the territory to achieve the objectives of the policies carried out on the territory. Achieving optimal spatial efficiency remains utopian. The aim of policies would be to endeavour to approach it. Spatial efficiency can be translated by the fact of taking maximum advantage of what the territory can offer at the lowest possible costs in the widest meaning. It is then possible, for example, to think about reducing distances by considering the distribution of places of demand and places of supply, to increase



liveable densities in the city, or to choose the most judicious way to implement new projects.

- Can be mobilised mainly for vision dimensions N°: 2, 3, 5, 6 and 10.

3.3 Accessibility of everyone to the transport / mobility system

Social and spatial distinctions are often interconnected. The objective of an accessibility of everyone to the transport / mobility system can therefore overlap the previous one at to a large extent, while having a more social dimension and a focus on social and individual abilities. It concerns the access of everyone to everywhere in the territory and involves considering, within mobility policies, the specificities of all populations in their various social, cultural, physical, gender, generational and financial aspects. However, access for people with mobility impairments and people on low incomes to the transport networks and resources they need is the main aim of this policy. The main objective is to ensure that the quality of travel is equivalent from one group to another.

This ensures both freedom of movement without necessarily having to resort to vehicle ownership or the ability to travel or drive. We can mention here, as examples, pricing adapted to income or specific services for specific populations (age, disabilities...). We should stress here that liberty of movement is one of the fundamental rights of the Charter of Human Rights that all European countries have signed. However, like any liberty, it is not absolute. It can be reconsidered or limited according to the public interest. One of the most prominent examples is the lockdowns that have been taking place during the COVID-19 pandemic.

Access to the transport network for everyone could be ensured by adapting vehicles and infrastructure for people with mobility impairments, or by offering adapted services such as transport on demand. As far as the socio-economic dimension is concerned, it is strongly recommended to consider the possibility of free transport or the introduction of a solidarity-based pricing system that would, among other things, be dependent on people's income.

- Can be mobilised mainly for vision dimensions N°: 3, 5, 6, 8 and 10.

3.4 Calming the city

Calming the city is a general policy objective that is strongly related to mobility, but can go beyond that. It can also take several forms, namely the reduction of traffic, flows, speed, accidents, congestion or noise and at the same time the increase of safety, calm and well-being. Reaching this objective can be achieved by making more space available in the city for the lightest, least encumbering and least dangerous modes of transport, in particular soft/active modes. Redistributing public space to calm the city involves rethinking the road system in a more equitable way. It also implies various restrictions on encumbering individual modes of travel such as the car (reduction of parking spaces, paid parking, urban parking...). And in return, it implies the favouring of less encumbering and slower individual or collective modes. Rethinking the road infrastructure should also make it possible to introduce more nature into the city. Calming down the city, on the one hand, reduces speeds, serious accidents, stress and noise and, on the other hand, increases the feeling of belonging and local well-being. In order not to penalise citizens and companies, it is necessary



to provide efficient alternative mobility and transport solutions, especially public transport.

- Can be mobilised mainly for vision dimensions N°: 3, 4, 6, 7, 8, 9, and 10.

3.5 Reliable, modern, comfortable and safe transport equipment and infrastructure

The quality and reliability of transport infrastructures and systems (public transport, shared modes, mobility hubs, active modes) are essential criteria for European citizens to be able to rely on alternative modes of transport instead of cars, namely private ones, in the first place. It goes without saying that, as mentioned above, transport means and infrastructures must firstly be efficient and allow accessibility for any user to and from any location. That is, everyone can access the resources they need. Once efficiency and safety are ensured, other dimensions can be taken into account such as comfort (number of seats in public transport, quality of seats...). In the major European cities, transport infrastructure, particularly public transport, has already reached a certain level of efficiency, allowing access to every destination. Ensuring the quality, modernity and comfort of travel is a political objective that would further reduce the modal share of cars in cities by competing directly with one of the main arguments of car users, which is comfort.

- Can be mobilised mainly for vision dimensions N°: 2, 3, 4, 6, and 10.

3.6 People centred transport and public space

It consists of leading a policy that (re)puts people at the heart of transport and urban policies, especially on a local scale. This point in particular joins the policies previously promoted and complements them by highlighting the human scale in urban reflection and decision-making on transport policies. The objective is to make sure that public space and travel within it can be used with sustainable transport (active modes, public transport, shared modes, etc.) in a pleasant and enjoyable way that ensures that human activities can take place in suitable and satisfactory conditions. This can take on several dimensions that do not necessarily include transport infrastructure. One example is the response to local needs, whether they are observed, anticipated, expected or clearly expressed by the population. For example, encouraging the establishment of local resources that are not available in the area, relocating workers close to their workplaces, etc. A particular interest in proximity, i.e. in the distances/time of travel between the demand and supply areas, is necessary. We can mention for example the TOD and the 15-minute city. In addition to ensuring proximity, other dimensions are also important for a human-centred transport and public space. This means taking measures which are adapted to the characteristics of the local community (social, cultural, economic, health, etc.). Such a policy creates, among other things, a feeling of attachment to the territory and contributes to both the improvement of the local urban space and the reduction of travel needs.

- Can be mobilised mainly for vision dimensions N°: 1, 3, 4, 6, 7, 8, and 10.



3.7 Mobility as a human experience: the need for seamlessness

The intention here is to guarantee simple, intuitive travel with as few difficulties and interruptions as possible. The objective here is to track down whatever might affect the ease of (sustainable) travel and act as a disincentive to use it. The aim is to ensure that the user has a simple and pleasant travel experience by removing all difficulties or by relegating them to the back of the screen and making them invisible. These difficulties may in fact cause the user to abandon sustainable trips in favour of less sustainable ones. Focusing on the user experience offers policymakers several opportunities for improvement that can in turn serve several other purposes. On the one hand, there is a need to ensure the physical continuity of infrastructure (e.g. reducing the number of changes in public transport) and the reduction of interruptions (e.g. bicycle tunnels) for a smoother traffic flow and a more pleasant travel experience. On the other hand, this objective can have a more virtual dimension, such as the homogenisation of travel experiences, from booking, to route choice, and payment... We can recommend here the homogenisation of mobility data exchanges, the use of MaaS on a European scale, the homogenisation of standards (particularly signage) and rules...

Besides, it should be highlighted that there is a debate about the need to provide seamless mobility. Among other things, promoting seamlessness can have the undesirable effect of increasing non-essential trips (length and frequency). More philosophically, the experience of seams in movement recalls that moving involves an expense of resources. In addition, similarly to detours, experiencing, spending time in seams and interfaces, beside representing a burden to movement, contains the potential to enrich the experience of the traveller by developing its adherence to the visited territory. This controversy about seamless mobility puts it at a low level of priority. However, it should be recalled that, as for travel comfort, transport in Europe, particularly public transport, has achieved considerable seamlessness in many countries. This could explain why this dimension is relegated to the background. It is therefore necessary to find a balance that does not discourage users of sustainable transport but does not lead them to increase their travel. The debate raises the question whether seamlessness should be conserved as a high-level policy objective, or not, and if not by what objective should we replace it. Indeed, not all current European transport policies are aligned with the principles of seamlessness, if we consider for instance Low Emissions Zones that introduce constraints to the easiness of travel for specific vehicles in urban areas. A possibility would be to explicitly restrict the seamlessness objective to sustainable transport modes.

- Can be mobilised mainly for vision dimensions N°: 1, 3, 4, 6 and 10.



3.8 Reduction of individual mobility needs

Policies of reduction of mobility needs are intended to minimise travel, particularly individual and most polluting journeys, whether in terms of time, distance or number, while preserving the freedom of travel. There are two main approaches. The first one is to reduce the most frequent constrained journeys, such as those to and from work or to and from school, by eliminating the need to travel or by providing an alternative public service. We can mention, for example, the encouragement of teleworking, the creation of teleworking spaces, the reinforcement of the telecommunication and internet network, the development of school bus services, pedibuses (walking to school), the encouragement of itinerant shops, local markets, home deliveries... The second way, linked to the first one, is to reduce the distances of optional and leisure trips. This could be achieved by strengthening local attachment through the revitalisation of neighbourhoods or villages, or by developing local life nodes that offer commercial, social, cultural or leisure activities.

- Can be mobilised mainly for vision dimensions N°: 1, 2, 4, 6 and 8.

The policies to implement the mobility of the future, as described in REBALANCE deliverable D4.3, mentioned above and summarised in Table 1 below, can only be effective if they are translated into concrete action, especially in terms of infrastructure and services. Therefore, what infrastructure policies should be adopted in Europe?

Table 1: Translation of the "vision" into policy objective

N°	Vision	Policy objectives
1	<i>Cultural change</i>	Behavioural change
		Calming the city
		People centred transport and public space
		Mobility as a human experience: the need for seamlessness
		Reduction of individual mobility needs
2	<i>Modernity and mobility</i>	Behavioural change
		Connectivity / accessibility to everywhere
		Reliable, modern, comfortable and safe transport equipment and infrastructure
		Reduction of individual mobility needs
3	<i>Critical revisitation of speed and efficiency</i>	Behavioural change
		Connectivity / accessibility to everywhere
		Accessibility of everyone to the transport / mobility system
		Calming the city
		Reliable, modern, comfortable and safe transport equipment and infrastructure
		People centred transport and public space
		Mobility as a human experience: the need for seamlessness
4	<i>Technology that prevents place detachment</i>	Calming the city
		Reliable, modern, comfortable and safe transport equipment and infrastructure
		People centred transport and public space

	<i>and time alienation</i>	Mobility as a human experience: the need for seamlessness
		Reduction of individual mobility needs
5	<i>Mobility justice</i>	Connectivity / accessibility to everywhere
		Accessibility of everyone to the transport / mobility system
6	<i>People-centred mobility</i>	Behavioural change
		Connectivity / accessibility to everywhere
		Accessibility of everyone to the transport / mobility system
		Calming the city
		Reliable, modern, comfortable and safe transport equipment and infrastructure
		People centred transport and public space
		Mobility as a human experience: the need for seamlessness
		Reduction of individual mobility needs
7	<i>Active mobility</i>	Calming the city
		People centred transport and public space
8	<i>Meaningful travel time</i>	Accessibility of everyone to the transport / mobility system
		Calming the city
		People centred transport and public space
		Reduction of individual mobility needs
9	<i>Dyschronicity</i>	Calming the city
		Mobility as a human experience: the need for seamlessness
10	<i>Customised mobility</i>	Behavioural change
		Connectivity / accessibility to everywhere
		Accessibility of everyone to the transport / mobility system
		Calming the city
		Reliable, modern, comfortable and safe transport equipment and infrastructure
		People centred transport and public space
		Mobility as a human experience: the need for seamlessness

4 SECTION 2: GUIDANCE ON TRANSPORT INFRASTRUCTURE RELATED POLICIES

Disclaimer: this guidance emanates from the findings of the project and should be considered as directions that seem relevant from this point of view, without seeking a comprehensive definition of transport infrastructures policy in Europe.

The REBALANCE project has noticed that a shift in the mobility culture is already occurring. Moreover, the transport and mobility infrastructures have evolved remarkably during the last 10 years. They have helped to support a cultural change that was already happening and have even fostered it. So, in this section, we do not pretend to completely revolutionise transport infrastructures. We will focus on making recommendations that will help to be aligned with the vision of future mobility and the policies that would lead to it. The recommendations will be divided into four main parts, namely, general recommendation for infrastructure policies, infrastructure to be restrained, infrastructure to be further developed and infrastructure to be tested.

4.1 General recommendation for infrastructure policies

With the aim of fulfilling the vision of mobility on a European scale as expressed in REBALANCE D4.3, it is necessary to establish rules for the development of infrastructure policies that are both common to the member states and leave them enough freedom to consider regional and local specificities. In this context, it is possible to mention:

4.1.1 MULTISCALE MOBILITY AND TRANSPORT INFRASTRUCTURES POLICIES THINKING

The main concern here is to have a global and multiscale vision, thinking and planning of transport and mobility in Europe. As well as developing European structural transport axes, it may be necessary to ensure the continuity of existing infrastructures and improve their compatibility and interconnectivity. Not only it is necessary to take into account the local consideration of these structuring axes, but it is recommended to think of other hierarchical and connected infrastructures responding to more national, regional or local issues. For each scale of proposed infrastructure, it is necessary to systematically involve European, national, regional, and local decision-makers in the decision-making process, but in variable proportions according to the scale of the project. For example, the more local the project, the more beneficial and democratic the involvement of the inhabitants. In this context, the creation of a European High Authority for Urban Planning and Development, with particular charge of transport, and with representatives in national, regional and local authorities, might appear to be very valuable.

- Can be mobilised mainly for vision dimensions N°: 2, 3, 5, 6, 8 and 10.



4.1.2 SOCIAL JUSTICE AND INCLUSION

As well as considering the diversity of scales in the planning of European mobility and transport infrastructure policies, the social dimension holds a key weight in the development of a new European mobility culture. It is therefore important, when designing and implementing urban mobility infrastructure policies, to systematically include and consider the different social groups in all of their diversity (income, specific needs, gender, etc.). The inclusion of the different social groups in all their diversities will strengthen the sense of belonging and will also contribute to the accomplishment of equity and social justice.

- Can be mobilised mainly for vision dimensions N°: 1, 5, and 8.

4.1.3 TRANSPORT INFRASTRUCTURE ALLOWING THE SEAMLESSNESS OF USER EXPERIENCE

Even if the idea of *seamlessness* is controversial, it should be taken into account in European countries where the sustainable transport system, especially public transport, is complicated and makes it difficult to use. The aim here is to encourage and develop all the infrastructures that make it possible to harmonise, improve and simplify the mobility experience of commuters, particularly in their daily activities, to facilitate the process of familiarisation and to develop more sustainable mobility reflexes and automatisms. This may involve both physical infrastructures, which are visible to users (secure bicycle parking, urban consigns, bicycle tunnels, tramway lines, etc.) and less visible or virtual infrastructures, which enhance the user experience, and help to make it simpler and more secure (internet infrastructures, data exchange protocols, development of MaaS, etc.)

- Can be mobilised mainly for vision dimensions N°: 1, 2, 3, 4, 6, 8 and 10

4.1.4 CALM MOBILITY IN THE CITY AND FAST CONNECTIONS BETWEEN CITIES

The aim is to rethink the city and its urban space as a coherent and harmonious system in order to create a calm, convivial, and appeased environment and to guarantee fast connections between cities. Nowadays, there is a feeling of lack of time, a *time famine* among some populations because of the acceleration of the life rhythm. Confronting the feeling of *time famine* and lack of time should be the aspiration to dispose of greater time, greater prosperity or temporal wealth. However, it is not the aspiration to slow down the rhythm of life that should be questioned, but rather the aspiration to greater temporal prosperity.¹ The infrastructures to be developed in the city may encourage deceleration by including different solutions, such as the creation of chicanes, the installation of speed bumps, the reorganisation of roads for better integration and distribution between the various modes of transport, pedestrianisation, 30 km/h general speed limitation, etc. High-speed connections between cities may be reinforced or developed, such as high-speed trains (TGV, Hyperloop, etc.). It is also possible to work towards reducing the quantity and frequency of constrained travel (work, shopping, accompanying, etc.) and to make it virtual by strengthening the telecommunications infrastructure.

- Can be mobilised mainly for vision dimensions N°: 1, 3, 8, 6, and 9.

¹ Emmanuel Munch, Leslie Belton Chevallier, Gwendal Simon, 2022. Rapport final du projet PMD², 195 pages.



4.1.5 GENERALISE RESTRICTIONS ON LARGE MOTORISED OR POLLUTING VEHICLES IN CITIES

The target here is to reduce the presence of large or polluting vehicles (other than public transport) in urban areas and to reallocate them to more virtuous uses that contribute to a calmer city and a reduction in negative effects on quality of life. Within this framework, it is also recommended to develop a unified and homogeneous policy of restrictions on access or traffic in large and medium-sized cities, both in terms of content and form (pictograms, signs, etc.). One of the aims of standardisation on a European scale should be to make the user's experience of transport systems simpler, more intuitive and seamless.

- Can be mobilised mainly for vision dimensions N°: 3, 6, and 7.

4.1.6 ENSURE A FLEXIBLE PUBLIC SPACE WHICH CAN BE ADAPTED TO NEW, SMALLER MODES OF TRANSPORT

A flexible space is an evolving space. It is designed to withstand different changes more or less easily and to evolve, among other things, according to uses or technologies. For example, the infrastructures installed in a flexible space could be dismantled / disassembled without strongly impacting the space itself. It can also evolve according to the evolution of needs or technologies.

A flexible place, could also be characterised by its availability for full-scale tests and experiments in a living laboratory, and by its ability to be used for the development of new infrastructures or new modes of transport. One characteristic of a flexible space is that it can be used for real-life trials and projects within a real-life framework. Flexible infrastructures could support the adjustment and evolution in line with technological advances and innovations. They may also allow, on the one hand, to facilitate the acceptance of some projects by the inhabitants and to perpetuate successful experiments and, on the other hand, they may allow a comeback for failed experiments with the minimum possible impact on the urban space. In this sense a flexible urban space allows to accommodate more easily tactical urbanism measurements. Prominent examples of tactical urbanism include bike lanes introduced hastily during the pandemics, allowing cities to implement in a very short time frame longer term planned bike infrastructure.

- Can be mobilised mainly for vision dimensions N°: 1, 4, 7, 8, and 10.

4.1.7 MODERNISE NETWORKS

The modernisation of networks is necessary in order to maintain the quality of transport networks and to upgrade them, whilst taking into account new standards (environmental, regulatory, safety, etc.) and integrating new technologies for a better end-user service. Besides, modernising does not mean abandoning / losing the old technologies, flexibility remains necessary both for ecological reasons and to cover a period of latency allowing the gradual transition to the new technologies while ensuring backward compatibility. The modernisation of networks is a fundamental part of the smart city concept. Modern networks should allow a significant role for security and the collection and interchange of data.

- Can be mobilised mainly for vision dimensions N°: 4, 6, and 10.



4.1.8 RETHINK ZONING FOR A BETTER URBAN MIX

Zoning, by separating urban spaces according to the type of activity or building, has certainly contributed to the reduction of several nuisances in the city. However, by creating specialised zones, it has contributed to the distancing of inhabitants from the facilities they need (work, industries, shops, etc.) and therefore increased the need for mobility and the length of journeys. This has led to introduce the car into the city and to consolidate its hegemony. Rethinking the current zoning and making it more flexible is thus a way to reduce the number of trips, their length and their frequency. Several potential improvements to zoning are possible, such as the encouragement of urban diversity, the multiplication of living centres (proximity resources) for polycentric cities, the encouragement of the relocation of households close to (or on) their place of work, etc. Rethinking zoning in this way will also contribute to the strengthening of local life, both economically and socially, and will reinforce the feeling of belonging.

- Can be mobilised mainly for vision dimensions N°: 1, 3, 5, 6, 8, and 10.

4.1.9 PRIORITISE OPERATIONS ACCORDING TO THEIR ENVIRONMENTAL AND SOCIAL IMPACT

The development of mobility policies and, among other things, the implementation of transport infrastructures, goes through various phases of more or less long-time span, including impact studies or cost estimates. Cities planning several infrastructures at the same time can proceed to a hierarchy and a gradual implementation of their infrastructures in several phases. The economic aspect, admittedly with some reason, has an important and essential place. However, the shift in Europeans' expectations in terms of mobility, coupled with the climate emergency, calls for a rethinking of priorities. Giving more consideration to ecological, social and cultural criteria is becoming more and more crucial.

- Can be mobilised mainly for vision dimensions N°: 3, 5, 7, 8, and 10.

4.1.10 GENERALISE AND UNIFY MOBILITY SERVICES AND MAAS

"Mobility as a Service (MaaS) integrates various forms of transport and transport-related services into a single, comprehensive, and on-demand mobility service. MaaS offers end-users the added value of accessing mobility through a single application and a single payment channel (instead of multiple ticketing and payment operations)" (MaaS Alliance, 2022).² The idea of bringing together different mobility services into a single one to simplify travellers' journeys is a valuable and worthwhile cause. However, the multiplication of MaaS applications, sometimes in the same city or region, could compromise the objective of making travelling more seamless for travellers. Ideally, data exchange and processing protocols should be harmonised to provide European-wide MaaS applications (or a single one), bringing together all mobility services on the European territory. To a lesser extent, developing MaaS applications at the country level would already be a considerable evolution. As a first step, it is necessary to harmonise and connect MaaSs with each other, while preserving the originality of each of them. The objective of this approach is to ensure a good user experience for

² MaaS Alliance. What is MaaS? – MAAS-Alliance 2022. <https://maas-alliance.eu/homepage/what-is-maas/> (accessed August 18, 2022).

each traveller and to remove the obstacles to a new mobility in line with the vision of the mobility of the future expressed by REBALANCE.

- Can be mobilised mainly for vision dimensions N°: 2, 3, 4, 5, 6, 9 and 10.

4.2 General recommendations for infrastructure investments

In addition to the above guidelines for transport infrastructure development policies, the following recommendations can be made in a more practical way: some infrastructure investments should be **reduced**, others should be **encouraged** and others should be **experimented**:

4.2.1 INVESTMENTS TO BE REDUCED

While keeping the existing networks in good condition, which has nevertheless brought considerable progress, particularly in terms of safety, the first thing to do should be to **reduce investment in new infrastructure in favour of the most encumbering modes of transport, and those that are most prejudicial to the environment and to the population** (mainly cars, vans and lorries), as long as more responsible and genuinely effective solutions are not introduced:

- We can mention, for example, roads, motorways, petrol stations, car parks, ports (especially marinas), airports...
- In the same sense, it is necessary to intensify the efforts to **counteract urban sprawl** while promoting **rational densification in cities**. We can then mention the discouragement of the development of, among others, peri-urban commercial areas that are difficult to access without cars, low density housing estates outside the cities and out of the public transport networks...

4.2.2 INVESTMENTS TO BE ENCOURAGED

Moving to a new mobility culture that encourages alternative mobility behaviours reflecting an evolution in European mobility values and culture requires further enhancement of the transport infrastructure in this direction. In REBALANCE, we have pointed out that the culture of mobility, after having evolved considerably over the last decades and years, has even started to shift. In this sense, the infrastructure suggestions we make here are not innovative in themselves. It is mainly a question of continuing the investment in some existing infrastructures and of reinforcing approaches that have already been tested. The aim is to generalise and harmonise these infrastructure policies amongst European countries:

- With regard to the infrastructures to be consolidated and developed further, we can mention **rail transport in its various forms (and speeds), whether for people or for goods**. It has the advantage of being able to move the largest number of passengers and the highest volumes of goods.
- In the same direction, it is also necessary to increase the development of **public transport networks** (especially those in dedicated lines, such as tramways, high service level buses, cable cars, etc.), focusing mainly on small and medium-sized cities which are often less well-equipped with public transport.
- There is also a need to intensify investment in **infrastructure for soft/active modes**, such as cycling facilities, 20 km/h zones prioritising active transport modes, pedestrian streets, as well as in **related facilities** that make it more

convenient to use these infrastructures, such as specific street furniture for parking bicycles, scooters, public benches, luggage lockers...

- The objective is not only to extend the networks, but **to strengthen the connectivity of the lines between themselves and to improve interconnectivity with other modes.**
- It is then also necessary to continue with the development of infrastructures **fostering multi-modality and intermodality**, by rethinking the design of stations and public transport vehicles, for example, as well as by setting up more park-and-ride facilities and mobility hubs.
- Along the same lines, we can also propose to invest more in **shared modes**, especially in areas with limited public transport, or in small and medium-sized towns and suburban areas. We can mention for example the implementation of mobility hubs of different types (according to their size, vehicles, services provided...) as well as the implementation of a network of shared cars, bicycles and micromodes, carpooling areas...
- For areas with limited connections to transport networks (other than the car), or for infrequent or delayed journeys, it would probably be appropriate to continue the development of **on-demand transport** services.
- In order to ensure the transfer from cars and heavy modes of transport to other encouraged modes of transport, in addition to reinforcing the alternatives, it is necessary to continue to develop **regulation and control infrastructures** such as urban tolls, limited or paid parking, speed cameras, automatic video inspection, access restrictions (low emission zones, meeting zones, etc.), speed bumps, traffic chicanes.
- **Revisiting the hierarchy of modes and their cohabitation** could be a way of improving the existing networks. The aim is to reduce interruptions in the networks and dangerous intersections between modes. We can mention for example of crossing infrastructures (bridges, tunnels) for pedestrians and bicycles, or adapted traffic junctions...
- In addition to the implementation of infrastructures favouring one mode or restricting another, it is also important to **reinforce internet and telecommunication networks, services and infrastructures that are sometimes invisible to users.**



4.2.3 INVESTMENTS TO BE EXPERIMENTED

Within the framework of the REBALANCE project, we have envisioned the mobility of the future, which would reflect, among other things, the most probable perspectives according to the experts and the aspirations of the European citizens. However, aiming at and establishing the mobility culture of the future for 2050 and beyond with accuracy and precision is not an unproblematic task. Several factors may interfere, including the international political or economic situation, environmental or technological evolutions, etc. For this reason, it is essential to make enough scope for research, innovation and experiential learning. This will encourage, for instance, citizen and private initiatives, which can further enhance the value of the sector. We can mention, for example, hydrogen-powered boats and planes, airships, hypersonic planes/trains, shared and autonomous travel modules, mini-vehicles, etc. Testing innovative modes and the infrastructures adapted to them can prove to be successful. In this case, it will be possible to maintain the infrastructures or to develop them on a larger scale. If not, it may be possible to abandon them and learn from their mistakes to propose other solutions.

Given that we now can foresee the mobility infrastructure of the future, summarised in Table 2 below, stakeholders will have to make choices that should be motivated by the interest they represent for the community. Therefore, what are the most useful assessment, monitoring and decision support methods in this context?

Table 2: Translation of the "vision" into infrastructures

Nº	Vision	Infrastructure
1	<i>Cultural change</i>	Considering the different social groups
		Seamlessness of user experience
		Calm mobility in the city and fast connections between cities
		Ensure a flexible public space
		Rethink zoning
2	<i>Modernity and mobility</i>	Multiscale mobility and transport thinking
		Seamlessness of user experience
		Generalise and unify MaaS
		Ensure a flexible public space
		Modernise networks
3	<i>Critical revisitation of speed and efficiency</i>	Multiscale mobility and transport thinking
		Seamlessness of user experience
		Calm mobility in the city and fast connections between cities
		Generalise restrictions on large motorised or polluting vehicles
		Continue to extend and interconnect public transport networks
		Continue to develop multimodality and intermodality
		Continue to develop shared mobility
		Continue to develop transport on demand
		Continue to develop active mobility networks (cycling and pedestrian)
		Rethink zoning

		Prioritise operations according to their environmental and social impact
4	<i>Technology that prevents place detachment and time alienation</i>	Seamlessness of user experience
		Generalise and unify MaaS
		Ensure a flexible public space
		Modernise networks
5	<i>Mobility justice</i>	Multiscale mobility and transport thinking
		Considering the different social groups
		Continue to extend and interconnect public transport networks
		Continue to develop multimodality and intermodality
		Continue to develop shared mobility
		Continue to develop transport on demand
		Continue to develop active mobility networks (cycling and pedestrian)
		Generalise and unify MaaS
		Rethink zoning
		Prioritise operations according to their environmental and social impact
6	<i>People-centred mobility</i>	Multiscale mobility and transport thinking
		Considering the different social groups
		Seamlessness of user experience
		Calm mobility in the city and fast connections between cities
		Generalise restrictions on large motorised or polluting vehicles
		Generalise and unify MaaS
		Ensure a flexible public space
		Modernise networks
		Rethink zoning
7	<i>Active mobility</i>	Generalise restrictions on large motorised or polluting vehicles
		Ensure a flexible public space
		Prioritise operations according to their environmental and social impact
8	<i>Meaningful travel time</i>	Multiscale mobility and transport thinking
		Considering the different social groups
		Seamlessness of user experience
		Calm mobility in the city and fast connections between cities
		Ensure a flexible public space
		Rethink zoning
		Prioritise operations according to their environmental and social impact
9	<i>Dyschronicity</i>	Calm mobility in the city and fast connections between cities
		Generalise and unify MaaS

		Modernise networks
10	<i>Customised mobility</i>	Multiscale mobility and transport thinking
		Considering the different social groups
		Seamlessness of user experience
		Continue to extend and interconnect public transport networks
		Continue to develop multimodality and intermobility
		Continue to develop shared mobility
		Continue to develop transport on demand
		Continue to develop active mobility networks (cycling and pedestrian)
		Generalise and unify MaaS
		Ensure a flexible public space
		Modernise networks
		Rethink zoning
		Prioritise operations according to their environmental and social impact



5 SECTION 3: ASSESSMENT METHODS

The implementation of transport or mobility-related infrastructure necessarily requires a validation and choice between several proposals and alternatives. Making the best choice, which is in accordance with the public interest, can be challenging and may depend on various dimensions including political, economic, social and environmental considerations... An assessment step of the draft projects and their impacts is necessary. Two methods in particular have been detailed by REBALANCE in Deliverable D3.3: CBA (Cost-Benefit Analysis) and MCA (MultiCriteria Analysis). Each of them has its advantages and disadvantages. The question of perfecting existing methods or using new ones, more in line with the emerging future mobility culture, legitimately arises. In this chapter, we will review the CBA and MCA evaluation methods and present some of the limitations they may encounter, illustrated by a real-life example. Finally, we will present a selection of alternative analysis methods to be further developed.

On the basis of REBALANCE deliverable D3.3, it is possible to summarise here the main principles of CBA and MCA:

5.1 Cost-benefit analysis (CBA)

Cost-benefit analysis is the most frequently adopted tool for project and investment assessment. Within the transport sector, it is mainly used to evaluate investments with a perspective to maximise benefits when managing public funds. The guidelines in place for such assessment are based on national regulations and schemes that cover a wide range of effects or individual values that may differ from one country to another. In most cases, the assessment procedures are in line with EU policies. Over the last few decades, there has been a significant number of detailed studies on the methods of assessing transport infrastructure projects (Mackie et al. 2014, Odgaard et al., 2006, Nijkamp et al. 2003, Grant-Muller et al. 2001, Bristow and Nellthorp 2000).

In these analyses, net benefits are usually assessed (i.e. user benefits + wider economic impacts + social impacts) and net costs (i.e. construction costs + operating costs + maintenance + user costs - revenues). The benefits may vary depending on the user's trip purpose and the hour of the day. However, there are several methods of cost-benefit analysis.

Similar to all other assessment methods, the use of cost-benefit analysis in a public transport project can have strengths and limitations:

- *Strengths*
 - enables us to express an opinion on the socio-economic convenience of a project;
 - enables us to create rankings among projects;
 - encourages the practice of identifying the economic benefits and costs, even if they are not immediately monetisable.

- *Limitations*
 - does not take redistributive effects into consideration (for these, one can use a multicriteria analysis)
 - does not consider the effect on the economic return of non-monetisable benefits or costs;
 - sometimes uses discretionary criteria for the monetisation of the costs and benefits for which no market exists.”

5.2 MultiCriteria Analysis (MCA)

MultiCriteria Analysis, is one of the methods that has been developed from the CBA critique (Thomopoulos et al., 2009). It is “*capable of eliciting the trade-offs between objectives (e.g., transportation efficiency, improved equity, and reduced environmental externalities) in ways that enable decision-makers to make rational and systematic choices regarding the preferred project*” (Berechman, 2009, p. 306).

The method has evolved as a multi-objective decision-making method for circumstances where a single criterion method would not be able to provide the required assessment framework due to generally conflicting criteria (Berechman, 2009; Thomopoulos et al., 2009). MCA aims “to allow each decision-making environment to engender its own set of criteria, *measure and score them, and then generate a system of relative weights specific to the given context.*” (Berechman, 2009, p. 308). It is necessary to specify that “[p]articipation of the decision-makers in the process is a central part of the approach.” (Thomopoulos et al., 2009, p. 3). The MCA differs from the CBA mainly in the following two aspects:

- The MCA does not set limits on the criteria, as the MCA also allows for *intangible* elements to be taken into account, such as equity considerations;
- The MCA does not require the inclusion of prices, the MCA relies on weights and scores (although it should be stressed that prices can be used in calculating these overall scores).

Among the **strengths** of the MCA we can mention:

- A very open attitude towards differing values and opinions
- Encouraging the participation of a wide range of stakeholders
- Preferences are revealed in a more direct and practical way
- The ability to take both qualitative and intangible impacts into consideration
- Contribution to the legitimisation of decision-makers' behaviour

With regard to **limitations**, we can mention:

- The subjectivity of the weights created.
- The technical complexity (especially the selection of criteria)
- A process that can be time-consuming
- Reluctance of experts to share their knowledge and power.
- Information bias of some stakeholders to strengthen their power

In connection with the study of current assessment methods, the REBALANCE project has raised the attention towards the notion of public interest in the juridical domain and its possible interaction with assessment methods.

5.3 Public interest and assessment methods

Successful mobility policies require, amongst other things, compatibility with both applicable legislation and the public interest. However, there is no precise definition of the term *public interest* in European legislation. The assessment of the adequacy of a project with the public interest depends largely on the ex-ante appreciation of decision-makers and the ex-post review of judges in case of disputes. Judges are called to assess the compatibility of a policy with the public interest by considering, in a holistic way, constitutional principles, laws, regulations, customs and traditions etc. Depending on the particularities of each situation, the court decides whether or not there is a public interest or whether a decision should be taken to favour the public interest as perceived or, in the case of several concurrent and divergent interests, to identify the most important one to protect.

In this context, as an example, we can refer to the lawsuit between the city of Madrid to the association Aedenat-Ecologistas en Acción de Madrid regarding the Ordinance suspending the functioning of the surveillance system for entry in Madrid's low emission zone (so-called "Madrid Central"). The purpose of these zones is to regulate access to a certain area of the city centre for certain vehicles by applying restrictions based on their emissions (their categories). Due to a flaw in the system, the video cameras installed at the entry points of Madrid Central incorrectly fined vehicles which in fact possessed the required permits to enter Madrid Central. The city government then implemented a moratorium on the imposition of the fines while an audit of the surveillance for entry into the low emission zones was carried out. The plaintiffs, Aedenat-Ecologistas en Acción de Madrid, opposed the moratorium established by Ordinance because it would in effect make access to Madrid Central available to any vehicle, as non-authorised vehicles entering the low emission zone would only get a warning, instead of a fine, which would not disincentivize illegal entry. This dispute first landed before the Contentious-Administrative Court of Madrid³ and the deciding judge ruled that *"the protection of health and the environment are principles that must govern [the actions of] the public authorities. And in this case, it is required to a greater extent given that an action aimed at protecting both constitutional assets is being suppressed, without offering alternatives or optional measures."* In addition, the ruling argues that the moratorium *"implies the renunciation of the municipal administration to the main mechanism to guarantee compliance with the rule recognized by the legal system, which is the exercise of the sanctioning power of the administration."* The court added, with regards to the low emission zone, that Madrid Central *"declared purpose is the protection of life, health and physical integrity of people, the protection of the environment and the management of mobility for the protection of the safety of people and road safety"*.

The court found that the public interests of health and environmental protection outweighed the legal certainty of receiving an incorrect penalty as a result of a failure of the camera system. The judge therefore criticised the city of Madrid for not having found an alternative solution to the camera system in order to safeguard public health and the environment, and stated that this situation caused damage that could not be compensated because any compensation would not have resolved the health problems created or aggravated by the non-compliance with the low emission

³ Juzgado de lo Contencioso-Administrativo nº 24 de Madrid, NIG: 28.079.00.3-2019/0016503 Procedimiento Ordinario 298/2019, 16 July 2019.



zone. However, a similar claim filed by the International Institute of Law and Environment (IIDMA) and three individuals against the Ordinance against the City of Madrid on the grounds of the violation of fundamental rights, was dismissed by another judge of the Contentious-Administrative court of Madrid⁴, citing a lack of causal relationship between the suspension of the functioning of the entry surveillance system into Madrid Central and the possible impacts on health for the citizens. The evidence provided did not point to the violation of the fundamental rights to health and the environment. In fact, in order for these rights to be considered violated, without calling into question the pre-eminence of the right to health and the environment, it was necessary to prove that, as a result of the moratorium, traffic in the low-emission zone had increased, which, in turn, would have led to an increase in pollutant emissions and the air quality. The judge indicated that the reports and studies used as evidence were only generic with regards to the health effects of environmental pollution.

Ultimately, the Madrid Central system was halted by the Spanish Supreme Court due to errors in the economic reports, causing nullity of the system.⁵

The question then arises whether the fact of being relative and assessed in an ad hoc manner, invalidates the very notion of *public interest*? We advocate that the notion is still valid. It could even prove essential to generate more cohesion around various political decisions, especially those that affect negatively, but not disproportionately, the interests of a minority of individuals for the common public interest. In this case, we consider that the public interest represents the interest of the majority at a given moment in achieving its objectives. In order to evaluate the effects of decisions and policies, especially urban ones, on the public interest, pre-impact studies, as well as post-impact assessment or monitoring, could, if well conducted, provide solid "scientific and objective" arguments. These will contribute to explicit, instantiate the public interest without however substituting for the opinions of experts or those of the majority (democracy).

We may also mention that the public interest may shift over time. National or European public interests today are not the same as they were several years ago. We can therefore discuss whether it would be possible to distinguish between 'immediate', 'medium-term' and 'long-term/strategic' public interest, where long-term public interest should prevail over shorter-term public interest. Public interest may also be different for one group or another, making it possible to distinguish between universal (for humanity), European, national, local... public interest, where the universal public interest should prevail over the local.

Within the framework of REBALANCE, it is possible to consider that there is a cross connecting link between the concepts of *shift in mobility culture*, *public interest* and *democracy*. Therefore, education and communication from all perspectives are essential for a generalised awareness raising. This will help to set the right basis for a cultural change. It should also facilitate/streamline the interpretation of the *public interest* which is not always in line with the interest of the individuals. The notion of public interest raises issues around the idea of the optimum situation for a social group. A form of *Pareto optimum* situation should be found that would benefit for a majority of citizens while not harm disproportionality minority groups.

⁴ Contencioso-administrativo nº 27 Madrid, en sentencia 189/2020, (Recurso 304/2019), 1 September 2020.

⁵ R. CASACION núm.: 5257/2020, 29 April 2021



And by accommodating the interests of the majority, without harming disproportionately minority groups, acceptability by experts and populations would be wider, democracy is better assured and decisions better explained and less contested. To conclude, we would recommend maintaining a flexible notion of *public interest*, which represents a major principle that needs to be reflected in expert assessments, particularly regarding mobility issues, which are multidimensional, multi-scale and very often counterintuitive. With this rationale supported by impact studies and objective assessments, it is possible to consider the notion of *public interest* in mobility policies, while leaving its appreciation to judges, notably by means of expert opinions. However, experts, politicians, regulators and judges need to understand the 'public interest' dimension of each mobility policy. Therefore, experts (who are the representatives of pragmatism) politicians (who draft laws and policies), and judges (who represent the defenders of the public and private interest within the framework of democratically voted laws) must be aware of the cultural change that is being promoted and understand these advantages and disadvantages.

5.4 Need for new assessment methods?

The concern for spatial and social justice (connecting to spatial planning, territorial imbalances) in the new mobility culture that is already emerging and that needs to be supported, leads us to consider that MCA would be a more appropriate method of project evaluation. But we can also wonder whether other methods are still needed. In this sense, we may think that it would be advisable to develop a method that combines the MCA and the CBA, in which some of the "values" of the MCA matrix are derived from the quantitative assessment carried out in the CBA.

Once the mobility policies have been defined, and the methods for their assessment established, what strategy should be used to improve the acceptability of the measures to be implemented by the population, and how can their mobility culture be evolved?



6 SECTION 4: POLICY STRATEGY FOR THE FUTURE OF EUROPEAN TRANSPORT

Initiating or guiding the transition in the culture of mobility towards a new one that is more in line with the needs and expectations of the European populations, as well as the political, social, economic or environmental challenges, cannot (should not) be done in a brutal way, but must go through several steps. We will propose here a strategy composed of 4 main pillars (Figure 2). This strategy is in line with the values defended by Europe as stated by the European Union, confirmed and completed by the Charter of Fundamental Rights of the EU, Maastricht Treaty and the Lisbon Treaty. These values are: *"respect for human dignity, freedom, democracy, equality, the state of law, respect for human rights, including the rights of persons belonging to minorities. They are said to be common to the Member States in a society characterised by pluralism, non-discrimination, tolerance, justice, solidarity and equality between women and men"* (Vie-publique, 2021).⁶ They represent normative values, that the EU is endeavouring to achieve. They do not reflect the actual descriptive dimensions of values that exist in EU societies. A further question should be how to overcome the dissonance between the values that the transport system and mobility policy reflect and the normative objectives of the EU.

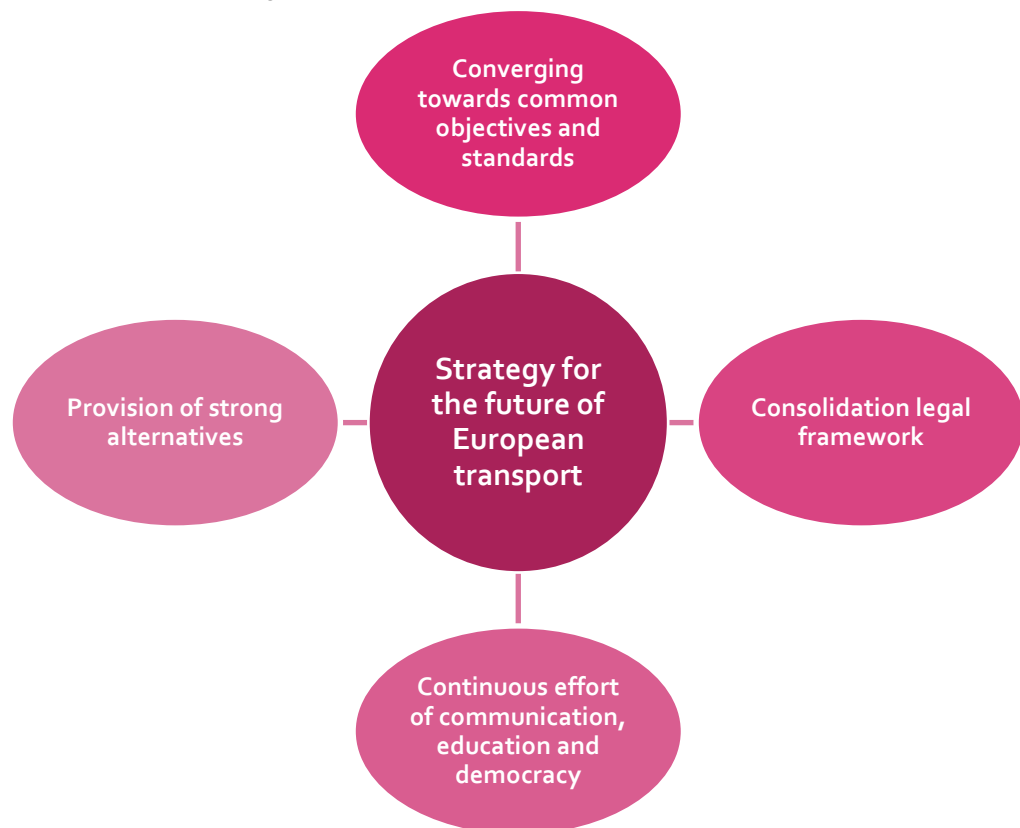


Figure 2: Strategy for the future of European transport, 4 pillars

⁶ Vie-publique. Quelles valeurs l'Union européenne défend-elle? Vie-Publiquefr 2021. <https://www.vie-publique.fr/fiches/20302-quelles-valeurs-lunion-europeenne-defend-elle> (accessed August 18, 2022).

6.1 Converging towards common objectives and standards

The first pillar is political. It involves the **establishment of objectives and standards** in relation to mobility and transport (emissions, speeds, social pricing, urban planning...) and in accordance with the public interest. These targets should be multiscale in their approach. Global objectives at European and regional level and specific objectives for each member country according to their specificities, priorities and capacities. These objectives should be time-phased and accompanied by a roadmap with clear deadlines.

6.2 Consolidation legal framework

The second pillar is legal. It consists of **creating a legal framework** favourable to the achievement of the objectives that have been identified. This means firstly checking that these objectives respect European principles, existing laws and their real compatibility with the public interest. Changes in existing laws or their prioritisation may be necessary to achieve the desired targets. New laws may also have to be introduced. Once the European legal framework is up-to-date, it may be important to adapt these laws to each country. The creation of a European High Authority for Mobility and Transport, mentioned previously, would be particularly helpful for each country and for the monitoring of the progress made towards achieving the laws and objectives.

6.3 Continuous effort of communication, education and democracy

While the first two pillars should be initiated quickly to start the cultural change in the field of mobility and transport, the third pillar consists of a **continuous, evolving and global effort**, which accompanies all phases until the objectives are reached. It is a question of continuously mobilising efforts and principles of **communication, education and democracy** addressed to all categories of populations, companies or stakeholders (Karbaumer, 2021).⁷ This communication has to be targeted and adapted to each type of interlocutor (children, adults, students, companies, stakeholders ...). The main objective is to make society aware of the challenges of mobility and transport. In this context, it is necessary to provide facts and hard evidence based on scientific and statistical facts. Then it would be useful to make each individual responsible and involved by specifying the objectives targeted in accordance with their specific interests and the public interest. Making use of participatory democracy, particularly at local level, would ensure better involvement and accountability of everyone. It would also allow the emergence of ideas, issues, and solutions that are original and probably more appropriate and innovative. The next step is to suggest solutions that are both in line with European and local expectations. Raising awareness, increasing responsibility and involving people will facilitate the choice and acceptance of the solutions to be adopted. Once these solutions have been adopted, it is necessary to continue to communicate on their evolution and their participation in the achievement of the objectives, while valuing and acknowledging individual and collective efforts. The solutions adopted can evolve throughout their implementation according to various dimensions, such as

⁷ Karbaumer R. Bremen's mobil.punkte Communication Strategies for Specific Target Groups 2021.



unexpected problems. In addition to category-specific communication, broader communication should also be adopted for prevention, awareness raising and responsibility. This communication could be based on the principles of mass influence in a soft, indirect way and in a clear, direct way. Soft and indirect communication would convey subtle messages aimed at the subconscious of each person, without stating them. It could be done through artistic, cinematographic, theatrical, musical, literary works... Direct and repeated communication would convey clear messages based on television, radio, social media, all advertising media...

6.4 Provision of strong alternatives

The last pillar is to propose and **build credible alternatives** to the current mobility system heavily based on the use of the private car, which respond to the common public interest and the objectives pursued, in parallel to the restrictions on unwanted mobility and the mobility behaviour to be surpassed. It will then be necessary to foster and promote good practice (public interest) by using examples or incentives. In addition to the communication efforts mentioned above, the aim is to mainstream good practice that helps to achieve the objectives and public interest. Practices that contradict this will then gradually be perceived as marginal and negative for society as a whole. In this context, accelerating restrictions and the gradual replacement of unwanted modes/mobility becomes meaningful.

For the implementation of the strategy to ensure a shift from the current mobility culture to one that is more responsible and in line with European objectives, a legislative framework is essential.

7 SECTION 5: EXISTING EU LAWS THAT SHOULD BE MODIFIED

Ensuring a change in the culture of mobility on a European scale, through policies of various types and the implementation of diverse infrastructures, requires a legal framework that allows this to happen. Fortunately, several European laws already provide a framework for mobility and related fields. However, several laws still need to evolve, amongst others in the direction of generalisation and standardisation. In this section, we will briefly recall the European laws already in force that frame mobility and transport, and we will then propose a list of laws that need to be modified in order to implement the proposed strategy.

7.1 European laws that frame mobility

Amongst the European laws that frame mobility we can mention as a reminder of the REBALANCE deliverable D3.3: The Urban Mobility Package, The Health and Environment Pan-European Programme (The PEP), The 2014 Paris Declaration ("City in motion: People first"), and The European Green Deal.



7.2 Laws that should evolve

Amongst the laws that should evolve, we propose to harmonise the following laws so that all European countries participate in an equitable way that respects the particularities of each member country in the achievement of the jointly established common goals:

- Traffic / road / street codes, in a way that harmonises the priorities of the modes, the symbols, pictograms and signs, the system of restriction to undesirable mobility and the system of encouragement to desired mobility
- Laws concerning freight transport, to encourage less polluting freight, particularly by train or inland waterways, to harmonise restrictions on access to towns and city centres for lorries and vans, to encourage light and active delivery methods in towns...
- Energy related laws, to encourage green energies produced locally by each member country over more polluting energies and to adopt a homogeneous energy taxation system at European level
- Labour laws, to bring more flexibility to the labour world and reduce the need for non-essential travel, thanks to the development of communication and computer technologies that have made telework possible. The objective is to make telework the norm and to make presence on company sites exceptional whenever tasks can be accomplished without having to commute. The aim is also to generalise incentives for employees to move into more sustainable modes, to reduce company car fleets, to enable companies to switch to a more sustainable fleet...
- Urban planning and development laws. The target here is to enable all over Europe to introduce the necessary modifications to urban spaces in favour of a new mobility, whether in terms of the implementation of transport infrastructure or the relocation of households or the redistribution of resources...
- Communication and information laws to enable targeted or widespread communication (as described above) aimed at increasing awareness of mobility and transport issues among the population, businesses and decision-makers, and to make them feel more responsible and involved in a process aimed at achieving the common public interest mobility goals.
- Civil / criminal laws. The aim is to enable and develop and homogenise restrictions on mobility and unwanted mobility behaviour.
- Eventually, review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport.



Table 3 below summarises the laws that would require modification to be in line with the vision of mobility as described in REBALANCE.



Table 3: The "vision" and laws modification

N°	Vision	EU laws to be modified
1	<i>Cultural change</i>	Traffic / road / street codes
		Laws concerning freight transport
		Energy related laws
		Labour laws
		Urban planning and development laws
		Communication and information laws
		Civil / criminal laws
		Eventually review the hierarchy of laws
2	<i>Modernity and mobility</i>	Traffic / road / street codes
		Laws concerning freight transport
		Energy related laws
		Labour laws
		Urban planning and development laws
		Communication and information laws
3	<i>Critical revisitation of speed and efficiency</i>	Traffic / road / street codes
		Laws concerning freight transport
		Energy related laws
		Labour laws
		Urban planning and development laws
4	<i>Technology that prevents place detachment and time alienation</i>	Communication and information laws
		Traffic / road / street codes
		Urban planning and development laws
		Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
5	<i>Mobility justice</i>	Traffic / road / street codes
		Labour laws
		Urban planning and development laws
		Communication and information laws
		Civil / criminal laws
		Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
6	<i>People-centred mobility</i>	Traffic / road / street codes
		Urban planning and development laws
		Communication and information laws
		Civil / criminal laws
		Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
7	<i>Active mobility</i>	Traffic / road / street codes
		Laws concerning freight transport
		Energy related laws

		Labour laws
		Urban planning and development laws
		Communication and information laws
		Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
8	<i>Meaningful travel time</i>	Traffic / road / street codes
		Laws concerning freight transport
		Energy related laws
		Labour laws
		Urban planning and development laws
		Communication and information laws
		Civil / criminal laws
		Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
9	<i>Dyschronicity</i>	Traffic / road / street codes
		Labour laws
		Urban planning and development laws
		Communication and information laws
		Civil / criminal laws
		Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
10	<i>Customised mobility</i>	Traffic / road / street codes
		Energy related laws
		Labour laws
		Urban planning and development laws
		Communication and information laws
		Civil / criminal laws
		Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport

8 WAYS FORWARD AND CONCLUSION

Within the framework of this deliverable we have mainly based on the previous outputs of REBALANCE, in particular on the deliverables D3.3: "Current Values behind the politics of Mobility: Critical Review", D4.3: "The alternative mobility vision" and D5.1: "New concepts for regulatory policies". We have mainly focused on translating the 10 points representing the alternative vision of future mobility expressed in deliverable D4.3, first into policy objectives, then into principles for the choice and development of transport and mobility related infrastructures, and finally into recommendations for European laws to be adapted in order to achieve the objectives targeted at the European scale. The table in the attachments summarises our different proposals for each point of the vision in terms of policy objectives, infrastructure or legislation. In parallel, to achieve a shift in the mobility culture, we recommended an adapted communication approach and methods for assessing and deciding on transport projects.

Our recommendations are wide-ranging and need to be further clarified in terms of specific objectives for each EU member state. Following this, methods for evaluating policies and projects should be adopted, taking the MCA methods as a basis and going further.



9 ATTACHMENTS

Table 4: Translation of the "vision" into policy objectives, infrastructures and laws

N°	Vision	Policy objectives	Infrastructure	EU laws to be modified
1	Cultural change	Behavioural change	Considering the different social groups	Traffic / road / street codes
		Calming the city	Seamlessness of user experience	Laws concerning freight transport
		People centred transport and public space	Calm mobility in the city and fast connections between cities	Energy related laws
		Mobility as a human experience: the need for seamlessness	Ensure a flexible public space	Labour laws
		Reduction of individual mobility needs	Rethink zoning	Urban planning and development laws
				Communication and information laws
				Civil / criminal laws
				Eventually review the hierarchy of laws
2	Modernity and mobility	Behavioural change	Multiscale mobility and transport thinking	Traffic / road / street codes
		Connectivity / accessibility to everywhere	Seamlessness of user experience	Laws concerning freight transport
		Reliable, modern, comfortable and safe transport equipment and infrastructure	Generalise and unify MaaS	Energy related laws
		Reduction of individual mobility needs	Ensure a flexible public space	Labour laws
			Modernise networks	Urban planning and development laws
				Communication and information laws
3	Critical revisitation of speed and efficiency	Behavioural change	Multiscale mobility and transport thinking	Traffic / road / street codes
		Connectivity / accessibility to everywhere	Seamlessness of user experience	Laws concerning freight transport
		Accessibility of everyone to the transport / mobility system	Calm mobility in the city and fast connections between cities	Energy related laws
		Calming the city	Generalise restrictions on large motorised or	Labour laws

			polluting vehicles	
		Reliable, modern, comfortable and safe transport equipment and infrastructure	Continue to extend and interconnect public transport networks	Urban planning and development laws
		People centred transport and public space	Continue to develop multimodality and intermodality	Communication and information laws
		Mobility as a human experience: the need for seamlessness	Continue to develop shared mobility	
			Continue to develop transport on demand	
			Continue to develop active mobility networks (cycling and pedestrian)	
			Rethink zoning	
			Prioritise operations according to their environmental and social impact	
4	<i>Technology that prevents place detachment and time alienation</i>	Calming the city	Seamlessness of user experience	Traffic / road / street codes
		Reliable, modern, comfortable and safe transport equipment and infrastructure	Generalise and unify MaaS	Urban planning and development laws
		People centred transport and public space	Ensure a flexible public space	Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
		Mobility as a human experience: the need for seamlessness	Modernise networks	
		Reduction of individual mobility needs		
5	<i>Mobility justice</i>	Connectivity / accessibility to everywhere	Multiscale mobility and transport thinking	Traffic / road / street codes
		Accessibility of everyone to the transport / mobility system	Considering the different social groups	Labour laws
			Continue to extend and interconnect public transport networks	Urban planning and development laws
			Continue to develop	Communication

			multimodality and intermodality	and information laws
			Continue to develop shared mobility	Civil / criminal laws
			Continue to develop transport on demand	Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
			Continue to develop active mobility networks (cycling and pedestrian)	
			Generalise and unify MaaS	
			Rethink zoning	
			Prioritise operations according to their environmental and social impact	
6	People-centred mobility	Behavioural change	Multiscale mobility and transport thinking	Traffic / road / street codes
		Connectivity / accessibility to everywhere	Considering the different social groups	Urban planning and development laws
		Accessibility of everyone to the transport / mobility system	Seamlessness of user experience	Communication and information laws
		Calming the city	Calm mobility in the city and fast connections between cities	Civil / criminal laws
		Reliable, modern, comfortable and safe transport equipment and infrastructure	Generalise restrictions on large motorised or polluting vehicles	Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
		People centred transport and public space	Generalise and unify MaaS	
		Mobility as a human experience: the need for seamlessness	Ensure a flexible public space	
		Reduction of individual mobility needs	Modernise networks	
			Rethink zoning	
7	Active mobility	Calming the city	Generalise restrictions on large motorised or	Traffic / road / street codes

8			polluting vehicles	
		People centred transport and public space	Ensure a flexible public space	Laws concerning freight transport
			Prioritise operations according to their environmental and social impact	Energy related laws
				Labour laws
				Urban planning and development laws
				Communication and information laws
				Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
	Meaningful travel time	Accessibility of everyone to the transport / mobility system	Multiscale mobility and transport thinking	Traffic / road / street codes
		Calming the city	Considering the different social groups	Laws concerning freight transport
		People centred transport and public space	Seamlessness of user experience	Energy related laws
		Reduction of individual mobility needs	Calm mobility in the city and fast connections between cities	Labour laws
			Ensure a flexible public space	Urban planning and development laws
			Rethink zoning	Communication and information laws
			Prioritise operations according to their environmental and social impact	Civil / criminal laws
				Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport



9	Dysynchronicity	Calming the city	Calm mobility in the city and fast connections between cities	Traffic / road / street codes
		Mobility as a human experience: the need for seamlessness	Generalise and unify MaaS	Labour laws
			Modernise networks	Urban planning and development laws
				Communication and information laws
				Civil / criminal laws
				Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
10	Customised mobility	Behavioural change	Multiscale mobility and transport thinking	Traffic / road / street codes
		Connectivity / accessibility to everywhere	Considering the different social groups	Energy related laws
		Accessibility of everyone to the transport / mobility system	Seamlessness of user experience	Labour laws
		Calming the city	Continue to extend and interconnect public transport networks	Urban planning and development laws
		Reliable, modern, comfortable and safe transport equipment and infrastructure	Continue to develop multimodality and intermodality	Communication and information laws
		People centred transport and public space	Continue to develop shared mobility	Civil / criminal laws
		Mobility as a human experience: the need for seamlessness	Continue to develop transport on demand	Eventually review the hierarchy of laws to generalise the obligation to address sustainable development, particularly in transport
			Continue to develop active mobility networks (cycling and pedestrian)	
			Generalise and unify MaaS	
			Ensure a flexible public space	



			Modernise networks	
			Rethink zoning	
			Prioritise operations according to their environmental and social impact	



10 ILLUSTRATION TABLE

Figure 1: Structure of D5.2 and links with other deliverables / findings	6
Figure 2: Strategy for the future of European transport, 4 pillars	30
Table 1: Translation of the "vision" into policy objective	14
Table 2: Translation of the "vision" into infrastructures.....	22
Table 3: The "vision" and laws modification	34
Table 4: Translation of the "vision" into policy objectives, infrastructures and laws .	37

