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## D2.3 Political Imperatives

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## Abbreviations

ANP	Analytical Network Process
ATM	Air Traffic Management
DCP	Dissemination and Communication Plan
EC	European Commission
EU	European Union
FP	Framework Programme for Research and Technological Development
H2020	Horizon 2020 EU Research and Innovation Program
ICT	Information and Communication Technology
INGO	International Non-Governmental Organization
MaaS	Mobility as a Service
NGO	Non-Governmental Organization
PI	Political Imperative
WP	Work Package

## Executive summary

This document illustrates the findings regarding Political Imperatives, those influencing the future of the European transport sector. This deliverable has been elaborated by the Technische Universität Berlin as task leader and by the Centre for Research and Technology Hellas (CERTH) / Hellenic Institute of Transport (HIT) as contributor.

The identification of the European Political Imperatives in the transport sector is guided by the influence they can have in being ‘game-changers’ for the whole sector. This analysis is one component of the work conducted within WP2 ‘Mapping the future prospects of transport’. Together with the other two components (‘technological advances’ and ‘future transport concepts’) the identified Political Imperatives are a key factor for identifying future challenges related to the European transport sector (in development in WP 3), and thus in deriving the elements for EU’s future transport research agenda (in development in WP 4).

Once the meaning and the use of the term ‘Political Imperative’ was defined, this report gained an INTEND working definition of the term, and developed a clear methodology for its work. This has led to analysis of 130+ Political Imperatives as produced both within and out of Europe, focusing on the different actors developing those Imperatives. As described in Chapter 3, in this Deliverable claims/demands are imperatives formulated to while intentions are imperatives formulated by the political sphere. Thus, based on frequency and relevance, the report lists circa 60+ claims/demands and an equal number of Intentions as suggested by those Political Imperatives.

As a final outcome, a comparison of formulated demands/ claims to and identified notices of intentions by the political sphere allows to identify those imperatives that are not yet part of the political agendas, but might gain importance in the future. The core analysis shows which political imperatives are currently dominating the discourse and are thus important starting points for creating an image of the future transport sector.

Imperatives that are amongst other aspects directly or indirectly having the goals of reducing GHG emissions by supporting modal shift, substituting the source of energy (EV’s, alternative fuels) or using existing infrastructure more efficiently are making up the majority. For the demands/ claims 15 out of 32 shortlisted imperatives are addressing this topic. For the intentions 13 out of 35 shortlisted imperatives are addressing this topic. These are depicted in Table 9 and Table 10.

In general, it can be stated that the demands/ claims are rather focusing the creation/ implementation of clear and reliable frameworks and regulations. On the contrary imperatives pointing to standardization and harmonization of regulations were – with one exception – completely missing in the short-list of the intentions. Here, an important point is especially the harmonization of standards, rules and regulations inside the European Union.

Forward looking imperatives are especially touching urban transport and data issues. Here it can be stated that the imperatives coming from the European stakeholders were much more forward looking and that topics like intelligent transport systems, MaaS, green logistics have – although quite weak – already found entrance into some strategy papers.

Other demands strongly point to research and development in sharing services, autonomous vehicles which are currently revolutionizing the transport sector. This requires innovative



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planning strategies and ways to regulate and develop new markets into the “right” direction, which opens-up another topic. Other demands/ claims were formulating respectively suggesting a reform of the research environment itself also by taking over a new rather holistic perspective on mobility and to orient research on societal needs. An interesting imperative that has been identified as a demand and intentions was to develop ways to reduce traffic demand and to escape from the growth-spiral.

The deliverable has created an initial snapshot of the current state of imperatives with relation to the transport sector. However, it has to be expressed that a deeper and especially longer lasting assessment of the international sphere and national sphere also by integrating other methodological approaches like expert interviews into the research concept would have been able to create deeper insights or to validate the outcomes.

This deliverable has, nevertheless, created a sufficient and most of all structured overview of the most important political imperatives can be valuable source for further analyses.

## 1 Introduction

The overall objective of the INTEND project is to deliver an elaborated study of the research needs and priorities in the transport sector. This is done by utilizing a systematic data collection method. One of the main elements of the INTEND project is the review of pertinent literature (EU and international research projects including strategic research agendas, studies or roadmaps) in order to identify future technologies for each transport mode (road, aviation, rail, maritime) as well as infrastructure and transport systems. The INTEND project will also review past and recent studies scenarios, in order to address mobility concepts future(s). Megatrends that will affect the future transport system will be identified via literature review. To ensure validity of the results, the Analytical Network Process (ANP) will be used to weight the megatrends, the influence of technological development trends, and Political Imperatives, in order to derive reliable outcomes on the most predominant trends. Finally, INTEND will develop a transport agenda to pave the way to an innovative and competitive European Transport sector. The project is driven by three main objectives:

- Define the transport research landscape
- Define the Megatrends and their impact on research needs
- Identify the main transport research needs and priorities

To enable a wide range of stakeholders to gain access to the results, INTEND will also develop an online platform, the INTEND Synopsis tool, which will constitute a dynamic knowledge base repository on the major developments in the transport sector. This will provide a visualization of main outcomes resulting from the already described ANP. The basis for the platform will be the Transport Synopsis Tool that is already developed as part of the RACE2050 project coordinated by TUB. The repository will be updated and integrated into the INTEND website to provide a comprehensive picture of all forward-looking studies focusing on technological developments, megatrends and policies.

### 1.1 The INTEND work structure

Figure 1 depicts the work flow of the INTEND project.

WP 1 and WP 5 are building the framework of the content-related work packages.

#### 1.1.1 The Work Package 2 in the frame of the INTEND project

The data collections and its analyses, as implemented within Work Package 2 (WP 2) prepare a sound basis for the identification of future challenges (WP 3) and the scouting of those drivers for the future transport research agenda of the European Union (WP4).

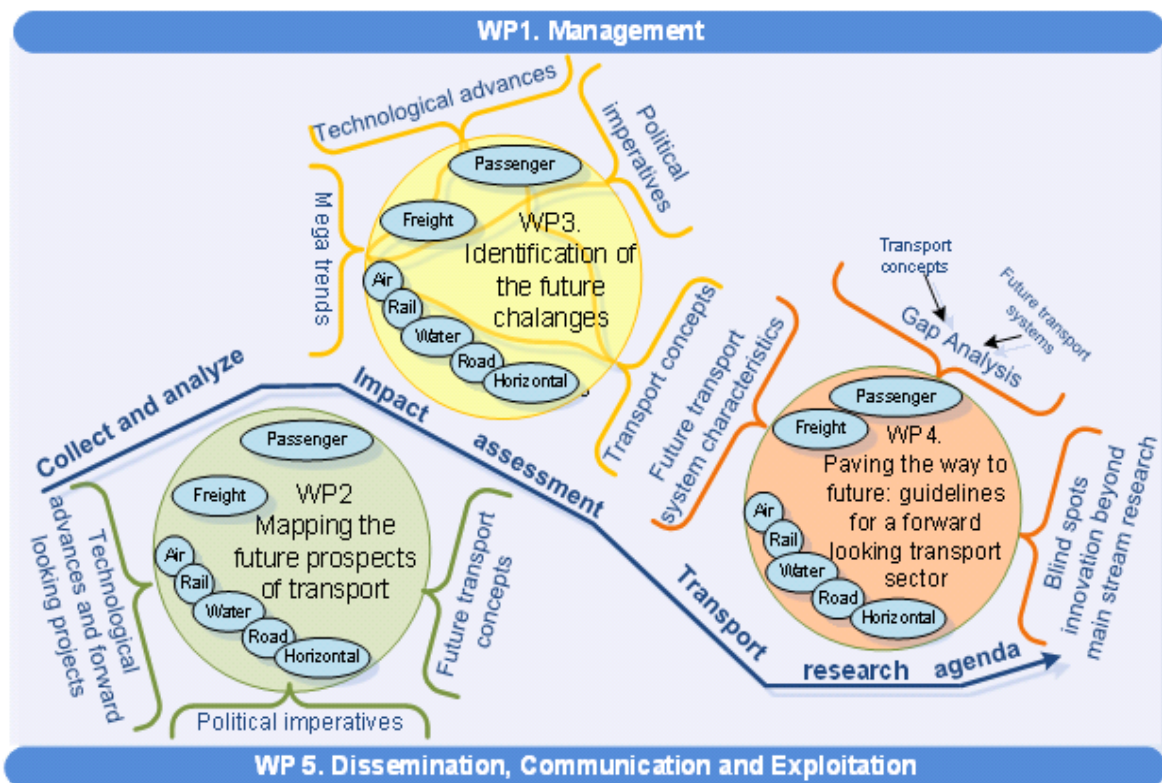
The identification of future challenges as under development in WP 3 relies on the information gathered and skimmed in WP2. In other words, WP2 offer a platform for the work of the other WPs, a platform which tackles the following elements:

- Technological advances and forward-looking projects
- Future transport concepts
- Political imperatives.

The review of information from these different perspectives will be clustered according to different dimensions. These are as follows:

- By sector:
  - Passenger transportation
  - Freight transportation
- By traffic carrier
  - Air
  - Rail
  - Water
  - Road
- Horizontal (touching the transport system as a whole).

Figure 1: Workflow in INTEND and relations of WPs



Although focusing on Europe, the review aims at gathering information also beyond the European borders. This is of utmost importance for two reasons. Firstly, in a globalized world innovative developments, if market ready, are reaching sufficient levels of market penetration quicker and bear at the same time more often a larger potential to fundamentally change the rules of existing markets. Secondly, during the last decade in many emerging countries the external effects of car depended transport systems became more and more obvious. For instance, the resulting pressure to act led, especially in China, to massive investments in sustainable transport solutions, which also supported the development of a specific innovation milieu, creating a self-enforcing agenda.

In consequence all information gathered, will allow having a first impression about trends in recent technical developments, about visions for (and concepts of) the future transport sector,

as well as about central claims and goals formulated to or by the political sphere that will shape and are already shaping – emission cuts – the future development of the transport sector.

In summary the work that is being conducted in WP 2 can be seen as the fundament for all following work packages.

### **1.1.2 Task 2.3: Political imperatives, their role within Work Package 2 and their relation to other tasks of the project**

Policies - as a direct and indirect result of political imperatives - are shaping day-to-day and future mobility by impacting the transport system itself, or influencing mobility framework conditions. With a focus on the different perspectives mentioned above, policies and their imperatives are among the most crucial factors shaping the transport market. Via direct regulation or via defining market rules, those policies address future transport concepts and technologies.

It is the goal of Task 2.3 and if this report to map, analyze and define those imperatives that might result in political actions in near future – with a time horizon of 2030/2050 – that is those imperative that might influence the future development path of mobility in the European Union.

Considering INTEND WP2's goals and work-plan it is not request to assess the identified Political Imperatives and their probability in developing real-world policy, or their importance for the future of the transport system. It is instead a central goal of this report to show a snapshot of predominant forward-looking Political Imperatives. This is done with relevance by type, spatial provenance, originator and addressee. They will moreover be clustered according to the dimension listed in the previous chapter.

The results of the WP 3 activities will then show the relevance of the chosen imperatives for the resulting ranking of the "transport systems of the future" which will be accessible via the Revised "Transport Research Synopsis Tool" hosted as subpage of the INTEND homepage.

## 2 Objectives of and approach to Task 2.3

The objectives and the approach related to Task 2.3 are described in the succeeding chapters.

### 2.1 Objectives

As stated in INTEND proposal, the objectives of T 2.3 can be listed into four tasks:

1. Identification of relevant sector-specific Political Imperatives (hereafter PI) and visions in Europe,
2. Identification of relevant sector-specific PIs and visions outside of Europe,
3. Comparison of sector-specific European and non-European Imperatives and visions
4. Identification of the most important ones to serve as an input for T 3.2.

The work that relates to task 1 and task 2 does naturally include the assessment of targeted tools and research needs.

The working definition, described in Chapter 3, **will show that a political imperative can be either the formulation of a demand/ claim or goal/ intention to reach a desired target state. But it can also be the formulation of a demand/ claim or goal/ intention to implement a certain policy or action in order to reach a previously defined target state.**

### 2.2 Methodology

As described in Chapter 2.1, the report aims at identifying most important PIs that shall serve as an input for Task 3.2. This requires the development of an adequate approach and a sound methodology, those able to filter and structure the worldwide ensemble of existing PIs that are – at the moment – part of the political discourse or deemed as putatively relevant for the future development of the transport sector in a reasonable manner.

Transformed into a research question:

***Which PIs, formulated by and to whom, are at the moment part of the worldwide political discourse or deemed as putatively relevant for the future development of the European transport sector?***

The approach that has been developed to answer this question and therein included aspects is using Mayring's method of qualitative content analysis (Mayring, 2002). Seen before the background of a challenging timeframe and limited capacities, this method shall guarantee that:

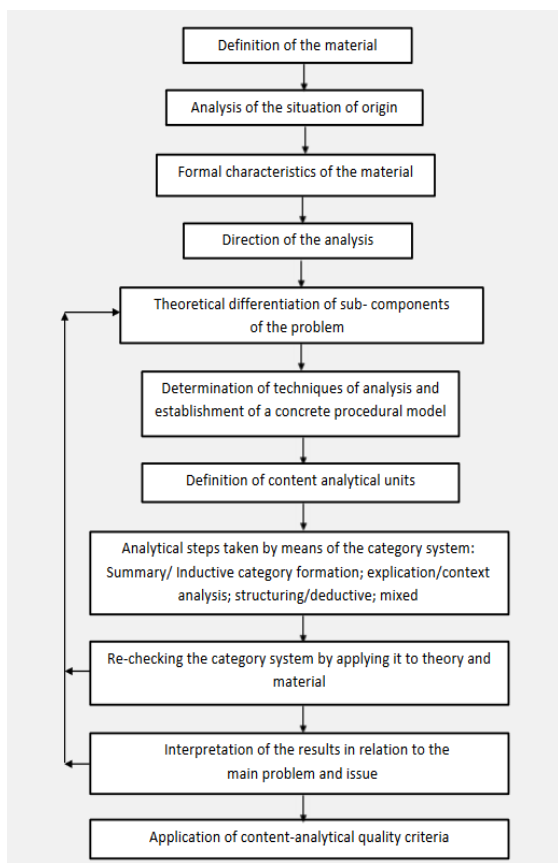
- Relevant sources containing important PIs are being identified and scanned (efficiency and effectiveness),
- Relevant PIs can be extracted from the sources identified,
- Interrelations between content, addressee and originator are made visible in a best possible way.

## 2.2.1 Methodological Review

Following Mayring (2002), the main basic concept of qualitative content analysis describes the process of "...analyzing texts [material] in a systematical manner, by using a category system that is being developed, based on the material given in a theory-based way" (Mayring 2002: 114; see also Ramsenthaler 2013: 23 [translated by the author]).

This means that this method's main purpose is to summarize text and therein included messages (content) that are being "translated" into categories organized in a specific system. The resulting "coded" and "categorized" text passages form the basis for further content-related analyses and the interpretation of the results in relation to the formulated problem (Ramsenthaler 2013: 23).

**Figure 2: General content-analytical procedural model (Mayring 2014: 54)**



For this reason, "Content analysis is not a standardized instrument that always remains the same; it must be fitted to suit the particular object or material in question and constructed especially for the issue at hand. This is defined in advance in a procedural model, which defines the individual steps of analysis and stipulates their order." (Mayring, 2014: 39).

Mayring differentiates four central characteristics of the approach. These are as follows:

- Assignment to a communication model,
- Adherence to a systematic analytical procedure,
- Category-centeredness,
- Quality criteria (Ramsenthaler, 2013: 25 [translated by the author]).

These characteristics find their expression in the procedural model, depicted in Figure 2.

The model can again be summarized into four basic working steps:

The first step comprehends a detailed examination of the research subject, the research question, the related material as well as of its communication model.

The second step focuses on the determination of analytical techniques and the development of a concrete procedural model for the analysis.

The third step consists of the actual analysis. Here the material is being reviewed based on an inductively, deductively, mixed form of both developed category systems. Thus, the content analysis can result in different kinds of outputs. These are as follows: summary, explication, structured material or mixed forms.

The fourth and last step aims at interpreting the results in relation to the main problem and issue.

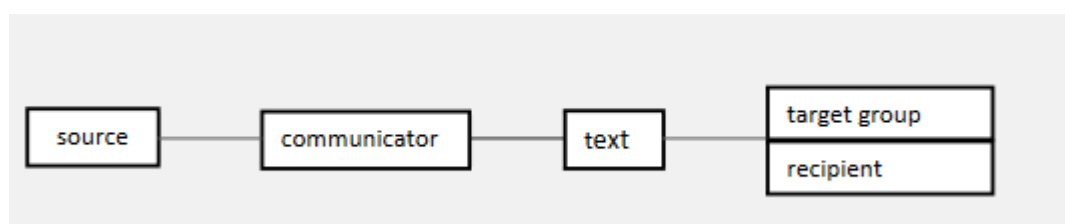
### 2.2.2 Operationalization

As already mentioned in the preceding chapter, the content analysis is not a standardized instrument, hence its procedural model needs to be adapted to the specific analytical goal. In this specific case, we consider as first task to investigate define the research subject itself. This creates the main prerequisite for identifying adequate literature containing relevant PIs. Moreover, this very first step is – at the same time – delivering a part of the basic structure for building the before mentioned system of analytical categories.

Without wanting to anticipate the working definition of the term “Political Imperative” for INTEND, which is being formulated in Chapter 3, it is common understanding that imperatives are always target- or goal-oriented.

When a simplified communication model such as the one by Lagerberg (1975) – illustrated in Figure 3 below – is applied to the case of a PI, then it becomes clear that PIs can besides their main content distinguished by originator (source) and/ or recipient (addressee).

**Figure 3; Simple content-analytical communication model (Lagerberg, 1975 cited by Mayring 2014:48)**



Consequently, a reasonable approach for identifying relevant literature would be to investigate literature containing statements, declarations, demands, claims created by stakeholders having a relation to the transport sector.

An analysis of stakeholders that are influencing the discourse on transport related PIs – being originators, intensifiers and enunciators of PIs – has to be conducted. These stakeholders can be grouped in categories as follows:

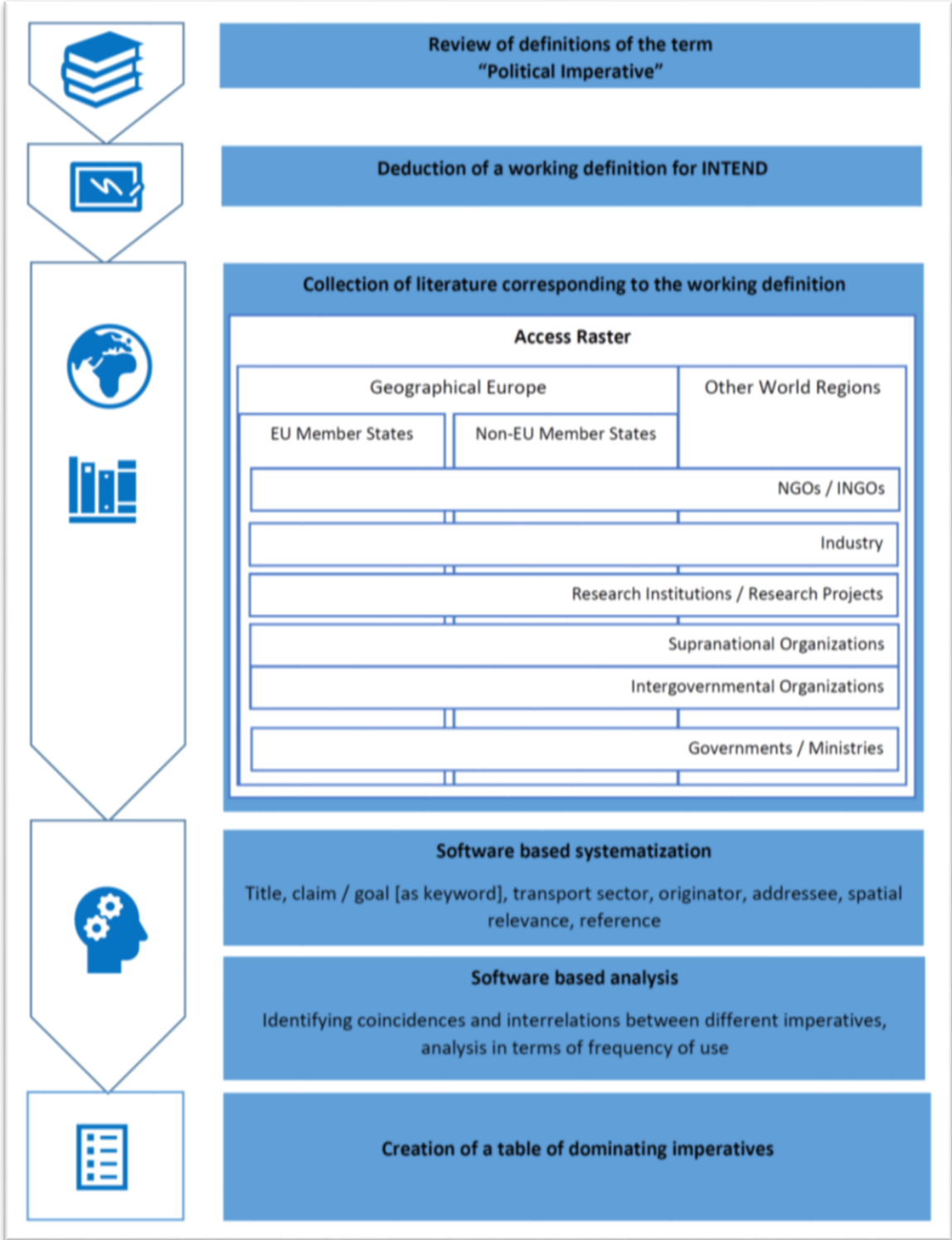
- International non-governmental organizations (INGOs), Non-governmental organizations (NGOs),
- Important companies of the transport industry,
- Research institutions (in form of scientific publications),
- Supranational organizations, intergovernmental organizations,
- Governments/ ministries.

Although the European Economic Area is from an economic perspective the world’s leading economic area, its future development is these days due to a further globalizing economy and emerging competitors more subject to external influences than ever before. This means that a stakeholder analysis and a search for adequate literature should also cover world regions beyond the European borders hence including also a spatial dimension.



As a result, we worked on a methodological model (see Figure 4).

Figure 4: Methodological approach and research process for D 2.3



After the finalization of step three – literature collection – the outcomes will be migrated to the Atlas.ti database. Atlas.ti is a scientific software for qualitative data analysis. With the help of this software, text passages containing transport related PIs can be coded (e.g. categorized according to Mayring). This is an approach that combines deductive and inductive category



and it has been chosen in order to develop the category system. The deductive set of categories consists of the ones previously defined, namely geographic region of origin, kind of stakeholder being the originator, kind of stakeholder being addressed.

The inductive set of categories – the ones that are being developed during the literature review – consist of the content related ones, meaning the imperatives themselves (claim, formulated demand, notice of intention) and the part of the transport sector that is being addressed.

This asked for a reiteration of the research. In other words, after a first round of categorization, additional sources that may be relevant to the research subject and which have not yet been identified during the first step will also emerge. These texts are subsequently added to the collection of all sources and are also taken into account in the further procedure. Indeed, after approximately a third of the literature has been coded, the inductively developed set of categories – the content related ones – will have to be consolidated and reduced. This process is being performed by merging codes with the same meaning or generalization of existing ones in order to subsume a certain number of codes under a top-level code with a more generalized message.

The final product of this whole process is a database containing a huge amount of literature whose texts have been summarized and structured in form of codes. This allows to perform different kind of analyses in order to identify overlaps, as well as interrelations between different codes (categories). Moreover, the software also allowed to perform quantitative statistical analyses. This included analyses of appearance frequencies and overlaps with other codes (code-co-occurrence). In this way, the aforementioned category system can indicate which imperative was formulated in which region, how often by what kind of author to what kind of addressee.

These results will be summarized in form of table, and the identification of the more often appearing PIs. Since all the collected literature has been fully read, assessed and coded, the list will also contain PIs aside the mainstream, which let us to identify alternative paths that are not yet part of the political discourse. Here a comparative analysis will show which demands/claims that have been formulated to the political sphere have found entrance to the discourse about the future transport system and are already part of the intentions formulated by the political sphere.

These working steps address the Objectives 1, 2, 3 as stated in Chapter 2.1.

The final table will consist of the main columns, visible in Table 1.

**Table 1: Column headers of the results table**

Political Imperative Demand/ Claim, Intention (as keyword)	Origin	Frequency of Occurrence	Sector being addressed (Frequency)

Besides the development of the table comprising PIs as an input for Task 3.2, a sector-specific comparison regarding the European and Non-European imperatives and visions for the transports sector will be performed. This working step addresses the Objective 3, as stated in chapter 2.1.

### 2.2.3 Securing quality of research and reflection of research limitations

Mayring states that the results of qualitative content analyses are often not objective. Having a look at different approaches to text analysis, two extreme positions - coming from different epistemological – backgrounds can be differentiated (Mayring, 2014).

According to Mayring (2014), these are:

1. “The hermeneutical position, embedded within a constructivist theory, tries to understand the meaning of the text as interaction between the preconceptions of the reader and the intentions of the text producer” (Mayring, 2014: 7).
2. “The positivistic position tries to measure, to record and to quantify overt aspects of the text. Those aspects of the text can be detected automatically; their frequencies can be analyzed statistically. The results of the analysis claim objectivity” (Mayring, 2014: 8).

In the last decades, the movement of mixed methods research has evolved as a new alternative, as a “third way” in social and behavioral science, but has not led to a new methodology (Mayring, 2014). This has led to the situation that researchers looking for adequate methods are often confronted with handbooks and textbooks representing the one or the other family using different criteria and sometimes including the permission to mix them up, but without a theory of integration (ibid.).

The best way to escape this (“postmodern”) arbitrary methodology would be formulating obligatory quality criteria valuable for quantitative as well as qualitative (as well as mixed method) research (ibid.). For the Qualitative Content Analysis important aspects that should secure the adherence to latter mentioned quality criteria are already structurally included in the analytical process presented in Figure 2.

Furthermore, the main principle is to start from the methodological basis of Quantitative Content Analysis, but to conceptualize the process of assigning categories to text passages as a qualitative-interpretive act, following content-analytical rules (ibid.). The Qualitative Content Analysis itself is to be understood as a data analysis technique within a rule guided research process (ibid.). This shall reduce mistakes related to the interpretation of content and their transformation of codes as well as mistakes during the process of generalizing/ merging codes.

Reflecting the communication model presented in Chapter 2.2.1 an unbalanced selection of source and communicator can lead to distortions regarding the frequency of occurrence of specific elements. Since it is a central goal of this Deliverable to assess the importance of certain imperatives based on the frequency of occurrence, mistakes related to literature selection (subjective selection, misleading ineffective search queries) might produce strong distortions.

In order to reduce the impact of subjective interpretation and literature selection a set of strict procedural rules as well as an iterative reflection of the search/ interpretation results has been designed for this deliverable. The double-eye check of selected literature for each group of stakeholders shall safeguard a critical reflection of the material chosen. These rules and their application are being documented in Chapter 4.1

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Additionally, it should not be neglected that this approach will show a snapshot of what has been filtered from available material and can thus only collect and assess information that has been found by the researchers. There will always be material that has not been considered and included in the analysis. However, the quantitative aspect of the method chosen – by assessing the frequency of occurrence of imperatives – and the systematic identification of stakeholder groups and an analysis of a larger amount of material the ‘law of large numbers’ is supporting the goal of creating a comprehensive and realistic snapshot of the actual discourse.

### 3 Defining the term “Political Imperative”

It is not in the scope of INTEND to offer an in-depth and theoretical analysis of the term “Political imperative” (hereafter PI), nor to define its philosophical backgrounds in Western culture (which is mainly built after Kant’s deontological moral philosophy). Still it is useful to briefly assess the concept, so to better frame the activity of project and better address the H2020 call’s goals.

#### 3.1 Semantic change – A review of definition and actual use

In this regard a definition of what a PI has to be offered. Following Trebilcock, the variety of meanings about “normative” is “startling” (Trebilcock 2014, p. 9). Political imperative has been dubbed as political visions, or “political culture”, “political agendas” or “political ends” (Savage and Kong 1993). In order to offer a common stand point, after Trebilcock’s suggestion, we assume that (political) imperatives are “perspectives or theories that purport to advise governments on what policies they should adopt in this context as a matter of efficiency, fairness, justice, or some other conception of right and wrong” (Trebilcock 2014, p. 9).

In this respect, Political Imperative looks like a very strong tool, which should address strategic view and public decision in every field of action of political actors. These PIs can be manifest or not. Some PIs don’t need any formulation, being part of a general political concept, universally accepted, which does not need to be explicit (for instance the idea of the state protecting its citizens, or the state’s monopoly in managing justice). This means we have no written PIs because around some arguments there is an unquestioned *idem sentire de republica*.

On the contrary, if PIs are manifest, this means that the value portrayed by the PI is not (yet) perceived as fully part of the political discourse. In these cases, the PI is the result of declining value previously given for granted, shifting perceptions, or new threat to social live. A pertinent example is the climate change, which asked a change in the existing policies and, thus, to reach new goals (as for Co2 emission reduction, energy saving etc.).

So, one manifest, the PI can have a variety of backgrounds and goals.

1. PIs are developed in order to enforce an *idem sentire* which is largely accepted, but still not fully in the political, social or economic debate and practise (e.g. Co2 reduction)
2. Explicit PIs are necessary in defining a sense of urgency and the need of action, which goes beyond the mere agreement on the issue (e.g. EU policy on climate change).
3. PIs can be a top-down action so to build an *idem sentire* on issue which are not yet portrait as crucial by a larger pool of stakeholders (e.g. industry competitiveness).

This let us to define the PI as a tool to shape the political debate and to inform consequently policies able to reach the designated goal.

It should thus be clear that PI’s goal - by its own nature – is addressing at large fundamental concepts, and “to advise governments on what policies they should adopt”. In other words, a PI is an indication of a desired target. It is true that PI presents itself with very strong definitions, encompasses both the word “political” (e.g. the state monopoly of power) and the word

“imperative” (e.g. something absolutely necessary or required; unavoidable), but the combination of the two into PI does not represent *in se* a policy. PIs are instrumental in nudging stakeholders and citizens to inform their actions towards desired goals. In this vein, a PI *in se* does not define (practical) action for the achieving of the portrayed goals, nor builds a roadmap.

In this regard, the concept of PI resembles normative scenarios, being the latter also used as a suggestion in formulating public policy able to reach a designed goal. This leads us to understand also why PIs and normative scenarios can overlap and how both can have strong value and clear target (e.g., 50% Co2 emission reduction for 2050), but they still have very vague strategy for the achievement of their targets.

Finally, PIs can vary according to time, geographies and “producers”.

About time, if we focus on the transport field, it is interesting to remark how a (explicit) PI of the past was the motorisation of agricultural work and transport, with little or null awareness of the long-term consequences (Ladd 2008). The consciousness of externalities has changed this PI, and new PIs are now aiming to not-motorized transport solutions, especially in urban areas.

About geographies, PIs can vary, even dramatically, according to local characteristics and situations. Thus PIs can be having divergent or even clashing goals. For instance, the role of climate change in formulating PIs is indeed crucial in many governmental circles, both in Europe and Asia, but is marginal (or even denied) in USA (at least at the federal level).

Indeed, the case of USA introduces to the question of the PI “producers”. In that case, while the federal government is refusing to inform its policy and its PIs according to climate change and transition toward sustainability, several USA states still address their own PIs in line with those objectives. This leads us to define PIs as the result of national, international and supranational governmental bodies’ action. Just to add more complexity to the picture, also intergovernmental organizations are PIs producers. In this symphony of PIs, we can also aspect private actor’s and stakeholder’s attempt to lobby their interests, and thus shape the debate and the PIs formulation.

### **3.2 Political imperatives in transport research and planning**

Once we move to a more detailed understanding of PIs engaging the transport sector, still we realize the need of a preliminary and notional framing of the concept. We have seen as PIs are assuming the form of commendation in formulating public policy. But, often, and exactly because of their goals (large and general in the scope), not always PIs are precise in their devising. Some PIs are very clear and self-evident: EU’s PI of keeping European industry competitive in a global scale is a great example. Another good example is EU Co2 reduction goal: while many if not all of us can agree on this PI, it is also true that we need more information about the PIs, so to understand if they need to be part of our investigation about the transport sector. This is a slippery issue, because often PIs address issues which impact transport policy, though they don’t openly address topics or issues immediately linked to transport. PIs on Co2 emission reduction for instance deal with a more general environmental argument, but without doubt transport is of the main filed of implementation. Sometime the connection is less straightforward. Social inclusion is an important PI, with a growing relevance

and here it comes the twist: the role of transport in shaping social exclusion (or vice versa to shape inclusion) is gaining traction...

This situation asks us to define two methodological line of action.

- In first place we need to identify those PIs which are really tied up with the transport sector, regardless of the definition of the topic.
- In second place, once the selection of those PIs is accomplished, we should consider and analyse only those PIs which are part of INTEND range of action and interpretation (e.g. "Identify the *main* transport research needs and priorities").

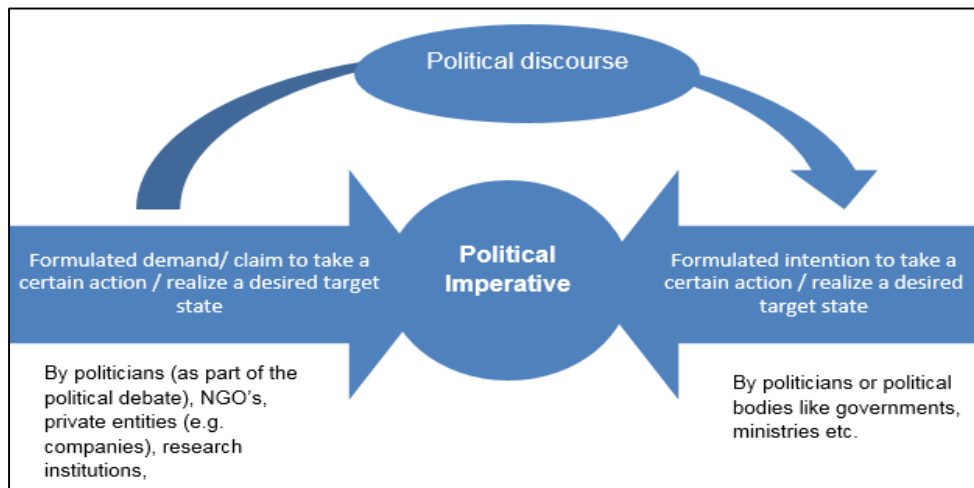
### 3.3 A practical definition for INTEND

At this stage we can finally shape a practical definition of PI, one that fits the scope of the project and, more in detail, this deliverable.

We assume that, as Figure 5. illustrates, PIs are of a dichotomous nature:

1. They are "...perspectives or theories that purport to advise governments on what policies they should adopt in this context as a matter of efficiency, fairness, justice, or some other conception of right and wrong" (Trebilcock 2014, p. 9).
2. In the context of specific perspectives and theories, Political Imperatives are notices of intention to implement specific policies/ to reach specific goals, in order to achieve efficiency, fairness, justice, or some other conception of right and wrong purported to be adequate.

Figure 5: A practical definition of the term "Political Imperative" for INTEND



This deliverable aims to identify PIs according to their actual field of engagement, regardless of their labelling or definition.

It, moreover, focuses on those major PIs affecting "economic efficiency, competitiveness, sustainability, user convenience and inclusiveness" (European Commission, 2015).

## 4 Stakeholder Analysis and compilation of political imperatives in the transport sector

### 4.1 Stakeholder Analysis/ Collection of Literature

As described in Chapter 2.2.1, qualitative content analyses always bear the risk that the selection of adequate sources as well as the assessment of their contents are being influenced by subjective actions of the scientist/ person working on the analysis itself.

In order to minimize this risk Chapter 2.2.1 already underlined that clear criteria for literature selection and assessment have to be fixed right in the beginning. The involvement of more than one person, double-checking of the appliance of latter mentioned criteria as well as an intensive critical reflection of first results and a continuously critical reflection during the collection and assessment phase can also safeguard to keep the influence of bias as a result of subjectivity as minimal as possible.

During the phase of stakeholder analysis and literature collection, criteria have been applied as presented in Table 2 and Table 3

The global criteria were the guiding principles valid for the whole stakeholder analysis and collection of literature. The criteria presented in Table 3 have been applied stakeholder-type specific.

**Table 2: Global criteria**

Criterion	Description/ Explanation
Internet search engines	Google, Qwant, Yahoo, Bing
Search queries	For the literature research, the search terms were mostly entered directly into the search function on the websites of the specific stakeholders previously identified as relevant. The following search terms were used: 'future', 'transport', 'mobility', 'future of transport/mobility', 'transport strategy', 'transport policy', and 'infrastructure development plans'. Often it was also possible to get results through using the menu function on a certain webpage. When searching on research platforms, the terms were entered directly into the search engine of the specific scientific research platform.
Use of direct sources	<ul style="list-style-type: none"> <li>• Only literature/ sources of information of the stakeholder itself or produced based on a subcontract have to be used. This shall safeguard capturing the intention/ demand that has been formulated by the stakeholder and not capturing the interpretation of another party that might be subject to influences of a third party. Example: Transport Strategy of a government instead of EC country reports.</li> <li>• Statements in press and media are not to be included for following reasons: <ol style="list-style-type: none"> <li>1. Statements in local/ regional/ national press and media are often depending on politics of the day and are thus seldom valid for a longer period of time.</li> <li>2. Statements in press and media are often formulated in the respective national language. Thus they are seldom reaching the international discourse (only indirectly as an interpretation by international press agencies). Scanning national press and media as well as would have</li> </ol> </li> </ul>



	resulted in unpredictable additional efforts (language) and many uncertainties (gaining a balanced picture).
Actuality	<ul style="list-style-type: none"> <li>• Only sources pointing to the near and far future have to be considered. This also includes statements regarding the assessment of the current</li> <li>• For transport strategies of governments/ ministries the year of this study (2018) had to fall into the period of validity of the concept/ strategy.</li> </ul>
Language	<ul style="list-style-type: none"> <li>• Only sources in English language have to be considered, for two reasons: <ol style="list-style-type: none"> <li>1. Publishing reports and statements in English language –especially via governmental/ ministerial channels – is an indicator that the publishing entity is actively participating in the international discourse.</li> <li>2. Assessing reports and statements in other national languages would have been resulted in unpredictable efforts or resulted in an unbalanced picture of the discourse.</li> </ol> </li> </ul>

Table 3: Stakeholder-specific criteria

Stakeholder	Criterion
Websites and reports of International non-governmental organizations (INGOs)	<ul style="list-style-type: none"> <li>• The reports and statements of interest should focus on a global scale or at least on one specific region covering more than one country.</li> </ul>
Non-governmental organizations (NGOs)	<ul style="list-style-type: none"> <li>• The reports and statements of interest should focus on a certain region or more than one country.</li> <li>• Reports and statements of national NGOs should not be included to avoid creating an unbalanced picture.</li> </ul>
Important companies of the transport industry	<ul style="list-style-type: none"> <li>• Companies of the transport industry have their headquarters in one country. In order to avoid creating an unbalanced picture only globally operating companies will be included. The sectors investigated are as follows: Consultants, Oil/ Gas Companies, Logistics Companies, Automobile Producers, Conglomerates, Maritime/ Shipping Companies</li> <li>• For the identification of the most important, globally operating enterprises in the field of transport, the ranking list of the business magazine Forbes was used, which can be found at the following address: <a href="https://www.forbes.com/global2000/list/">https://www.forbes.com/global2000/list/</a>. The first five companies with the highest market value in the specific sector were used for the analysis.</li> </ul>
Supranational organizations, intergovernmental organizations	<ul style="list-style-type: none"> <li>• Reports of supranational and intergovernmental organizations will be differentiated according to their spatial relevance: Global, Europe, Other world regions</li> </ul>
Governments/ ministries	<ul style="list-style-type: none"> <li>• State structures and ministerial organization/ responsibilities vary from country to country.</li> <li>• In order to include imperatives formulated by the political sphere of the most important economies official governmental websites of countries with the ten largest GDPs have been scanned. The underlying assumption was that these big economies with their huge transportation markets have an important influence on the direction of the discourse regarding the future transport system [science,</li> </ul>



	<p>research and development, production, consumption, implementation].</p> <ul style="list-style-type: none"> <li>• Since Europe is the main focus of the Intend project, reports and statements by the political sphere in Europe are of special interest.</li> <li>• For the EU 28 governmental websites and websites of the respective ministries have to be scanned in order to extract relevant statements and reports.</li> <li>• Since countries of Geographical Europe have strong economic/ societal/ political/ scientific relations with EU member states or might be future member states reports or statements by their political sphere regarding the future of the transport system is of special interest as well. Therefore their governmental websites, independent from the country's size or economic power, have to be included in the scanning process.</li> </ul>
Science	<ul style="list-style-type: none"> <li>• Research and science play a key role in developing concepts and scenarios for a future transport sector. Although the influence of third-party funded research is constantly rising – putting the research's independence at risk – publications in international journals have usually undergone profound review processes assuring that the results presented have been derived based on adequate research design. Therefore only peer-reviewed scientific articles will be included. The scientific search engines that will be used are: sciencedirect.com, scholar.google.com, and webofknowledge.com</li> </ul>

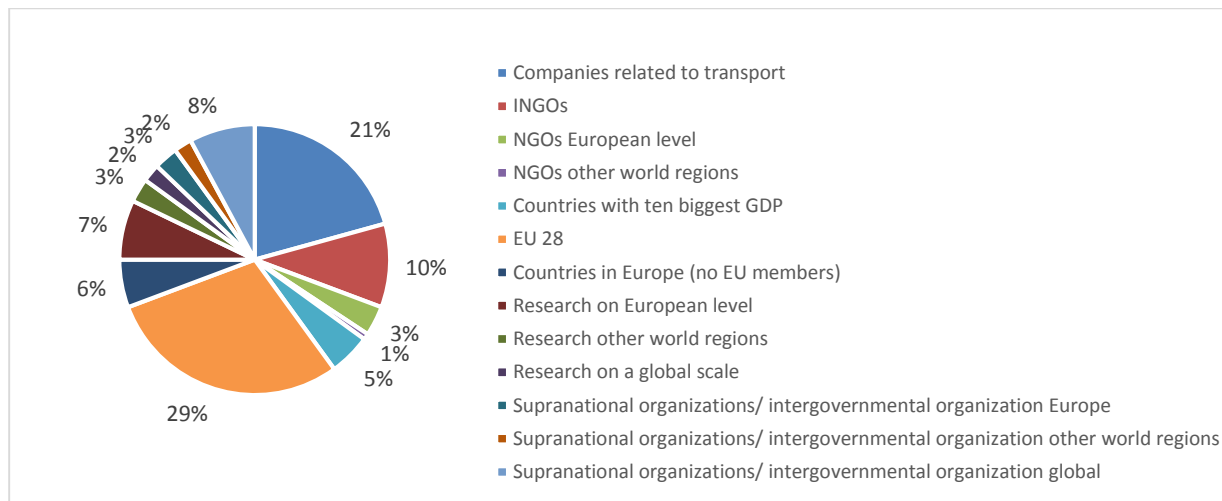
In order to avoid bias resulting from subjective perceptions of the transport sector the internet has been scanned for potential sources by more than two researchers, possibly with different backgrounds. For each type of stakeholder group the results have been discussed afterwards before the respective stakeholder found its way onto the stakeholder map, presented in Annex 1 and before the related report/ statement became part of the literature list.

## Results

As a result of the stakeholder analysis and literature collection altogether 135 sources for political imperatives have been collected. This material comprises around 7,920 pages of information. As stated before, the material identified can be based on the communication model assigned to certain groups of stakeholders.

The relative distribution of the material is being illustrated in Figure 6. With regard to these numbers it has to be stated that governmental reports are nearly forming a third of the material that has been identified as relevant. The reason for this is that this deliverable also tries to capture imperatives by the political sphere.

**Figure 6: Relative distribution of material delivering stakeholders by stakeholder group**



In order to guarantee a comprehensive snapshot of the “state of imperatives” in Europe as well as outside of Europe, governmental and ministerial homepages of all EU member states have been scanned for relevant sources. This also with the purpose of later associating the European “state of imperatives” with the context of the worldwide “state of imperatives”.

The overview in Annex 1 shows those stakeholders – per group and geographical provenance – for whom material containing political imperatives – according to the definition of Chapter 3 – has been identified.

Here, it has to be mentioned that for the different groups more material has been searched and initially assessed, but that only material of those stakeholders was finally included that fulfilled the global and stakeholder-specific criteria, as presented in Chapter 4.1. For stakeholders marked in “orange” no material in English language could be identified. Although French and German are also official European languages the international discourse is taking place in English. Therefore, it can be assumed that information that is not being provided in English especially by governments and ministries faces higher barriers to find entrance to the international – partly also European – discourse.

Moreover, some material has been produced/ published by the same stakeholder. This is for example the case concerning big organizations like the European Union or the World Bank.

The whole list of the collected material with clear references is included in Annex 2 of this deliverable.

## 4.2 Adding Literature to the Atlas.ti Database

Atlas.ti offers the possibility to add different document types to the project and to use them for evaluation: not only text documents, but also web pages, geo data, audio and video files.

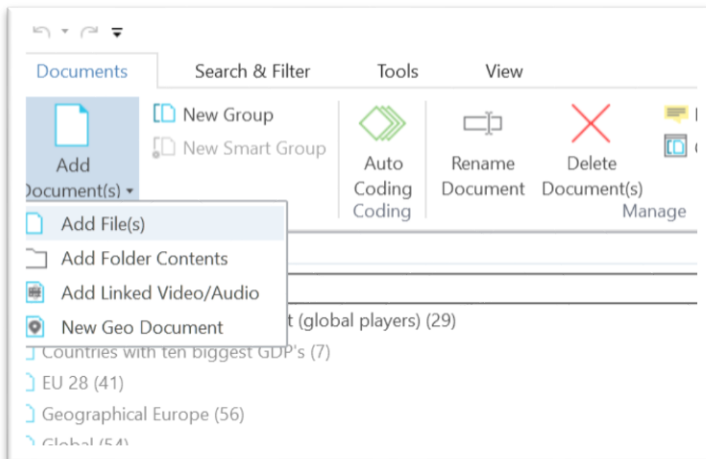
For this deliverable only text documents e.g. PDF-files, HTML-files and doc-files were used, which were identified as suitable sources during the literature research. As described in Chapter 4.1., websites and reports of International Non-governmental organizations (INGOs), Non-governmental organizations (NGOs), important companies of the transport sector,

## D2.3 Political Imperatives

supranational organizations and intergovernmental organizations, governments/ministries and scientific research were used. To prevent any interpretation by a third party, only sources directly from the respective stakeholder were used for the study.

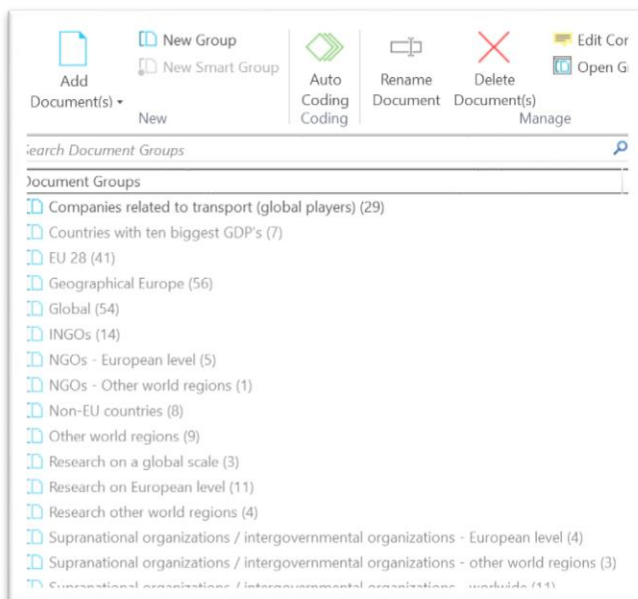
As Figure 7 illustrates, documents can be added under 'Add File(s)' in the submenu of 'Add Document(s)'. The added documents are stored as a copy in a specific program folder. The document is opened immediately and can be edited.

**Figure 7: Adding sources in Atlas.ti**



In addition, it is possible to assign the documents to specific document groups, which facilitates subsequent evaluation and processing. The document groups of this analysis are based on the deductive categorization of the various stakeholders, which have been defined in advance, and on the type and geographical affiliation of the specific stakeholder.

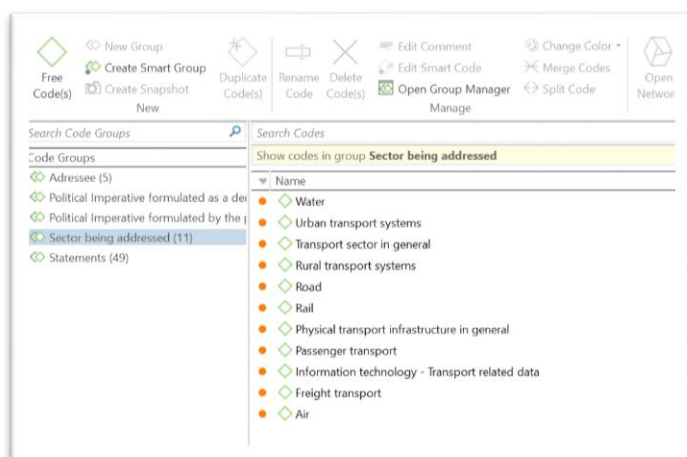
**Figure 8: Assigning literature to document groups**



### 4.3 Scanning and Coding Literature with Atlas.ti

As already described in Chapter 2.2.2., the analysis of the sources consists of a deductive set of categories (kind of the stakeholder being the originator and kind of stakeholder being addressed, transport sector that is being addressed), which were defined in advance, and an inductive creation of categories (imperatives themselves: claim, formulated demand, notice of intention), which are developed during the coding process.

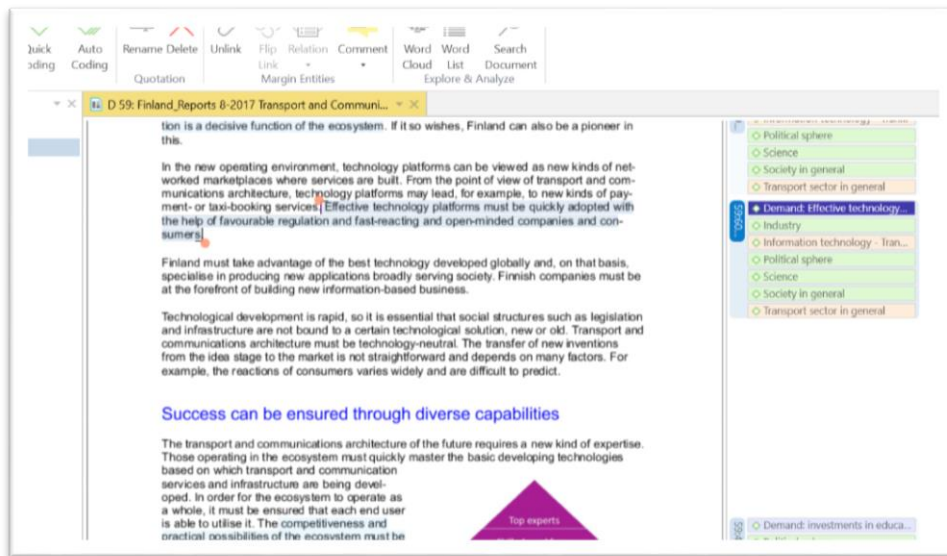
Figure 9: Creating code groups in Atlas.ti



To make the categorization process more efficient, Atlas.ti offers the option of creating code groups (Figure 9) and highlighting them in color. Documents are scanned directly in Atlas.ti and text passages related to transport specific PIs were – according to the rules of qualitative content analyses – systematically coded.

During the coding process, each marked text passage is assigned whether it is an intention or a demand (as described in Chapter 5), to which transport sector the imperative can be assigned and, in the case of a demand, who is the originator of the claim and to whom it is addressed. The following screenshot (Figure 10) shows a typical imperative that would be identified as a demand: “Effective technology platforms must be quickly adopted with the help of favourable regulation and fast-reacting and open-minded companies and consumers.” (Ministry of Transport and Communications [Ed.] 2017: 29).

Figure 10: Assigning a text passage to a specific code



In this case, the imperative was classified as ‘demand’ because it represents a claim to specific actors within the sector. If this imperative has not been mentioned before and has not yet been entered as a code, a new code must be created. If the code already exists, it can be selected from a list, which also contains a search function to search for already created codes.

The text passage that has been mentioned before contains a demand to the political sphere, that ‘favorable regulation’ is necessary to adopt effective technology platforms. The industry (and R&D) is responsible in case of ‘fast-reacting and open-minded companies’. With ‘consumers’ society in general is addressed. In this case, the demand is addressed to the transport sector in general and to information technology, which was also assigned to the text passage using the codes. The sector being addressed and the addressee and originator can also be selected from the list.

In order to avoid a too subjective perspective on the content of the sources, care was taken to ensure that more than two scientists were involved in the coding process.

In this way, all texts were read and coded, enabling a detailed analysis of all sources.

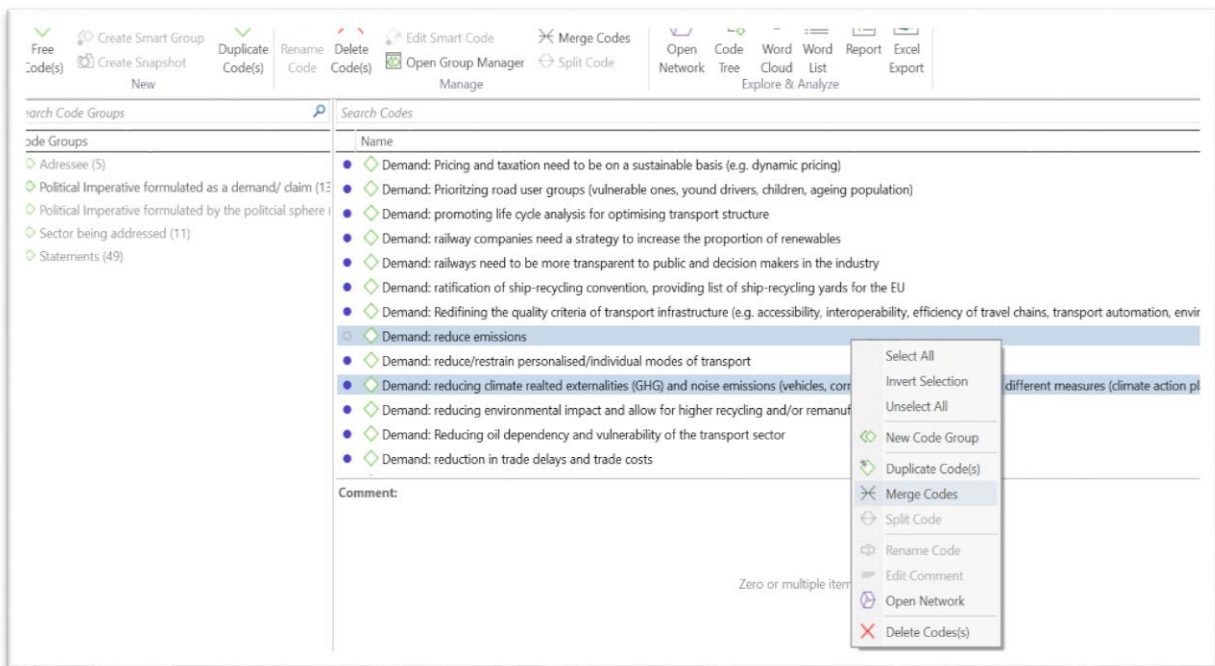
### 4.4 Generalization of codes

The merging of equivalent codes was carried out continuously during the coding process to maintain clarity. As the number of codes increases, the search function of the code list becomes increasingly complex, making it essential to organize and merge the codes for more effective and accurate work.

The following screenshot (Figure 11) shows a typical example of a merging of two similar codes.

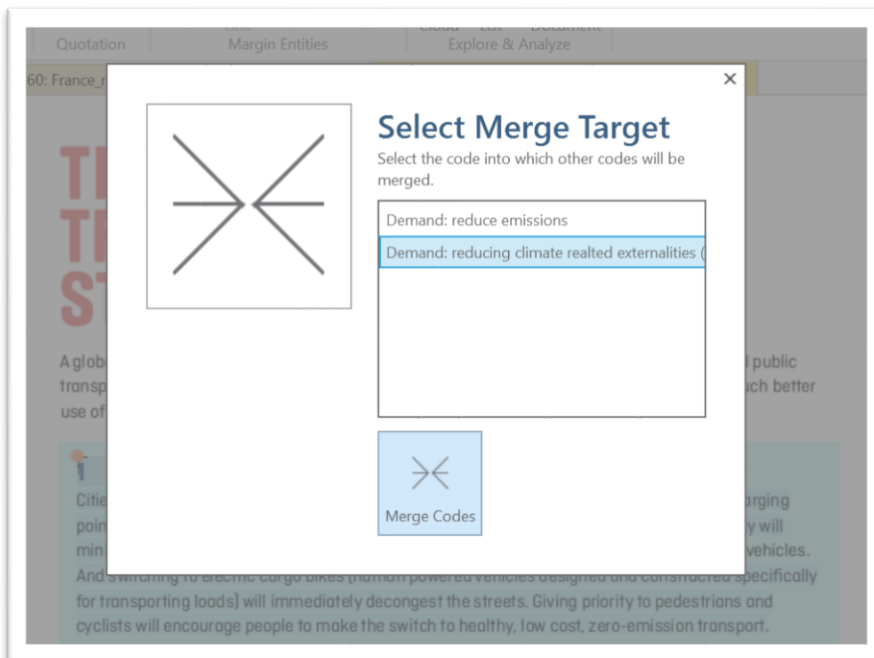
## D2.3 Political Imperatives

Figure 11: Merging two codes with similar meanings



In the following window (Figure 12) it is necessary to select in Atlas.ti which code should be used for generalization.

Figure 12: Selecting merge target



During the process of coding, it is important to ensure that the statement is generalized as precisely as possible. However, it is also important to note that no information is lost during the abstraction process.

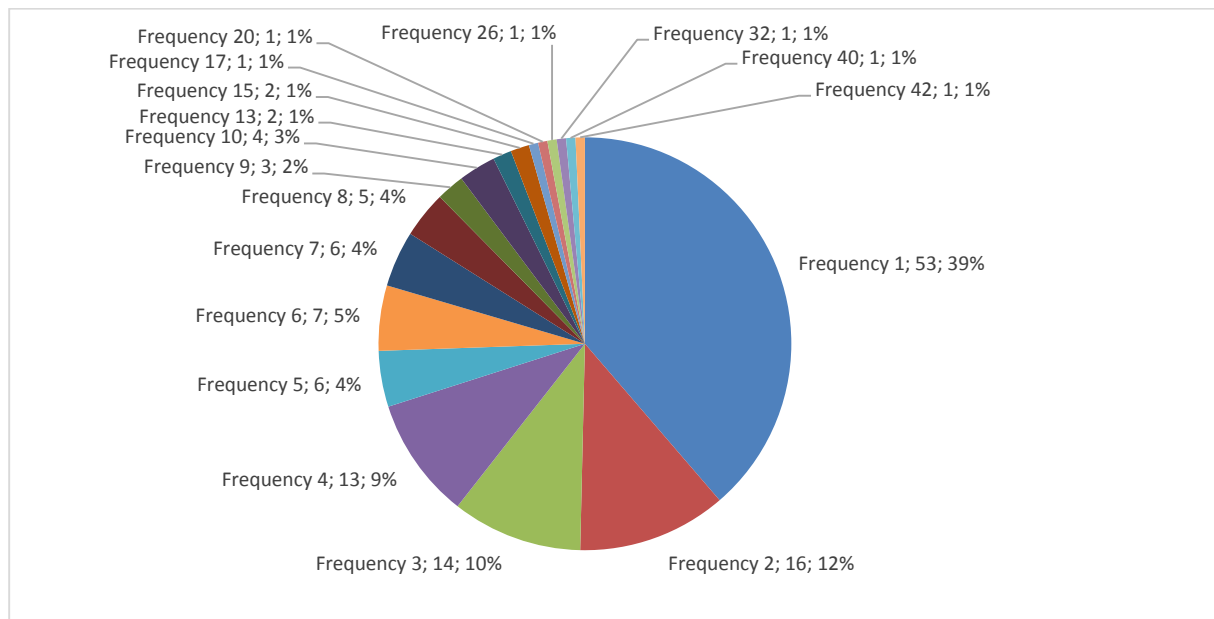
## 4.5 Results

With regard to the imperatives themselves it can be stated that for each field – demand/ claim or intention – every time a relevant passage had been identified a new code was created or the passage was assigned to an already existing code. As a result the huge number of imperatives had at the end of the assessment process a frequency of occurrence of “1”, “2”, or “3”. Although most of the resulting imperatives could – during the phase of generalization/ merging – be assigned to a top level code a huge amount of imperatives only occurring once or twice could not be generalized respectively summarized with another code. Altogether the original amount of around 633 identified demands/ claims and around 847 identified intentions could be generalized to 137 demands/ claims and 149 intentions respectively. This results in higher frequencies of occurrence per imperative allowing to identify those that seem to be of more or less importance.

For the demands/ claims it can be stated that – as depicted in Figure 13– around two thirds of identified demands were less than four times found in the different sources that have been assessed and could not be further summarized respectively merged with higher frequency codes.

As a result although demands/ claims with a frequency between 42 – 5 are only representing one third of the frequencies identified, they are representing 70% – around two thirds – of the marked passages in all sources.

**Figure 13: Shares of demands/ claims by frequency**

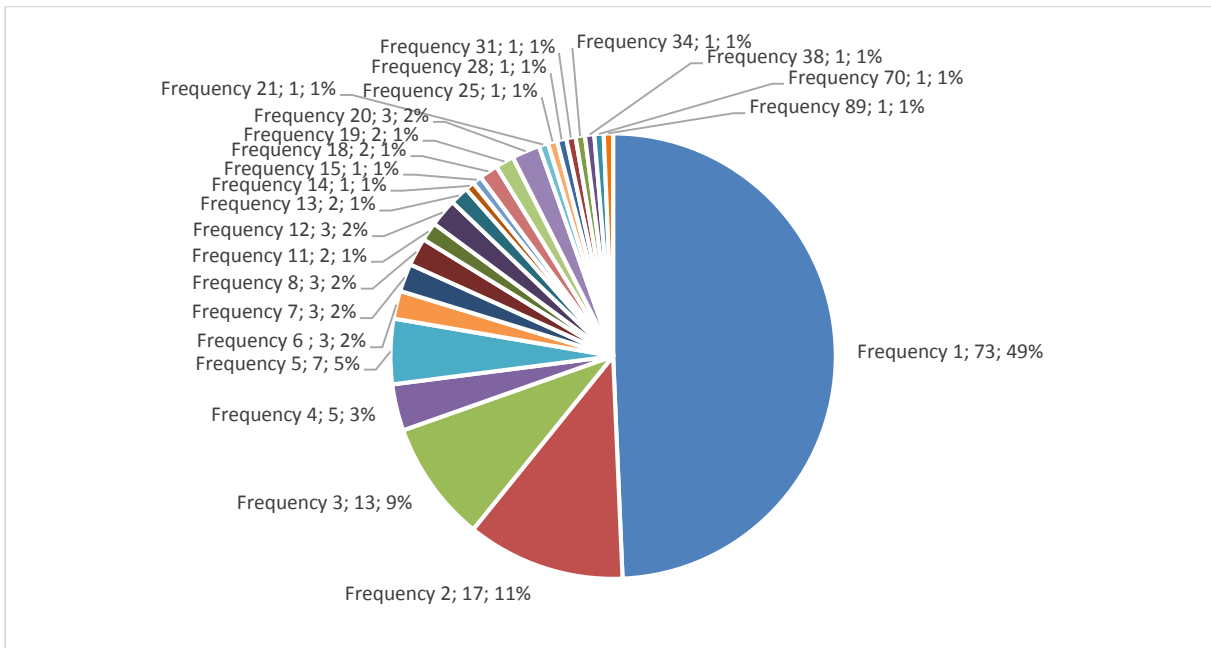


For the intentions it can be stated that – as depicted in Figure 14 – more than two thirds of identified demands/claims were less than four times found in the different sources that have been assessed and could not be further summarized respectively merged with higher frequency codes.

Although intentions with a frequency between 42 – 5 are only representing one third of the frequencies identified, they are representing 76% of the marked passages in all sources.

## D2.3 Political Imperatives

Figure 14: Shares of intentions by frequency



Again, it has to be stated that also the process of generalization and merging is based on the interpretation of the content hence potentially subject to misinterpretation.

Moreover, naturally, imperatives vary with regard to their level of detail, why they are sometimes difficult to distinguish from each other what can sometimes result in overlapping.



## D2.3 Political Imperatives

For the demands/ claims the imperatives having the highest frequencies of occurrence are:

**Table 4: Demands/ Claims with frequencies between 5 – 45**

<b>Demands Frequency 5 – 45</b>	<b>F</b>
Reducing climate related externalities (esp. GHG, noise emissions, land take by vehicles, on corridors, at hubs) by implementing different measures (climate action plans, supporting green private investments, building international coalitions, enforcement of cap trade)	45
Supporting industries and science in developing and implementing innovative fuel technologies (incl. battery technology, advanced bio-fuels), related infrastructure development as well as raising awareness for alternative (incl. electric) fuels	41
Revision, enforcement of safety standards, by creating industry-independent testing/ certifying organizations, integration of safety aspects in planning frameworks like SUMP, increasing budgets, harmonization of regulations (speed limits, vehicle safety, zero alcohol tolerance, helmet wearing for all cyclists in EU), creating a European safety agency, research on traffic safety	32
Vehicle efficiency should be addressed as a key factor to gain more energy efficiency/ reduce consumption	29
Closer public and private cooperation (private investments in the network need to become more attractive [incl. PPP])	26
Supporting modal shift (aviation to rail or inland waterway, motorized to public transport/active modes)	19
Modernizing/ extending (peak hours) Urban Mass Public Transport Systems (Metro, BRT, LRT) improving energy efficiency, and marketing for PT	18
Raising investment in infrastructure development (modernization, capacity upgrade) in rural and urban areas	18
Standardization, harmonization and adaptation of regulations on EU level (energy characteristics for rail; minimum requirements for road markings, safety barriers etc.; cross-border road conventions, single European Sky Initiative)	14
Revision of fuel and power taxation as well as regulation standards (reducing subsidies, taxes should foster innovations in fuel efficiency, clear indexing [also of impacts] for increasing comparability)	13
Reliable, economical, affordable and environmentally friendly energy supply	10
Combination of electricity, transport and heat sector based on renewable electricity, bio fuels (sector coupling)	10
Controlling or reducing travel demand	10
Further developments in technology necessary (also vehicle technology: EV's, modular vehicles, innovative materials)	10
Higher efficiency of transport systems	10
Incentives/ awareness raising campaigns for fleet electrification (buses, private vehicles, rail); public and commercial procurement	10
Increasing connectivity, intermodal access and fit-for-purpose network standards	10
Investments in research and development activities must be strengthened	10
Coherent EU framework for autonomous vehicles (infrastructure investments, safe deployment, regulations for the transitional phase, reform of vehicle safety approval regime, regulation, registration)	9
Digitization strategy/ regulations/ markets at national, European and international level (incl. transport sector)	8
Improving bulk transportation methods for long distance freight transport (rail/river)	8
Innovative research system (stronger evaluation and coordination of research policies and their impact, international research in strategic fields, long-term [basic] research considering the innovation cycle, supporting side-paths [where failing is too expensive for private research])	8
Political measures must be transparent and predictable (esp. for the industry)	8
Exploitation, piloting of new technologies must be promoted/ regional test beds for experiments, failing should be part of the ecosystem	7
Harmonized development activities and systematically implement a comprehensive vision for a competitive and sustainable European transport system and industry (preserving the competitiveness of the petroleum and fuel industry)	7
Higher rate of vehicle occupancy	7
Improved risk management (legislation, data and information sharing, risk quantification metrics, scenario planning, two way information sharing)	7
Increasing hub capacities (ports, airports, stations)	7
Market opening needs to go hand in hand with quality jobs and working conditions	7
Research and planning should follow a holistic perspective on transport and mobility (consumer preferences, perceptions, mode choice, behavioral aspects)	7
Research related to autonomous vehicles (environmental impact, impact on mobility behavior, human-machine interfaces in vessels, cyber- and data security, infrastructure investments, planning policies)	7
Universal application and enforcement of high working standards (safety/security, environmental protection, working conditions, payment)	7

## D2.3 Political Imperatives

The demands/ claims mentioned less often, but more than four and up to six times are:

**Table 5: Demands/ claims with frequencies between 5 – 6**

<b>Demands Frequency 5 – 6</b>	<b>F</b>
Balanced revision of standards related to consumer's rights and information (strengthening consumer's rights, rights should not harm the industry, introduction of new testing and benchmarking decisions)	6
Clear framework for bike-sharing (system costs should not be socialized, system development should be part of the planning framework, coordination between service providers and municipalities, parking zones, upgrading existing infrastructures, clear contracts with operators)	6
Innovative scenario development (harmonization of impact assessment and long-term scenarios)	6
Supporting innovative and green solutions for freight and commercial transport (green logistics, multi-brand platooning of lorries, cargo bikes, mobility plans, low altitude drones)	6
Creation of approaches, networks/ infrastructures and resources related to search and rescue (inhabitants, migrants, vulnerable groups)	6
Incentives and education for sustainable behavior	6
Increasing resilience of transport infrastructures	6
Investments in digital infrastructure	5
Policy framework for establishing sustainable [low carbon, efficient, secure] aviation fuels (SAF), European aviation industry as the front runner	5
Redefining quality criteria of transport infrastructure (e.g. accessibility, interoperability, efficiency of travel chains, transport automation, environmental friendliness)	5
Securing fair market access/ trade agreements (transport industry, producers, infrastructure operators, service providers)	5
Strengthening of institutions and administrative capacities (acceleration of policy implementation, de-centralization vs. centralization) [	5

For the sake of clarity, the demands/ claims mentioned less often will not be listed.

## D2.3 Political Imperatives

For the intentions the imperatives having the highest frequencies of occurrence are:

**Table 6: Intentions with frequencies between 7 – 98**

<b>Intentions Frequency 7 – 98</b>	<b>F</b>
Sustainable transition of energy supply and transport sector (low emissions, electrification, bio-fuels)	98
Improving safety standards (vehicles and infrastructures, incl. innovative technologies [C-IST]); safety training (emphasis on vulnerable groups)	74
Developing public transport systems (demand-responsive, comfortable, accessible, barrier-free, affordable, attractive, efficient, subsidized, innovative [mobility chains])	39
Improving connectivity within and of regions in a national and international (incl. European) context (incl. cross-border commuting)	36
Investments in transport infrastructure (arteries [incl. oil and gas distribution infrastructure] and gateways [airports, ports, train stations])	34
Improving intermodality	33
Increasing competitiveness and efficiency through organizational, management and functional optimization (incl. new technological solutions)	27
Implementation of intelligent transport systems (incl. autonomously driving vehicles)	23
Increasing efficiency and capacities (incl. elimination of bottlenecks)	23
Creating incentives for a modal shift, favoring environmentally-friendly modes	21
Fleet renewal and electrification	21
Supporting high speed connections, reducing travel times between cities	21
Strengthening national/ international competitiveness	21
Improving cost-effectiveness and sustainability of the financing system, developing innovative financing models	20
Reducing travel demand (e.g. by demand reducing land use structures, better communication infrastructures)	19
Improving security/ security training	18
Improving the quality of the railway infrastructure (TEN-T, freight corridors)	16
Minimization of negative impacts (externalities regarding health and climate) of transport and infrastructure	15
Improving accessibility (also for persons with reduced mobility)	14
Creating attractive infrastructures for slow modes	13
Research and development of new fuels and new transport technologies	13
Supporting ICT, open data	13
Development towards MaaS	12
Strategy development together with policy makers, science and industry	11
Improved connectivity to support growth of tourism industry	10
Increase competition in national rail market	10
Developing/ harmonizing rules concerning data collection (ownership, management etc. vehicle registration, road traffic crashes, drivers licenses, status of infrastructures), improving data quality, using innovative technologies for data collection	9
Transport sector should be privatized (passenger and freight)	9
Developing a climate change adaptation approach	8
Increasing capacities and qualities of airports	8
Creation of recharging and refueling infrastructure networks	7
Establishing a single African air transport market	7
Improving airport accessibility and predictability of first and last mile connections (passenger and freight)	7
Supporting local SMEs	7
Transport should promote environmental and urban sustainability	7

The intentions mentioned less often, but five up to six times are:

**Table 7: Intentions with frequencies between 5 – 6**

<b>Intentions 5 – 6</b>	<b>F</b>
Creating a single European transport area	6
Developing marine business (incl. tourism)	6
Effective and transparent use of funds (e.g. national, European)	6
Reducing GHG emissions by implementing alternative policy options, innovative approaches coming from the science sector	5
Reducing waiting times at airports (baggage handling, security check)	5
Reforming tax policies (uniform rules, carbon taxes, tax incentives e.g. for new vehicles or privately financed infrastructure projects)	5
Support rail as leading carrier of freight and passenger	5
Supporting Smart Mobility	5
Creating a single European transport area	5
Developing marine business (incl. tourism)	5

For the sake of clarity, the intentions mentioned less often will not be listed.

### Sectoral Assignment

With regard to an effective handling respectively merging of in their content related codes – e.g. increasing infrastructure investments in rail and road sectors – it was necessary to assign imperatives (demands/ claims or intentions) to certain transport sectors/ types of transport. This was moreover necessary since topics related to inter- and multimodality or data and IT are gaining more importance and require a perceptual extension of traditional perspectives on mobility and transport.

Therefore, additional categories topics/ sectors addressed have been added inductively during the process of coding. Due to the fact that sometimes the imperatives were formulated quite general no specific sector had been addressed. This was for example the case when typical general statements like “... investments in the transport system itself have to be increased.” Thus, we agreed to create a general category named as follows: “transport sector in general.”

This resulted in specific eight sub- and six main categories as presented in

Table 8.

**Table 8: Sectors addressed by the imperatives**

Traffic Carrier				Type of Transport		Spatial Dimension		Transport sector in general	Physical transport infrastructure	Transport related data and IT
Road	Rail	Water	Air	Passenger	Freight	Urban	Rural			

This is reasonable since the main sectors are only representing different perspectives/ dimensions of the transport system itself. This means that, naturally, more than one sector could be addressed by an imperative. Example: “...investments in rural transport infrastructures have to be increased.” In the latter case imperative was addressing the sectors, “Rural” and “Transport sector in general”.

Consequently the reported (absolute) frequencies of occurrence for the different sectors – shown in Figure 15– have to be understood as a partly overlapping. This makes it possible to find out which sectors have been mentioned together – Code-Co-Occurrence – and which sectors are actually underrepresented or not in the scope imperative producers.

Figure 15: Frequencies of occurrence in different sectors

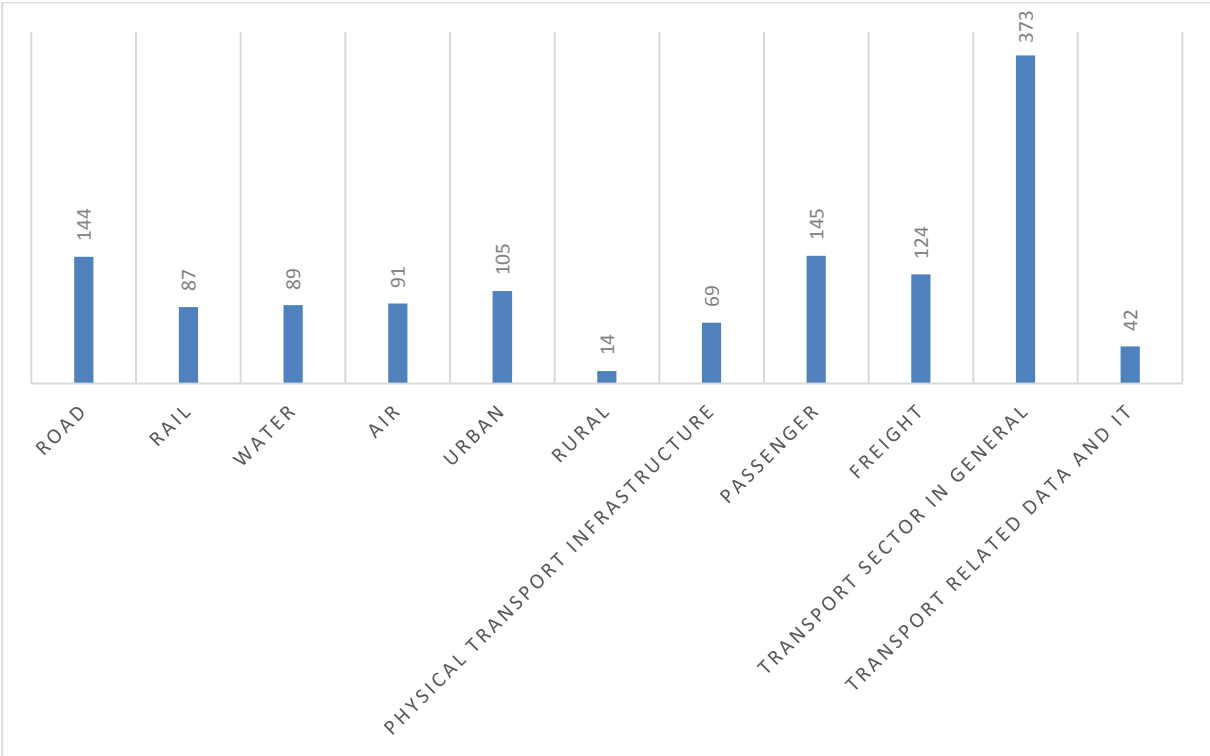


Figure 15 clearly shows that rural transport has not been addressed often, but that the relatively new topic of “Transport related data and IT” is already an important part of the actual discourse. All other sectors are showing quite balanced frequencies.

## 5 Identification of predominant/ game-changing political imperatives

The previous chapter showed the results of the coding and merging processes from a general perspective. This chapter will show results of further data processing and analysis hence clarifying how the most important imperatives could be identified, showing the most important imperatives in light of their spatial provenance and originator, conduct a comparison of demands/claims and intentions.

The latter mentioned procedure will show which demands/ claims are already included in imperatives (intentions) being formulated by the political sphere and which are not (yet) part of it.

### 5.1 Demands/ claims and Intentions

In this section demands/ claims and intentions will be handled separately. As presented in Chapter 4.5, the assessment of the identified sources has led to long lists of imperatives for demands/ claim to the political sphere and intentions that have been formulated by the political sphere.

By filtering according to frequency of occurrence, it is possible to structure these lists in a descending order, starting with those imperatives with highest frequencies and ending with those with lowest frequencies. Due to the fact that the material and codes (e.g. PIs) have also been clustered makes possible to filter and define imperatives based on their frequency of occurrence by source and/ or sector.

This led to methodological questions: is every imperative relevant? If not, how to short-list the imperatives?

As explained in Chapter 4.5, the majority of imperatives on both lists was only mentioned one to six times. This means that the probability is quite high that the respective imperative with such a frequency is coming from a single source. The goal is thus to present a balanced picture, and this should be done avoiding a resonance effect by those long and repetitive sources. In other words we need to impose a “threshold frequency”. This means that the threshold frequency is the one that decides whether the imperative should be shortlisted or not.

#### 5.1.1 Imposing a threshold frequency

The optimal way of identifying whether a code is the outcome of a single source is to create a cross-table containing the sources of the imperatives on the X-axis and the imperatives on the Y-axis. In such a diagram, it becomes evident if a given code has been mentioned in one source. This table has been created for in Atlas.ti and then been exported to MS Excel. By counting how often values of “1 – imperative mentioned only one time for a source”, “2 – imperative mentioned two times for a source”, etc. it is possible to determine from which frequency of occurrence it can be assured that the imperative is not coming from on source only. For the imperatives identified in this deliverable for frequencies higher than “6” the values are “0”. Thus it can be assured that all imperatives with a higher frequency value than “6” are coming from more than one source.

### **5.1.2 Short-listing the results**

By applying such a threshold (and including the cross-frequencies for the type of stakeholder and sector addressed) we can define the outputs as shown in Table 9 and Table 10.

For better understandability, the cell colors are representing the cell values. Red represents high frequency of occurrence, blue represents low/ zero frequency of occurrence.

**Table 9: Short-listed Demands/ Claims (Imperatives) to the political sphere**

No	Formulated demand/ claim to the Political Sphere - based on Atlas.ti Code	Origin													Target											
		World			World Regions Outside Europe				Geographical Europe						Frequency	Traffic Carrier being addressed				Traffic Purpose		Spatial Dimension		Physical transport infrastructure in general	Transport sector in general	Information technology - Transport related data
		Companies related to transport (global players)	INGOs	Supra-, intergovernmental organizations - worldwide	Countries with ten biggest GDP's	NGOs - Other world regions	Supra-, intergovernmental organizations - other world regions	Research other world regions	EU 28	Non-EU countries	Research on European level	Supra-, intergovernmental organizations - European level	NGOs - European level	Air		Road	Rail	Water	Passenger transport	Freight transport	Urban transport systems	Rural transport systems				
1	Reducing climate related externalities (esp. GHG, noise emissions, land take by vehicles, on corridors, at hubs) by implementing different measures (climate action plans, supporting green private investments, building international coalitions, enforcement of cap trade)	2	9	17	1	0	0	0	5	0	2	3	6	45	4	5	1	7	4	0	4	0	3	22	0	
2	Supporting industries and science in developing and implementing innovative fuel technologies (incl. battery technology, advanced bio-fuels), related infrastructure development as well as raising awareness for alternative (incl. electric) fuels	5	6	4	1	0	0	0	17	0	3	1	4	41	4	3	1	2	2	4	5	0	3	15	0	
3	Revision, enforcement of safety standards, by creating industry-independent testing/ certifying organizations, integration of safety aspects in planning frameworks like SUMP, increasing budgets, harmonization of regulations (speed limits, vehicle safety, zero alcohol tolerance, helmet wearing for all cyclists in EU), creating a European safety agency, research on traffic safety	0	4	2	2	0	0	1	2	0	0	0	21	32	0	23	0	0	1	0	3	1	1	3	0	
4	Vehicle efficiency should be addressed as a key factor to gain more energy efficiency/ reduce consumption	1	5	5	0	0	1	0	11	0	1	4	1	29	0	0	1	0	1	1	0	0	4	11	0	
5	Closer public and private cooperation (private investments in the network need to become more attractive [incl. PPP])	2	0	6	3	0	5	0	5	0	4	1	0	26	0	0	2	0	0	2	1	0	1	15	1	
6	Supporting modal shift (aviation to rail or inland waterway, motorized to public transport/active modes)	1	2	6	0	1	0	2	4	0	0	3	0	19	1	1	5	1	3	2	5	0	2	4	0	
7	Modernizing/ extending (peak hours) Urban Mass Public Transport Systems (Metro, BRT, LRT) improving energy efficiency, and marketing for PT	0	3	2	2	0	0	0	6	0	4	1	0	18	0	0	1	0	10	1	12	0	1	1	0	
8	Raising investment in infrastructure development (modernization, capacity upgrade) in rural and urban areas	2	0	4	4	0	2	0	3	1	1	1	0	18	1	0	2	0	3	6	1	0	6	4	0	
9	Standardization, harmonization and adaptation of regulations on EU level (energy characteristics for rail, minimum requirements for road markings, safety barriers etc.; cross-border road conventions, single European Sky Initiative)	0	0	1	2	0	0	0	2	0	1	1	7	14	1	8	1	0	1	3	0	0	1	2	1	
10	Revision of fuel and power taxation as well as regulation standards (reducing subsidies, taxes should foster innovations in fuel efficiency, clear indexing [also of impacts] for increasing comparability)	1	2	3	1	0	0	0	1	0	1	0	4	13	1	2	0	1	0	1	0	0	0	7	0	
11	Reliable, economical, affordable and environmentally friendly energy supply	0	0	1	0	0	0	1	2	0	0	2	4	10	0	0	0	0	1	2	0	0	0	6	0	
12	Combination of electricity, transport and heat sector based on renewable electricity, bio fuels (sector coupling)	0	2	0	0	0	0	0	4	0	4	0	0	10	0	0	0	0	3	0	2	0	1	7	0	
13	Controlling or reducing travel demand	0	4	1	0	0	0	0	3	0	0	0	2	10	1	1	0	0	2	1	1	0	4	0	0	



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14	Further developments in technology necessary (also vehicle technology: EV's, modular vehicles, innovative materials)	0	0	1	0	0	0	0	4	0	4	1	0	10	1	5	1	2	1	0	1	0	0	3	0
15	Higher efficiency of transport systems	1	0	3	1	0	0	0	1	0	0	3	1	10	1	1	0	0	1	1	1	0	0	4	1
16	Incentives/ awareness raising campaigns for fleet electrification (buses, private vehicles, rail); public and commercial procurement	1	0	4	0	0	0	0	0	0	4	0	1	10	0	2	1	1	1	0	1	0	0	4	0
17	Increasing connectivity, intermodal access and fit-for-purpose network standards	0	0	2	2	0	2	1	1	1	1	0	0	10	0	0	0	0	5	0	3	3	3	3	1
18	Investments in research and development activities must be strengthened	1	1	0	1	0	0	0	7	0	0	0	0	10	1	1	1	0	1	2	0	0	1	3	1
19	Coherent EU framework for autonomous vehicles (infrastructure investments, safe deployment, regulations for the transitional phase, reform of vehicle safety approval regime, regulation, registration)	1	0	0	1	0	0	0	3	0	1	0	3	9	0	8	0	0	2	2	0	0	1	4	1
20	Digitization strategy/ regulations/ markets at national, European and international level (incl. transport sector)	1	0	0	0	0	0	0	6	0	0	0	1	8	0	3	0	0	2	3	0	0	1	5	3
21	Improving bulk transportation methods for long distance freight transport (rail/river)	0	2	1	0	0	0	0	4	0	0	1	0	8	1	2	6	5	1	4	0	0	2	0	0
22	Innovative research system (stronger evaluation and coordination of research policies and their impact, international research in strategic fields, long-term [basic] research considering the innovation cycle, supporting side-paths [where failing is too expensive for private research])	0	0	0	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	0	0	0	0	8	0
23	Political measures must be transparent and predictable (esp. for the industry)	3	1	1	0	0	0	0	2	0	0	1	0	8	0	1	0	1	0	0	0	0	0	2	1
24	Exploitation, piloting of new technologies must be promoted/ regional test beds for experiments, failing should be part of the ecosystem	0	0	1	0	0	0	0	4	0	1	0	1	7	0	2	0	0	1	2	0	0	1	3	1
25	Harmonized development activities and systematically implement a comprehensive vision for a competitive and sustainable European transport system and industry (preserving the competitiveness of the petroleum and fuel industry)	1	0	0	0	0	0	0	3	0	1	0	2	7	0	1	0	0	1	1	0	0	0	4	0
26	Higher rate of vehicle occupancy	1	0	2	1	0	0	0	1	0	0	2	0	7	0	0	0	0	3	2	1	0	1	1	2
27	Improved risk management (legislation, data and information sharing, risk quantification metrics, scenario planning, two way information sharing)	0	3	0	1	0	0	0	3	0	0	0	0	7	0	2	0	1	2	4	0	0	0	4	3
28	Increasing hub capacities (ports, airports, stations)	1	1	1	3	0	0	0	0	0	0	1	0	7	3	0	0	4	0	2	0	0	0	1	0
29	Market opening needs to go hand in hand with quality jobs and working conditions	0	0	1	2	0	0	0	1	0	2	1	0	7	1	0	0	0	0	0	0	0	0	5	0
30	Research and planning should follow a holistic perspective on transport and mobility (consumer preferences, perceptions, mode choice, behavioral aspects)	2	0	0	0	1	0	2	0	0	1	0	1	7	0	1	0	0	0	0	0	0	0	5	0
31	Research related to autonomous vehicles (environmental impact, impact on mobility behavior, human-machine interfaces in vessels, cyber- and data security, infrastructure investments, planning policies)	1	0	0	0	0	0	0	0	0	6	0	0	7	0	7	0	0	0	0	0	0	0	0	0
32	Universal application and enforcement of high working standards (safety/security, environmental protection, working conditions, payment)	0	0	1	2	0	0	0	3	0	0	1	0	7	3	0	0	1	0	0	0	0	1	1	0

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Table 10: Short-listed Intentions (Imperatives) by the political sphere

No	Formulated intention by the Political Sphere - based on Atlas.ti Codes	Origin											Target												
		World			World Regions Outside Europe				Geographical Europe				Frequency	Traffic Carrier being addressed				Traffic Purpose		Spatial dimension		Physical transport infrastructure in general	Transport sector in general	Information technology - Transport related data	
		Companies related to transport (global players)	INGOs	Supra-, intergovernmental organizations - worldwide	Countries with ten biggest GDP's	NGOs - Other world regions	Supra-, intergovernmental organizations - other world regions	Research other world regions	EU 28	Non-EU countries	Research on European level	Supra-, intergovernmental organizations - European level		NGOs - European level	Air	Road	Rail	Water	Passenger transport	Freight transport	Urban transport systems				Rural transport systems
1	Sustainable transition of energy supply and transport sector (low emissions, electrification, bio-fuels)	0	0	10	2	0	5	1	66	9	0	4	1	98	8	10	11	15	17	11	6	5	12	45	3
2	Improving safety standards (vehicles and infrastructures, incl. innovative technologies [C-IST]); safety training (emphasis on vulnerable groups)	0	6	5	10	0	2	1	24	5	0	2	19	74	3	37	3	1	8	2	6	2	3	20	3
3	Developing public transport systems (demand-responsive, comfortable, accessible, barrier-free, affordable, attractive, efficient, subsidized, innovative [mobility chains])	0	0	2	2	0	0	0	29	5	0	1	0	39	1	4	5	2	25	3	10	5	3	15	1
4	Improving connectivity within and of regions in a national and international (incl. European) context (incl. cross-border commuting)	0	1	2	5	0	2	0	23	3	0	0	0	36	4	4	9	3	9	7	4	0	0	19	1
5	Investments in transport infrastructure (arteries [incl. oil and gas distribution infrastructure] and gateways [airports, ports, train stations])	1	0	3	6	0	3	0	19	2	0	0	0	34	2	8	11	2	7	7	2	1	7	11	1
6	Improving intermodality	0	0	5	4	0	3	0	19	0	0	2	0	33	4	3	4	2	9	3	5	1	5	13	1
7	Increasing competitiveness and efficiency through organizational, management and functional optimization (incl. new technological solutions)	0	0	2	2	0	0	0	13	8	0	2	0	27	3	4	2	1	2	4	2	0	2	14	2
8	Implementation of intelligent transport systems (incl. autonomously driving vehicles)	0	1	2	2	0	0	0	13	3	0	2	0	23	0	6	0	1	3	3	2	1	2	10	7
9	Increasing efficiency and capacities (incl. elimination of bottlenecks)	0	0	3	2	0	1	0	9	6	0	2	0	23	2	4	4	2	5	4	1	2	1	7	1
10	Creating incentives for a modal shift, favoring environmentally-friendly modes	0	0	2	0	0	1	0	17	0	0	1	0	21	1	4	5	3	9	2	3	4	1	6	2
11	Fleet renewal and electrification	0	1	1	0	0	0	0	17	1	0	1	0	21	2	9	8	4	9	4	5	0	4	8	2
12	Supporting high speed connections, reducing travel times between cities	0	0	3	4	0	3	0	8	3	0	0	0	21	1	3	15	0	8	2	4	0	1	4	0
13	Strengthening national/ international competitiveness	0	1	3	2	0	1	0	11	1	0	2	0	21	0	1	2	5	1	6	0	0	0	8	1
14	Improving cost-effectiveness and sustainability of the financing system, developing innovative financing models	0	0	0	1	0	0	0	13	6	0	0	0	20	1	2	2	4	4	2	1	2	2	12	1
15	Reducing travel demand (e.g. by demand reducing land use structures, better communication infrastructures)	0	0	0	0	0	0	0	19	0	0	0	0	19	0	0	0	1	4	2	2	1	2	9	3
16	Improving security/ security training	0	0	4	2	0	1	0	3	5	0	3	0	18	3	2	1	2	3	3	0	1	0	5	1
17	Improving the quality of the railway infrastructure (TEN-T, freight corridors)	0	0	5	0	0	1	0	5	1	0	4	0	16	0	0	10	0	3	6	0	0	1	1	0

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18	Minimization of negative impacts (externalities regarding health and climate) of transport and infrastructure	0	0	0	0	0	0	0	13	1	0	0	1	15	1	2	1	0	2	0	2	0	0	11	0
19	Improving accessibility (also for persons with reduced mobility)	0	0	1	2	0	1	0	10	0	0	0	0	14	0	2	0	0	6	1	3	3	0	6	0
20	Creating attractive infrastructures for slow modes	0	0	1	1	0	0	0	10	0	0	1	0	13	1	3	2	2	6	0	7	1	2	2	0
21	Research and development of new fuels and new transport technologies	4	0	0	3	0	0	0	6	0	0	0	0	13	1	1	1	1	1	0	1	0	3	11	1
22	Supporting ICT, open data	0	0	1	3	0	1	0	6	0	0	1	1	13	0	0	0	1	3	2	0	1	1	5	6
23	Development towards MaaS	0	1	0	2	0	0	0	8	1	0	0	0	12	0	0	0	0	5	0	4	1	3	6	3
24	Strategy development together with policy makers, science and industry	0	2	0	2	0	0	0	6	1	0	0	0	11	1	1	0	0	0	0	1	0	0	8	0
25	Improved connectivity to support growth of tourism industry	0	0	2	0	0	2	0	5	1	0	0	0	10	4	1	1	1	3	2	1	1	1	2	0
26	Increase competition in national rail market	0	0	4	1	0	2	0	0	1	0	2	0	10	0	0	6	0	1	1	0	0	0	0	0
27	Developing/ harmonizing rules concerning data collection (ownership, management etc. vehicle registration, road traffic crashes, drivers licenses, status of infrastructures), improving data quality, using innovative technologies for data collection	0	1	2	1	0	1	0	3	0	0	1	0	9	0	4	0	0	1	1	0	0	2	2	5
28	Transport sector should be privatized (passenger and freight)	0	0	1	1	0	1	0	0	6	0	0	0	9	0	0	3	1	0	2	0	0	0	4	0
29	Developing a climate change adaptation approach	0	0	0	0	0	0	0	8	0	0	0	0	8	0	0	0	0	0	0	0	0	0	8	0
30	Increasing capacities and qualities of airports	0	0	2	4	0	1	0	0	0	0	1	0	8	4	1	3	2	0	1	2	0	1	1	0
31	Creation of recharging and refueling infrastructure networks	0	0	0	0	0	0	0	7	0	0	0	0	7	0	2	0	0	0	0	0	0	3	1	0
32	Establishing a single African air transport market	0	1	3	0	0	3	0	0	0	0	0	0	7	3	0	0	0	1	2	0	0	0	1	0
33	Improving airport accessibility and predictability of first and last mile connections (passenger and freight)	0	0	1	0	0	1	0	5	0	0	0	0	7	3	1	1	0	2	1	0	0	1	0	0
34	Supporting local SMEs	0	0	0	0	0	0	0	7	0	0	0	0	7	1	1	0	1	0	1	0	0	0	3	1
35	Transport should promote environmental and urban sustainability	0	0	2	2	0	2	0	1	0	0	0	0	7	0	0	0	0	1	1	3	0	0	2	0

As a general outcome, it is remarkable that the imperatives with the highest frequencies are the ones that have the goals of making the transport sector more sustainable and safe and are thus targeting the whole sector. This includes PIs with goals of reducing GHG emissions by supporting modal shift, substituting the source of energy (EV's, alternative fuels) or using existing infrastructure more efficiently are making up the majority. For the demands/ claims 15 out of 32 imperatives are addressing this topic. For the intentions 13 out of 35 imperatives are addressing this topic.

On both lists the aspect of traffic safety received a quite high ranking (Demands/ Claims Rank 3, Intentions Rank 2) and the imperatives are over proportionally often targeting road transport.

### 5.1.3 Demands/ Claims

In general, it can be stated that the demands/ claims focus mainly on the creation and implementation of clear and reliable frameworks and regulations. This is the case for the demands/ claims 1, 2, 9, 10, 19, 20, 23, 25, 27 and 32 as shown in Table 9. Here an important point is especially the harmonization of standards, rules and regulations inside the European Union (e.g. soft-policy tools). Forward looking imperatives are especially touching urban transport and data issues. Here the imperatives are demanding:

- A standardized EU-wide framework for autonomous driving vehicles, including the transition phase;
- A digitization strategy for the transport sector (including clear and secure standards for data generation, management and privacy);
- Harmonized development activities and a systematically implementation of a comprehensive vision for a competitive and sustainable European transport system and industry (preserving the competitiveness of the fossil fuel industry).

According to the imperatives identified, the development and implementation of new technologies should be fostered by stronger financial commitment of the governments – also by regulatory measures like fair fuel taxes – but also by raising the attractiveness for private investors. Moreover, there are demands/ claims that are not exclusively targeting further growth, extensions of infrastructures. The imperatives 4, 12, 13, 15 and 26 are stressing the point of reducing the use of existing capacities, raise efficiency levels – e.g. by creating synergies via sector coupling – or increase levels of vehicle occupation.

Some demands are also stating that the customer should be able to make informed decisions, as for example in the cases of mode choice, vehicle procurement, and fuel-consumption. According to the related imperatives this can be reached by implementing information campaigns, an implementation of transparent and comparable pricing standards, but also via an advance information tool (carbon footprints of possible mobility alternatives), as stated in the imperatives 2, 7, 10 and 30.

### 5.1.4 Intentions

The intentions are also mostly focused on the transport sector in general. The two most important targets are i) to realize the transition of the energy supply (electrification of the transport sector) and ii) to improve traffic safety. The latter imperative is mostly related to road

transport. Altogether, 11 out of 35 imperatives formulated policy intentions to directly or indirectly reduce the negative impacts on the environment. In general, it can be stated that imperatives pointing to standardization, harmonization of regulations were in the short-list of the intentions – with one exception – completely missing.

Instead, the imperatives were more often pointing to a local, regional, national, international integration of physical networks to improve connectivity or accessibility and thus create a more attractive climate for enterprises. Here 8 out of 35 imperatives were directly or indirectly addressing this target. These were the intentions 4, 5, 12, 17, 19, 25, 32, 33.

Another often mentioned topic was the one that targeted an optimization of existing networks (nodes and hubs) by reducing bottlenecks or extending existing capacities. This topic has been addressed by the imperatives 3, 5, 7, 9, 12, 30.

A general observation that can already be made even by having a quick look of Table 10: the imperatives are in equal measure addressing most of the target sectors. While the demand/claims were mostly focusing urban transport systems, it can be observed here that also rural transport seems to play an important role. Additionally, aspects like barrier-freedom or accessibility of vehicles and areas are more often mentioned. This is of course related to the kind of source and stakeholder.

So, the forward looking intentions (imperatives) that have been mentioned are:

- Increasing competitiveness and efficiency through organizational, management and functional optimization (incl. new technological solutions);
- Implementation of intelligent transport systems (incl. autonomously driving vehicles);
- Improving cost-effectiveness and sustainability of the financing system, developing innovative financing models;
- Supporting ICT, open data;
- Development towards MaaS.

### **5.1.5 Demands/ claims and intentions with relation to research**

Generally speaking, the sources used addressed more often demand and claim than intentions.

Highest frequencies can be reported for the technology based research, such as:

- Supporting industries and R&D in developing and implementing innovative fuel technologies (incl. battery technology, advanced bio-fuels), related infrastructure development as well as raising awareness for alternative [incl. electric] fuels;
- Research on traffic safety;
- Further developments in technology necessary (also vehicle technology: EV's, modular vehicles, innovative materials).

Other demands/ claims were formulating respectively suggesting a reform of the research environment itself or research on the impact of new technological solutions, transport systems:

- Investments in research and development activities must be strengthened;

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- Innovative research system (stronger evaluation and coordination of research policies and their impact, international research in strategic fields, long-term [basic] research considering the innovation cycle, supporting side-paths in risky but promising research fields [where failing is too expensive for private research]);
- Exploitation, piloting of new technologies must be promoted/ regional test beds for experiments, failing should be part of the ecosystem;
- Research and planning should be realized/ conducted following a holistic perspective of transport and mobility (consumer preferences, perceptions, mode choice, behavioural aspects);
- Research related to autonomous vehicles (environmental impact, impact on mobility behaviour, human-machine interfaces in vessels, cyber- and data security, infrastructure investments, planning policies).

For the intentions only five imperatives related to research and development could be identified. These were more related to the development of strategic approaches or innovative policies:

- Improving cost-effectiveness and sustainability of the financing system, developing innovative financing models;
- Research and development of new fuels and new transport technologies;
- Strategy development together with policy makers, science and industry;
- Developing/ harmonizing rules concerning data collection;
- Developing a climate change adaptation approach.

## 5.2 Analysis in in terms of spatial provenance and originator

Comparing the demands/ claims with the intentions formulated, it can be stated that the intentions formulated are generally more comprehensive. From our point of view, this has two reasons:

1. As explained before, demands/ claims are being formulated mostly by entities such as companies, NGO's and governments so to support their respective policy, and thus driving the agenda and nudging toward an implementation stage. For this reason, there are usually less comprehensive and consequently addressing a certain issue perceived as problematic.
2. The formulated intentions by the political sphere are actually an outcome of the political discourse around the demands/ claims that have before been formulated from different sides to the political sphere. Thus, political strategy papers have a rather comprehensive view on the system itself – regardless whether the transport system is only perceived as a system of physical interrelated infrastructures or as a multilevel approach serving the people's mobility requirements. They can – in most cases being regarded as a compromise – balancing the demands and expectations formulated by different stakeholders. This is the main reason why – also visible in Table 10 – most of the intentions are addressing more than one sector.

### **Companies**

Demands/ claims by companies are usually formulated to the regulating political sphere.

Reviewing the demands/ claims by companies, it can be stated that they mostly address topics that have a positive influence on their own economic development and competitiveness. As a result, strategy papers here analyzed demanded more investments. This was the case in 8 out of 32 imperatives, which e.g. included more investments in infrastructure, supporting vehicle procurement (especially EV's), supporting research and development activities. These claims were mostly addressing the transport sector in general but were often also linked to freight transport.

Formulated demands related to infrastructure investments were, moreover, mostly linked to air transport. Reviewing several annual reports by companies it could be observed that in such type of sources imperatives were mostly formulated indirectly and demanding to provide a stable, predictable, transparent policy framework. Imperatives including this kind of demands were 19, 21, 23, 25.

### **INGOs/ NGOs**

Both INGOs and NGOs were addressing those topics that had quite high frequencies of occurrence for the imperatives related to a demand/ claim. The main difference between the two groups of NGOs was – besides their spatial scope and orientation e.g. economy, environment, human-rights, Union-related – that for the European level NGOs the harmonization and standardization of regulations was much more important than for the INGOs. The most important demands in this regard were:

- Revision, enforcement of safety standards, by creating industry-independent testing/ certifying organizations, integration of safety aspects in planning frameworks like SUMP, increasing budgets, harmonization of regulations (speed limits, vehicle safety, zero alcohol tolerance, helmet wearing for all cyclists in EU), creating a European safety agency, research on traffic safety;
- Supporting standardization, harmonization and regulations at the EU level (energy characteristics for rail; minimum requirements for road markings, safety barriers etc.; cross-border road conventions, single European Sky Initiative);
- Governments need to revise fuel and power taxation as well as regulation standards (reducing subsidies, taxes should foster innovations in fuel efficiency, clear indexing [also of impacts] for increasing comparability);
- Coherent EU framework for autonomous vehicles (infrastructure investments, safe deployment, regulations for the transitional phase, reform of vehicle safety approval regime, regulation, registration);
- Harmonized development activities and systematically implement a comprehensive vision for a competitive and sustainable European transport system and industry (preserving the competitiveness of the petroleum and fuel industry).

On international level the most important demands formulated by the INGOs were as follows:

- Reducing climate related externalities (esp. GHG, noise emissions, land take by vehicles, on corridors, at hubs) by implementing different measures (climate action

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plans, investments, supporting green private investments, building international coalitions, regulation enforcement of cap trade);

- Supporting industries and R&D in developing and implementing innovative fuel technologies (incl. battery technology, advanced bio-fuels), related infrastructure development as well as raising awareness for alternative [incl. electric] fuels;
- Revision, enforcement of safety standards, by creating industry-independent testing/certifying organizations, integration of safety aspects in planning frameworks like SUMP, increasing budgets, harmonization of regulations (speed limits, vehicle safety, zero alcohol tolerance, helmet wearing for all cyclists in EU), creating a European safety agency, research on traffic safety;
- Vehicle efficiency should be addressed as a key factor to gain more energy efficiency/ reduce consumption;
- Improving/ Extending Urban Mass Public Transport Systems like Metro, BRT, Light rail (modernization, extension of capacities [peak hours], energy efficiency), Marketing Campaigns for PT;
- Controlling or reducing travel demand;
- Improved risk management (legislation, data and information sharing, risk quantification metrics, scenario planning, trusted networks, two-way information sharing).

### **Supranational, intergovernmental organizations worldwide and in Europe**

With regard to organizations on world level the most important demands are as follows:

- Reducing climate related externalities (esp. GHG, noise emissions, land take by vehicles, on corridors, at hubs) by implementing different measures (climate action plans, investments, supporting green private investments, building international coalitions, regulation enforcement of cap trade);
- Supporting industries and science in developing and implementing innovative fuel technologies (incl. battery technology, advanced bio-fuels), related infrastructure development as well as raising awareness for alternative [incl. electric] fuels;
- Incentives/ awareness raising campaigns for fleet electrification (buses, private vehicles, rail); public and commercial procurement;
- Supporting modal shift (aviation to rail or inland waterway, motorized to public transport/active modes);
- Closer public and private cooperation (private investments in the network need to become more attractive [incl. PPP]);
- Raising investment in infrastructure development (modernization, capacity upgrade) in rural and urban areas.

The two latter mentioned imperatives also reached the highest frequencies in papers of organizations in other world regions.

However, the European organizations have again a slightly different priority ranking. Here the reduction of climate related externalities was also among the most important imperatives, but imperatives related to higher vehicle efficiency and modal shift – imperatives 4, 6, 15 – also showed to have high frequencies.



For the supra- and intergovernmental organizations, the most important intentions that have been formulated were:

- Sustainable transition of energy supply and transport sector (low emissions, electrification, bio-fuels);
- Improving safety standards (vehicles and infrastructures, incl. innovative technologies [C-IST]) and safety training (also putting special emphasis on vulnerable groups);
- Improving inter-modality;
- Improving the quality of the railway infrastructure (TEN-T, freight corridors);
- Increase competition in national rail market.

### **Science sector**

Most often the demands/ claims that have been formulated from by this stakeholder group were coming from Europe. This is also the case because most of the studies that have been identified as relevant for the analytical goal of the study were focusing on the European transport system. In terms of frequencies, the most important imperatives were the ones demanding a change respectively further development of the research system itself and more support for research activities related to autonomous driving.

The majority of the demands/ claims that are also of importance strongly relate to intensified research activities, focusing on technological developments or a faster implementation of new technological solutions. One important aspect in this regard is the electrification of the transport sector. These are the other important imperatives having a frequency of more than two:

- Closer public and private cooperation (private investments in the network need to become more attractive [incl. PPP]);
- Improving/ Extending Urban Mass Public Transport Systems like Metro, BRT, Light rail (modernization, extension of capacities [peak hours], energy efficiency), Marketing Campaigns for PT;
- Combination of electricity, transport and heat sector based on renewable electricity, bio fuels (sector coupling);
- Further developments in technology necessary (also vehicle technology: EV's, modular vehicles, innovative materials);
- Incentives/ awareness raising campaigns for fleet electrification (buses, private vehicles, rail); public and commercial procurement;
- Innovative research system (stronger evaluation and coordination of research policies and their impact, international research in strategic fields, long-term [basic] research considering the innovation cycle, supporting side-paths in risky but promising research fields [where failing is too expensive for private research]);
- Research related to autonomous vehicles (environmental impact, impact on mobility behavior, human-machine interfaces in vessels, cyber- and data security, infrastructure investments, planning policies).

The low-frequency demands of European and international reports were:

- Increase connectivity, intermodal access and fit-for-purpose network standards;

- Research and planning should be realized/ conducted following a holistic perspective of transport and mobility (consumer preferences, perceptions, mode choice, behavioral aspects).

### **Governments (EU 28, European non-EU members, 10 biggest world economies)**

As described before, imperatives by the political sphere are mostly notions of intentions, meaning that they are usually included in strategy papers, national transport development plans or strategic summaries on governmental/ ministerial homepages. As already mentioned they are usually addressing more than one sector. Reviewing the stakeholder map in Annex 2, it was remarkable that larger economies inside the EU – like Italy and Spain – or outside the EU – like Turkey, Brazil, Mexico or Indonesia – have no online accessible information in English language addressing their future strategy for the transport sector. Also, inside the EU it was difficult to gather appropriate and up-to-date material.

Regarding the formulated demands, it has to be stated that the frequencies are in comparison to the intentions relatively low. The reason for this lies in the fact that the political sphere is usually the addressee of the imperative and has only limited options to formulate demands to other stakeholders. If this has been done mostly national demands were formulated:

1. ...to higher level organizations like the EU (usually demanding further harmonization or standardization of rules and regulations);
2. ...to the private sector, NGOs, national governments formulating the need for more commitment and support.

The most important demands formulated by European governments were:

- Reducing climate related externalities (esp. GHG, noise emissions, land take by vehicles, on corridors, at hubs) by implementing different measures (climate action plans, investments, supporting green private investments, building international coalitions, regulation enforcement of cap trade);
- Supporting industries and science in developing and implementing innovative fuel technologies (incl. battery technology, advanced bio-fuels), related infrastructure development as well as raising awareness for alternative [incl. electric] fuels;
- Vehicle efficiency should be addressed as a key factor to gain more energy efficiency/ reduce consumption;
- Improving/ Extending Urban Mass Public Transport Systems like Metro, BRT, Light rail (modernization, extension of capacities [peak hours], energy efficiency), Marketing Campaigns for PT;
- Raising investment in infrastructure development (modernization, capacity upgrade) in rural and urban areas.

From the governmental side, of the ten biggest world economies, only the EU governments/ ministries and a sufficient number of the countries of Geographical Europe clearly formulated to foster the transition to E-vehicle in terms of energy supply chain. The intention with the second largest frequency was the one that targeted the further developing of public transport systems (demand-responsive, comfortable, accessible, barrier-free, affordable, attractive, efficient, subsidized, innovative [mobility chains]). This intention was again not under the top level rankings of the intentions formulated by the 10 biggest world economies outside of Europe.

Other important intentions with higher frequencies in Geographical Europe were:

- Creating incentives for a modal shift favouring environmentally-friendly modes;
- Fleet renewal and electrification;
- Improving cost-effectiveness and sustainability of the financing system, developing innovative financing models;
- Reducing travel demand (e.g. by demand reducing land use structures, better communication infrastructures).

Those imperatives that have been formulated by the ten biggest world economies as well as the EU and non-EU countries were as follows:

- Improving safety standards (vehicles and infrastructures, incl. innovative technologies [C-IST]) and safety training (also putting special emphasis on vulnerable groups);
- Improving connectivity within and of regions in a national and international (incl. European) context (incl. cross-border commuting);
- Investments in transport infrastructure (arteries [incl. oil and gas distribution infrastructure] and gateways [airports, ports, train stations]);
- Improving intermodality;
- Supporting high speed connections, reducing travel times between cities.

In summary it can be stated that the demands as well as the intentions formulated by the European – Geographical Europe – political sphere were much more forward-looking than the ones formulated by the governments of the ten biggest world economies. An indicator for this is that more intentions consider aspects that are also part of the demands/ claims formulated by other stakeholders to the political sphere. The intentions of the ten biggest world economies also included forward-looking aspects like investments in ICT, open data policies etc. but other important intentions like the transition of the energy supply in the transport sector what is especially with regard to global warming considered a very important policy could not be identified.

However, this statement is partly subject to restriction since for the assessment of the imperatives of the ten largest world economies no strategy papers from the ministerial side have been included.

Another very important aspect that was perceivable during the literature assessment and coding was that the programs and strategy papers of “older” EU member countries were more demanding towards the EU, as much as in terms of visions about the future transport system. These were much more “progressive” than the ones coming from Eastern and South-Eastern Europe. They are also addressing environmental aspects and consider and reflect most of the elements in the European White Paper of transport, but not in a very innovative manner, e.g. not including consideration of new technologies, approaches like MaaS or autonomous driving.

### **5.3 Gap Analysis (Comparison of *Demands* and *Intentions*)**

This last paragraph presents a final methodological matter:

how Political Imperatives demands/claims have been properly listed *ALSO* as intentions (formulated by the political sphere).

This matching will work as an input for the “gap analysis” that will be conducted in WP4. We have an underlying assumption in this matching: that is, claims/demands that have already found their entrance into political programs will be (sooner or later) a target in the actual policy making actions (including, but not limited to) research, subsidy or investment programs.

This means that demands/claims that are (so far) not being addressed by respective intentions *could* become important in future. In this vein, these demands/claims are, at the moment, not part of the mainstream. Therefore, this list of claims/demands not (yet) addressed by respective intentions could include important aspects that should not be neglected. Therefore, this qualitative comparison has been added to this Deliverable in order to support the work that will be conducted in WP4.

Following this approach, all claims and intentions with a frequency higher than four have been included. They represent one third of the demands/ claims, as well as intentions identified (this represents 70% – 80% of the marked text passages). In order to solve this complex task in an effective manner, the overview (visible in Annex 3) has been created. In Annex 3 we connected each demand/claim with imperatives: thus it was possible to identify those demands that showed only weak connections or even had no complementary imperative on the side of the intentions.

This deliverable and its results – especially this gap analysis – does not aim to exhaustiveness, nor it was the author’s intention, nor it was in INTEND’s work-plan. However, it may give a first impression of the areas in which further research could be necessary.

The demands/ claims that were thematically not covered by the intentions and showed high frequencies – got therefore shortlisted – were as follows:

- Digitization strategy/ regulations/ markets at national, European and international level (incl. transport sector);
- Improving bulk transportation methods for long distance freight transport (rail/river);
- Political measures must be transparent and predictable (esp. for the industry);
- Higher rate of vehicle occupancy;
- Market opening needs to go hand in hand with quality jobs and working conditions;
- Research and planning should follow a holistic perspective on transport and mobility (consumer preferences, perceptions, mode choice, behavioral aspects);
- Research related to autonomous vehicles (environmental impact, impact on mobility behavior, human-machine interfaces in vessels, cyber- and data security, infrastructure investments, planning policies);
- Universal application and enforcement of high working standards (safety/security, environmental protection, working conditions, payment).

Reviewing the list, it can be stated that several items might be of importance for the future European transport sector. Two items deal with research and development and target technological research and the research framework as well as the perception of mobility itself. Two other items are related to working standards and conditions that are e.g. in Germany in terms of safeguarding the future availability of skilled personnel already an important topic and might become in future a crucial topic also in other European countries.

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The other two topics relate to long-term strategies that are also making the policy framework more predictable for the industries. Clear and harmonized standards inside the EU were part of many other imperatives as well.

With regard to the digitization strategy it can be stated that the topics of data standards/ use and data safety were addressed by more than one imperative pointing to one or more sectors of the transport system. However, the only forward-looking source that really assessed the importance of digitization in relation to the transport sector itself has been created by the Finnish Ministry of Transport and Communications [Ed.] (2017): Transport and Communications Architecture 2030 and 2050.

Demands/ claims that were also not covered by any intention but have due to the low frequencies of 5 – 6 not been shortlisted were as follows:

- Balanced revision of standards related to consumer's rights and information (strengthening consumer's rights, rights should not harm the industry, introduction of new testing and benchmarking decisions);
- Clear framework for bike-sharing (system costs should not being socialized, system development should be part of the planning framework, coordination between service providers and municipalities, parking zones, upgrading existing infrastructures, clear contracts with operators);
- Innovative scenario development (harmonization of impact assessment and long-term scenarios);
- Creation of approaches, networks/ infrastructures and resources related to search and rescue (inhabitants, migrants, vulnerable groups);
- Redefining quality criteria of transport infrastructure (e.g. accessibility, interoperability, efficiency of travel chains, transport automation, environmental friendliness);
- Securing fair market access/ trade agreements (transport industry, producers, infrastructure operators, service providers);
- Governments need to cooperate further with the industry (also share data) for improving security (terrorist attacks);
- Ratification of ship-recycling convention, providing list of ship-recycling yards for the EU;
- Alignment of research priorities should orient on societal challenges, policy objectives, discussed in a broad context of stakeholders, based on road-maps comprising different innovation fields;
- Creating the possibility of generating added value (services, planning) for transport stakeholders based on data collection/ sharing;
- Developing and testing governance, regulatory and public procurement strategies (assessment of supply chains, risk of transportation);
- Encouraging elderly-friendly design of new vehicles, vehicles for persons with reduced mobility, evaluating impact of new technologies on drivers;
- EU energy efficiency target should include clear reference to the transport sector,
- Coordinating body must have a picture of future development trends and the development needs of architecture.

This demands/ claim are quite diverse, and thus they can not be further clustered, although they are also including quite actual and challenging demands that directly correspond to

## D2.3 Political Imperatives

currently rising problems/ trends like terror attacks, flows of refugees, data security, customers rights and aging societies.

## 6 Summary and outlook

This meta-analysis has assessed altogether 135 different sources by stakeholders with relation to the European and global transport sector. A software supported qualitative content analysis of around 8,000 pages led to the result that altogether 286 political imperatives – 137 demands/ claims formulated to the political sphere and 149 intentions formulated by the political sphere– have been identified.

Imperatives that are amongst other aspects directly or indirectly having the goals of reducing GHG emissions by supporting modal shift, substituting the source of energy (EV's, alternative fuels) or using existing infrastructure more efficiently are making up the majority. For the demands/ claims 15 out of 32 shortlisted imperatives are addressing this topic. For the intentions 13 out of 35 shortlisted imperatives are addressing this topic.

Moreover, on both lists the aspect of traffic safety received a quite high ranking (Demands/ Claims Rank 3, Intentions Rank 2) and the imperatives are over proportionally often targeting road transport.

In general, it can be stated that the demands/ claims are rather focusing the creation/ implementation of clear and reliable frameworks and regulations. On the contrary imperatives pointing to standardization and harmonization of regulations were – with one exception – completely missing in the short-list of the intentions. Here, an important point is especially the harmonization of standards, rules and regulations inside the European Union.

Forward looking imperatives are especially touching urban transport and data issues. Here it can be stated that the imperatives coming from the European stakeholders were much more forward looking and that topics like intelligent transport systems, MaaS, green logistics have already – although quite weak – already found entrance into some strategy papers.

Nevertheless, there were still demands that might become more relevant in future and have yet not been sufficiently considered. These demands mostly relate to the development of long-term strategies in order to create also a reliable development for the economy. This touches topics like a digitization strategy for the transport sector, a strategy to apply and enforce high working standards also to safeguard a sufficient amount of workforce in the transport sector.

Other demands strongly point to research and development in sharing services, autonomous vehicles which are currently revolutionizing the transport sector. This requires innovative planning strategies and ways to regulate and develop new markets into the “right” direction, which opens-up another topic. Other demands/ claims were formulating respectively suggesting a reform of the research environment itself also by taking over a new rather holistic perspective on mobility and to orient research on societal needs. An interesting imperative that has been identified as a demand and intentions was to develop ways to reduce traffic demand and to escape from the growth-spiral.

Finally, the method chosen proofed to be adequate for delivering an initial snapshot of the current state of imperatives with relation to the transport sector. However, it has to be expressed that a deeper and especially longer lasting assessment of the international sphere and national sphere also by integrating other methodological approaches like expert interviews into the research concept would have been able to create deeper insights or to validate the outcomes. This was due to the limited amount of time not possible. This deliverable has,

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nevertheless, created a sufficient and most of all structured overview of the most important political imperatives can be valuable source for further analyses.



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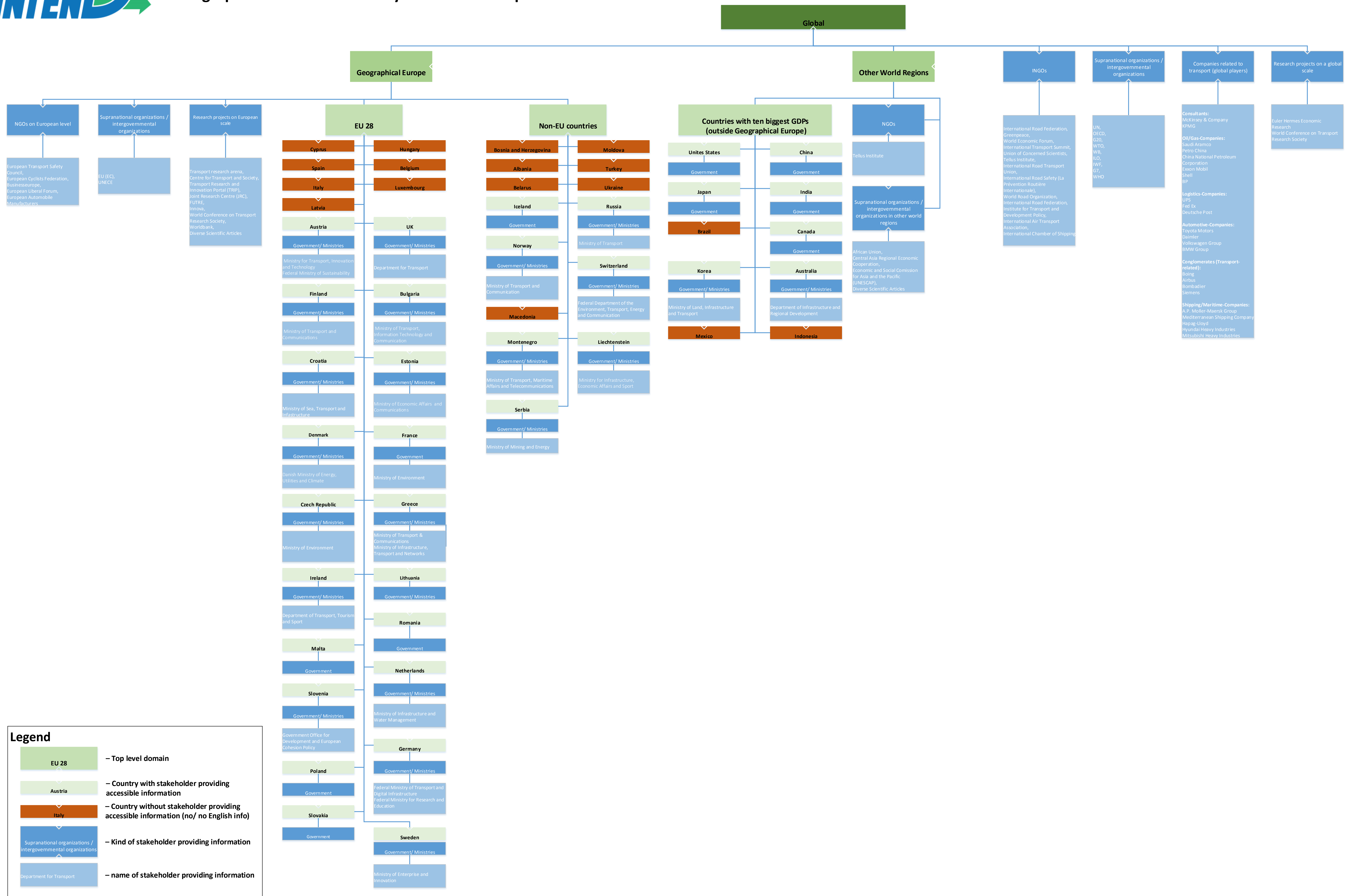
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**8 Annex 1 – Stakeholder map**



# Geographical Stakeholder Analysis – Political Imperatives



**Legend**

- EU 28** – Top level domain
- Austria** – Country with stakeholder providing accessible information
- Italy** – Country without stakeholder providing accessible information (no/ no English info)
- Supranational organizations / intergovernmental organizations** – Kind of stakeholder providing information
- Department for Transport** – name of stakeholder providing information

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## **10 Annex 3 – Comparison of demands and imperatives**

This annex comprises a comparison of demands/ claims and intentions. The blue lines are connecting demands/claims with related intentions formulated by the political sphere.





# ANNEX 3 – Comparison of Demands/ Claims and Intentions

## Demands/ Claims

## Intentions

Shortlisted (Frequency > 7)

Not Shortlisted (Frequency < 7)

Reducing climate related externalities (esp. GHG, noise emissions, land take by vehicles, on corridors, at hubs) by implementing different measures (climate action plans, supporting green private investments, building international coalitions, enforcement of cap trade) [10]
Supporting industries and science in developing and implementing innovative fuel technologies (incl. battery technology, advanced bio-fuels), related infrastructure development as well as raising awareness for alternative (incl. electric) fuels [4]
Revision, enforcement of safety standards, by creating industry-independent testing/ certifying organizations, integration of safety aspects in planning frameworks like SUMP, increasing budgets, harmonization of regulations (speed limits, vehicle safety, zero alcohol tolerance, helmet wearing for all cyclists in EU), creating a European safety agency, research on traffic safety [2]
Vehicle efficiency should be addressed as a key factor to gain more energy efficiency/ reduce consumption [2]
Closer public and private cooperation (private investments in the network need to become more attractive [incl. PPP]) [3]
Supporting modal shift (aviation to rail or inland waterway, motorized to public transport/active modes) [7]
Modernizing/ extending (peak hours) Urban Mass Public Transport Systems (Metro, BRT, LRT) improving energy efficiency, and marketing for PT [10]
Raising investment in infrastructure development (modernization, capacity upgrade) in rural and urban areas [4]
Standardization, harmonization and adaptation of regulations on EU level (energy characteristics for rail; minimum requirements for road markings, safety barriers etc.; cross-border road conventions, single European Sky Initiative) [3]
Revision of fuel and power taxation as well as regulation standards (reducing subsidies, taxes should foster innovations in fuel efficiency, clear indexing [also of impacts] for increasing comparability) [1]
Combination of electricity, transport and heat sector based on renewable electricity, bio fuels (sector coupling) [1]
Controlling or reducing travel demand [1]
Further developments in technology necessary (also vehicle technology: EV's, modular vehicles, innovative materials) [1]
Higher efficiency of transport systems [4]
Incentives/ awareness raising campaigns for fleet electrification (buses, private vehicles, rail); public and commercial procurement [2]
Increasing connectivity, intermodal access and fit-for-purpose network standards [2]
Investments in research and development activities must be strengthened [1]
Coherent EU framework for autonomous vehicles (infrastructure investments, safe deployment, regulations for the transitional phase, reform of vehicle safety approval regime, regulation, registration) [1]
Digitization strategy/ regulations/ markets at national, European and international level (incl. transport sector)
Improving bulk transportation methods for long distance freight transport (rail/river)
Innovative research system (stronger evaluation and coordination of research policies and their impact, international research in strategic fields, long-term [basic] research considering the innovation cycle, supporting side-paths [where failing is too expensive for private research]) [1]
Political measures must be transparent and predictable (esp. for the industry)
Exploitation, piloting of new technologies must be promoted/ regional test beds for experiments, failing should be part of the ecosystem [1]
Harmonized development activities and systematically implement a comprehensive vision for a competitive and sustainable European transport system and industry (preserving the competitiveness of the petroleum and fuel industry) [11]
Higher rate of vehicle occupancy
Improved risk management (legislation, data and information sharing, risk quantification metrics, scenario planning, two way information sharing) [2]
Increasing hub capacities (ports, airports, stations) [3]
Market opening needs to go hand in hand with quality jobs and working conditions
Research and planning should follow a holistic perspective on transport and mobility (consumer preferences, perceptions, mode choice, behavioral aspects)
Research related to autonomous vehicles (environmental impact, impact on mobility behavior, human-machine interfaces in vessels, cyber- and data security, infrastructure investments, planning policies)
Universal application and enforcement of high working standards (safety/security, environmental protection, working conditions, payment)
Balanced revision of standards related to consumer's rights and information (strengthening consumer's rights, rights should not harm the industry, introduction of new testing and benchmarking decisions)
Clear framework for bike-sharing (system costs should not be socialized, system development should be part of the planning framework, coordination between service providers and municipalities, parking zones, upgrading existing infrastructures, clear contracts with operators)
Innovative scenario development (harmonization of impact assessment and long-term scenarios)
Supporting innovative and green solutions for freight and commercial transport (green logistics, multi-brand platooning of lorries, cargo bikes, mobility plans, low altitude drones) [7]
Creation of approaches, networks/ infrastructures and resources related to search and rescue (inhabitants, migrants, vulnerable groups)
Incentives and education for sustainable behavior
Increasing resilience of transport infrastructures [4]
Investments in digital infrastructure [2]
Policy framework for establishing sustainable [low carbon, efficient, secure] aviation fuels (SAF), European aviation industry as the front runner [4]
Redefining quality criteria of transport infrastructure (e.g. accessibility, interoperability, efficiency of travel chains, transport automation, environmental friendliness)
Securing fair market access/ trade agreements (transport industry, producers, infrastructure operators, service providers)
Strengthening of institutions and administrative capacities (acceleration of policy implementation, de-centralization vs. centralization) [1]
Governments need to cooperate further with the industry (also share data) for improving security (terrorist attacks)
(MaaS) European standards for communication/ interoperability of user devices, infrastructures and vehicles, public data sharing, data access for private individual mobility operators, reformation of public procurement (from good to service) [1]
Carbon emissions need to be subject to much tighter regulations / charging (that they find entrance into supply chain calculations) [2]
Deciding on the principles of data collection, ownership, security and management (incl. safety management systems) [2]
Developing a common understanding/ definition of the term "MaaS" (accessible, affordable, sustainable, low emission) [1]
Establishment of strategic alliances (industry) [1]
New mobility solutions must be integrated [4]
Ratification of ship-recycling convention, providing list of ship-recycling yards for the EU
Smarter vehicles (intelligent speed assistance systems, data generating vehicle[for impact calculation, modeling]) [2]
Supporting multimodality (security guidelines, infrastructure investments) [4]
Following a multistakeholder and market-specific approach, creating synergies, new collaboration models [2]
Alignment of research priorities should orient on societal challenges, policy objectives, discussed in a broad context of stakeholders, based on road-maps comprising different innovation fields
Building modernized efficient air traffic management systems (ATM) [2]
Building new ports along the coast/ increase attractiveness of coastal shipping [3]
Creating the possibility of generating added value (services, planning) for transport stakeholders based on data collection/ sharing
Developing and testing governance, regulatory and public procurement strategies (assessment of supply chains, risk of transportation)
Differentiated fare rates and adjusted levels [1]
Encouraging elderly-friendly design of new vehicles, vehicles for persons with reduced mobility, evaluating impact of new technologies on drivers
EU energy efficiency target should include clear reference to the transport sector
New financing plans have to be implemented, considering increasing costs of erecting and maintaining infrastructures [1]
Optimization of the European transport network via an innovative Network Traffic Management System approach [2]
Reducing oil dependency and vulnerability of the transport sector [4]
Common vision of the airport of the future (reduced waiting times), align airport investments with airport needs, promote sustainable governance of airports [2]
Coordinating body must have a picture of future development trends and the development needs of architecture

Sustainable transition of energy supply and transport sector (low emissions, electrification, bio-fuels)
Improving safety standards (vehicles and infrastructures, incl. innovative technologies [C-IST]); safety training (emphasis on vulnerable groups)
Developing public transport systems (demand-responsive, comfortable, accessible, barrier-free, affordable, attractive, efficient, subsidized, innovative [mobility chains])
Improving connectivity within and of regions in a national and international (incl. European) context (incl. cross-border commuting)
Investments in transport infrastructure (arteries [incl. oil and gas distribution infrastructure] and gateways [airports, ports, train stations])
Improving intermodality
Increasing competitiveness and efficiency through organizational, management and functional optimization (incl. new technological solutions)
Implementation of intelligent transport systems (incl. autonomously driving vehicles)
Increasing efficiency and capacities (incl. elimination of bottlenecks)
Creating incentives for a modal shift, favoring environmentally-friendly modes
Fleet renewal and electrification
Supporting high speed connections, reducing travel times between cities
Strengthening national/ international competitiveness
Improving cost-effectiveness and sustainability of the financing system, developing innovative financing models
Reducing travel demand (e.g. by demand reducing land use structures, better communication infrastructures)
Improving security/ security training
Improving the quality of the railway infrastructure (TEN-T, freight corridors)
Minimization of negative impacts (externalities regarding health and climate) of transport and infrastructure
Improving accessibility (also for persons with reduced mobility)
Creating attractive infrastructures for slow modes
Research and development of new fuels and new transport technologies
Supporting ICT, open data
Development towards MaaS
Strategy development together with policy makers, science and industry
Improved connectivity to support growth of tourism industry
Increase competition in national rail market
Developing/ harmonizing rules concerning data collection (ownership, management etc. vehicle registration, road traffic crashes, drivers licenses, status of infrastructures), improving data quality, using innovative technologies for data collection
Transport sector should be privatized (passenger and freight)
Developing a climate change adaptation approach
Increasing capacities and qualities of airports
Creation of recharging and refueling infrastructure networks
Establishing a single African air transport market
Improving airport accessibility and predictability of first and last mile connections (passenger and freight)
Supporting local SMEs
Transport should promote environmental and urban sustainability
Creating a single European transport area
Developing marine business (incl. tourism)
Effective and transparent use of funds (e.g. national, European)
Reducing GHG emissions by implementing alternative policy options, innovative approaches coming from the science sector
Reducing waiting times at airports (baggage handling, security check)
Reforming tax policies (uniform rules, carbon taxes, tax incentives e.g. for new vehicles or privately financed infrastructure projects)
Support rail as leading carrier of freight and passenger
Supporting Smart Mobility
Improving collaboration between different planning sectors
Internalization of external effects
Reducing transport-/ operating costs
Strengthening international cooperation
Supporting market liberalization and improving market entry for efficient drives and alternative fuels
Supporting multi-modality
Using airspace more efficiently
Creating an innovation climate, environment for field trials
Improving conditions for logistics
Improving the services and functions of national, regional and local transport hubs
Integration of the transport sector into the social and economic development
Providing convenient and safe air traffic
Reducing energy intensity in transport
Supporting balanced regional development
supporting green tourism (public transport and green mobility)

