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Deliverable D1.1

User Requirements

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Glossary

ASSIST	Assessing the social and economic impacts of past and future sustainable transport policy in Europe (FP 7 research project).
ASTRA-EC	Impact Assessment Model
CGE	Computable General Equilibrium
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
C_xH_y	Hydrocarbon
dB	Decibel
dB(A)	Decibel, A-weighted Noise Measurement
DG MOVE	European Commission's Directorate-General for Mobility & Transport
DRIP	Dynamic Route Information Panels
EC	European Commission
EEA	European Environment Agency
ETISplus	European Transport Policy Information System
EU	European Union
GAINS	Analytical tool for the integrated assessment of emission control strategies for both air pollution and greenhouse gases.
GDP	Gross Domestic Product
GEM-E3	Recursive dynamic computable general equilibrium model covering the interactions between the economy, the energy system and the environment.
GHG	Greenhouse Gas
GUI	Graphical User Interface
GVA	Gross Value Added
iTREN-2030	Integrated Transport and Energy Baseline until 2030 (FP 6 research project)
ITS	Intelligent Transport System
JRC-IPTS	Institute for Prospective Technological Studies of the European Commission's Joint Research Centre
N_2O	Nitrous Oxide
NO_x	Nitrogen Oxides
OECD	Organisation for Economic Co-operation and Development
PASHMINA	Paradigm Shifts Modelling and Innovative Approaches (FP 7 research project)
Pb	Lead
pkm	Passenger-kilometre
PM	Particulate Matter
PRIMES	Partial equilibrium model for the European Union energy markets.
REFIT	Refinement and test of sustainable indicators and tools with regard to European Transport (FP 6 research project).
SO_2	Sulphur Dioxide
SUMMA	Sustainable Mobility, Policy Measures and Assessment (FP 5 research project)

TENtec	Information system of the European Commission to coordinate and support the Trans-European Transport Network Policy.
TEN-T	Trans-European Transport Network
tkm	Tonne-kilometre
toe	Tonne of Oil Equivalent
TRANSFORUM	Scientific Forum on Transport Forecast Validation and Policy Assessment (FP 6 research project)
TRANS-TOOLS	Network-based European Transport Model
TransVisions	Report on Transport Scenarios with a 20 and 40 Year Horizon (project funded by the European Commission)
TREMOVE	Policy assessment model to study the effects of different transport and environment policies on the emissions of the transport sector.
vkm	Vehicle-kilometre
VOC	Volatile Organic Compound
VSL	Variable Speed Limit

Executive Summary

The HIGH-TOOL project aims at developing a strategic transport model to assess economic, social and environmental impacts of transport policy measures. The main users of the HIGH-TOOL model will be transport policy specialists of the EC. Deliverable D1.1 reports on the user requirements of the HIGH-TOOL model. User needs have been gathered during the First User Workshop and by an Online Survey with respect to four dimensions:

- On the policy side: Which (type of) policy measures should the tool be able to assess?
- On the indicators: Which impact indicators shall be selected to assess policy measures (for a specific policy objective)?
- On the link to other tools: How should HIGH-TOOL relate to other tools and data sources?
- On the user interface and technical issues: How will the user interact with the tool and what are the requirements regarding runtime and online capabilities?

Deliverable D1.1 will continuously feed the later work packages and will serve as a guiding document throughout the project lifetime.

The deliverable starts with presenting the consortium's understanding of user requirements prior to in-depth discussions with the specialists of the EC. This served as a starting point for the First User Workshop held on 25 June 2013, and the subsequent Online Survey in July/August 2013. During the Workshop, EC opinions on user requirements where gathered and discussed. In the subsequent Online Survey, further opinions were collected from EC staff on issues which had come up during the Workshop. This has been the basis for HIGH-TOOL to obtain a holistic view on EC requirements of and expectations on HIGH-TOOL. An overview of key user requirements is summarised below.

Regarding **policy measures** to be assessed by the HIGH-TOOL model, it has become clear, that besides allowing the user to select pre-defined policy measures, an open approach should be adopted. This implies that a set of pre-defined adjustable input parameters should be provided allowing the user to analyse custom policy measures. This will facilitate more freedom for detailed, user-designed policy assessment. The prioritisation of policy categories, i.e. a group of policy measures that are targeting specific aspects of the transport sector, is an important basis to decide which (level of detail of) policy input parameters should be included in the HIGH-TOOL model. During the First User Workshop, the following policy areas were particularly highlighted as priority by the EC participants:

- Internal market – intra-modal (road, rail, inland waterway transport, maritime, air)
- External cost charges
- Infrastructure charging/Access restrictions schemes
- Multimodal transport
- Safety.

As concerns **impact indicators**, the consensus is to focus on a non-exhaustive set of indicators, capturing all key aspects of the transport system. A provisional selection of impact indicators has been derived from discussions and obtained answers. Key priority indicators among this selection include:

- Economic growth
- Employment
- Cost savings[1]
- Safety
- Transport sector employment
- Energy demand in transport
- GHG emissions.

It has become clear that the preferred level of detail of output indicators is the regional level (NUTS-2). However, some of the indicators proposed in this deliverable may turn out to be computed at a higher spatial level only, for instance due to data availability restrictions.

The users expect **consistency and complementarity with currently available tools** (such as PRIMES-TREMOVE, TRANS-TOOLS, GEM-E3, ASTRA), rather than integration. Between HIGH-TOOL and TRANS-TOOLS, linking data and results should be facilitated. As such, HIGH-TOOL should focus on the demand side (including modal choice), without including a network or an assignment module. The technical possibilities for data exchange between HIGH-TOOL and TRANS-TOOLS will need to be examined further within the runtime of the project.

The **EU Reference Scenario 2013** will form the baseline scenario for HIGH-TOOL. Furthermore, the initial calibration of HIGH-TOOL should be consistent with data from Eurostat, ETISplus and TENtec to the maximum possible extent.

[1] Total costs (incl. external costs) were not included in the voting. However, these are also important.

For now, few user requirements are imposed regarding the user interface, which gives the consortium some freedom in the design of the HIGH-TOOL interface. The need for flexibility but also consistency checks, highlighting reasonable ranges and interference of parameters, has been emphasised. Furthermore, the future users have indicated that runtime would not be a too critical issue for HIGH-TOOL. A longer computation time (up to a few hours) would be acceptable, corresponding to the level of detail provided. However, the model code should be optimized such that a longer computation time only reflects the higher level of detail provided. Furthermore, some model properties have been highlighted as being indispensable for HIGH-TOOL:

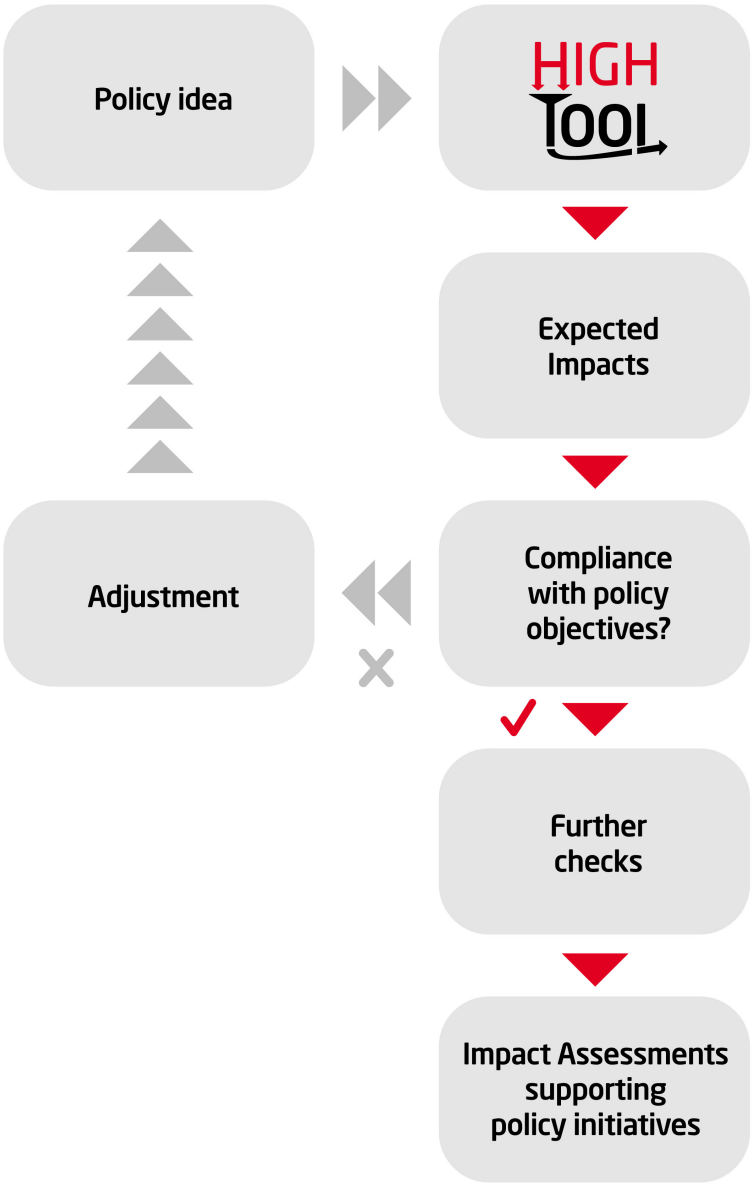
- Provision of endogenous projections for passenger and freight transport activity at regional level for EU Member States (EU28) with a 2050 time horizon;
- Coverage of all transport modes, vehicle technologies and distance classes;
- Implementation of a modular structure, programmed in open, transparent code.

Finally, while the HIGH-TOOL *Inception Report* (Szimba et al., 2013) describes HIGH-TOOL as a high-level strategic model, the functionality of HIGH-TOOL as a **pre**-impact assessment tool is challenged. Several Workshop participants of the EC have expressed the desire for HIGH-TOOL to be useful for specific impact assessment and requested a higher level of detail for some policy domains. Others, however, have emphasised the strategic functionality as expressed in the Inception Report. The prioritisation of policy categories and the desire for complementarity to currently available models provide valuable guidance for model development. However, it will likely be infeasible to deal with all policy domains on a strategic level, while simultaneously providing great detail for some areas. Thus, choices will need to be made regarding the desired scope and detail for HIGH-TOOL. This remains an open issue to be picked up in the continuous user involvement. The next stages of the HIGH-TOOL project, i.e. conceptual design and development of the prototype, should bring clarification from the consortium's side regarding modular design, and the feasibility of providing more detail for specific domains. Furthermore, the evaluation of the prototype will allow the future users to refine the desired scope and to further decide on (non-)priorities.

1 Introduction

1.1 Objective of the HIGH-TOOL Model

The HIGH-TOOL project aims at developing a free and open high-level strategic transport model to assess economic, social and environmental impacts of transport policy. The HIGH-TOOL model should be a means to support policy-makers in assessing policy measures. The main users of the HIGH-TOOL model will be transport policy specialists of the EC. Figure 1 shows the process flow to which HIGH-TOOL will belong. In order to address an issue or inefficiency in the transport system, the users will elaborate ideas on policy measures.



These proposed policy measures need to be assessed by modelling tools such as HIGH-TOOL. In case the expected impacts comply with EU policy objectives, further internal processes (e.g., application of complementary models, such as TRANS-TOOLS) are carried out. In case of unsatisfactory or undesirable impacts, the policy option needs to be either skipped or adjusted. In such iteration, the policy-maker may reconsider and adapt policy measures and re-evaluate them with HIGH-TOOL in another iteration. The comprehensive analysis described above, including the analysis carried out using complementary models, may become the basis for Impact Assessments accompanying EC policy initiatives.

Figure 1: HIGH-TOOL process flow

The model should provide the essential high-level impacts of intended policy measures that can be further complemented with more detailed models and tools (e.g., TRANS-TOOLS). Input and output indicators and variables of the model need to be based on policy targets of the Transport *White Paper* (European Commission, 2011a), the *Impact Assessment Guidelines* (European Commission, 2009) and various other relevant EC documents. The HIGH-TOOL model will be largely based on equations and elasticities.

1.2 Objective and Structure of the Deliverable

The scope of Deliverable D1.1 is to describe the preparation of and conclusions from the First User Workshop and the Online Survey, and to derive the user requirements for the HIGH-TOOL model in terms of transport policies, impact indicators, relation to other tools and user interface. Deliverable D1.1 feeds the other work packages and will serve as a guiding document throughout the project lifetime. The current report can be seen as one of the outputs of the user involvement process. The continuous user involvement in HIGH-TOOL may allow the consideration of further upcoming user requirements in the future, subject to feasibility of implementation.

Figure 2 shows the approach to identify the user requirements for the HIGH-TOOL model. First, the consortium's understanding of user requirements is presented, prior to in-depth discussions with the specialists of the EC. This served as a starting point for the First User Workshop and subsequent Online Survey, where opinions of the future users from the EC were gathered to further develop EC demands and expectations for HIGH-TOOL. The Deliverable is structured as follows:

- Chapter 2 summarises the consortium aligned views on the user requirements;
- Chapter 3 summarises the outputs of the First User Workshop and of the Online Survey. This includes factional reporting (i.e. reports from MeetingSphere and discussion notes). Key discussions and priorities are highlighted;
- Chapter 4 presents the final user requirements, describing all important EC demands and expectations for HIGH-TOOL. This final chapter will be used as input to design the model specification throughout the project.

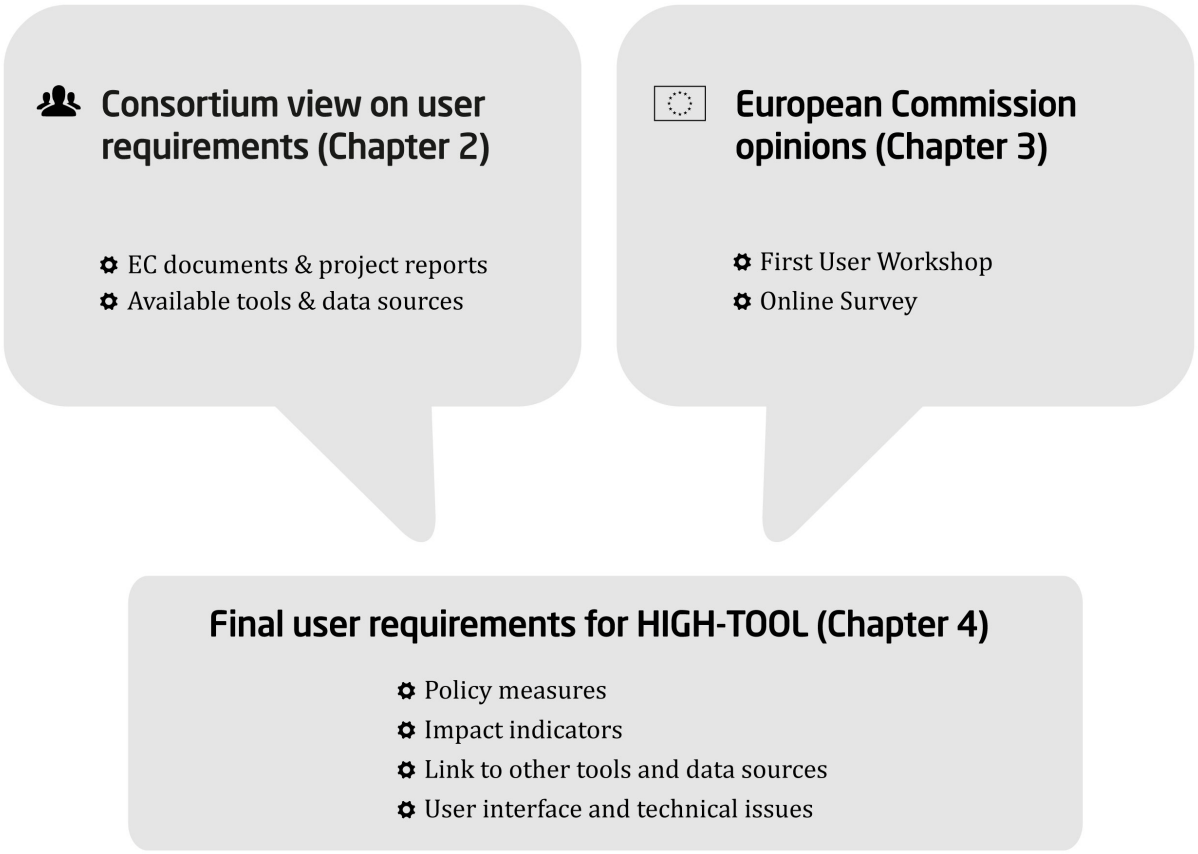


Figure 2: Approach for elaborating the HIGH-TOOL user requirements

2 Consortium's View on User Requirements

This chapter drafts the consortium's view on user requirements. The contents of this chapter are largely based on the draft version of this Deliverable (Vanherle et al., 2013) which served as an input to the First User Workshop.

The chapter is structured as follows: First, some main features of HIGH-TOOL are explained (section 2.1). Following this general section, user requirements with regard to four topics are discussed, corresponding to the Inception Report (Szimba et al., 2013), namely: policy measures (section 2.2), impact indicators (section 2.3), link to other tools and data sources (section 2.4) and User Interface (section 2.5). Additional and more general user requirements are addressed in section 2.6.

2.1 The Role of Models in Policy Assessment

The European Commission's Directorate General Mobility & Transport (DG MOVE) follows a challenging objective: to develop transport policies for the European Union by ensuring efficient mobility in a single European transport area, sustaining environmental policy and competitiveness. This requires a focus on policy analysis to identify policy measures that will best meet this objective. In this sense, the European Commission has constructed guidelines on how to assess the impacts of policy proposals. The various Directorate General's of the EC have developed tools that enable EC officials to analyse policy options in line with the internal guidelines for impact assessment. HIGH-TOOL aims to find a specific role in this family of policy analysis tools.

In the view of the consortium, HIGH-TOOL's place is at the early stages of policy development, as explained in section 1.1. In our understanding, there may be a hiatus in the policy development process at which policy ideas can quickly be 'scanned' and interpreted as either promising or not suitable for further development. This stage of policy development process is dominated by interpretation and intuition, focusing on the main effects of the policy. There is a risk of underestimating the extent of the impact or of disregarding unexpected effects. Clearly, a first conceptual stage is always needed. A quantitative tool can support the policy-maker in this stage by supplying an objective, scientifically supported 'first glance' of a set of policy measures.

Most of the research partners involved in the HIGH-TOOL project have knowledge of different kinds of models, which are currently used by DG MOVE. These include models that have a rather specific purpose, such as TRANS-TOOLS (Burgess et al., 2008) that is mainly designed to assess the impact of infrastructure policies on the TEN-T networks.

Another example of a detailed model in use is the PRIMES-TREMOVE model. This model allows detailed policy assessment of pricing (e.g., internalisation of external costs) and technologies. Both models require expert knowledge when used for policy impact assessment.

On the other side of the spectrum, there are tools such as TransVisions: TransVisions represents a high-level illustrative tool used to explore impacts of various White Paper policy measures. This tool differs from the detailed tools mentioned above in the sense that it has a broad perspective and the impacts of policy measures are assessed at a high level only. As input, it also requires the user to estimate the impact of a measure on specific drivers (e.g., impact on demand). In this case, the user is not necessarily an expert user, thus greatly expanding the potential user base for the tool. In particular, any EC policy officer can use the tool to quickly scan options. The trade-off compared to the detailed models, however, lies in the limitations with respect to the level of detail of input (i.e. policy definition) and output (i.e. impact variables).

HIGH-TOOL is building on both approaches with the ability to scan policy options (TransVisions), but including some parts of the detailed models' capabilities to assess policy impacts endogenously.

2.2 Policy Measures

HIGH-TOOL should be able to evaluate all potential policy measures that are relevant for DG MOVE. Naturally, this implies that the Transport *White Paper* (European Commission, 2011a) is the main guiding document for selecting policy measures. Key to the core property of the **strategic** tool is that it needs to cover a wide range of (transport) policy areas. As such, HIGH-TOOL should not become a 'sectoral' model, and should consider the transport sector as a whole.

The selection of policy measures has been elaborated as follows: First, in section 2.2.1 the sources are listed that have been used to identify relevant policy measures, thus stating *'where'* information comes from. Then, categories of policy measures are presented (section 2.2.2). This provides insight in *'what'* we are dealing with, and guidance for understanding the user requirements. These policy categories are prioritised, labelling them as 'crucial', 'important' or 'optional'. This prioritisation supports the decision on which types of policy measures should be focused on, and at which level of detail these measures are to be formulated. Section 2.2.3 provides a few examples of this required level of detail, showing *'how'* different policy measures are to be formulated. These three steps allow for deriving the consortium's view on scope of the HIGH-TOOL model in terms of policy coverage.

2.2.1 Sources

The main guiding document for the policy measures that HIGH-TOOL should be able to evaluate, is the Transport *White Paper* (European Commission, 2011a). The document describes 40 policy initiatives, i.e. sets of policy measures with a common purpose (e.g., regulatory framework for innovative transport, safer shipping, and seamless door-to-door mobility). In these 40 initiatives, the Transport *White Paper* contains 131 policy measures. For the preparation of the First User Workshop, these policy measures have been considered. In order to categorise and further detail the policy measures, the accompanying documents to the *White Paper* represent useful inputs, too. Summarising, the following sources have been considered to identify policy measures for HIGH-TOOL:

- Transport *White Paper* (European Commission, 2011a)
- *Impact Assessment Working Paper Accompanying the White Paper* (European Commission, 2011b)
- *Commission Staff Working Document Accompanying the White Paper* (European Commission, 2011d).

2.2.2 Categorisation and Prioritisation

For an in-depth understanding of DG MOVE's priorities and requirements, a systematic overview is needed. Therefore, a categorisation scheme for different levels of policy measures is applied: In this report, a 'policy area' refers to a generic grouping of policy measures. A 'policy category' refers to a group of policy measures that are targeting specific aspects of the transport sector. A 'subcategory', if applicable, adds further specific grouping. The prioritisation of these categories, labelling them as 'crucial', 'important' or 'optional', states the relative importance of the policy measures belonging to a certain category.

Following the *Impact Assessment Working Paper Accompanying the White Paper* (European Commission, 2011b), policy measures are divided into seven policy areas, which serve as the highest level for the policy categorisation:

- Pricing
- Taxation
- Research and innovation
- Efficiency standards and flanking measures
- Internal market
- Infrastructure
- Transport planning.

In order to further categorise these policy areas, the approach followed by ASSIST (Maurer et al., 2011) is taken into account. The first two columns of Table 1 describe the categories by ASSIST. Based on assumptions by the consortium, a **tentative prioritisation** has been assigned to the policy categories. This is shown in the rightmost three columns of Table 1, where each category is marked with (x) as crucial, important or optional. Naturally, the effort that will be put into ensuring that a certain policy measure can be modelled in HIGH-TOOL in a sufficiently detailed way correlates with the prioritisation given to the policy measure. The more important a policy measure is labelled, the more effort will be put into developing the model functionalities at the desired level of detail. Note that the prioritisation does not reflect on the political importance of the policy category for the EC; it rather refers to the priority for the HIGH-TOOL model to be able to assess its impacts.

Table 1: Proposed policy categorisation and prioritisation by HIGH-TOOL

Policy areas	Policy categories	Prioritisation Crucial	Important	Optional
1. Pricing				
	1.1: Infrastructure charging/Access restrictions schemes	x		
	1.2: External cost charges	x		
	1.3: Public funding of transport		x	
	1.4: Other/New financing instruments			x
2. Taxation				
	2.1: Fuel taxation		x	
	2.2: Transport taxation		x	
3. Research and innovation				
	3.1: Technology			
	3.1.1: Vehicle Technology	x		
	3.1.2: Transport infrastructure and system			x
	3.1.3: Transport information systems, management and service	x		
	3.2: Framework			
	3.2.1: Transport safety	x		
	3.2.2: Promotion and incentives		x	
	3.2.3: Technology and infrastructure		x	
4. Efficiency standards and flanking measures				
	4.1: Standards			
	4.1.1: Transport safety standards	x		

Table 1: Proposed policy categorisation and prioritisation by HIGH-TOOL (cont.)

Policy areas	Policy categories	Prioritisation Crucial	Important	Optional
	4.1.2: Passenger rights standards		x	
	4.1.3: Environmental standards	x		
	4.2: Flanking measures			
	4.2.1: Promotion, information and dialogue		x	
	4.2.2: Regulation		x	
5. Internal market				
	5.1: Internal market – intra-modal			
	5.1.1: Road internal market	x		
	5.1.2: Rail internal market	x		
	5.1.3: Inland waterway transport internal market	x		
	5.1.4: Maritime internal market	x		
	5.1.5: Air internal market	x		
	5.2: Transport security			
	5.2.1: Cargo security		x	
	5.2.2: Passenger security		x	
	5.2.3: Land transport security		x	
	5.2.4: 'End-to-end' security		x	
	5.3: Multimodal transport	x		
6. Infrastructure				
	6.1: European TEN-T core network	x		
	6.2: Planning procedure (timing, communication framework, environmental issues)			x
	6.3: Capacity and quality of transport systems	x		
	6.4: EU transport infrastructure in view of energy efficiency needs and climate change challenges		x	
7. Transport planning				
	7.1: Mobility strategies and plans			x
	7.2: Urban mobility			
	7.2.1: Plans and audits		x	
	7.2.2: Certification			x
	7.2.3: Management and monitoring			x
	7.2.4: Urban logistics strategies		x	
	7.2.5: 'Zero emission' strategies	x		

2.2.3 Required Level of Detail

In order to understand the requirements of HIGH-TOOL, it is crucial to define the level of detail to be considered for the policy measures to be assessed. To recapitulate, from the *Inception Report* (Szimba et al., 2013), in HIGH-TOOL a "high-level strategic transport model will be developed to scan transport policy options", in order to "obtain preliminary results, which in the preceding steps are assessed in depth by advanced and more detailed instruments".

In any aspect of HIGH-TOOL, be it the policies, the indicators, the user interface or the relation to other tools, the exact interpretation of the term 'high-level' is to be determined. A high-level tool implies that detailed analysis is not the main goal. **The right balance needs to be found between detailed analysis and fast scanning**. This also holds for the design of the policy measure input side of HIGH-TOOL. Understanding the user requirements on the level of detail is crucial. This pertains firstly to the required detail of the policy measure input. Secondly, different levels of detail are possible for the implementation of a policy measure in the model.

Since HIGH-TOOL will be designed as a strategic modelling tool, there are limitations to the level of detail of the implementation of policy measures. Naturally, the required level of detail may vary for different policy categories or measures. Although a high level of detail is generally not feasible, exceptions may be needed to model measures of certain priority policy categories.

Table 2 provides some examples of policy measures, elaborated in varying levels of detail. As such, this table demonstrates different possibilities for formulating the policy measures for input to HIGH-TOOL. The left column lists three low-detail policy measures. Each of these is split up into several medium-level policy measures, which may be further elaborated into separate high-level measures (right column). Note that a high-detail level is not conceivable for all policy measures. The policy initiatives of the Transport *White Paper* (European Commission, 2011a) correspond generally to the low-detail level, while the policy measures represent the medium-detail level. For the high-detail level these policy measures can be specified even further, for instance based on the *Commission Staff Working Document Accompanying the White Paper* (European Commission, 2011d) or other relevant sources. However, not all topics are elaborated to the same extent in the Transport *White Paper*, so these relationships vary for different policy measures.

The level of detail a certain policy measure will be considered with in HIGH-TOOL depends on the priority of the category it belongs to, and the feasibility of adding more detail.

Table 2: Level of detail of some policy measures chosen as examples

Low detail	Medium detail	High detail
A true internal market for rail services	Opening domestic rail passenger market to competition	» Open access (competition in market) » Competitively tendered public service contract (competition for market)
	Single vehicle type authorisation and a single railway undertaking safety certification	
	Integrated approach to freight corridor management	» Allocation cross-border capacity » Timing of investment » Infrastructure standards » Track access charges
	Ensure non-discriminatory access to rail infrastructure and services; separation between infrastructure management and service provision	
	Establish legal and financial framework	
Increase deployment of ITS	Travel information services	» Static route planners » Dynamic and real-time route planners » Personalised travel information » Infrastructure bounded travel information for public transport » Infrastructure bounded travel information for road transport (DRIPs: VSL, Lane-keeping assistance, Travel times) » In-vehicle travel information
	Mobility services	» E-ticketing » Mobile phone ticketing » Multimodal smart cards » Mobile phone payments » Bike sharing services » Car sharing services » Demand Responsive Transport systems
	Transport management systems	» Public transport management systems » Linking timetables of different public transport operators to improve interconnectivity » General transport management systems; examples are: Ramp metering, Peak lanes, Traffic signal coordination
TEN-T core network	Improve inter-country connectivity via core network; integrate eastern and western part of EU	» Establish missing rail link between region A and region B » Improve road bottleneck between region C and D
	Focus EU-funded transport investments to meet energy efficiency needs and climate change challenges	» Varying climate resilience of new infrastructure » Different construction material

2.3 Impact Indicators

2.3.1 Methodology

The identification of impact indicators is based on a wide range of different inputs:

- The European Commission's *Impact Assessment Guidelines* (European Commission, 2009)
- Recent EU transport policy documents
- Outcomes of EU-funded research projects.

The starting point is established by the European Commission's *Impact Assessment Guidelines*, which provides a generic structure of impact variables. By applying EU transport policy documents the generic scope of impact indicators is adjusted to the requirements of EU transport policy. Finally, EU-funded research projects are analysed. On the basis of these inputs, the proposal for HIGH-TOOL output indicators is derived. This methodology is illustrated and summarised by Figure 3.

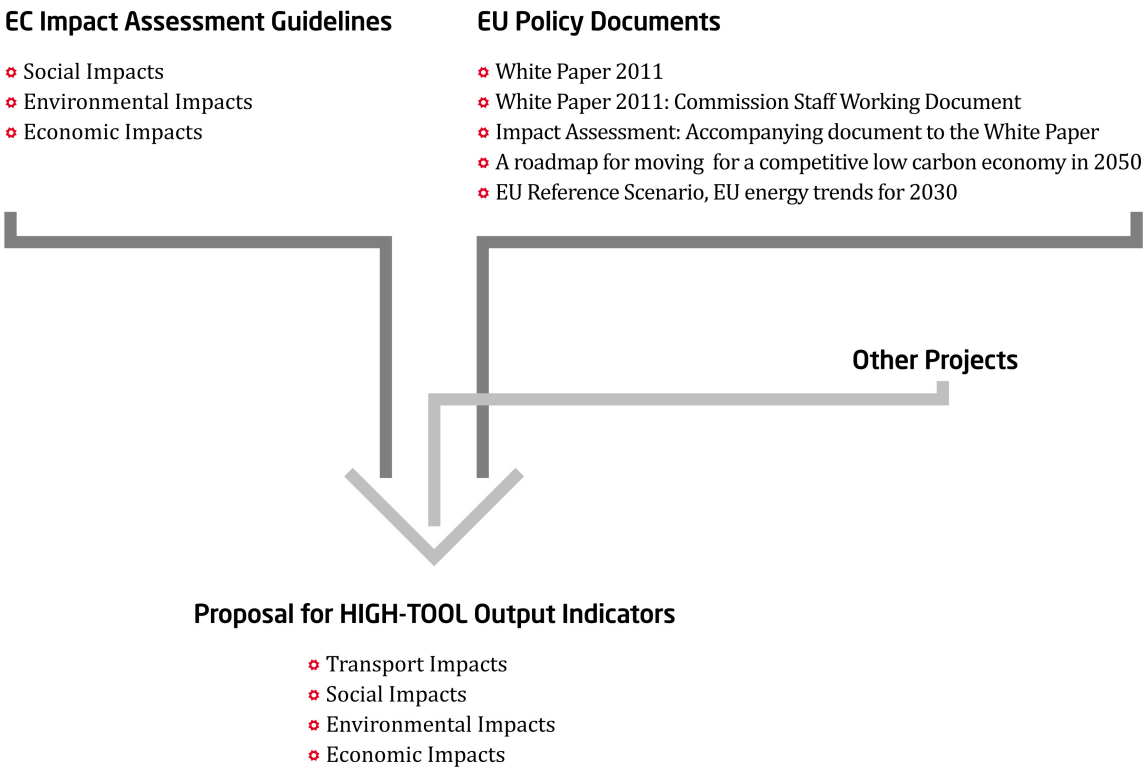


Figure 3: Methodology of deriving HIGH-TOOL impact indicators

2.3.2 Impact Assessment Guidelines of the European Commission

The basis of the identification of potential impact indicators of the HIGH-TOOL model is represented by the *Impact Assessment Guidelines* (European Commission, 2009). These Guidelines are an important foundation for EC policy specialists involved in impact assessments. They explain what impact assessment is about, and give "guidance on the analytical steps to follow" in impact assessment. The Guidelines for conducting impact assessments have a general scope and are not related to a specific sector such as transport. Nevertheless, the document provides a basis on economic, social and environmental variables, which may represent assessment indicators. Each impact criterion category is supplemented by a set of "key questions" (European Commission, 2009): For example, the indicator "Macroeconomic environment" is complemented by a set of key questions such as:

- Does it have overall consequences of the option for economic growth and employment?
- How does the option contribute to improving the conditions for investment and the proper functioning of markets?
- Does the option have direct impacts on macro-economic stabilisation?

In the following, an overview is provided on impact indicators which are listed in the *Impact Assessment Guidelines*. The scope of **economic impacts** is as follows:

- Functioning of the internal market and competition
- Competitiveness, trade and investment flows
- Operating costs and conduct of business/Small and medium enterprises
- Administrative burdens on businesses
- Public authorities
- Property rights
- Innovation and research
- Consumers and households
- Specific regions or sectors
- Third countries and international relations
- Macroeconomic environment.

The following **social impacts** are part of the *Impact Assessment Guidelines*:

- Employment and labour markets
- Standards and rights related to job quality
- Social inclusion and protection of particular groups
- Gender equality, equality treatment and opportunities, non-discrimination
- Individuals, private and family life, personal data
- Governance, participation, good administration access to justice, media and ethics
- Public health and safety
- Crime, terrorism and security
- Access to and effects on social protection, health and educational systems
- Culture
- Social impacts in third countries.

The *Impact Assessment Guidelines'* scope of **environmental impacts** is as follows:

- Climate
- Transport and the use of energy
- Air quality
- Biodiversity, flora, fauna and landscapes
- Water quality and resources
- Soil quality or resources
- Land use
- Renewable or non-renewable resources
- The environmental consequences of firms and consumers
- Waste production/generation/recycling
- The likelihood or scale of environmental risks
- Animal welfare
- International environmental impacts.

This generic list of possible impacts to be considered by impact assessment schemes needs to be adjusted to the requirements of transport policy. For this purpose, in order to facilitate a more focused approach, key documents of EU transport policy are screened in the following paragraphs.

2.3.3 Transport Policy Impact Indicators

2.3.3.1 Structure of impact variables

While the impact variables of the *Impact Assessment Guidelines* differentiate between economic, social and environmental impacts, the analyses of transport policy documents reveal the requirement to consider also transport sector related impact variables. Hence the impact indicators are structured along the following four main categories:

- Transport activity
- Economic impacts
- Social impacts
- Environmental impacts.

2.3.3.2 EU transport policy documents

In order to identify key impact variables from EU Transport Policy Documents, a set of five policy documents has been taken into account:

- *White Paper*: *Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system* (European Commission, 2011a);
- *Commission Staff Working Document Accompanying the White Paper: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system* (European Commission, 2011d);
- *Impact Assessment Working Paper Accompanying the White Paper*: *Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system* (European Commission, 2011b);
- *A Roadmap for moving to a competitive low carbon economy in 2050* (European Commission, 2011c);
- EU Reference Scenario 2013: *EU energy trends to 2030* (European Commission, 2010).

The most prominent document of this list is the Transport *White Paper*, which comprises a thorough outline of the EC's strategic policy outline. Two other documents are directly related to the Transport *White Paper*. The EU Reference Scenario 2013 has been taken into account, since it represents an important reference document for HIGH-TOOL. Table 3 comprises all relevant impact indicators of these documents.

Table 3: Impact indicators of EU policy documents

Category	Impact indicator
Transport impacts	» Passenger volume » Freight volume » Load factors » Modal share passenger » Modal share freight » Unit costs passenger » Unit costs freight » Congestion
Economic impacts	» Economic growth (GDP) » Household income » Employment level » Trade (import, export) » Oil price » Tax revenue
Social impacts	» Accessibility » Safety (number of fatalities)
Environmental impacts	» GHG emissions » Air pollution » Noise pollution » Local air pollution » Energy use » Market share of new fuels and propulsion systems » Market share of internal combustion engine electric hybrids

2.3.3.3 EU research projects

The following tables summarise several impact indicators used in the EU projects ASSIST (Maurer et al., 2011), TRANSFORUM (van der Waard, 2007), SUMMA (Rahman and van Grol, 2005), iTREN-2030 (Fiorello et al., 2009) and REFIT (Sessa et al., 2007). These indicators are also structured by four main categories 'transport activity', 'economic impacts', 'social impacts' and 'environmental impacts'. Table 4 refers to impact indicators used in the ASSIST project, Table 5 shows the impact indicators from the TRANSFORUM project, Table 6 indicates the SUMMA impact indicators, Table 7 displays the impact indicators used in the iTREN-2030 project, while impact indicators applied in the REFIT project are listed in Table 8.

Table 4: Impact indicators of the ASSIST project

Category	Impact indicator
Transport impacts	» Modal share » Costs of mobility
Economic impacts	» Effects on the competitiveness of business (sectoral, spatial) » Employment » Tax revenues for government » Insurance (e.g., to cover accidental damages) » Health service costs (e.g., caused by accidental injuries) » Time savings
Social impacts	» Accessibility » Safety » Choice of travel modes (availability, capacity, cost, time, information, privacy) » Health (noise, emissions) » Social cohesion
Environmental impacts	» Climate » Pollutant emissions » Noise emissions

Table 5: Impact indicators of the TRANSFORUM project

Category	Impact indicator
Transport impacts	» Passenger transport performance » Freight transport performance » Travel time » Car ownership and use
Economic impacts	» Economic Growth (GDP) » Production » Income » Household income » Employment » Trade » Fuel price
Social impacts	» Accessibility » Safety (number of fatalities, value of freight lost) » Security (injured and attacked people)
Environmental impacts	» GHG emissions » Air pollution » Noise pollution

Table 6: impact indicators of the SUMMA project

Category	Impact indicator
Transport impacts	—
Economic impacts	» Transport costs
Social impacts	» Accessibility » Safety
Environmental impacts	» GHG emissions » Noise pollution » Air pollution

Table 7: Impact indicators of the iTREN-2030 project

Category	Impact indicator
Transport impacts	» Passenger volume » Freight volume
Economic impacts	» GDP » Oil price
Social impacts	—
Environmental impacts	» GHG emissions » Energy use » Share of renewable energy sources » Share of biofuels

Table 8: Impact indicators of the REFIT project

Category	Impact indicator
Transport impacts	» Load factors
Economic impacts	» GDP » Transport sector production » Trade » Transport costs » Employment » Government net revenue
Social impacts	» Accessibility » Safety (injuries, fatalities)
Environmental impacts	» GHG emissions » Local air quality » Noise » Energy use

2.3.4 Consolidated Set of Impact Variables

In the current step, the impact variables from EU policy documents and EU-funded research projects are combined. Table 9 provides an overview of the consolidated set of impact indicators.

Table 9: Consolidated set of impact indicators

Category	Impact indicator
Transport impacts	» Passenger volume » Freight volume » Passenger transport performance » Freight transport performance » Load factors » Modal share passenger » Modal share freight » Unit costs for passenger transport » Unit costs for freight transport » Congestion » Car ownership*
Economic impacts	» Economic growth (GDP)* » Value added of the transport sector (GVA) » Household income » Employment level* » Trade (import, export)* » Oil price, fuel price* » Tax net revenue for government » Effect on competitiveness of business (sectoral, spatial) » Insurance (i.e. due to accidental injuries) » Time savings
Social impacts	» Accessibility » Safety (number of fatalities, value of freight lost) » Security (injured and attacked people) » Choice of travel modes (availability, capacity, cost, time, information, privacy) » Health (noise, emissions) » Social cohesion
Environmental impacts	» GHG emissions » Air pollution » Noise pollution » Local air pollution » Energy use » Market share of new fuels and propulsion systems » Market share of internal combustion engine electric hybrids » Market share of biofuels

* … this variable can be used both exogenously and endogenously

2.3.5 Proposed Impact Indicators

The indicators presented in this section aim at providing a rather complete overview of relevant impact criteria. However, due to the strategic focus of the HIGH-TOOL model, some of the listed indicators are likely to be beyond the scope of HIGH-TOOL. These indicators are labelled by footnotes.

2.3.5.1 Transport impacts

The transport sector-related impact indicators and the impact measurement are summarised in Table 10.

Table 10: Transport impact indicators and measurement

Impact indicator	Impact measurement
Passenger volume, per mode	» Number of trips
Freight volume, per mode	» Number of tons carried
Passenger transport performance, per mode	» Passenger-kilometre » Vehicle-kilometre
Freight transport performance, per mode	» Tonne-kilometre » Vehicle-kilometre
Passenger load factor, per mode†	» Load factor
Freight load factor, per mode†	» Load factor
Modal share passenger transport	» Percentage share
Modal share freight transport	» Percentage share
Unit costs for passenger transport, per mode	» Generalised costs, from the viewpoint of a user
Unit costs for freight transport, per mode	» Generalised costs, from the viewpoint of a user
Congestion†	» Loss of time due to congestion
Car ownership*	» Number of private passenger cars per 1,000 inhabitants

* … this variable can be used both exogenously and endogenously
† … this impact indicator might be beyond the scope of HIGH-TOOL

2.3.5.2 Economic impacts

Table 11 displays the economic impact variables to be potential output indicators of the HIGH-TOOL model.

Table 11: Economic impact indicators and measurement

Impact indicator	Impact measurement
Economic growth* and GVA by sector	» Total GDP, GDP/capita and GDP growth rate, GVA by sector growth rate
Added value of the transport sector	» GVA of the transport sector
Household income†	» Available income per household
Employment by sector*	» Number of employed persons » Rate of unemployment
Transport sector employment	» Number of employed persons
Trade, import and export*	» Trade, measured in total volume and monetary terms
Fuel price*	» Fuel price for gasoline, bunker, diesel, gas and kerosene
Energy price*	» Energy price for e-mobility
Cost savings	» Costs savings, measured in monetary terms
Time savings	» Time savings, measured in monetary terms
Tax net revenue for government	» Tax net revenue for government, measured in monetary terms

* … this variable can be used both exogenously and endogenously
† … this impact indicator might be beyond the scope of HIGH-TOOL

2.3.5.3 Social impacts

The social impacts and possibilities to measure them are summarised in Table 12. Safety and security distinguish by transport mode.

Table 12: Social impact indicators and measurement

Impact indicator	Impact measurement
Accessibility†	» Accessibility, e.g., measured by infrastructure-based-, generalised cost-based, utility-based, gravity or space-time approaches
Safety	» Number of accidents (absolute and per pkm) » Number of fatalities per pkm » Number of injured persons (absolute and per pkm) » Damages due to accidents and incidents (absolute and per pkm) » Freight losses, measured in monetary terms† » External and social costs of accidents
Security†	» Number of serious incidents
Social cohesion†	» Income inequality » Income distortions

† … this impact indicator/measurement might be beyond the scope of HIGH-TOOL

2.3.5.4 Environmental impacts

Table 13 displays the measurement of the impact indicators: GHG emissions, (local) air pollution, noise pollution and energy use. These indicators need to distinguish by transport mode.

Table 13: Environmental impact indicators and measurement

Impact indicator	Impact measurement
GHG emissions	» GHG emissions (e.g., CO_2, CH_4, N_2O), measured in tonnes » External costs of GHG emissions
(Local) air pollution	» (Local) air pollution (e.g., PM, CO, Pb, C_xH_y, NO_x, SO_2, VOC) measured in tonnes » External costs of (local) air pollution
Noise pollution†	» Number of people at home exposed to noise levels above 60 dB on average per year » Percentage share of population exposed to L_{den} > 55 dB(A) and L_{night} > 45 dB(A) » External costs of noise pollution
Energy use	» Energy use, measured in toe/year » Percentage share of new fuels and propulsion systems » Percentage share of internal combustion engine electric hybrids » Percentage share of biofuels

† … this impact indicator might be beyond the scope of HIGH-TOOL

2.4 Link to Other Tools and Data Sources

HIGH-TOOL should serve as a pre-selection tool of policy options. Those policy options that are deemed promising can be evaluated in more detail by other models that are more suited for in-depth assessment. To be able to fulfil this objective, it needs to be considered which tools are routinely used for in-depth assessment, to ensure HIGH-TOOL's compatibility and consistency. Apart from linkages to other tools, also HIGH-TOOL's links to data sources needs to be addressed.

This section describes the views of the consortium on valid tools and data sources to be considered at the outset of the HIGH-TOOL project. As a starting point, Table 14 provides a list of available tools which has been derived from the annexes to the *Impact Assessment Guidelines* (European Commission, 2009). This rather comprehensive list of available tools contains many tools that may be out of scope as targets for linkage or consistency.

Table 14: List of tools

Type	Tool
CGE	EDGE
	GEM-CCGT
	GEM-E3
	OECDTAX
	PACE
	WORLDSCAN
Sectoral	PRIMES
	POLES
	SAFIRE
	ASTRA
	EXPEDITE
	SCENES
	TREMOVE
	TRANS-TOOLS
	CAPRI
	SIMAC
Macro-econometric	E3ME†
	NEMESIS†
	QUEST II†
	WARM†
Environmental impact assessment	ECOSENSE†
	FUND†
	IMAGE†
	RAINS†
	SMART†
	GAINS†
Micro-simulation	EspaSim†
	ETA†
	EUROMOD†
	TAXBEN†

† … this tool may be beyond the scope of HIGH-TOOL

With respects to data sources the list in Table 15 has been compiled. These data sources are general purpose sources that are employed to drive many of the tools listed above and are generally used as primary source for transport-related studies.

The final list of data sources will be influenced by the user needs of HIGH-TOOL itself, as well as the other tools and data sources it has to be consistent with.

Table 15: List of data sources

Data source
Eurostat
ETISplus
OECD
TENtec

2.5 User Interface

At this early stage of development of the HIGH-TOOL model, it is important to raise key questions related to the operability of the tool and its interface. This will provide indirect information on the conceptual approach of the tool, e.g., its expected level of complexity, its runtime and the format of its outputs. This section describes in separate paragraphs a number of key principles, which are based on Tognazzini (2013) and are aimed at making the HIGH-TOOL interface user-friendly (easy to understand), efficient (easy to perform common tasks) and powerful (allowing performing tasks according to the users' expectations). These principles will be retained at the core of the HIGH-TOOL interface design.

2.5.1 Anticipation

The HIGH-TOOL user interface will attempt to anticipate the user needs. Users will not be expected to search for information or evoke necessary tools, but the information and tools needed for each step of the process will be provided to the users in a natural way. Defaults in HIGH-TOOL will be 'intelligent' and responsive.

2.5.2 Visible Navigation

In HIGH-TOOL, navigation will be reduced to a minimum. The interface will be designed so that users can access configuration – hypotheses – calculations – results screens using a minimum number of clicks and actions. Navigation will be clear and natural, allowing a user to quickly transition from novice to expert.

2.5.3 Efficiency of the User

HIGH-TOOL will focus on the user's productivity, not the computer's. The application will be designed so that task flows are comfortable, clear and optimal for the user, rather than organised according to programming needs. Help messages will be responsive to problems, with clear messages that pay off in terms of comprehension and efficiency. Menu and button labels will mention key word(s) first.

2.5.4 Global Positioning

The HIGH-TOOL interface will be designed such that users are able to glance at their work environment and be able to gather at least a first approximation of the state and workload for undertaking envisaged tasks.

2.5.5 Consistency

The most important kind of consistency in HIGH-TOOL will be consistency with user expectations, such as:

- Logical short-keys which stay coherent along the application;
- Buttons, input fields and navigational controls will always be located in the same position of the interface;
- Harmonious overall 'look' of the different screens.

However, HIGH-TOOL will avoid uniformity making it visually 'inconsistent' when things must act differently. This is just as important as it is to be visually consistent when things act the same.

In relation to logical consistency in policy evaluation, HIGH-TOOL will provide quick and easy navigation to the most relevant impact indicators. This way, the user is guided in the interpretation of the output results.

2.5.6 Explorable Interfaces

Users in HIGH-TOOL will be offered a line of least resistance allowing them to do just what they want to get the job done in the quickest way possible, while still supporting those who want to explore further. This means stable visual elements to allow fast navigation, making actions reversible and always allowing a way out while making it easier to stay in.

2.5.7 Readability

Texts in HIGH-TOOL will be incorporated in such a way that they can be read properly without effort, favouring dark text on pale backgrounds, avoiding grey backgrounds and using font sizes that are large enough to be readable on standard monitors. A code of colours will be provided for different kinds of cells in the interface (e.g., cells containing exogenous assumptions, cells containing intermediate results).

2.5.8 Colour Blindness

Any time you use colour to convey information in the interface, you should also use clear, secondary cues. Most people have colour displays nowadays, but they are not universal. In addition, the interface should also be applicable by colour blind users.

2.5.9 Learnability

HIGH-TOOL will provide an interface such that its learning curve allows users to quickly get used to the application and learn how to perform tasks within the minimum time possible.

The following screenshots, Figure 4 (source: PASHMINA, 2012), Figure 5 (source: PASHMINA, 2012) and Figure 6 (source: Randers, 2012), give an impression of possible starting points for the development of the user interface of the HIGH-TOOL model. The interface of the ASTRA-EC model will be considered, too.

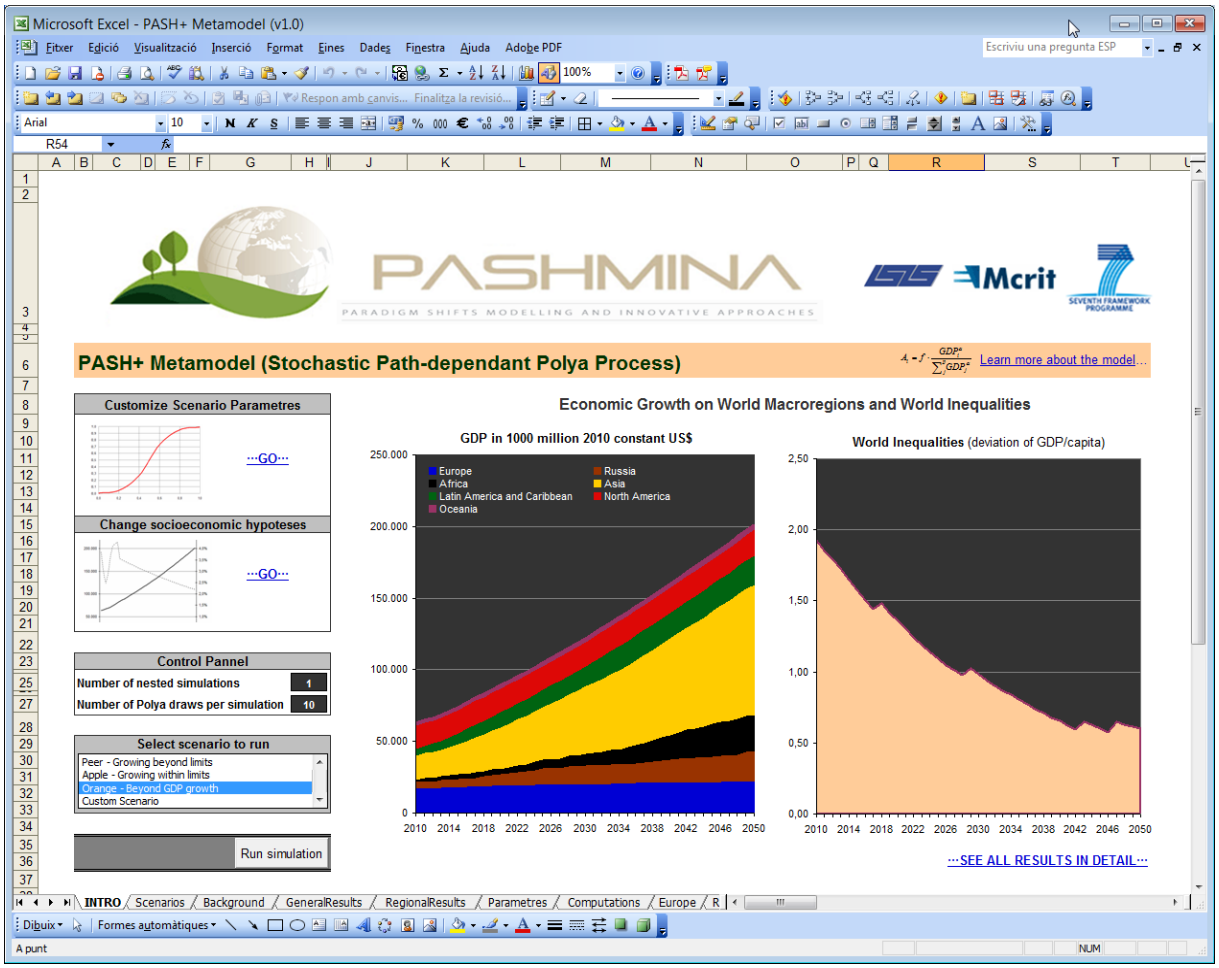


Figure 4: Example of the graphical orientation of the user interface in the PASH+ meta-model application

The PASHMINA model was designed in such a way that most common tasks were made accessible already from the main control panel, which also included most relevant results of simulations. The design of the tool was made in a way that it was intuitive and attractive to users. Background knowledge on hypothesis to be established and formulations used by the model was provided whenever necessary, as well as references to background theory.

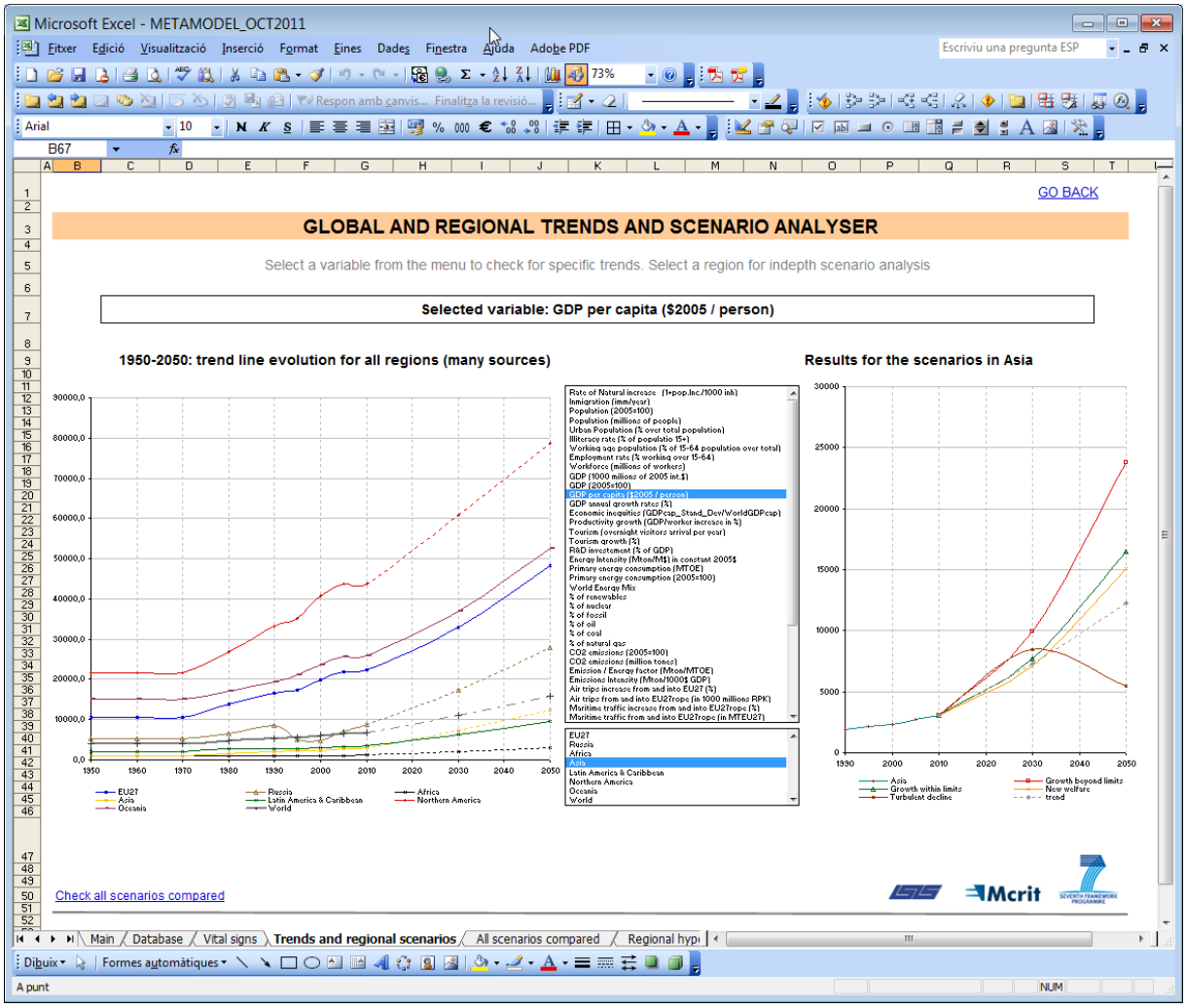


Figure 5: Mouse selective panels increase the user friendliness of navigation

The PASHMINA model presented full results in a quick and easy to understand navigation scheme. Different trends to be visualised could be selected from pop-up menus built in the Microsoft Excel environment.

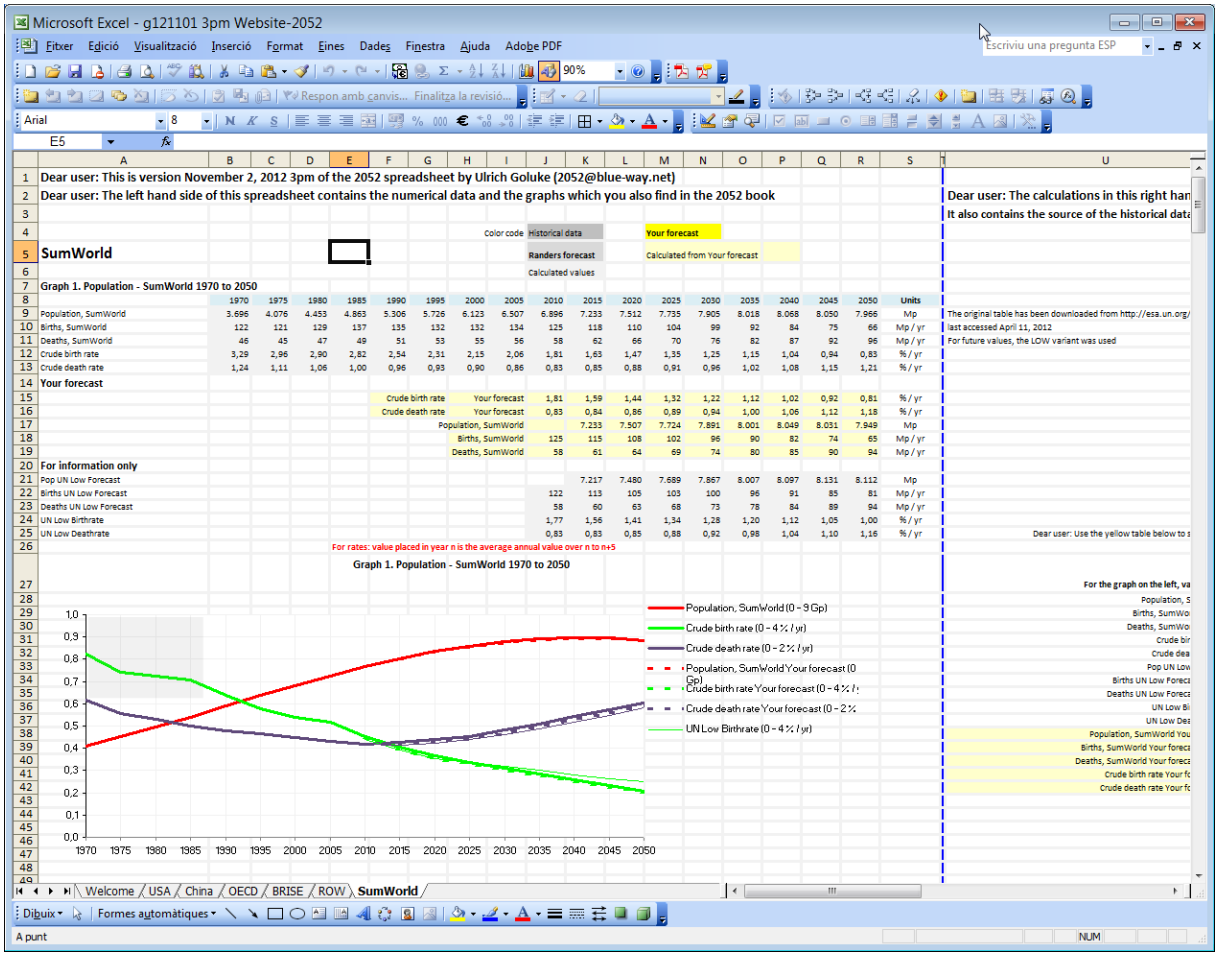


Figure 6: Example of full user transparency in the calculation processes of the 2052@blue-way world meta-model application

The 2052@blue-way meta-model is a good example of how a transparent application should be. All calculations, formulations and intermediate results are shown to the user, so that full transparency and user understanding of the functioning of the model is promoted. Colour codes are used to differentiate the nature of cells, e.g., user's inputs (independent variables), intermediate results and final results.

The interface of HIGH-TOOL will be developed in an iterative process, beginning with an application prototype early in the project (February 2014) incorporating basic calculus functionalities and a first formal proposal of overall navigational principles.

2.6 Miscellaneous/Essential Model Properties

Apart from model properties elaborated in the previous sections, specific tool requirements by the EC have been highlighted during the kick-off meeting (European Commission, 2013a):

- Free, open source and transparent (traceability);
- Endogenous projections for passenger & freight transport activity at regional level for EU Member States (EU28);
- Differentiation by distance classes (< 300 km; between 300 km and 1000 km and > 1000 km);
- Consideration of all transport modes and vehicle technologies for the assessment of economic, social and environmental impacts of transport policy options;
- Modular structure allowing stepwise validation;
- 2050 time horizon.

3 First User Workshop and Online Survey

This chapter provides results of the First User Workshop, which was held in Brussels on 25 June 2013 in order to collect and discuss the user requirements for HIGH-TOOL. Following the Workshop, an Online Survey was organised in July/August 2013 to complement the consortium's understanding of the user requirements. The results of the Online Survey are included in this chapter as well.

This chapter is structured as follows: Section 3.1 provides an overview of participants of the First User Workshop, while section 3.2 contains the Workshop agenda. Section 3.3 explains the objective of the Workshop and the approach that was followed. Subsequently, section 3.4 reports the questions, answers and main conclusions of the Workshop, while section 3.5 summarises contents and obtained answers of the Online Survey. A complete overview of obtained answers is available in the Annex.

3.1 Workshop Participants

The First User Workshop was attended by 30 participants from DG MOVE and the consortium:

- EC/DG MOVE: Helmut Adelsberger, Jesus Bonet, Andrea Bomhoff, Thorsten Brunzema, Olivier Coppens, Maria Delligianni, Massimiliano Esposito, Maciej Grzeszczyk, Aleksandra Ivanova, Annika Kroon, Frank Laurent, Maria Cristina Mohora, Julie Raffaillac, Sandro Santamato, Guus van de Schouw, Helena Hinto, Peter Szatmári, Monique van Wortel, Martin Zeitler.
- KIT: Eckhard Szimba, Christian Meyer.
- MCRIT: Efrain Larrea.
- TNO: Ming Chen.
- MKmetric: Benedikt Mandel.
- Panteia: Jan Kiel, Michel Winnubst.
- TML: Kris Vanherle, Ruben Corthout.
- Significance: Rik van Grol.
- FŐMTERV: Ferenc Cselle.

3.2 Workshop Agenda

The following screenshot shows the agenda of the First User Workshop.

First User Workshop

Agenda

25 June 2013 • Brussels, Belgium
DG MOVE • Rue de Mot 28 • 1040 Brussels • Room: 08/69

Key objective
• collect and discuss user requirements of the HIGH-TOOL model regarding policies, impact indicators, the user interface and other technical issues

09^{30}.....Welcome remarks
➔Sandro Santamato (Head of Unit), *DG MOVE A3*

09^{35}.....Introduction to the HIGH-TOOL project
➔Dr. Eckhard Szimba, *KIT*

09^{55}.....Objectives of the workshop & technical information
➔Kris Vanherle, *TML*; Michel Winnubst, *Panteia*

Policy requirements: policy measures and impact indicators, initiated by brief presentations by Kris Vanherle, TML (policy measures) and Eckhard Szimba, KIT (impact indicators)

10^{00}.....Guided discussion/collection of opinions on selected aspects regarding policy measures
➔all participants

10^{40}.....Guided discussion/collection of opinions on selected aspects regarding impact indicators
➔all participants

11^{10}.....COFFEE BREAK

11^{25}.....Open discussion on policy measures and impact indicators
➔all participants

Policy requirements: user interface and technical issues, initiated by a brief presentation by Efrain Larrea, MCRIT

11^{55}.....Guided discussion/collection of opinions on selected aspects regarding user interface and technical issues
➔all participants

12^{15}.....Open discussion on user interface and technical issues
➔all participants

12^{45}.....Summary and conclusions
➔Dr. Benedikt Mandel, *MKm*

12^{55}.....Closing remark
➔Dr. Eckhard Szimba, *KIT*

13^{00}.....End of the Workshop

Figure 7: Agenda of the First User Workshop

3.3 Workshop Objective and Approach

The objective of the First User Workshop was to learn about and understand the EC requirements for HIGH-TOOL and reveal discrepancies between actual user requirements and user requirements as anticipated by the consortium. Corresponding to the HIGH-TOOL *Inception Report* (Szimba et al, 2013), the Workshop addressed the user requirements on four topics, namely policy measures, impact indicators, link to other tools & data sources and user interface.

During the Workshop, a set of prepared questions were put forward to consortium and EC participants. In order to facilitate an efficient collection of as many opinions as possible, MeetingSphere was used. MeetingSphere is a software tool designed to support workshops with a large number of participants. Via MeetingSphere, answers and votes of all participants to pre-prepared questions are automatically collected. Two types of questions can be distinguished in MeetingSphere: Open 'brainstorm' questions to which the participants may provide any answer, and 'rating', for which the participants cast their vote, choosing between predefined options.

Following each of the four topics, an open discussion was held to further clarify the opinions of the Workshop participants. Also for the Online Survey, MeetingSphere was used to collect opinions from the EC on some additional topics which had emerged during the Workshop.

3.4 Workshop Report

This section follows the structure of the Workshop agenda. For the various topics, first the prepared questions are presented. Open questions are termed 'Brainstorm', whereas 'Rating' represents a voting. Subsequently, an aggregate overview of the given answers is provided. The answers are categorised by answers given by 'EC' participants and answers given by the 'Consortium' in order to provide a clear view on potentially diverging opinions between the two groups. A full documentation of the survey results is contained in the Annex of this deliverable. Finally, also the open discussions are reported and the main conclusions are drawn.

3.4.1 Collection of Opinions on Policy Measures

In this first part of the Workshop dealing with policy measures, three questions were posed to the participants via MeetingSphere. The responses and conclusions to these questions are presented in three separate paragraphs.

3.4.1.1 Agreement on policy areas used in the impact assessment of the White Paper 2011

As a trial question, to make the participants familiar with MeetingSphere and the adopted approach for the Workshop, the participants were asked the following question:

Q ***"Do you agree with the suggested seven policy areas used in the impact assessment of the transport White Paper?"*** *(Brainstorm)*

The seven suggested policy areas used in the impact assessment of the Transport *White Paper* are as follows: pricing, taxation, research and innovation, efficiency standards and flanking measures, internal market, infrastructure, transport planning. The participants' answers are categorised and presented in Figure 8 (n=18) and Figure 9 (n=8).

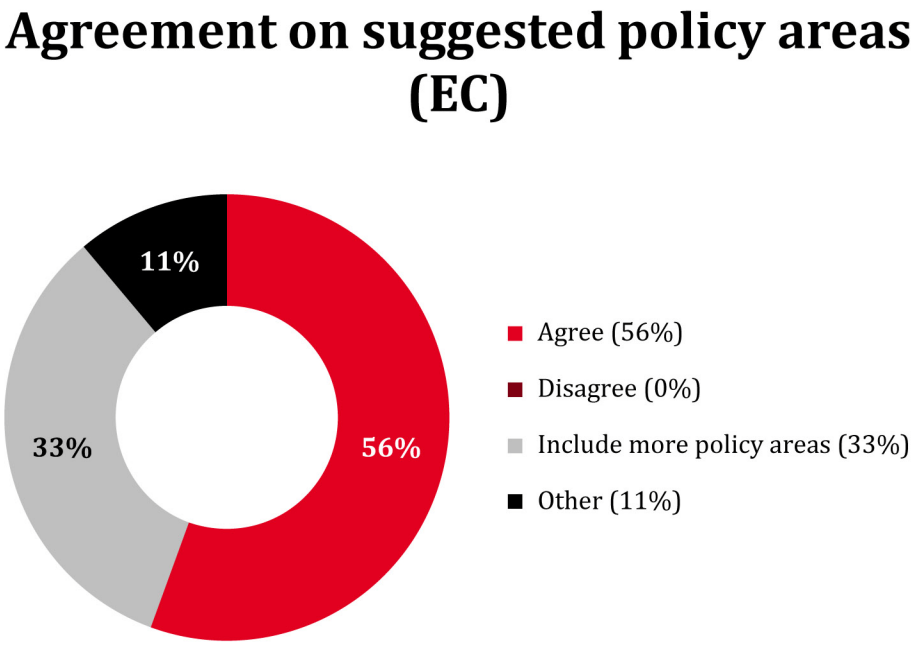


Figure 8: Level of agreement on the suggested seven policy areas (EC)

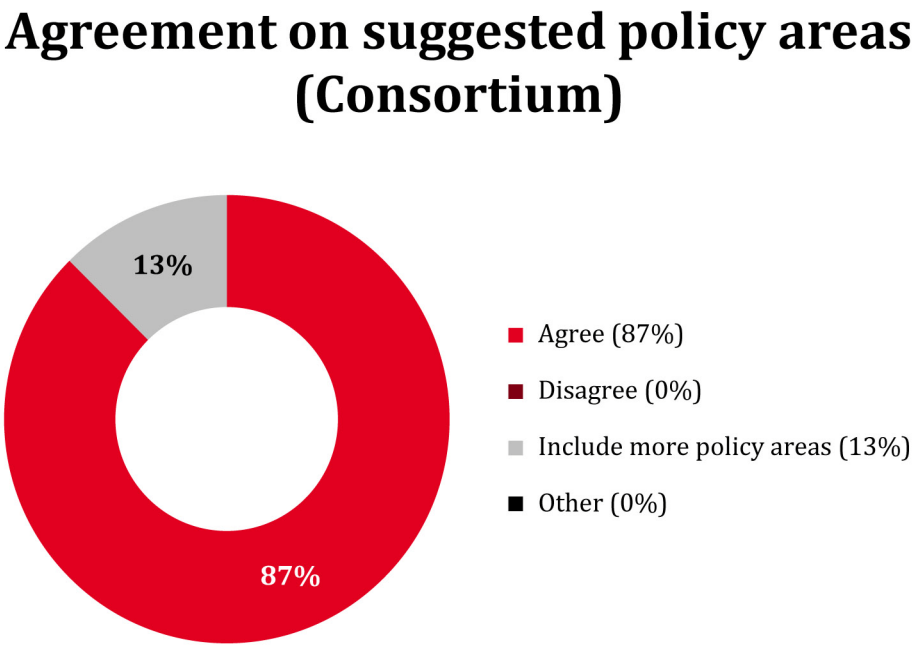


Figure 9: Level of agreement on the suggested seven policy areas (consortium)

In general, the consortium members and the participants of the EC agreed to the policy areas described. In the category 'Include more policy areas' some additional policy areas were suggested such as teleworking, safety, security, interoperability, and passenger rights. The answers categorised under 'Other' raised the question in how far this issue was relevant for the Workshop or HIGH-TOOL. As the question was posed as a trial question, it is not further discussed.

3.4.1.2 Prioritisation of policy categories

In order to obtain information on the relevance of policy categories for HIGH-TOOL, subsequently the following question was asked:

Q	***"Select priorities and non-priorities in the policy categories."*** *(Rating)*

More specifically, the participants were asked to select **five policy categories** which they find to have **high priority** and five with **lower priority** from the list of policy categories of Table 1. This prioritisation should support the decision on which types of policy measures HIGH-TOOL should focus, and on what level of detail each category should be elaborated.

Figure 10 and Figure 11 below depict the voting results for the eight policy categories which received the most priority votes. Voting results (in %) are shown in a cumulative manner from left to right. The complete voting results are displayed by Table A-1 and Table A-2 in the Annex.

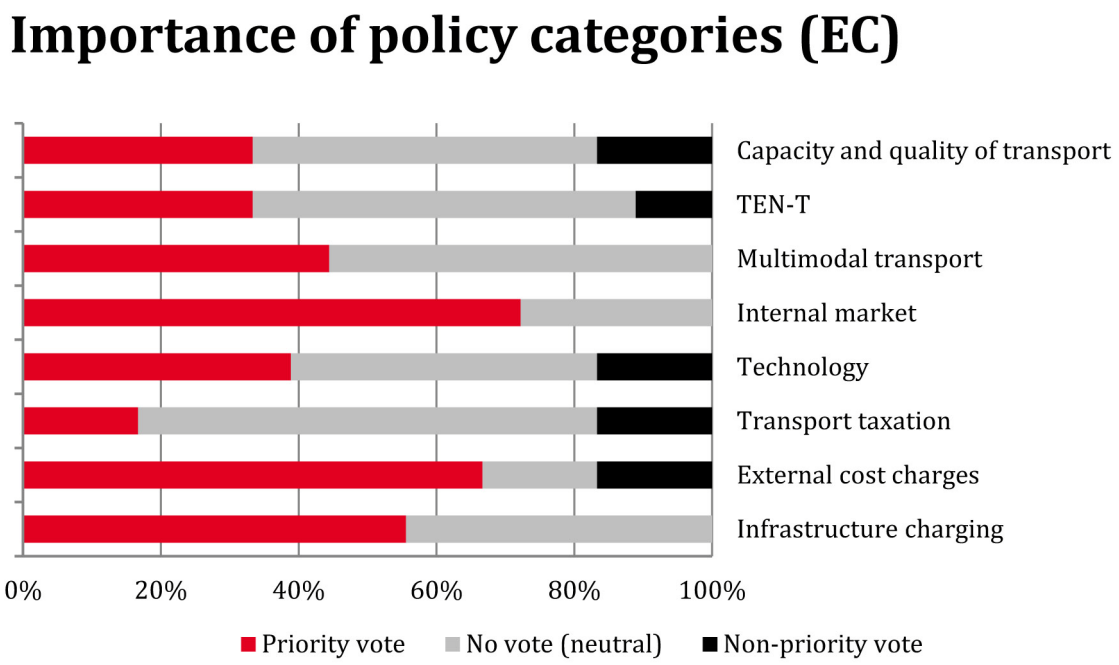


Figure 10: Rating of importance of policy categories (EC)

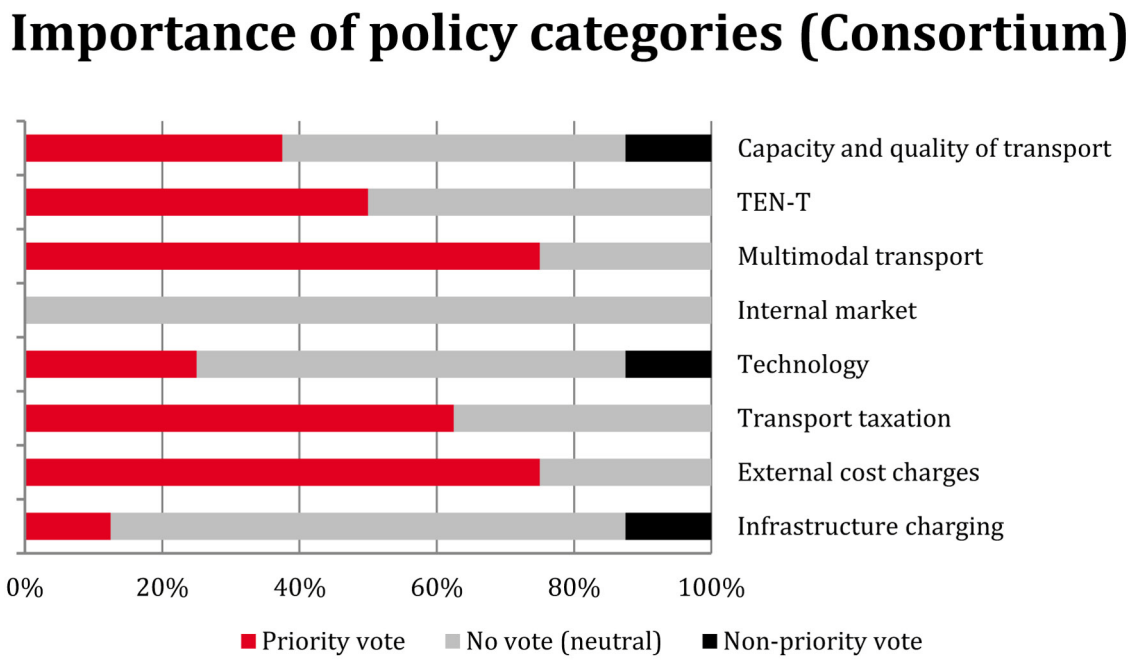


Figure 11: Rating of importance of policy categories (consortium)

The most important policy categories for the participants of the EC are as follows:

- 5.1: Internal market – intra-modal (road, rail, inland waterway transport, maritime, air);
- 1.2: External cost charges;
- 1.1: Infrastructure charging/Access restrictions schemes;
- 5.3: Multimodal transport.

Overall, the consortium's view on priorities was quite well in line with that of the EC participants. Only the priorities of categories 5.1 (internal market) and 1.1 (infrastructure charging) were clearly underestimated by the consortium. One of the reasons why internal markets are of high priority is because the completion of the internal market in transport is a central goal of the White Paper 2011 and the EC currently does not have any model capable of evaluating policy measures in this area. On the other hand, categories 6.1 (TEN-T) and 2.2 (taxation) are deemed somewhat less important by the EC participants than anticipated by the consortium. For TEN-T the reason for this outcome originates from the fact that the consortium has explained to EC that the HIGH-TOOL will not include the transport network. Evaluating the impacts of the TEN-T policy with a model without a transport network is not deemed feasible. With regard to taxation, there are already other modelling tools available to EC which include a high level of detail.

It was mentioned that some categories should be grouped, while others should be more differentiated[2]. For example, the category 'EU transport infrastructure in view of energy efficiency needs and climate change challenges' was said to overlap with the other infrastructure categories. In some cases a category encompassed both high and low priority policy measures (e.g., the category 'standards'). This made it difficult for some categories to be prioritised. The policy category 'EU transport infrastructure in view of energy efficiency needs and climate change challenges' was specifically mentioned as being ambiguous in terms of the policy measures it encompasses. Based on these comments, it was decided to allow more detailed voting (on level of policy measures rather than categories) in the Online Survey following the First User Workshop.

[2] The lack of differentiation stems from the fact that the voting was held at the second level of the categorisation, so that for example 'standards' needed to be prioritised as a whole, instead of allowing differentiation on the third level (safety, passenger rights, environmental).

3.4.1.3 The required level of detail for policy input

In order to get a better understanding of the expectations with regard to the level of detail of policy input, the following question was posed:

Q ***"What is the required level of detail for the policy measure input in HIGH-TOOL?"*** *(Rating)*

The example policy measures of Table 2, each formulated in **three different levels of detail (low, medium, high)**, were used as an input to this question. 'High level' of detail means very detailed representation in the model, whereas 'low level' of detail implies the policy measure is dealt with in a course manner (see Table 2). The Workshop participants were asked to select for each policy measure the level of detail they find most appropriate. While the disaggregated results are contained in the Annex, Figure 12 and Figure 13 present the aggregated results.

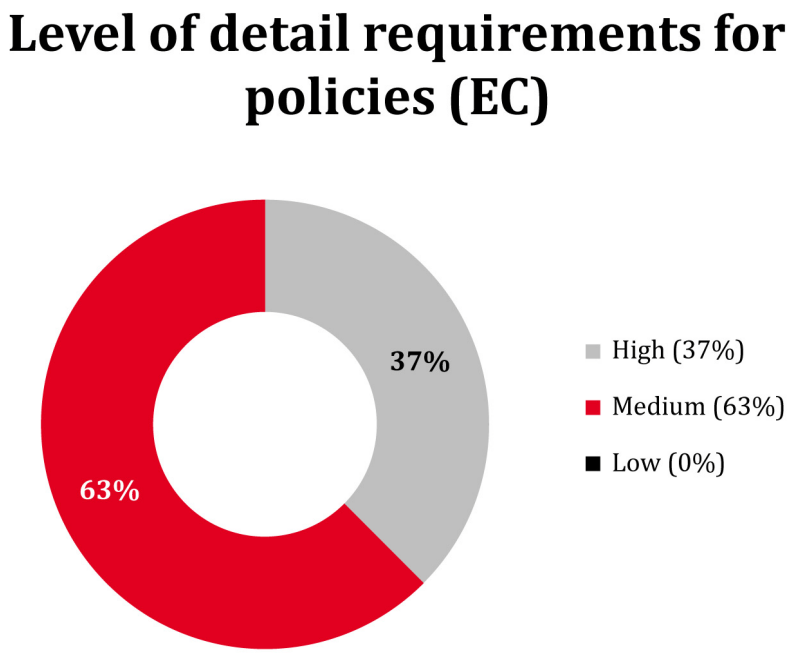


Figure 12: Level of detail requirement for policies (EC)

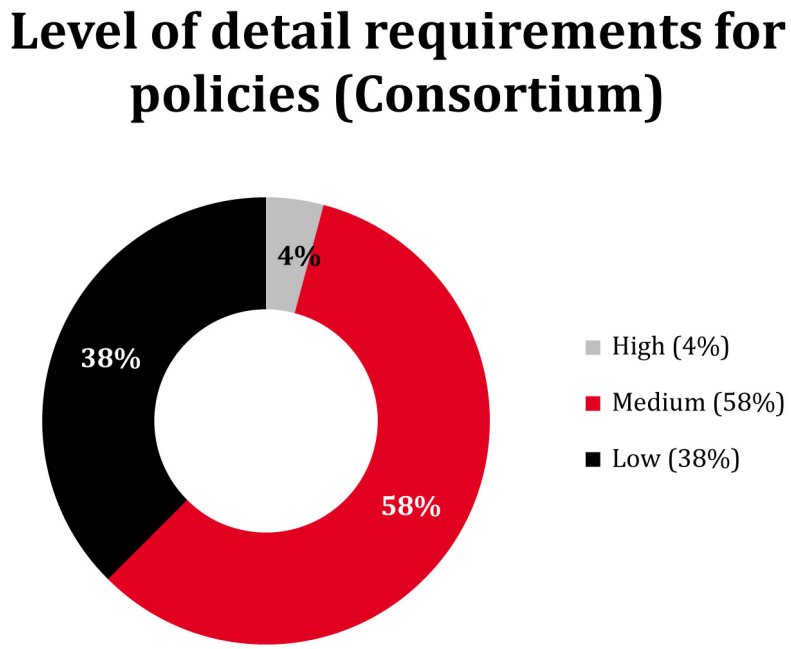


Figure 13: Level of detail requirement for policies (consortium)

It has become clear from the responses that for each of the examples the participants of the EC prefer a medium to high level of detail, whereas the consortium would like to adhere to a low to medium level of detail. Therefore, a good compromise seems to suggest a medium level of detail as the 'standard choice' when considering policy measures to be evaluated by HIGH-TOOL.

The level of detail was further discussed, given that opinions differ. Some participants reflecting the *Inception Report* (Szimba et al., 2013) saw HIGH-TOOL as a broad, strategic (pre-)impact assessment model covering all policy areas at a strategic level of detail, others stated that there were not many tools available at the EC and therefore a more detailed model would be very welcome. The request for using HIGH-TOOL directly for impact assessment (rather than just pre-impact assessment) was expressed by one participant of the EC but reflects a general preference towards this approach within DG MOVE.

The discussion underlined that a balanced decision on the HIGH-TOOL design would need to be elaborated in the further development process, since the model could not completely cover all policy domains and provide a lot of detail at the same time. The question was raised whether it was possible to partially leave the level of detail as an option to the user. The consortium replied that the model might have a modular design, such that some sub-models could be (de-)activated corresponding to the required level of detail. Also, the user interface could be defined in a way that it is possible to manually adjust generalised costs or other parameters, if certain policies are not directly considered in HIGH-TOOL.

3.4.2 Collection of Opinions on Impact Indicators

In order to obtain a precise view on the desired output indicators of the HIGH-TOOL model, the following question was posed to the participants:

> ***"Select priorities and non-priorities among the impact indicators."*** *(Rating)*

Among the impact indicators listed in Table 10 to Table 13 (see section 2.3.5) the Workshop participants were asked to select **five impact indicators** which according to their opinion have **high priority** or **low priority**. Figure 14 and Figure 15 display the voting for those impact indicators, which have been labelled as high priority by EC participants. Voting results (in %) are shown in a cumulative manner from left to right. A complete overview of results is provided in the Annex.

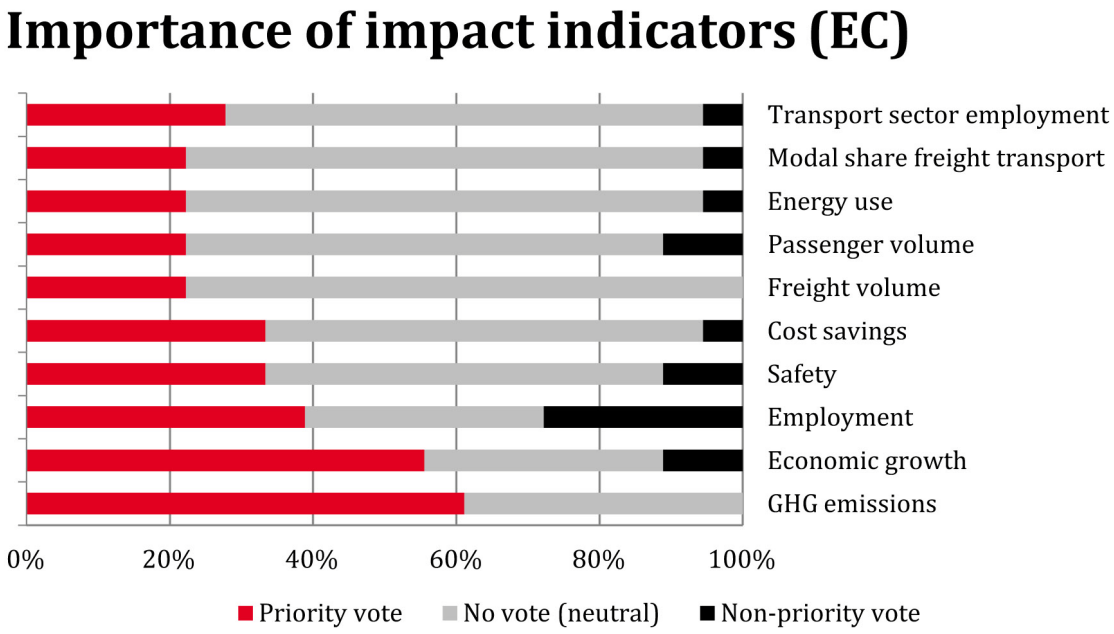


Figure 14: Importance of impact indicators (EC)

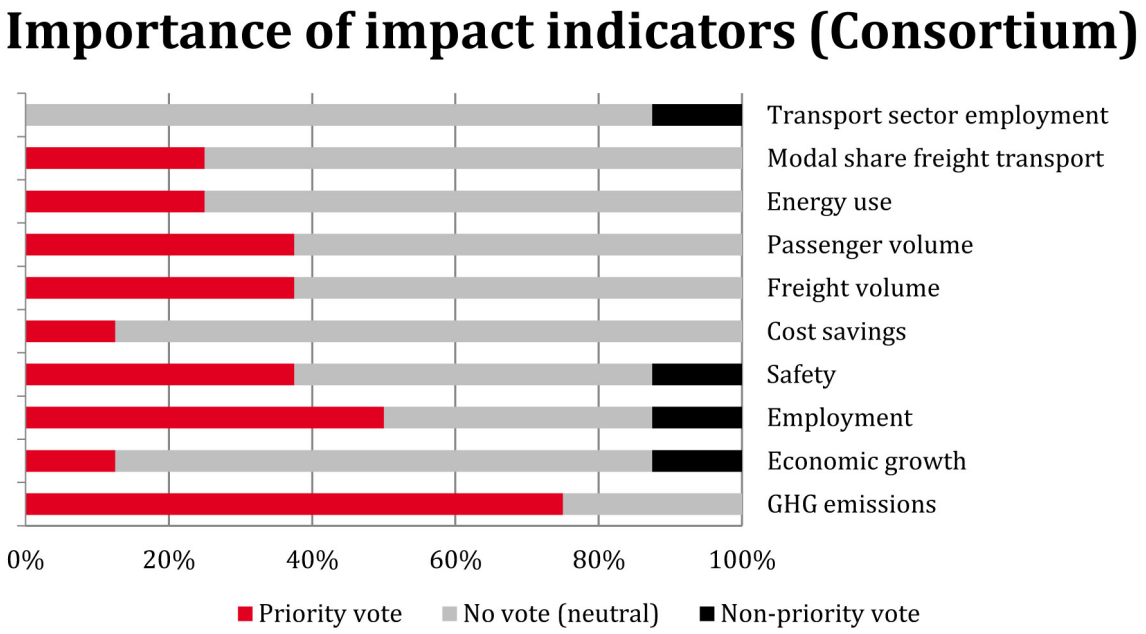


Figure 15: Importance of impact indicators (consortium)

The priority indicators receiving five or more priority votes from EC participants are as follows:

- GHG emissions
- Economic growth
- Employment
- Cost savings
- Safety
- Transport sector employment.

Most of the above indicators prioritised by the EC participants were also recognised as a priority by the consortium. Despite some EC priority votes for congestion, it was agreed in the following open discussion that congestion would not be a reasonable indicator for the HIGH-TOOL model because HIGH-TOOL would not be a network-based model such as TRANS-TOOLS. Therefore, any model output on congestion would have a rather speculative character. This is why congestion has not been included in the results.

During the discussion, also transport impacts, such as passenger and freight volumes and modal shares, were specifically mentioned as being important. Also the need was emphasised to differentiate between total and transport sector employment. It was pointed out that the fact of an impact indicator being voted as 'non-priority' did not automatically imply that it could be disregarded.

This outcome was a result of the workshop setup where 'non-priority' indicators had to be selected. Some of these indicators would still be needed, but they were also available within other modelling tools. Furthermore, an impact indicator could become more important over time, especially if HIGH-TOOL would be able to provide them at NUTS-2 level.

The HIGH-TOOL consortium mentioned that it might not be possible or reasonable for all indicators to be computed at the regional level (NUTS-2). For some indicators, the regional level would not provide added value (e.g., GHG emissions), for other indicators there might be data availability restrictions (e.g., social indicators). It was agreed that the Online Survey following the Workshop should inquire further about the requirements of output indicators to be generated at regional level (see Chapter 3.5.2).

3.4.3 Open Discussion on Policy Measures and Impact Indicators

As an introduction to feed the open discussion on policy measures and impact indicators, the following five statements were brought into the discussion:

Q

***Q1:* "It would be best if the tool focuses on some policy domains and/or impact categories."** *(Rating)*

***Q2:* "I want to be able to change the tool itself so I can model new measures beyond the scope of possibilities of the tool as it is delivered."** *(Rating)*

***Q3:* "It is up to the user to ensure policy inputs to the tool are sensible and consistent."** *(Rating)*

***Q4:* "I want to be able to change assumptions for both the baseline scenario and other scenarios."** *(Rating)*

***Q5:* "The HIGH-TOOL quick scan tool should be more focused on spatial aspects (NUTS-2 level) than only providing aggregate results at national level."** *(Rating)*

Participants were asked to express their agreement on the above statements. The obtained results are displayed by Figure 16. On the horizontal axis the five statements are ordered, while the vertical axis expresses the average rating.

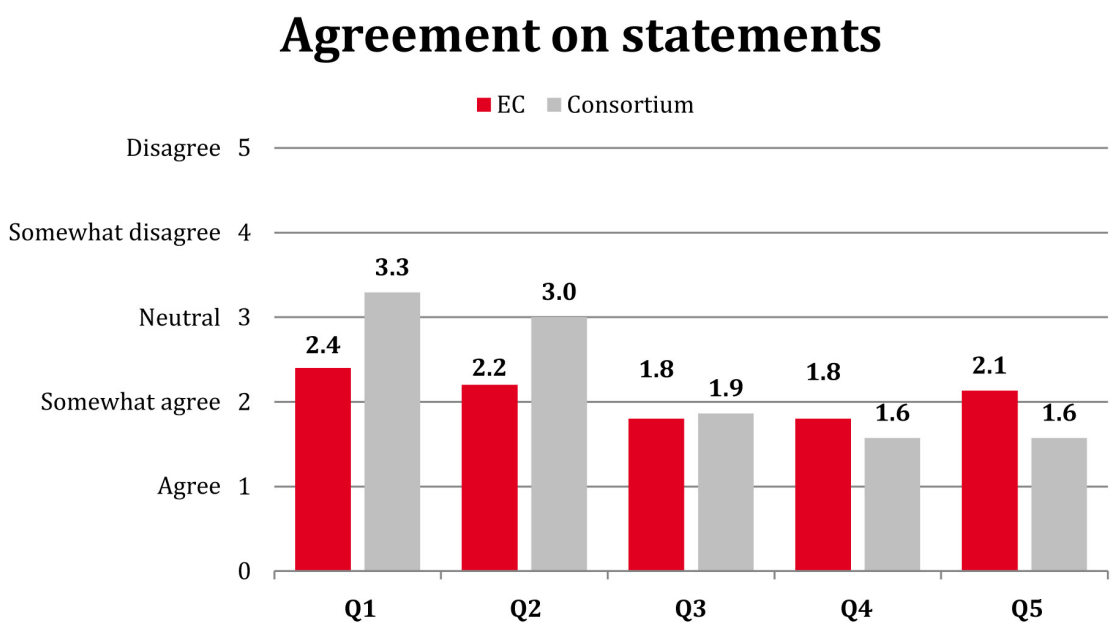


Figure 16: Level of agreement on specific statements

Due to ambiguity of the first statement, the validity of the obtained answers for this question is rather limited. Therefore, an additional question was created in MeetingSphere, requesting the participants' opinion whether HIGH-TOOL should focus on a restricted number of policy domains and impact indicators. The results are shown in Figure 17.

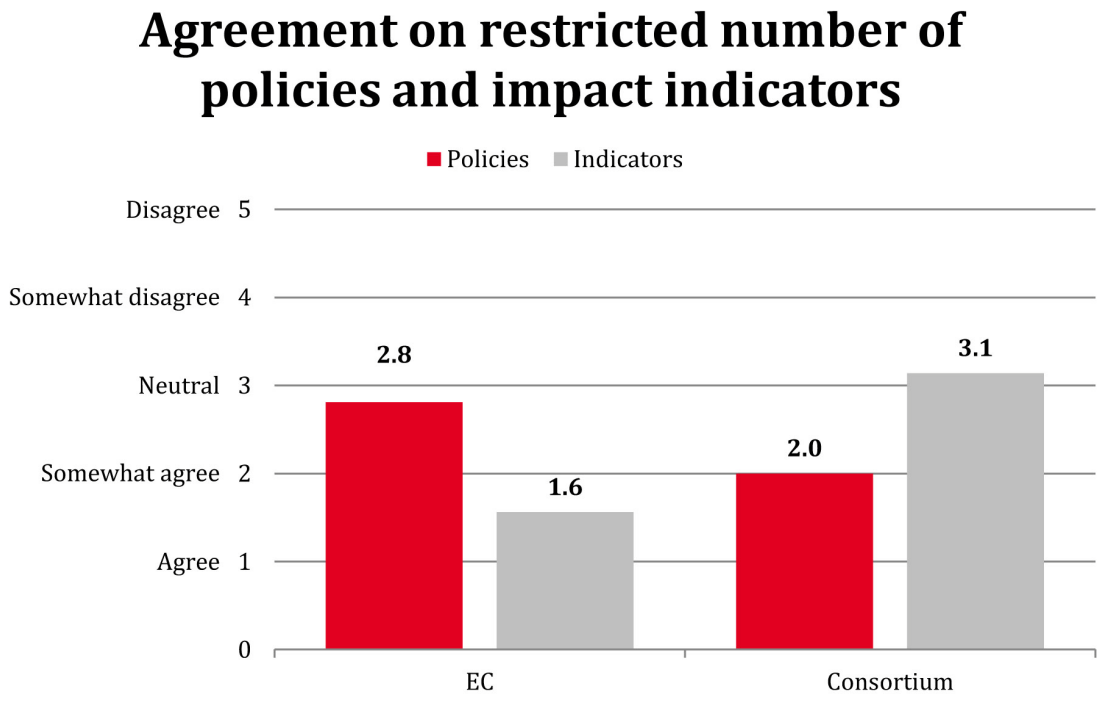


Figure 17: Level of agreement on limited focus on certain policies and indicators

The answers and discussions during the Workshop and the consequences for the design of HIGH-TOOL are summarised for the five pre-selected statements:

Q ***Q1.1:* "It would be best if the tool focuses on some policy domains."** *(Rating)*

The average rating for the EC participants was 2.8, almost exactly in the middle. This shows that opinions diverged whether HIGH-TOOL should focus on certain policy domains in more detail or rather should be defined as a broad, strategic model covering all domains. In the following discussion, the desire was expressed for HIGH-TOOL to cover all policy domains. The EC participants requested that some policy domains like the internal market should be explored in higher detail while others like infrastructure policy are less important for HIGH-TOOL, because HIGH-TOOL would not include the transport network and would not be able to properly assess these aspects.

Furthermore, an EC participant stressed the importance of the maritime sector. There was no consensus however, whether HIGH-TOOL should be a strategic model with a scope being as broad as possible (covering all policies), or a model focusing on some particular policy domains in detail. The consortium pointed out that it would be infeasible to deal with everything at a strategic level, and in addition provide great detail for some areas. The discussions emphasised the need to clarify this issue after the Workshop.

Q ***Q1.2:* "It would be best if the tool focuses on some impact categories."** *(Rating)*

With regard to the impact indicators, the result of the rating showed a certain degree of agreement that HIGH-TOOL should focus on a selected number of indicators that can be best assessed with the model, rather than aiming at being comprehensive.

Q ***Q2:* "I want to be able to change the tool itself so I can model new measures beyond the scope of possibilities of the tool as it is delivered."** *(Rating)*

The rating on this statement emphasised the desire for a flexible, transparent model. The consortium will follow this requirement to the maximum extent in the design of HIGH-TOOL.

Q ***Q3:* "It is up to the user to ensure policy inputs to the tool are sensible and consistent."** *(Rating)*

The results clearly indicated that the EC participants would be willing to take responsibility for the consistency of the policy inputs. Of course, this would not mean that no efforts would have to be made to provide some guidance to the user. The EC suggested to provide sensible ranges for parameters, and to flag and explain other model parameters that may have to be changed in conjunction (e.g., using pop-up windows notifying the user).

Q ***Q4:* "I want to be able to change assumptions for both the baseline scenario and other scenarios."** *(Rating)*

The EC participants put the ability to change assumptions to the baseline and other scenarios forward as a strong requirement for HIGH-TOOL. Otherwise, the model could easily become outdated. This topic is discussed in more detail in section 3.4.5.

Q ***Q5:* "The HIGH-TOOL quick scan tool should be more focused on spatial aspects (NUTS-2 level) than only providing aggregate results at national level."** *(Rating)*

The voting on this statement expressed the need for HIGH-TOOL to produce results on a NUTS-2 spatial level. Only for indicators for which the regional level does not provide added value, such as GHG emissions, aggregate results at national level would suffice. The Online Survey following the Workshop analysed further which indicators are needed at regional and national level.

Summarising, the participants were quite consentient on the pre-selected statements. This implies that clear conclusions can be drawn for the design of HIGH-TOOL. Only on the first statement – inquiring whether HIGH-TOOL should focus on subdomains or rather be defined as broad as possible – opinions diverged.

3.4.4 Collection of Opinions on Technical Issues

Three open questions were put forward to the Workshop participants regarding technical issues. The answers and conclusions to these questions are summarised in the following three paragraphs.

3.4.4.1 Preferred format for input data and scenarios

To help decision making for the design of the input side of HIGH-TOOL, participants were asked the following question:

Q ***"Would you prefer 'prefab' input data and scenarios and/or a flexible and potentially complex way of importing custom data?"*** *(Brainstorm)*

By **'prefab'**, input data and scenarios is meant that it is (almost) fully pre-prepared during development and inflexible for users to make changes. The answers to this open question have been categorised by votes for 'Prefab', 'Custom' or 'Both/Mix' input data (see Figure 18 (n=15) and Figure 19 (n=9)).

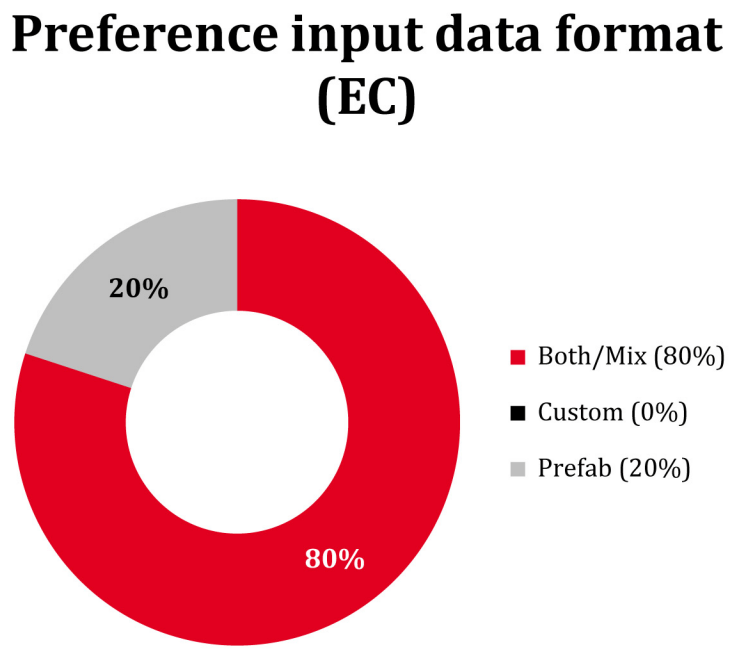


Figure 18: preference of input data format (EC)

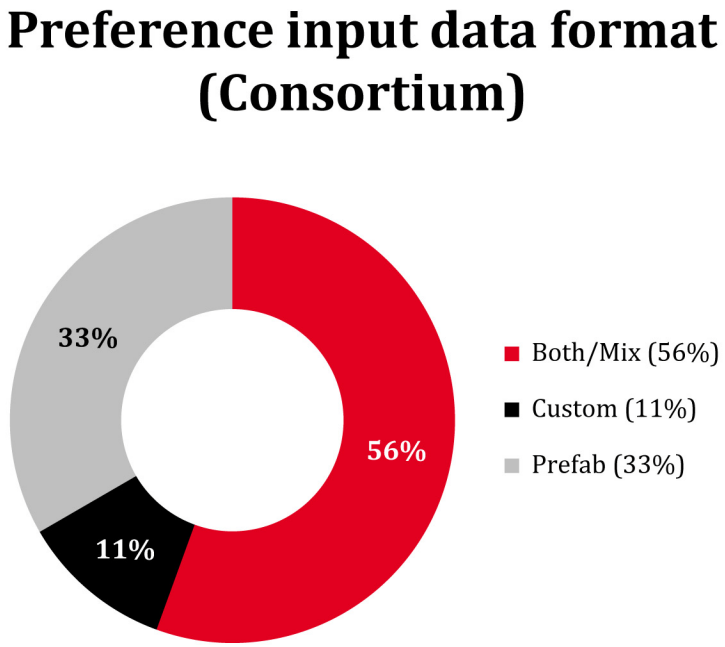


Figure 19: preference of input data format (consortium)

The majority of answers suggested considering both 'prefab' and 'custom' input. With regard to baseline and scenario data there was a clear understanding among all Workshop participants that the baseline and scenarios are pre-defined data sets which can be edited in a flexible way.

It was agreed that the EU Reference Scenario 2013 (European Commission, 2013b) would be the baseline scenario for HIGH-TOOL. In addition, HIGH-TOOL would need to be calibrated to reflect official statistics (e.g., GDP on NUTS-2 level from Eurostat). It was made clear by the consortium that in the calibration stage the model could not be forced to reflect the EU Reference Scenario 2013 or official statistics by 100%. If one did so, one would violate measured elasticity parameters or weighting factors for variables. However, the model should strive for a high level of consistency with official statistics for the historical years.

3.4.4.2 HIGH-TOOL runtime

This open question addressed the anticipated runtime for HIGH-TOOL, to identify the scope of acceptable time required for a HIGH-TOOL model run:

Q	***"Which model runtime is acceptable for HIGH-TOOL?"*** *(Brainstorm)*

The aggregated answers on expected model runtime are presented in Figure 20 (n=14) and Figure 21 (n=9).

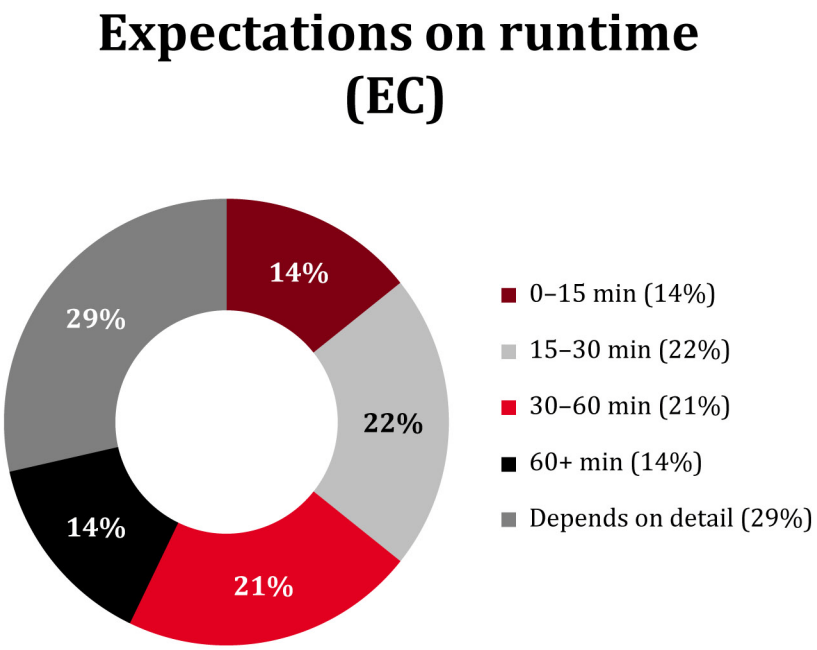


Figure 20: Expectations on model runtime (EC)

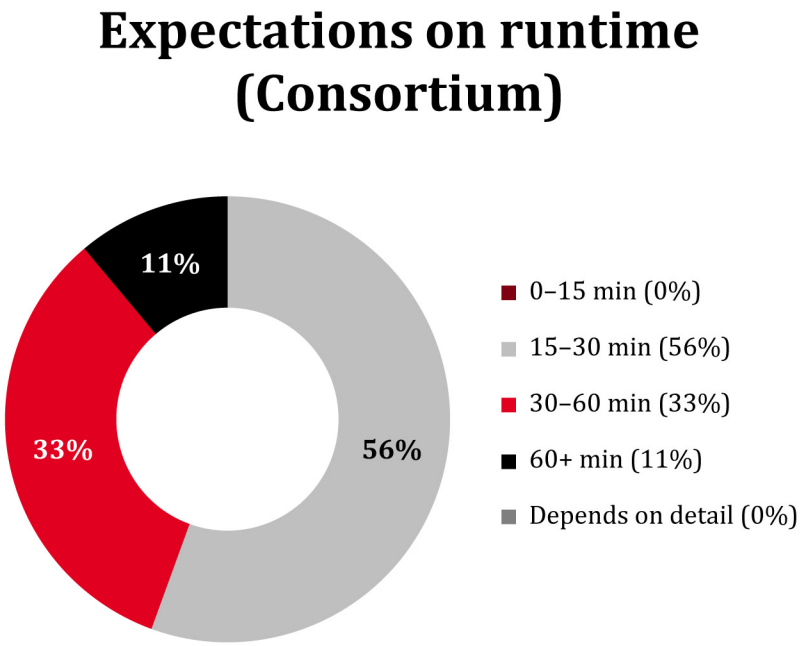


Figure 21: Expectations on model runtime (consortium)

There was an agreement that the runtime of the model would depend on the level of detail for policies. In general, the expectations on computation time were not overly restrictive (in the order of 30 min to several hours), although the need to optimise the runtime was expressed. It was suggested to include the feature to only run modules needed for a particular scenario to save computation time. The question was raised by the EC whether it would be possible to focus only on subregions (e.g., a few countries) to improve computation time. The consortium answered that this would depend on the existence of dependencies between regions for a certain scenario.

3.4.4.3 Requirements for online simulation and analysis

In order to determine whether the focus for HIGH-TOOL should be on creating a stand-alone or (also) an online version, the following open question was put forward to the participants:

Q ***"What are the required capabilities for online simulation and analysis with HIGH-TOOL?"*** *(Brainstorm)*

The opinions on this open question have been categorised by participants opting for online simulation capabilities and participants expressing satisfaction with an offline version.

With regard to the question of local or online version of HIGH-TOOL, the answers were slightly in favour of the local stand-alone version (see Figure 22 (n=13) and Figure 23 (n=6)), although it was mentioned that sharing runs and results with colleagues would be easier with an online version. The EC stressed that no other software licences besides standard software such as Office should be necessary to run the HIGH-TOOL model. However, this does not mean that other software that does not require a licence cannot be used.

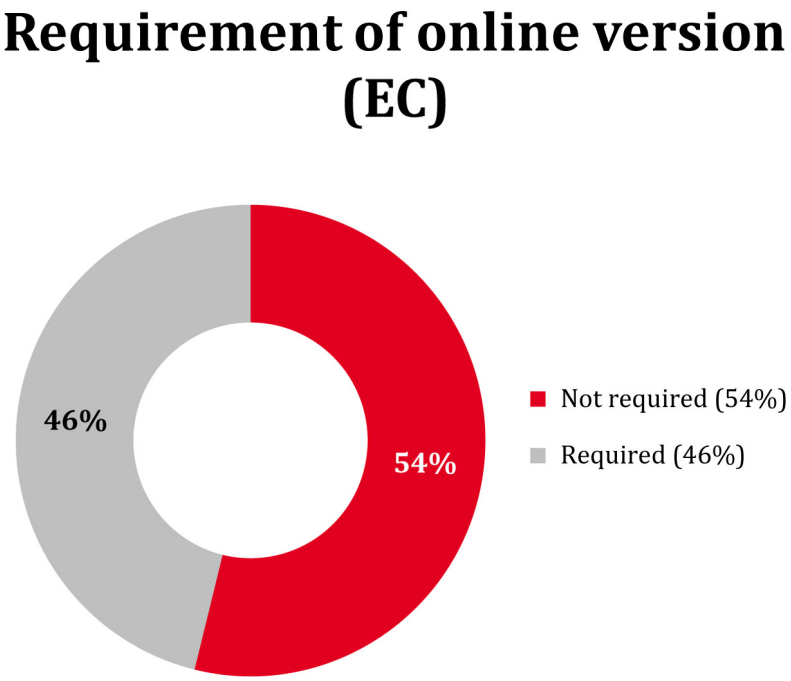


Figure 22: Requirements of online simulation capabilities (EC)

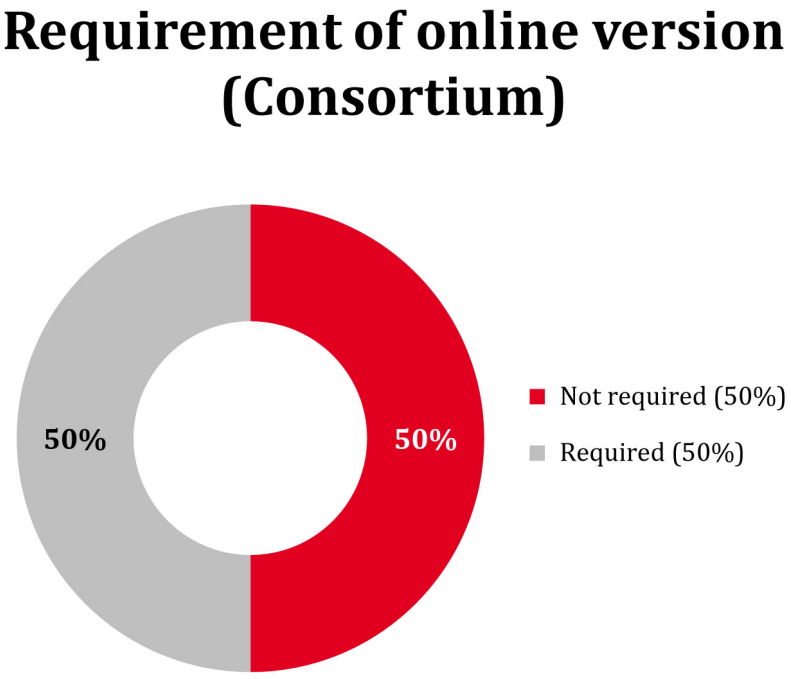


Figure 23: Requirements of online simulation capabilities (consortium)

3.4.5 Open Discussion on Technical Issues

In the open discussion on technical issues the desire was expressed for HIGH-TOOL to be complementary to existing models available at DG MOVE (TRANS-TOOLS, TREMOVE, ASTRA-EC, PRIMES). HIGH-TOOL should include an environmental module, but not at the high level of detail of PRIMES-TREMOVE. In particular, it would be important for HIGH-TOOL to be complementary to TRANS-TOOLS. HIGH-TOOL should focus on the demand side (including modal choice), without covering assignment. Therefore, HIGH-TOOL should not be a network model. Moreover, linking data and results between HIGH-TOOL and TRANS-TOOLS should be possible. The output of HIGH-TOOL should be easily transferable to TRANS-TOOLS, which could be used to carry out network assignment. There would be no strong link required with other models besides TRANS-TOOLS, but consistency with other models is important. The EC suggested the consortium to make a proposal of where it makes sense to link to other models (and estimate the effort).

3.4.6 Workshop Conclusions

This section summarises the key conclusions of the First User Workshop. The main outcomes are as follows:

- The EC and consortium agreed on the relevancy of the policy areas addressed in the Workshop.
- According to the MeetingSphere results, the following policy categories were highlighted as priority ones by the EC participants:
  - Internal market – intra-modal (road, rail, inland waterway transport, maritime, air);
  - External cost charges;
  - Infrastructure charging/Access restrictions schemes;
  - Multimodal transport.
- Regarding the impact indicators, the following are agreed upon as priority indicators:
  - GHG emissions
  - Economic growth
  - Employment
  - Cost savings[3]
  - Safety
  - Transport sector employment.

[3] Total costs (incl. external costs) were not included in the voting. However, these are also important.

- A low priority in the voting does not automatically mean that a policy or indicator can be disregarded. Some policies were considered low priority for HIGH-TOOL because this model would not be able to properly assess them (i.e. due to the lack of a transport network). Some indicators were considered low-priority because they are either available within other modelling tools or HIGH-TOOL was not the proper tool to address them due to the lack of the transport network (i.e. congestion). Still, it was agreed to focus on a selected number of impact indicators, rather than being comprehensive. Regarding the policies, such an agreement was not reached (see also the next point).
- The *Inception Report* (Szimba et al. 2013) describes HIGH-TOOL as a high-level strategic model, and some participants adhered to this model design. On the other hand, there were also requests for a higher level of detail for some domains, allowing for in depth analysis. In light of these differing opinions, a final decision on the appropriate level of detail for policies in the HIGH-TOOL model needs to be made. A compromise between the collected Meeting-Sphere responses suggests a medium level of detail as the 'standard choice' when defining policy measures to be evaluated by HIGH-TOOL.
- Regarding the spatial dimension, NUTS-2 is required; remarks indicate that even a lower level of regional differentiation would be desirable (i.e. NUTS-3 level).
- Baseline and scenarios will be pre-defined data sets, which should be easy to change.
- The initial calibration must be consistent with data from Eurostat. However, as there are limits to reasonable calibration to fit model results to data, it might not be possible to reflect the official statistics by 100%. However, the model should strive for a high level of consistency with official statistics for the historical years.
- The runtime is not really an issue for HIGH-TOOL. If the provided results become more detailed, a computation time of up to several hours is acceptable. However, the model code should be optimized to avoid unnecessary long running times.
- The link with TRANS-TOOLS is important. An assignment module is not necessary for HIGH-TOOL, but exchanging data and results between HIGH-TOOL and TRANS-TOOLS is desirable. With models other than TRANS-TOOLS, no strong link is required, only consistency was necessary.
- The need for a stand-alone model version (license free software) has been emphasised; the online capabilities are to be determined.

3.5 Online Survey Report

Following the Workshop, an Online Survey was opened to the participants from DG MOVE from 12 July 2013 to 13 August 2013. In this survey, EC opinions were collected on remaining open issues. This section reports on the questions of the Online Survey. Each subsection summarises the answers and draws the main conclusions.

3.5.1 Priority of Policy Measures for HIGH-TOOL

In order to obtain further insights in the scope of policy measures regarded as priority to be covered by HIGH-TOOL, the participants were asked to select priorities and non-priorities, respectively, on the basis of a long list of policy measures (drawn from the Transport *White Paper*):

Q

"From the provided list of White Paper policy measures, which ones are important to be modelled? Note that the HIGH-TOOL team will check after the end of the survey in how far the requested policy measures can be taken into account. You can select the policy measures that you see as a 'priority' and as a 'non-priority'; there is no limit on the number of selections." *(Rating)*

For the list of policy measures and the voting results, the reader is referred to Table A-11 in the Annex. The responses to this question were largely in line with the prioritisation given to policy categories in the First User Workshop (see section 3.4.1.2). The following policy categories were regarded as priority ones:

- Policy measures relating to the objectives of the internal market
- Internalisation of external costs
- Infrastructure charging
- Multimodal transport
- Safety.

In addition, for the categories 'TEN-T network' and 'Capacity and quality of transport systems' – which were only ranked average during the Workshop – several policy measures have received priority votes.

On the other hand, policy measures on public funding of transport and security have often been voted as a non-priority due to the fact that HIGH-TOOL was not perceived as the appropriate tool to assess their impacts. Due to the low number of respondents for this question, conclusions and follow-up actions are mainly drawn from unanimous votes.

3.5.2 Relevant Impact Indicators at Regional Level (NUTS-2)

In order to obtain information on user requirements with regard to the regional scope of impact indicators, the following question was asked to the respondents:

Q

"Which impact indicators are in your opinion required at regional level (NUTS-2)? Note that the HIGH-TOOL team will check after the end of the survey in how far the requested impact indicators can be computed at the regional level." *(Rating)*

Table 16 displays the results obtained. The number of participants voting for 'regional' or 'national' level is given. The last column (Ø) indicates the average rating (between 1 and 2).

Table 16: Requirement of computation of impact indicators at regional level (NUTS-2) sorted by mean

Rank	Impact Indicator	1 – Reg. Level	2 – Nat. Level	Ø
01	Social cohesion (e.g., income inequality)	2	3	**1.60**
02	Time savings (e.g., monetised travel time savings)	3	1	**1.25**
03	Cost saving (e.g., generalised costs)	4	1	**1.20**
	Economic growth (e.g., GDP growth rate)	4	1	**1.20**
	Employment (e.g., number of employed persons)	4	1	**1.20**
	Safety (e.g., number of accidents and fatalities, external costs)	4	1	**1.20**
07	(Local) Air Pollution (e.g., volumes of emitted air pollutants, external costs)	5	0	**1.00**
	Accessibility	5	0	**1.00**
	Transport demand (passenger and freight) (e.g., volumes, performance, modal share; each differentiated by trip distances: 0–300 km, 300–1000 km, 1000+ km)	5	0	**1.00**

The survey results show that the preferred spatial level of detail for this selection of impact indicators is the regional level. Only for social cohesion, output on national level may suffice.

3.5.3 Other Impact Indicators

To complete the view on impact indicators, participants were asked to mention further required impact indicators, if any:

Q

"Which further impact indicators are in your opinion required on national level?" *(Brainstorm)*

In response to this question, external costs of noise and external costs related to health issues were mentioned as additional indicators.

3.5.4 Requirements on the Design of HIGH-TOOL

In order to allow refining the expected design of HIGH-TOOL, two questions were posed to the participants:

Q

Q1: ***"For the design of HIGH-TOOL we could work with a list of pre-set policy measures or with more freedom for the user. The consequence of using a pre-set list is that it will be easier to feed the model with consistent policy input. However, it will be harder to simulate policy measures that are not "pre-loaded". An open approach is more demanding for the user. He/She needs to translate policy input to model input or parameters. Please indicate on a scale of 1 to 5 your preference (1 = pre-set, 3 = neutral, 5 = completely open)."*** *(Rating)*

Q2: ***"Accounting for the trade-off between "dummy-proof" use and expert-user making changes deep inside the model, where do you see HIGH-TOOL on a scale from 1 to 5 (1=dummy, 3 = neutral, 5 = expert)? The first extreme holds the advantage that every non-expert can use the tool but in a "rigid" and pre-defined way; the latter allows more detailed policy assessment, making changes to the tool when needed, but requires in-depth knowledge of the tool."*** *(Rating)*

Figure 24 and Figure 25 show the voting results for the above two questions.

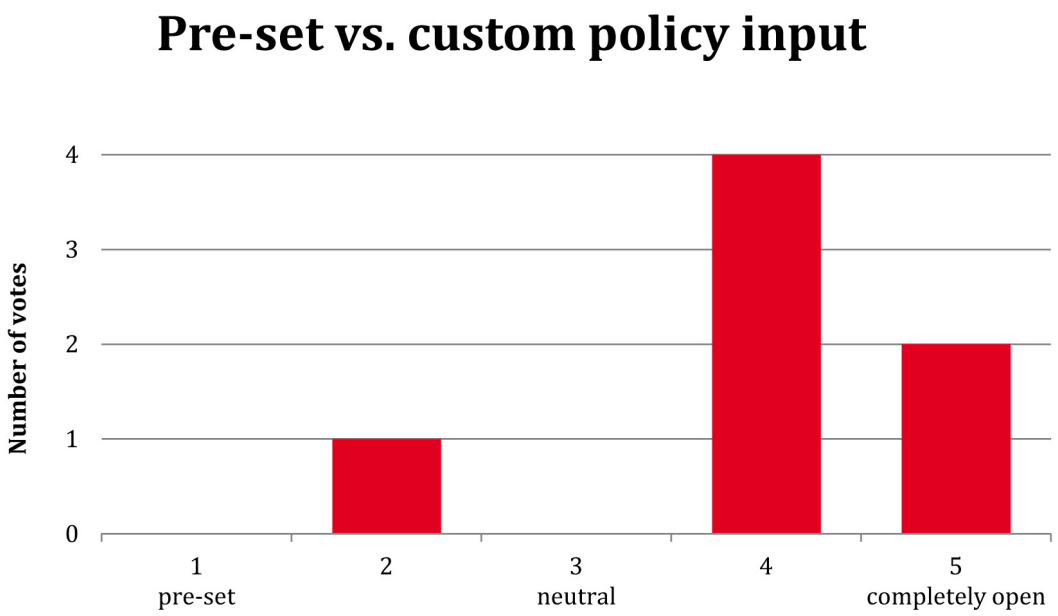


Figure 24: Voting results on pre-set versus custom policy input

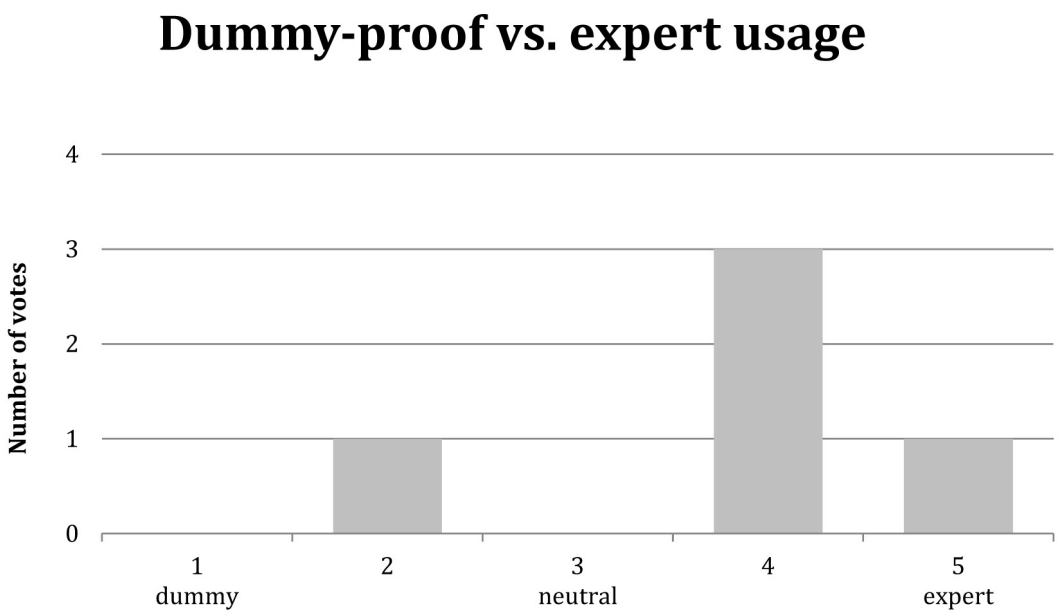


Figure 25: Voting results on dummy-proof versus expert use

Four additional comments are given on the first question, regarding the design of the HIGH-TOOL policy input:

- "Reasoning and assumptions in an IA should be as clear, coherent and traceable as possible. The model should be adjustable on a set of pre-defined, agreed input variables but not more, to ensure this and flexibility. " *(two votes)*

- "As our policy is evolving continuously the option for simulating additional policy measures that are maybe not foreseeable yet should be provided." *(five votes)*
- "Please see the considerations above. However, some consistency checks should be ensured for providing the input." (*four votes)*
- "The types of measures to be assessed for the purpose of Impact Assessments go much beyond what can be achieved by using the tool in a pre-defined way. The High-Tool model should be able to provide results that are used for the purpose of Impact Assessments." *(four votes)*

The responses on the first question clearly indicate the user requirement of an open approach with regard to policy input. Policy measures for HIGH-TOOL are not to be completely pre-defined. Instead, a set of pre-defined adjustable input parameters by which the user can reflect custom policy measures is the desired approach for HIGH-TOOL. Consistency checks are to be provided to highlight reasonable ranges and interference of parameters.

The answers to the second question support this requirement, stating that expert use of HIGH-TOOL can be the starting point. This is in line with the findings of the First User Workshop (see question 3 in section 3.4.3).

3.5.5 Example Interfaces for HIGH-TOOL

To inspire the HIGH-TOOL interface design, participants were asked:

Q ***"Can you indicate a few modelling user interfaces you consider Best Practices to inspire the HIGH-TOOL interface design?"*** *(Brainstorm)*

Only **one answer** was given in the Online Survey: "ASTRA-EC interface could be used as starting point. Emisia has also developed an interesting GUI for TREMOVE."

The limited response suggests that the consortium is given some freedom for the specific design the user interface itself. Of course, the user design will accommodate the user requirements mentioned on other topics (e.g., flexibility, consistency checks of input, an easy link to TRANS-TOOLS, etc.) to the highest extent possible. The two suggested user interfaces will be used for inspiration.

3.5.6 Tools and Data Sources Currently Used at DG MOVE

To complete our view on required links to other tools and data sources, the survey participants were asked following question:

> Q ***"Which tools and data are used most frequently in assessments at DG MOVE? Please elaborate as well about: What are the advantages and disadvantages of the specific tools and data sources? Are there any specific model properties that you consider as indispensable for HIGH-TOOL?"*** *(Brainstorm)*

Only **one answer** was provided: "Currently DG MOVE is using tools like PRIMES-TREMOVE, TRANS-TOOLS, GEM-E3." Most of these models (except GEM-E3) have already been mentioned during the Workshop. Consistency with these models is considered a point of attention for HIGH-TOOL.

3.5.7 Indispensable Model Properties for HIGH-TOOL

To ensure that no important aspects are being missed, which may not have been included in other survey questions, participants were asked:

> Q ***"What do you consider indispensable for HIGH-TOOL? (e.g., exchange of data between HIGH-TOOL and other tools used at DG MOVE)"*** *(Brainstorm)*

The following answers were given:

- "High-tools will be a valuable tool for impact assessments if it manages to focus on the impacts, not on the problem definition (which remains very often in practice a political problem). High-tools must take on itself all the parameters of transport policy to make serious IMPACT SIMULATIONS."
- "HIGHTOOL should be based on the latest available Statistics and make use of other DG MOVE projects such as ETIS+ or TENTEC."
- "It should be feasible to feed in HIGHTOOL output into more detailed modelling tools such as TRANSTOOLS."
- "HIGHTOOL shall be developed in a modular way which allows checking different sub-models independently."
- "To be calibrated to official statistics from Eurostat, EEA, etc."

- "To include all transport modes and in particular the maritime transport which is not well represented in other models."
- "To be possible to produce a baseline scenario in line with the EU Reference scenario (use the same inputs and produce very close projections)."
- "To provide projections up to 2050, by Member State (including Croatia) and at least at NUTS2 level (preferable NUTS3)."
- "To use the same software for developing all modules of the High-Tool model. The software should allow an easy check of the model code and should be fully open."

The answers obtained confirm earlier statements. The main issues of received answers can be summarised as follows:

- Focus on policy input parameters, not pre-defined policy measures;
- Pursue consistency of the HIGH-TOOL output with available official statistics (e.g., Eurostat, EEA) and with other DG MOVE projects such as ETISplus or TENtec. The baseline scenario must be consistent with the EU Reference Scenario 2013;
- Allow an easy output interchange between HIGH-TOOL and TRANS-TOOLS;
- Include all transport modes and make effort for a detailed spatial level;
- Develop a modular structure for HIGH-TOOL, programmed in open, transparent code.

4 Final User Requirements for HIGH-TOOL

This chapter addresses the final user requirements, which have been obtained on the basis of the First User Workshop and the Online Survey. These requirements will guide the development process of the HIGH-TOOL model.

4.1 Purpose of HIGH-TOOL

The initial starting point of the consortium for HIGH-TOOL is that the model is conceived as a quick scanning tool and as such would serve as a 'pre-impact assessment' tool. Based on feedback from the workshop, the functionality of HIGH-TOOL as mainly a pre-impact assessment tool is challenged. Several EC workshop participants expressed the desire for HIGH-TOOL to be an instrument for impact assessment. This has implications on the scope of the model and the level of detail.

The Online Survey among EC participants indicated diverging opinions on whether HIGH-TOOL should focus on a restricted number of policy domains in more detail or should rather be defined as a broad, strategic model covering all domains. With regard to this issue, a balanced choice needs to be made in the further course of the project, taking into account that it will hardly be possible to deal with all policy domains on a strategic level, and at the same time provide great detail for selected areas. If it is deemed feasible for some policy domains to be implemented in more detail in HIGH-TOOL, several considerations can be made regarding which domains desire extra attention. Firstly, from the workshop, survey and discussions, the following policy domains were highlighted as particularly important:

- Policy measures relating to the objectives of the internal market
- Internalisation of external costs
- Infrastructure charging
- Multimodal transport
- Safety.

Secondly, the focus should be steered by the need for HIGH-TOOL to be complementary to tools currently at the disposal of DG MOVE (TRANS-TOOLS, PRIMES-TREMOVE, ASTRA-EC). Policies related to internal market and the maritime sector were specifically highlighted as insufficiently covered by the currently available models.

Moreover, a strong integration between HIGH-TOOL and existing models is not required, except for TRANS-TOOLS. HIGH-TOOL would focus on the demand side (including modal choice) and would not include the assignment on the network, as this would be carried out by TRANS-TOOLS. Thus, HIGH-TOOL would not be a network model but it will represent the regional level (NUTS-2).

4.2 Policy Measures

User involvement during the First User Workshop and the Online Survey has answered three main questions:

- Should HIGH-TOOL use 'prefab' policy measures (e.g., from the Transport *White Paper*) or allow input of 'custom' policy measures?
- What is the appropriate level of detail for policy input for HIGH-TOOL?
- Which are the policy priorities to be assessed by HIGH-TOOL?

The first question is addressed in section 4.2.1, the second one in section 4.2.2, and the third in section 4.2.3. The design of the policy input side of HIGH-TOOL will meet all these requirements to the highest extent possible.

4.2.1 Form of Policy Input

The outcome of the Online Survey is very clear regarding the required form for the policy input for HIGH-TOOL. A rather open approach should be adopted, not working with pre-defined policy measures. Rather, a set of pre-defined adjustable input parameters should be provided allowing the user to model custom policy measures. This means that, foremost, the focus will be to implement parameters that can be used to model policy measures that are deemed important by the EC. This provides maximum flexibility for evaluating future policy measures. Moreover, it will be possible to experiment with different parameter values to reflect uncertain effects of policies. On the other hand, this places some responsibility on the users' side. This has also been accepted by the DG MOVE members during the Workshop and in the Online Survey by indicating that HIGH-TOOL should be designed for expert use, rather than dummy-proof. This will allow more freedom for detailed, user-designed policy assessment. However, the need for consistency checks, highlighting reasonable ranges and interference of parameters, needs to be taken into account, flagged and explained in the interface.

4.2.2 Level of Detail

Survey results and discussions of the First User Workshop encourage a medium-detail level of policy inputs as an appropriate compromise between user requirements and feasibility to model. This implies that the policy input parameters for HIGH-TOOL will (in general) be able to represent policy measures on the level of detail as the ones in the Transport *White Paper*. Thus, a medium-detail level is considered as the general starting point. However, the level of detail may vary depending on the priority of the policy domain or the (in-)feasibility to provide more detail.

Reflecting the outcomes of the user involvement, the user will be able to choose between policy input parameters of varying level of detail, as far as feasible from the implementation point of view. This will provide maximum flexibility to the user for assessing custom policy measures.

In either case, the level of detail of policy inputs is of less critical importance as initially anticipated, as it will be to large extent up to the user to translate policy measures to key model inputs. However, the capability of the model to discriminate effects of different policies is still an essential user requirement. The prioritisation of policy categories will be the basis for the development of a concept to cover policies with a sufficient level of detail.

4.2.3 Prioritisation

The user involvement undertaken so far has revealed the prioritisation of policy categories and measures as viewed by the EC participants being not very different from the consortium's anticipation. Neither the policy categories or measures, nor their prioritisation will be a direct input for HIGH-TOOL; the prioritisation will rather serve as a basis on which a set of policy input parameters to the HIGH-TOOL model will be developed. Naturally, the policy input parameters of HIGH-TOOL should foremost allow the modelling of important policy measures, belonging to priority policy categories. In the Workshop and Online Survey, the following policy categories were particularly highlighted as important:

- 5.1: Internal market – intra-modal (road, rail, inland waterway transport, maritime, air)
- 1.2: External cost charges
- 1.1: Infrastructure charging/Access restrictions schemes
- 5.3: Multimodal transport.

Furthermore, safety, environment and the maritime sector have come forward as important policy categories. Based on workshop and Online Survey responses and comments, the initial prioritisation has been adapted according to the EC user requirements.

Table 17 summarises the prioritisation of policy categories reflecting user requirements. The category 'EU transport infrastructure in view of energy efficiency needs and climate change challenges' has been removed, since the outcomes of the First User Workshop revealed that this category is too vague and overlaps with other categories.

Table 17: Prioritisation of policy categories reflecting user requirements

Policy areas	Policy categories	Prioritisation Crucial	Important	Optional
1. Pricing				
	1.1: Infrastructure charging/Access restrictions schemes	x		
	1.2: External cost charges	x		
	1.3: Public funding of transport		x	
	1.4: Other/New financing instruments			x
2. Taxation				
	2.1: Fuel taxation		x	
	2.2: Transport taxation		x	
3. Research and innovation				
	3.1: Technology			
	3.1.1: Vehicle Technology	x		
	3.1.2: Transport infrastructure and system		x	
	3.1.3: Transport information systems, management and service	x		
	3.2: Framework			
	3.2.1: Transport safety	x		
	3.2.2: Promotion and incentives			x
	3.2.3: Technology and infrastructure			x
4. Efficiency standards and flanking measures				
	4.1: Standards			
	4.1.1: Transport safety standards	x		
	4.1.2: Passenger rights standards		x	
	4.1.3: Environmental standards		x	
	4.2: Flanking measures			
	4.2.1: Promotion, information and dialogue			x
	4.2.2: Regulation			x

Table 17: Prioritisation of policy categories reflecting user requirements (cont.)

Policy areas	Policy categories	Prioritisation Crucial	Important	Optional
5. Internal market				
	5.1: Internal market – intra-modal			
	5.1.1: Road internal market	x		
	5.1.2: Rail internal market	x		
	5.1.3: Inland waterway transport internal market	x		
	5.1.4: Maritime internal market	x		
	5.1.5: Air internal market	x		
	5.2: Transport security			
	5.2.1: Cargo security			x
	5.2.2: Passenger security			x
	5.2.3: Land transport security			x
	5.2.4: 'End-to-end' security			x
	5.3: Multimodal transport	x		
6. Infrastructure				
	6.1: European TEN-T core network		x	
	6.2: Planning procedure (timing, communication framework, environmental issues)			x
	6.3: Capacity and quality of transport systems		x	
7. Transport planning				
	7.1: Mobility strategies and plans			x
	7.2: Urban mobility			
	7.2.1: Plans and audits		x	
	7.2.2: Certification			x
	7.2.3: Management and monitoring			x
	7.2.4: Urban logistics strategies			x
	7.2.5: 'Zero emission' strategies		x	

4.3 Impact Indicators

4.3.1 Outcome of Workshop and Online Survey

According to the outcome of the User Workshop and the Online Survey the following main conclusions can be drawn on the user requirements with regard to impact indicators in HIGH-TOOL.

The results of the Workshop rating whether HIGH-TOOL should focus on certain indicators, rather than aiming at being comprehensive, indicate some degree of agreement on focusing on certain indicators. The following list presents the selected impact indicators required by the EC participants:

- Transport impact indicators
- GHG emissions
- Economic growth
- Employment
- Cost savings[4]
- Safety
- Transport sector employment.

The following impact indicators have been classified as less important for the purposes of the HIGH-TOOL model:

- Fuel price
- Noise pollution
- Social cohesion
- Tax net revenue for government
- (Local) air pollution
- Trade, import and export
- Car ownership
- Energy price
- Household income
- Security
- Time savings
- Transport sector production.

[4] Total costs (incl. external costs) were not included in the voting. However, these are also important.

The indicators above would still be needed for the purpose of Impact Assessments, but they were either available within other modelling tools or HIGH-TOOL was not perceived as the proper tool to address them (i.e. congestion due to the lack of a transport network).

Several of the impact indicators identified as being less important as output indicators (e.g., fuel price, energy price and car ownership) will be considered in HIGH-TOOL as exogenous variables. Time savings is an element of cost savings – thus, this impact indicator will be considered indirectly. The usefulness of accessibility as an impact indicator needs to be further investigated on the basis of certain tool capabilities: without a network modelling approach, computed accessibility values only have a limited level of usefulness.

With regard to transport impacts, freight and passenger load factors are ambitious to model, since they are dependent on a wide range of transport company-specific policies (e.g., yield management systems). The feasibility of modelling load factors will need to be elaborated further. Some EC participants gave priority to congestion as impact indicator. However, the Workshop participants agreed on the argument that modelling congestion is hardly reasonable at a modelling level of NUTS-2, and without the application of detailed network models.

In the Online Survey, some participants mentioned the requirement of incorporating external costs of noise and external costs related to health issues to be added to the list of HIGH-TOOL impact indicators. Moreover, EC participants emphasised the need to be able to compute new, specific indicators on the basis of HIGH-TOOL output.

4.3.2 Selection of Impact Indicators

Taking into account the voting results at the First User Workshop, discussions and results of the Online Survey, a set of impact indicators has been composed (see Table 18). These impact indicators are grouped into four categories: transport impacts, economic impacts, social impacts and environmental impacts. The transport impacts need to be distinguishable by distance classes (below 300 km; 300 km to 1000 km; above 1000 km). During conceptual development of the HIGH-TOOL model some of these indicators may appear to be infeasible or insensible to be considered at the spatial level indicated in Table 18 (e.g., for safety, there might be data availability restrictions at the level of NUTS-2).

Table 18: Selection of impact indicators based on user requirements

Impact indicators by categories	Impact measurement	Spatial level
Transport impacts		
Passenger volume per mode and distance class	Number of trips	NUTS-2
Freight volume per mode and distance class	Number of tons carried	NUTS-2
Passenger transport performance per mode and distance class	Passenger-kilometre; Vehicle-kilometre	NUTS-2
Freight transport performance per mode and distance class	Tonne-kilometre; Vehicle-kilometre	NUTS-2
Passenger load factor per mode†	Load factor	NUTS-0
Freight load factor per mode†	Load factor	NUTS-0
Modal share passenger transport by distance class	Percentage share	NUTS-2
Modal share freight transport by distance class	Percentage share	NUTS-2
Unit costs for passenger transport per mode	Generalised costs, from the viewpoint of a user	NUTS-0
Unit costs for freight transport per mode	Generalised costs, from the viewpoint of a user	NUTS-0
Economic impacts		
Economic growth	Total GDP, total GVA, GDP/capita and GDP growth rate	NUTS-2
Employment	Number of employed persons; Rate of unemployment	NUTS-2
Transport sector employment	Number of employed persons	NUTS-0
Total costs (incl. external costs)	Measured in monetary terms	NUTS-2
Cost savings	Cost savings, measured in monetary terms	NUTS-2
Social impacts		
Accessibility†	Accessibility, e.g., measured by infrastructure-based-, generalised-cost-, constraint-based-, gravity-, utility-based-and space-time approaches	NUTS-2
Safety	Number of accidents (absolute and per pkm); Number of fatalities per pkm; Number of injured persons (absolute and per pkm); Damages due to accidents and incidents (absolute and per pkm); Freight losses, measured in monetary terms†; External and social costs of accidents	NUTS-2
Environmental impacts		
GHG emissions per mode	GHG emissions (e.g., CO_2, CH_4, N_2O), measured in tonnes; External costs of GHG emissions	NUTS-0
(Local) air pollution per mode	(Local) air pollution (e.g., PM, CO, Pb, C_xH_y, NO_x, SO_2, VOC), measured in tonnes; External costs of (local) air pollution	NUTS-2

Table 18: Selection of impact indicators based on user requirements (cont.)

Impact indicators by categories	Impact measurement	Spatial level
Environmental impacts		
Energy use per mode	Energy use by fuel, measured in toe/year; Percentage share of new fuels and propulsion systems; Percentage share of internal combustion engine electric hybrids; Percentage share of biofuels	NUTS-2

† … this impact indicator/measurement might be beyond the scope of HIGH-TOOL

Whatever indicators will finally be selected for HIGH-TOOL, it has become clear that the EC prefers a limited set of highly relevant indicators rather than a long list of indicators.

4.3.3 Spatial Level

The preferred spatial level of detail for the impact indicators is the regional level (NUTS-2). However, for GHG emissions, for which the regional level does not provide added value, aggregate results at national level suffice. For safety, there might be data availability restrictions at the level of NUTS-2. In general, it needs to be further checked for which impact indicators output on regional level is feasible in the light of possible technical, methodological or data availability constraints.

4.4 Link to Other Tools and Data Sources

4.4.1 Selection of Other Tools

As far as possible, HIGH-TOOL outputs should be consistent with outputs of the tools listed in Table 19. This requires access to the tools or to detailed results by the HIGH-TOOL consortium, as otherwise compatibility cannot be tested.

Table 19: Selected tools and their linkage type

Linkage	Tool
Consistency	ASTRA-EC
	GEM-E3
	PRIMES-TREMOVE
	GAINS
Data exchange interface	TRANS-TOOLS

Regarding the link to TRANS-TOOLS, a data exchange interface between both models has been requested. Challenges for the provision of this facility are different regional levels both models are operating at (TRANS-TOOLS – NUTS-3; HIGH-TOOL – NUTS-2), as well as the availability of different TRANS-TOOLS versions. In any case, the availability of a thorough technical documentation of TRANS-TOOLS will be an important pre-condition for the development of such interface. The technical possibilities will be examined further within the runtime of HIGH-TOOL.

4.4.2 Selection of Data Sources

The EU Reference Scenario 2013 will form the baseline scenario for HIGH-TOOL. The key data sources which are considered to be crucial for HIGH-TOOL (in terms of primary sources for the HIGH-TOOL model and/or for model calibration) are listed in Table 20.

Table 20: Selected data sources

Data source
EU Reference Scenario 2013
Eurostat
ETISplus
TENtec

4.5 User Interface and Technical Issues

4.5.1 User Interface

For now, few user requirements are imposed to the user interface. This means that the consortium is given some freedom for the specific design of the user interface. Of course, the user design will accommodate the user requirements mentioned on other topics (e.g., flexibility, consistency checks of input, an easy link to TRANS-TOOLS, etc.) to the highest possible extent.

The interface will provide help to the user when introducing the model input by different means such as pop-up windows, excel, sensible ranges for parameters and highlighting other model parameters that may need to be changed in conjunction so that the resulting scenario is consistent. User interfaces that are considered best practices to inspire the HIGH-TOOL interface design are the ASTRA-EC interface or the GUI designed for TREMOVE by Emisia.

The fact that the EC anticipates HIGH-TOOL to be mainly used by experts – not requiring a dummy proof design – indicates that, preferably, the interface should be customisable according to the user's own preferences. For the purpose of easy sharing of results and custom defined scenarios, the interface should allow exporting and importing all parameters needed to reproduce a simulation to excel.

4.5.2 Computation Time

The outcome of voting and discussions on the First User Workshop revealed that a very fast runtime is not a critical requirement for HIGH-TOOL. Depending on the detail and complexity of the calculation, a runtime between several minutes to several hours is acceptable. It is agreed that the model should work in a modular way so that the calculation time can be optimised by enabling and disabling some modules according to the simulation to be carried out.

A possible way to optimise further the runtime would be to limit the calculations to a specific geographical scope. However, this option will need to be further analysed, as overspill effects and dependencies between regions might exist for certain scenarios and variables. In any case, the model code should be optimised to avoid unnecessary long running time.

4.5.3 Online Capabilities

The HIGH-TOOL model needs to be a stand-alone application with no other third-party software licenses besides the Microsoft Office package. However, other software not requiring a licence could be used for the purpose of HIGH-TOOL. Nevertheless, an online version of the tool could be also useful to offer specific features such as:

- Having a dedicated server to run the online version might allow for more complex calculations offering detailed results, thus overcoming possible limitations of the Personal Computers running the stand-alone version;
- A mapping kit could be added in the online version to represent results in an integrated and easy way;
- The results of model runs could be saved directly through the online version, thus enabling a fast way of sharing them.

However, this online version should not imply developing a second HIGH-TOOL model that is different from the stand-alone version. As the need for the online capabilities was not strongly favoured, neither during the Workshop nor in the Online Survey, the main effort should be put on the stand-alone version.

4.6 Conclusions

As concerns the scope of policies to be covered by HIGH-TOOL an open approach is favoured, which implies that not all policy measures need to be pre-defined. A set of pre-defined adjustable input parameters is preferred which allows the user analysing custom policy measures and facilitates a higher degree of freedom for detailed, user-designed policy assessment. The prioritisation of policy categories is an important basis to decide which (level of detail of) policy input parameters need to be included in the HIGH-TOOL model.

Regarding output indicators, a provisional selection of impact indicators is derived from the user requirements. Most of these output indicators are preferred to be computed at the level of NUTS-2. The feasibility of impact indicator provision at regional level will need to be checked carefully in the further course of model development.

The EC expects consistency and complementarity with most currently available tools, rather than integration. However, linking data and results between HIGH-TOOL and TRANS-TOOLS should be facilitated. The development of an interface between the two models will require the availability of a technical documentation of the TRANS-TOOLS model.

The technical possibilities for linking data and results between both models will be examined in the further course of HIGH-TOOL. The EU Reference Scenario 2013 forms the baseline scenario for HIGH-TOOL, but the model should allow for changing the baseline scenario through the interface. This would avoid HIGH-TOOL being quickly outdated. Furthermore, the initial calibration of HIGH-TOOL should – as far as possible – be consistent with data from Eurostat, ETISplus and TENtec. For now, few user requirements are imposed regarding the user interface, which gives the consortium some freedom in the design of the HIGH-TOOL user interface. It has been emphasised that consistency checks, highlighting reasonable ranges and interference of parameters is an important feature of the tool's user interface. Furthermore, the EC indicated that the runtime is not a critical issue for HIGH-TOOL. A longer computation time, up to several hours, is acceptable, corresponding to the level of detail provided but the model code should be optimised to avoid unnecessary long running time.

While the HIGH-TOOL Inception Report describes HIGH-TOOL as a high-level strategic model, the functionality of HIGH-TOOL as a pre-impact assessment tool has been challenged. Several EC Workshop participants expressed the desire for HIGH-TOOL to be useful for specific impact assessment and requested a higher level of detail for some domains. Others, however, adhered to the strategic functionality as expressed in the Inception Report. With a medium-detail level as the general starting point, the prioritisation of policy categories and the desire for complementarity to currently available models provide valuable guidance for model development.

However, it will hardly be feasible to deal with all policy domains on a strategic level by in addition providing great detail for some specific areas. Thus, choices will need to be made regarding the desired scope and detail for HIGH-TOOL. This remains an open issue to be picked up in the continuous user involvement. The next stages of the HIGH-TOOL project, i.e. conceptual design and development of the prototype, should bring clarification from the consortium's side regarding a modular design, and the feasibility of providing more detail for specific domains. On the other hand, the evaluation of the prototype will allow the EC to refine their desired scope and to further decide on (non-)priorities.

Finally, it should be mentioned that the current deliverable does not embrace a complete documentation of all user requirements of HIGH-TOOL. User involvement within HIGH-TOOL is arranged as a continuous task and the model is developed in three stages from the prototype to the final tool. Therefore, under the assumption of feasibility in terms of technical and organisational aspects, user requirements can still be updated to cover possible future requirements.

5 References

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Deliverable D1.1 Annex

Workshop & Survey Report

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1 Questions and Answers of the First User Workshop

1.1 Collection of Opinions on Policy Measures

1.1.1 Agreement on Policy Areas used in the Impact Assessment of the Transport White Paper 2011

Q ***"Do you agree with the suggested seven policy areas used in the impact assessment of the transport White Paper?"*** *(Brainstorm)*

The seven suggested policy areas used in the impact assessment of the Transport White Paper are as follows: pricing, research and innovation, taxation, efficiency standards and flanking measures, internal market, infrastructure, transport planning.

A

- **Answers by the European Commission**
  - Yes (nine times)
  - Yes, but why are two measures grouped under point 4, they seem to be quite distinct
  - Yes, but transport safety and security should be better highlighted
  - What about passenger rights, safety, security?
  - The seven areas have been agreed in DG MOVE based on internal considerations. But what is their logic level of abstraction for the tool? Do the categories reflect sufficiently what the tool can do? Mutually exclusive categories?
  - Maybe others: traffic management and collaboration/partnerships/ stakeholders platform
  - Maybe useful to include a section on intelligent systems/IT (implementation, so separate from R&D)
  - I agree that transport safety, security and interoperability should be better highlighted
  - I also agree regarding passenger rights
  - I would like to know the criteria used to establish the relevance of this taxonomy and its expected impact on the input/output/analysis

- **Answers by Consortium**
  - Yes (five times)
  - Yes, I agree
  - Yes, some a bit more than others
  - Maybe "Other"? For measures such as "Telework"?

1.1.2 Prioritisation of Policy Categories

Q ***"Select priorities and non-priorities in the policy categories."*** *(Rating)*

More specifically, the participants were asked to select **five policy categories** which they find to have **high priority** and five with **lower priority** from the list of policy categories of Table 1 of the main document D1.1. The following tables show how often each policy category has been voted as a (non-)priority by EC and consortium participants respectively.

Table 1A: Prioritisation votes among EC participants

A

Rank	Policy category	Priorities Selections	Non-priorities Selections
01	5.1: Internal market – intra-modal (road, rail, inland waterway transport, maritime, air)	13	0
02	1.2: External cost charges	12	3
03	1.1: Infrastructure charging/Access restrictions schemes	10	0
04	5.3: Multimodal transport	8	0
05	3.1: Technology (vehicle technology, transport infrastructure and system, transport information systems, management and service)	7	3
06	4.1: Standards (transport safety, passenger rights, environmental)	6	6
07	6.4: Capacity and quality of transport systems	6	3
08	6.1: European TEN-T core network	6	2
	6.2: EU transport infrastructure in view of energy efficiency needs and climate change challenges	6	2
10	1.3: Public funding of transport	4	1
11	7.1: Mobility strategies and plans (plans and audits, certification, management and monitoring, urban logistics strategies, "zero emission" strategies)	3	9
12	5.2: Transport security (cargo, passenger, land transport, end-to-end)	3	7
13	2.2: Transport taxation	3	3
14	2.1: Fuel taxation	2	4

Table 1A: Prioritisation votes among EC participants (continued)

Rank	Policy category	Priorities Selections	Non-priorities Selections
15	7.2: Urban mobility	2	2
16	6.3: Planning procedure (timing, communication framework, environmental issues)	1	16
17	4.2: Flanking measures (promotion, information, dialogue, regulation)	1	15
18	3.2: Framework (transport safety, promotion incentives, technology and infrastructure)	1	8
19	1.4: Other/New financing instruments	1	7

Table 2A: Prioritisation votes among consortium participants

Rank	Policy category	Priorities Selections	Non-priorities Selections
01	1.2: External cost charges	6	0
	5.3: Multimodal transport	6	0
03	2.2: Transport taxation	5	0
04	6.1: European TEN-T core network	4	0
05	6.4: Capacity and quality of transport systems	3	1
06	2.1: Fuel taxation	3	0
07	3.1: Technology (vehicle technology, transport infrastructure and system, transport information systems, management and service)	2	1
	7.2: Urban mobility	2	1
09	1.4: Other/New financing instruments	1	3
10	1.3: Public funding of transport	1	2
	4.1: Standards (transport safety, passenger rights, environmental)	1	2
12	1.1: Infrastructure charging/Access restrictions schemes	1	1
13	7.1: Mobility strategies and plans (plans and audits, certification, management and monitoring, urban logistics strategies, “zero emission” strategies)	0	6
14	4.2: Flanking measures (promotion, information, dialogue, regulation)	0	5
	5.2: Transport security (cargo, passenger, land transport, end-to-end)	0	5
	6.3: Planning procedure (timing, communication framework, environmental issues)	0	5
17	3.2: Framework (transport safety, promotion incentives, technology and infrastructure)	0	3
18	5.1: Internal market – intra-modal (road, rail, inland waterway transport, maritime, air)	0	0
	6.2: EU transport infrastructure in view of energy efficiency needs and climate change challenges	0	0

1.1.3 Required Level of Detail for Policy Input

Q ***"What is the required level of detail for the policy measure input in HIGH-TOOL?"*** *(Rating)*

The example policy measures of Table 2 of the main document D1.1, each formulated in **three different levels of detail (low, medium, high)**, is used for this question. The Workshop participants were asked to select for each policy measure the level of detail they find most appropriate. The following tables show how often each item has been selected as the preferred level of detail by EC and consortium participants respectively.

Table 3A: Level of detail results among EC participants

A

Rank	Level of detail per policy category	Selections
01	**Increase deployment of ITS (Medium level)** (Travel information services; Mobility services; Transport management systems)	14
02	**A true internal market for rail services (High level)** (Open access (competition in market); Competitively tendered public service contract (competition for market); Allocation cross-border capacity; Timing of investment; Infrastructure standards; Track access charges)	10
	TEN-T core network (Medium level) Improve inter-country connectivity via core network, integrate eastern and western part of EU; Focus EU-funded transport investments to meet energy efficiency needs and climate change challenges	10
04	**A true internal market for rail services (Medium level)** (Opening domestic rail passenger market to competition; Single vehicle type authorisation and a single railway undertaking safety certification; Integrated approach to freight corridor management; Ensure non-discriminatory access to rail infra-structure and services, separation between infra-structure management and service provision; Establish legal and financial framework)	6
	TEN-T core network (High level) Establish missing rail link between region A and region B; Improve road bottleneck between region C and D; Varying climate resilience of new infrastructure; Different construction material	6
06	**Increase deployment of ITS (High level)** Static route planners; Dynamic and real-time route planners; Personalised travel information; Infrastructure bounded travel information for public transport; Infrastructure bounded travel information for road transport (DRIPs: VSL, Lane-keeping assistance, Travel times); In-vehicle travel information; E-ticketing; Mobile phone ticketing; Multimodal smart cards; Mobile phone payments; Bike sharing services; Car sharing services; Public transport management systems; Linking timetables of different public transport operators to improve interconnectivity; General transport management systems, examples are: Ramp metering, Peak lanes, Traffic signal coordination	2
07	**A true internal market for rail services (Low level)**	0
	Increase deployment of ITS (Low level)	0
	TEN-T core network (Low level)	0

Table 4A: Level of detail results among consortium participants

Rank	Level of detail per policy category	Selections
01	**TEN-T core network (Medium level)** Improve inter-country connectivity via core network, integrate eastern and western part of EU; Focus EU-funded transport investments to meet energy efficiency needs and climate change challenges	6
02	**A true internal market for rail services (Medium level)** (Opening domestic rail passenger market to competition; Single vehicle type authorisation and a single railway undertaking safety certification; Integrated approach to freight corridor management; Ensure non-discriminatory access to rail infra-structure and services, separation between infra-structure management and service provision; Establish legal and financial framework)	5
	Increase deployment of ITS (Low level)	5
04	**A true internal market for rail services (Low level)**	3
	Increase deployment of ITS (Medium level) (Travel information services; Mobility services; Transport management systems)	3
06	**TEN-T core network (High level)** Establish missing rail link between region A and region B; Improve road bottleneck between region C and D; Varying climate resilience of new infrastructure; Different construction material	1
	TEN-T core network (Low level)	1
07	**A true internal market for rail services (High level)** (Open access (competition in market); Competitively tendered public service contract (competition for market); Allocation cross-border capacity; Timing of investment; Infrastructure standards; Track access charges)	0
	Increase deployment of ITS (High level) Static route planners; Dynamic and real-time route planners; Personalised travel information; Infrastructure bounded travel information for public transport; Infrastructure bounded travel information for road transport (DRIPs: VSL, Lane-keeping assistance, Travel times); In-vehicle travel information; E-ticketing; Mobile phone ticketing; Multimodal smart cards; Mobile phone payments; Bike sharing services; Car sharing services; Public transport management systems; Linking timetables of different public transport operators to improve interconnectivity; General transport management systems, examples are: Ramp metering, Peak lanes, Traffic signal coordination	0

1.2 Collection of Opinions on Impact Indicators

Q ***"Select priorities and non-priorities among the impact indicators."*** *(Rating)*

The impact indicators that were proposed in this question are the ones listed in Table 10–13 of the main document D1.1. Participants were asked to select **five impact indicators** which they find to have **high priority** and five with **low priority**. The following tables show how often each impact indicator has been voted as a (non-)priority by EC and consortium participants respectively.

Table 5A: Indicator votes among EC participants

Rank	Impact indicator	Priorities Selections	Non-priorities Selections
01	Greenhouse Gas (GHG) emissions	11	0
02	Economic growth	10	2
03	Employment	7	5
04	Safety	6	2
05	Cost savings	6	1
06	Congestion	5	1
	Transport sector employment	5	1
08	Accessibility	4	2
	Passenger volume	4	2
10	Energy use	4	1
	Modal share freight transport	4	1
12	Freight volume	4	0
13	Modal share passenger transport	3	1
	Unit costs for freight transport, per mode	3	1
	Unit costs for passenger transport, per mode	3	1
16	Tax net revenue for government	2	8
17	Social cohesion	2	7
18	Noise pollution	2	4
19	Fuel price	2	2
20	Freight transport performance	2	1
	Passenger transport performance	2	1
22	Trade, import and export	1	5
23	(Local) air pollution	1	2
	Passenger load factor	1	2
25	Freight load factor	1	1
26	Household income	0	11
27	Car ownership	0	10
28	Security	0	4
29	Transport sector production	0	3
30	Energy price	0	2
31	Time savings	0	1

Table 6A: Indicator votes among consortium participants

Rank	Impact indicator	Priorities Selections	Non-priorities Selections
01	Greenhouse Gas (GHG) emissions	6	0
02	Employment	4	1
03	Safety	3	1
04	Freight volume	3	0
	Passenger volume	3	0
06	Energy use	2	0
	Freight transport performance	2	0
	Modal share freight transport	2	0
	Modal share passenger transport	2	0
	Passenger transport performance	2	0
	Time savings	2	0
	Unit costs for passenger transport, per mode	2	0
13	Social cohesion	1	4
14	Tax net revenue for government	1	2
15	Accessibility	1	1
	Economic growth	1	1
	Transport sector production	1	1
18	Cost savings	1	0
	Unit costs for freight transport, per mode	1	0
20	Car ownership	0	5
21	Congestion	0	3
	Energy price	0	3
	Freight load factor	0	3
	Household income	0	3
	Passenger load factor	0	3
	Security	0	3
27	Fuel price	0	2
	Trade, import and export	0	2
29	(Local) air pollution	0	1
	Transport sector employment	0	1
31	Noise pollution	0	0

1.3 Open Discussion on Policy Measures and Impact Indicators

The participants were asked to express their agreement on the following statements:

Q

Q1: ***"It would be best if the tool focuses on some policy domains and/or impact categories."*** *(Rating)*

Q2: ***"I want to be able to change the tool itself so I can model new measures beyond the scope of possibilities of the tool as it is delivered."*** *(Rating)*

Q3: ***"It is up to the user to ensure policy inputs to the tool are sensible and consistent."*** *(Rating)*

Q4: ***"I want to be able to change assumptions for both the baseline scenario and other scenarios."*** *(Rating)*

Q5: ***"The HIGH-TOOL quick scan tool should be more focused on spatial aspects (NUTS-2 level) than only providing aggregate results at national level."*** *(Rating)*

The following tables present the **rating given to the pre-selected statements**. The last row (Ø) shows the average rating among the participants.

Table 7A: Impact indicator rating among EC participants

A

Rating	Explanation	Q1	Q2	Q3	Q4	Q5
1	Agree	5	4	5	10	7
2	(Somewhat agree)	4	6	8	1	4
3	Neutral	3	3	2	2	1
4	(Somewhat disagree)	1	2	0	1	1
5	Disagree	2	0	0	1	2
Ø	**Average**	**2.4**	**2.2**	**1.8**	**1.8**	**2.1**

Table 8A: Impact indicator rating among consortium participants

Rating	Explanation	Q1	Q2	Q3	Q4	Q5
1	Agree	0	2	3	3	3
2	(Somewhat agree)	1	0	2	4	4
3	Neutral	3	3	2	0	0
4	(Somewhat disagree)	3	0	0	0	0
5	Disagree	0	2	0	0	0
Ø	**Average**	**3.3**	**3.0**	**1.9**	**1.6**	**1.6**

The ambiguity of the **first statement** does not allow **distinguishing between focus on policies and indicators** respectively. Therefore, the question is split into **two** separate statements:

Q

***Q1.1:* It would be best if the tool focuses on some policy domains.** *(Rating)*

***Q1.2:* It would be best if the tool focuses on some impact categories.** *(Rating)*

Table 9A: Focus on restricted number of policy domains/impact categories (EC participants)

A

Rating	Explanation	Q1.1	Q1.2
1	Agree	3	12
2	(Somewhat agree)	5	2
3	Neutral	2	0
4	(Somewhat disagree)	4	1
5	Disagree	2	1
Ø	**Average**	**2.8**	**1.6**

Table 10A: Focus on restricted number of policy domains/impact categories (consortium)

Rating	Explanation	Q1.1	Q1.2
1	Agree	2	1
2	(Somewhat agree)	3	0
3	Neutral	2	3
4	(Somewhat disagree)	0	3
5	Disagree	0	0
Ø	**Average**	**2.0**	**3.1**

1.4 Collection of Opinions on Technical Issues

1.4.1 Preferred Format for Input Data and Scenarios

Q

"Would you prefer 'prefab' input data and scenarios and/or a flexible and potentially complex way of importing custom data?" *(Brainstorm)*

By **'prefab',** input data and scenarios are meant that are (almost) fully pre-prepared during development and inflexible for users to make changes.

A

- **Answers by the European Commission**
  - Both (two times)
  - Both depending on the policy to assess
  - Both, depending on the case
  - Both, some pre-defined scenarios and also possibility to add own data
  - Both possibilities may be required, depending on the particular question
  - It should allow for both: a limited number of prefab input data and lots of flexibility for importing custom data
  - I would prefer both
  - Prefab input data
  - Dummy-proof and therefore prefab must be the basis of the model. If another, more customizable options can be offered in addition, nice add-on.
  - I prefer prefab data to ensure consensus/agreement on the inputs beforehand. But it should be possible to include more prefab data sets in next versions.
  - Some predefined scenarios with the possibility to make adjustments
  - A flexible approach is more desirable, but some prefab input possibility would make the model easier to use
  - A mix of both would be interesting – but for the flexible/more complex alternative need to make sure that the users can manage the task
- **Answers by Consortium**
  - Both…
  - Both!
  - Prefab data when is concern EC Background scenarios
  - Prefilled set of inputs that can be changed
  - Flexible when using policy scenarios
  - First you use prefab, than you revise.
  - Importing custom data might require technical or inside knowledge of the system
  - Pre-set of data are necessary but specific changes must be allowed to adopt to scenarios
  - For policies: either; for “background input”, we could allow for both
  - Prefab with a selection of input variables that can be changed by the user

1.4.2 HIGH-TOOL Runtime

Q ***"Which model runtime is acceptable for HIGH-TOOL?"*** *(Brainstorm)*

A

- **Answers by the European Commission**
  - 10 minutes max
  - 15 minutes to half an hour (two times)
  - It should be on the order of minutes, 30-45 minutes maximum
  - Up to 2h depending on complexity of policy to assess
  - Minutes to a few hours in more complex cases, anyway not days!
  - We are back to the question on the level of details
  - Given that the model should be usable by policy officers, it should be quite fast (30 minutes or so)
  - Don't mind waiting if for more comprehensive/refined results – future IT capabilities can also enable quicker runtimes
  - I agree it depends on details
  - The runtime should be adequate to the level of details of the assessment. Several minutes is acceptable
  - Would getting results within a few hours make it possible for the model to be more tailor-made?
  - It can be about 1 hour. The runtime should not have priority over the policies that can be evaluated with the model.
  - Runtime depends on the complexity of the question. Given that HIGH-TOOL's purpose seems to be screening, run time should not be too long – 15-30 min.
- **Answers by Consortium**
  - 15 minutes
  - Approximately 30 minutes
  - Up to 30 minutes
  - Up to 30 minutes maximum
  - Up to 45 minutes
  - Short where possible (few seconds), so only run the modules that are needed for the specific case. Complex modules could last up to 30 minutes

- Depending on the scenario definition; from some minutes to some hours, but not exceeding 3 hours
- At most minutes at national level up to an hour for higher levels of detail
- About an hour depending on how complex modelling is required

1.4.3 Requirements for Online Simulation and Analysis

Q ***"What are the required capabilities for online simulation and analysis with HIGH-TOOL?"*** *(Brainstorm)*

A

- **Answers by the European Commission**
  - PC (five times)
  - PC and possibly intranet
  - Online (two times)
  - Online, even if with complicated model and background calculation
  - Online if level of detail can be maintained vis-à-vis PC Version
  - Online, provided that the modelling quality and complexity is not negatively affected
  - Better online but provided it does not limit capability of HIGH TOOLS (priority should be capability of HIGH TOOLS to generate complex impacts calculations)
  - No need for online model; only if pc-based calculations take too long, a server-based calculation may be useful
  - Could also be a version check in the offline version, to tackle this issue?
- **Answers by Consortium**
  - PC with general available software in order to limit license problems
  - Online. Ensure all use the latest version. All could benefit from results of others (also reducing the need for additional calculation time).
  - Online capabilities should exceed the capabilities of the computer of a general user.
  - Will online give problems for use at the commission?
  - Maybe an "input template" can be submitted online, as input for calculation on server; no "Java-interface" development
  - Both in case I have to address questions when I'm out of office.

2 Questions and Answers of the Online Survey

2.1 Priority of Policy Measures for HIGH-TOOL

Q

"From the list of policy measures from the White Paper (see Table 11), which ones are important to be modelled? Note that the HIGH-TOOL team will check after the end of the survey in how far the requested policy measures can be taken into account. The main aim of this exercise is to get a better understanding of what you see as important measures. Regarding items marked with *: this policy measure might be beyond the scope of what is feasible to model with HIGH-TOOL. You can select the policy measures that you see as a 'priority' and as a 'non-priority'; there is no limit on the number of selections." *(Rating)*

The following table shows **how often each policy measure has been voted** as a (non-)priority by the survey participants.

Table 11A: Policy measure votes among survey participants

A

No.	Policy Measure	Priorities Selections	Non-priorities Selections
1	Airport Capacity – develop an approach to deal with future capacity problems including better integration with the railway network.	2	0
2	Concentrate European action on the components of the TEN-T network with the highest European added value (cross border missing links, intermodal connecting points and key bottlenecks).	2	0
3	Create in the context of the "core network" multimodal freight corridor structures to synchronise investments and infrastructure works and support efficient, innovative and multi-modal transport services, including rail services over medium and long distances.	2	0
4	Create the framework conditions to promote the development and use of intelligent systems for interoperable and multimodal scheduling, information, online reservation systems and smart ticketing. This could include a legislative proposal to ensure access of private service providers to travel and real time traffic information.	2	0
5	Define in new TEN-guidelines a core network of strategic European infrastructure integrating the eastern and western part of the European Union and shaping the Single European Transport Area. Foresee appropriate connections with neighbouring countries.	2	0
6	Deployment of ERTMS.	2	0
7	Deployment of next generation of multimodal traffic management and information systems.	2	0
8	Deployment of RIS.	2	0
9	Deploy the future air traffic management system (SESAR) in the agreed timeframe.	2	0

Table 11A: Policy measure votes among survey participants (continued)

No.	Policy Measure	Priorities Selections	Non-priorities Selections
10	Develop an integrated approach to freight corridor management, including track access charges.	2	0
11	Develop a validated framework for urban road user charging and access restriction schemes and their applications, including a legal and validated operational and technical framework covering vehicle and infrastructure applications.*	2	0
12	Elimination restriction road cabotage.	2	0
13	Ensure effective and non-discriminatory access to rail infrastructure, including rail-related services, in particular through structural separation between infrastructure management and service provision.	2	0
14	Evaluate existing car road charging schemes and their compatibility with the EU Treaties. Develop guidelines for the application of internalisation charges to road vehicles, covering the social costs of congestion, CO_2 – if not included in fuel tax – local pollution, noise and accidents. Provide incentives to Member States who launch pilot projects for the implementation of schemes along such guidelines.	2	0
15	Examine approaches to limit the maximum speed of light commercial road vehicles, in order to decrease energy consumption, to enhance road safety and to ensure a level playing field.	2	0
16	Focus on training and education of all users; promote the use of safety equipment (seat-belts, protective clothes, anti-tampering).	2	0
17	Further deployment of ITS.	2	0
18	Harmonise and deploy road safety technology – such as driver assistance systems, (smart) speed limiters, seat-belt reminders, eCall, cooperative systems and vehicle-infrastructure interfaces – as well as improved road worthiness tests including for alternative propulsion systems.	2	0
19	Improve the quality of transport for elderly people, passengers with reduced mobility and for disabled passengers, including better accessibility of infrastructure.	2	0
20	Innovations for sustainable urban mobility following up the CIVITAS programme and initiatives on urban road pricing and access restriction schemes.*	2	0
21	Integrate the use of monitoring tools by all relevant authorities, ensure the full interoperability between ICT systems in the waterborne sectors, guarantee the monitoring of vessels and freight (Blue Belt) and set up appropriate port facilities (“Blue Lanes”).	2	0
22	Open the domestic rail passengers market to competition, including mandatory award of public service contracts under competitive tendering.	2	0
23	Phase in a mandatory infrastructure charge for heavy-duty vehicles. The scheme would introduce a common tariff structure and cost components such as the recovery of wear and tear, noise and local pollution costs to replace the existing user charges.	2	0
24	Proceed to the full and mandatory internalisation of external costs (including noise, local pollution and congestion on top of the mandatory recovery of wear and tear costs) for road and rail transport. Internalise costs for local pollution and noise in ports and airports, as well as for air pollution at sea, and examine mandatory application of internalisation charges on all inland waterways on EU territory. Develop market based measures to further reduce GHG emissions.	2	0
25	Proceed with the internalisation of external costs for all modes of transport applying common principles while taking into account the specificity of each mode.	2	0

Table 11A: Policy measure votes among survey participants (continued)

No.	Policy Measure	Priorities Selections	Non-priorities Selections
26	Provide EU support for developing and deploying technologies that improve infrastructure use efficiency and decarbonisation (new road network pricing and tolling systems, ITS and capacity improvement programs).	2	0
27	Review the market situation of road freight transport as well as the degree of convergence on, among others, road user charges, social and safety legislation, transposition and enforcement of legislation in the Member States, with a view to further opening road transport markets.	2	0
28	Revise the Slot Regulation to favour more efficient use of airport capacity.	2	0
29	Safer infrastructure for vulnerable users such as pedestrians, cyclists and motorcyclists.	2	0
30	Stimulate the integration of inland waterways into the transport system.	2	0
31	Support multimodal transport and single wagon load business.	2	0
32	Support Urban Mobility Audits and Urban Mobility Plans.*	2	0
33	Technological innovation on information and communication systems to achieve better use of network and safer and more secure operations.	2	0
34	Adapt the legislation on weight and dimension to new circumstances, technologies and needs (e.g., weight of batteries, better aerodynamic performance), and to make sure it facilitates intermodal transport and the reduction of overall energy consumption and emissions.	1	1
35	Appropriate standards for CO_2 emissions of vehicles in all modes, where necessary supplemented by requirements on energy efficiency to address all types of propulsion systems.	1	0
36	Complete EU-wide one-stop security system for air cargo.*	1	1
37	Encourage business-based GHG certification schemes and develop common EU standards in order to estimate the carbon footprint of each passenger and freight journey with versions adapted to different users such as companies and individuals. This will allow better choices and easier marketing of cleaner transport solutions.	1	0
38	Enhance the certification and maintenance process for safety critical components used to build rolling stocks and railway infrastructures.	1	0
39	Ensure that CO_2 and pollutant emissions are reduced under real-world driving conditions by proposing at the latest by 2013 a revised test cycle to measure emissions.	1	0
40	Ensure that liability regimes promote rail, waterborne and intermodal transport.	1	1
41	Harmonisation of rail safety across sectors and EU: Progressively achieve a sector-wide approach to safety certification in the rail transport sector, building on existing approaches for infrastructure managers and railways undertakings and evaluating the possibility to rely on a European standard. Enhance the role of ERA in the field of rail safety, in particular its supervision on national safety measures taken by National Safety Authorities and their progressive harmonisation.	1	0
42	High levels of passenger security with minimum hassle: promote improved screening methods, fully respecting fundamental rights; such methods should underpin development of a “Check point of the future” – such as security corridors which would allow a high number of passengers being controlled with minimum hassle and intrusion. They should also support security provision in other vulnerable areas such as major transport interchanges.*	1	1

Table 11A: Policy measure votes among survey participants (continued)

No.	Policy Measure	Priorities Selections	Non-priorities Selections
43	Include eco-driving requirements in the future revisions of the driving licence directive and take steps to accelerate the deployment of ITS applications in support of eco-driving. Fuel saving techniques should also be developed and promoted in other modes – for example continuous descent for aircrafts.	1	0
44	Increase private sector engagement in infrastructure projects.*	1	0
45	Linking vehicle taxation to environmental performance.	1	0
46	Measures to promote increased replacement rate of inefficient and polluting vehicles.	1	0
47	Promote eco-innovation in freight transport.	1	0
48	Public procurement strategies to ensure rapid up take of new technologies.*	1	1
49	Put in practice the concepts of “single window” and “one-stop administrative shop”; by creating and deploying a single transport document in electronic form (electronic waybill), and creating the appropriate framework for the deployment of tracking and tracing technologies, RFID etc.).	1	1
50	Review restrictions on provision for port services.*	1	0
51	Revise motor fuel taxation with clear identification of the energy and CO_2 component.	1	0
52	Revising company car taxation to eliminate distortions and favour the deployment of clean vehicles.	1	0
53	Safer vehicle technologies for vulnerable users such as pedestrians, cyclists and motorcyclists.	1	0
54	Streamline the rules for the intermodal transport of dangerous goods to ensure interoperability between the different modes.	1	0
55	Support the deployment of new vehicles and vessels and retrofitting.	1	0
56	Support the market take-up of fuel efficient, safe and low-noise tyres beyond the performance requirements set in type approval.	1	0
57	Technological innovation on new fuels and propulsion systems to achieve cleaner energy use.	1	0
58	Technological innovation on vehicle efficiency through new engines, materials and design.	1	0
59	Uniform passenger rights across EU and in all modes.*	1	1
60	Vehicle standards for noise emission levels.	1	0
61	Achieve a single vehicle type authorisation and a single railway undertaking safety certification by reinforcing the role of the European Railway Agency (ERA).	0	1
62	Clarify and improve conditions to enter and provide quality services, including ground handling: ensure that all actors in an airport system meet minimum quality standards.	0	1
63	Encourage large employers to develop Corporate/Mobility Management Plans.*	0	2
64	Enhanced security of cargo in ports.*	0	2
65	Enhance the transparency on ports’ financing, clarifying the destination of public funding to the different port activities, with a view to avoid any distortion of competition.*	0	2

Table 11A: Policy measure votes among survey participants (continued)

No.	Policy Measure	Priorities Selections	Non-priorities Selections
66	Ensure the definition of mobility plans to ensure service continuity in case of disruptive events. The plans should address the issue of prioritisation in the use of working facilities, the cooperation of infrastructure managers, operators, national authorities and neighbouring countries, and the temporary adoption or relaxation of specific rules.*	0	2
67	Implement the Action Plan on Strengthening Air Cargo Security, define new rules on Air Cargo screening as necessary.*	0	2
68	Promote joint public procurement for low emission vehicles in commercial fleets (delivery vans, taxis, buses, etc.).	0	1
69	Reflecting on possible way forward to review the current VAT system concerning passenger transport.	0	1
70	Review the labelling Directive to make it more effective. This will, inter alia, consider the extension of the scope to light commercial and L-category vehicles, and the harmonisation of the label and vehicles fuel efficiency classes throughout the Member States.	0	2

2.2 Other Policy Measures to be Modelled by HIGH-TOOL

Q ***"Please give specific policy measures that are important for HIGH-TOOL to be able to model beyond what is in question 1 (see chapter 2.1). If possible please include a reference or link to background information. Use the textbox below to fill in your answer, and press enter or use the green checkmark to submit your input."*** *(Brainstorm)*

- **Answers by Survey Participants** **A**
  - No additional policy measures were mentioned.

2.3 Relevant Impact Indicators at Regional Level (NUTS-2)

Q ***"Which impact indicators are in your opinion required at regional level (NUTS-2)? Note that the HIGH-TOOL team will check after the end of the survey in how far the requested impact indicators can be computed at the regional level (1 = yes (required at regional level); 2 = no)."*** *(Rating)*

The following table shows the **voting each impact indicator received**. The last column (Ø) shows the average rating among the participants.

Table 12A: Relevant impact indicators at regional level (NUTS-2) sorted by mean

Rank	Impact Indicator	1 – Reg. Level	2 – Nat. Level	Ø
01	Social cohesion (e.g., income inequality)	2	3	**1.60**
02	Time savings (e.g., monetised travel time savings)	3	1	**1.25**
03	Cost saving (e.g., generalised costs)	4	1	**1.20**
	Economic growth (e.g., GDP growth rate)	4	1	**1.20**
	Employment (e.g., number of employed persons)	4	1	**1.20**
	Safety (e.g., number of accidents and fatalities, external costs)	4	1	**1.20**
07	(Local) Air Pollution (e.g., volumes of emitted air pollutants, external costs)	5	0	**1.00**
	Accessibility	5	0	**1.00**
	Transport demand (passenger and freight) (e.g., volumes, performance, modal share; each differentiated by trip distances: 0–300 km, 300–1000 km, 1000+ km)	5	0	**1.00**

A

2.4 Other Impact Indicators

Q

"Which further impact indicators are in your opinion required on national level?"

(Brainstorm)

A

- **Answers by Survey Participants**
  - External costs of Noise
  - External costs related to Health issues

2.5 Requirements on the Design of HIGH-TOOL

To allow refining the expected design of HIGH-TOOL, participants were asked to answer the following two questions and to explain their vote in a text box:

Q

Q1: ***"For the design of HIGH-TOOL we could work with a list of pre-set policy measures or with more freedom for the user. The consequence of using a pre-set list is that it will be easier to feed the model with consistent policy input. However, it will be harder to simulate policy measures that are not "pre-loaded". An open approach is more demanding for the user. He/She needs to translate policy input to model input or parameters. Please indicate on a scale of 1 to 5 your preference (1 = pre-set, 3 = neutral, 5 = completely open)."*** *(Rating)*

Q2: ***"Accounting for the trade-off between "dummy-proof" use and expert-user making changes deep inside the model, where do you see HIGH-TOOL on a scale from 1 to 5 (1=dummy, 3 = neutral, 5 = expert)? The first extreme holds the advantage that every non-expert can use the tool but in a "rigid" and pre-defined way; the latter allows more detailed policy assessment, making changes to the tool when needed, but requires in-depth knowledge of the tool."*** *(Rating)*

The following table presents the **rating given to the pre-selected statements**, according to the scale (1-5) mentioned in the question. The last row (Ø) shows the average rating among the participants.

Table 13A: Requirements on the design of HIGH-TOOL

Rating	Explanation	Q1	Rating	Explanation	Q2
1	Pre-set	0	**1**	Dummy	0
2	(Pre-set to neutral)	1	**2**	(Dummy to neutral)	1
3	Neutral	0	**3**	Neutral	0
4	(Neutral to completely open)	4	**4**	(Neutral to expert)	3
5	Completely open	2	**5**	Expert	1
Ø	**Average**	**4.0**	**Ø**	**Average**	**3.8**

A

Four additional comments were given on the first issue, regarding the design of the HIGH-TOOL policy input:

- **Comments by Survey Participants**
  - As our policy is evolving continuously the option for simulating additional policy measures that are maybe not foreseeable yet should be provided. (five votes)
  - Please see the considerations above. However, some consistency checks should be ensured for providing the input. (four votes)
  - The types of measures to be assessed for the purpose of Impact Assessments go much beyond what can be achieved by using the tool in a pre-defined way. The High-Tool model should be able to provide results that are used for the purpose of Impact Assessments. (four votes)
  - Reasoning and assumptions in an IA should be as clear, coherent and traceable as possible. The model should be adjustable on a set of pre-defined, agreed input variables but not more, to ensure this and flexibility. (two votes)

2.6 Example Interfaces for HIGH-TOOL

Q ***"Can you indicate a few modelling user interfaces you consider Best Practices to inspire the HIGH-TOOL interface design?"*** *(Brainstorm)*

- **Answers by Survey Participants** **A**
  - ASTRA-EC interface could be used as starting point. Emisia has also developed an interesting GUI for TREMOVE.

2.7 Tools and Data Sources Currently Used at DG MOVE

Q ***"Which tools and data are used most frequently in assessments at DG MOVE? Please elaborate as well about: What are the advantages and disadvantages of the specific tools and data sources? Are there any specific model properties that you consider as indispensable for HIGH-TOOL?"*** *(Brainstorm)*

- **Answers by Survey Participants** **A**
  - Currently DG MOVE is using tools like PRIMES, TREMOVE, TRANSTOOLS, GEM-E3.

2.8 Indispensable Model Properties for HIGH-TOOL

Q ***"What do you consider indispensable for HIGH-TOOL (e.g., exchange of data between HIGH-TOOL and other tools used at DG MOVE)?"*** *(Brainstorm)*

A

- **Answers by Survey Participants**
  - High-tools will be a valuable tool for impact assessments if it manages to focus on the impacts, not on the problem definition (which remains very often in practice a political problem). High-tools must take on itself all the parameters of transport policy to make serious IMPACT SIMULATIONS.
  - HIGHTOOL should be based on the latest available Statistics and make use of other DG MOVE projects such as ETIS+ or TENTEC.
  - It should be feasible to feed in HIGHTOOL output into more detailed modelling tools such as TRANSTOOLS.
  - HIGHTOOL shall be developed in a modular way which allows for checking different sub-models independently.
  - To be calibrated to official statistics from Eurostat, EEA, etc.
  - To include all transport modes and in particular the maritime transport which is not well represented in other models.
  - To be possible to produce a baseline scenario in line with the EU Reference scenario (use the same inputs and produce very close projections).
  - To provide projections up to 2050, by Member State (including Croatia) and at least at NUTS2 level (preferable NUTS3).
  - To use the same software for developing all modules of the High-Tool model. The software should allow an easy check of the model code and should be fully open.

2.9 Final Remarks

Q ***"Do you have any final remarks? Any final remarks, especially: is there anything else you want to address to the consortium for the development of the HIGH-TOOL model?"*** *(Brainstorm)*

A

- **Answers by Survey Participants**
  - No additional remarks were given.