

MASTER THESIS

MULTI-MODAL NETWORKS

**International Analysis of Trends Regarding Organizational Enhancement within
Selected Road and Transport Administrations**

Submission

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ABSTRACT

This diploma thesis is part of a multi-year research project *Evolution of the Mission and Structure of Road and Transport Administrations*. This project itself is carried out by the *Technical Committee (TC)* which is also known under the name *Performance of Transport Administrations*. This in turn represents a working group of the *World Road Association (PIARC)*. The results of this thesis serve as a basis for the final report of the PIARC as well as for various publications.

In the modern transportation, numerous interfaces and increasingly complex structures service the increasing demand for new developments in today's transportation network. The need for more efficiency leads to a clearly visible pattern regarding new organizational forms for road- and transportation infrastructure companies towards multi- and intermodal- systems.

This paper's objective is to carry out an international analysis regarding the trend of organizational developments of selected transport infrastructure companies with a special focus on intermodal activities.

The emphasis lies on the transport media of road, rail, waterways and aviation as well as on their interfaces.

Based on postulated hypotheses on the organization and its enhancement, a questionnaire was developed for the international data collection. 25 organizations from a total of 18 different countries have participated in this international survey. Thereby, taken within the context of the general framework, organizational jurisdictions, tasks and responsibilities, political control and accountabilities, institutional arrangements and their establishment as well as key organizational data have been surveyed. Additionally, multi-modal activities and the interactions between modes, functions, spatial tiers and stakeholders were also questioned. With regard to multi-modal organizations, interfaces and organizational divisions, the rationales for their creation as well as their success have been examined in detail. This study concludes by pointing out proposals, plans and discussions for future change regarding current strategies and their evaluation. The collected data is going to be presented and subsequently analyzed and interpreted for correlations.

The overall conclusion is that the planning and implementation of multi-modal measures are largely independent from the organizational form (single- or multi-modal organizations). For a successful application of intermodal activities, a strategic foundation within the company and active cooperation with other organization units or organizations are necessary. Other important prerequisites for an effective enhancement of transport infrastructure companies are the clear stakeholder orientation and special attention given to the customer.

The results of the international analysis show that these success factors are currently only partly implemented within the examined organizations. Also a structural change is expected to a subordinated extend within the next few years.

Keywords: Multi-modal Networks, Organizational Enhancement, Road and Transport Administrations, Transport Mode, Multi- and Intermodal Activities

KURZFASSUNG

Die vorliegende Arbeit ist Bestandteil des mehrjährigen Forschungsprojektes *Evolution of the Mission and Structure of Road and Transport Administrations*. Das Projekt selber wird vom *Technical Committee (TC)* ausgeführt, welches auch als *Performance of Transport Administrations* bezeichnet wird. Dieses wiederum stellt eine Arbeitsgruppe der *World Road Association (PIARC)* dar. Die Resultate der Arbeit dienen als Grundlage für den Abschlussbericht der *PIARC* und für diverse Publikationen.

Im heutigen Transportwesen, das über eine komplexe Struktur mit zahlreichen Schnittstellen verfügt und den stetigen Bedarf an Leistungssteigerung abdecken muss, liegt ein klar erkennbarer Trend hinsichtlich der Entwicklung von Straßen- und Verkehrsinfrastrukturunternehmen in Richtung einer multi- und intermodalen Abwicklung vor.

Ziel dieser Arbeit ist eine internationale Analyse der Trends einer organisatorischen Weiterentwicklung von ausgewählten Verkehrsinfrastrukturunternehmen, wobei ein besonderer Schwerpunkt auf die intermodalen Aktivitäten gelegt wurde.

Dabei wurde der Fokus auf die Transportmedien Straße, Schiene, Schiff- und Luftfahrt sowie deren Schnittstellen gelegt.

Auf der Grundlage aufgestellter Hypothesen zur Organisation und deren Weiterentwicklung wurde ein Fragebogen für die internationale Datenerhebung entwickelt. An der internationalen Umfrage nahmen insgesamt 25 Organisationen von 18 verschiedenen Ländern teil. Dabei wurden die im Kontext stehenden Rahmenbedingungen wie die organisatorischen Zuständigkeiten, Aufgaben und Verantwortlichkeiten, die politische Kontrolle und deren Verantwortung, institutionelle Regelungen und deren Etablierung sowie organisatorische Kennzahlen erhoben. Des Weiteren wurden multimodale Aktivitäten und die Interaktion zwischen Betrieben, Aufgaben, räumlichen Ebenen und Stakeholdern abgefragt. Im Hinblick auf multimodale Organisationen wurden die Schnittstellen und organisatorischen Abteilungen, der Grund für die Schaffung sowie deren Erfolg in Erfahrung gebracht. Den Abschluss der Arbeit bilden Anregungen, Pläne und Diskussionen für eine zukünftige Veränderung auf Grundlage der aktuellen Strategien und deren Bewertung. Die erhobenen Daten werden im Zuge dieses Prozesses präsentiert und im Anschluss hinsichtlich der Zusammenhänge analysiert und interpretiert.

Zusammenfassend kann festgestellt werden, dass die Planung und Umsetzung von verkehrsträgerübergreifenden Maßnahmen weitgehend unabhängig von der Organisationsform (single- oder multi-modal agierende Organisationen) getroffen werden und dass für die erfolgreiche Umsetzung von intermodalen Maßnahmen die strategische Verankerung im Unternehmen und aktive Kooperationen mit anderen Organisationseinheiten bzw. Organisationen erforderlich sind. Auch die klare Stakeholderorientierung und insbesondere die Kundenorientierung sind wichtige Voraussetzungen für die erfolgreiche Weiterentwicklung von Verkehrsinfrastrukturunternehmen.

Die Ergebnisse der internationalen Analyse zeigen, dass diese Erfolgsfaktoren derzeit nur zum Teil bei den untersuchten Organisationen umgesetzt werden, und auch strukturelle Veränderungen nur im untergeordneten Ausmaß für die nächsten Jahre geplant sind.

Stichwörter: Multi-modale Netzwerke, organisatorische Weiterentwicklung, Straßen- und Verkehrsinfrastrukturunternehmen, Verkehrsträger, multi- und intermodale Aktivitäten

DECLARATION

“I declare that this paper is my own work and was written without literature other than the sources indicated in the bibliography. Information used from the published or unpublished work of others has been acknowledged in the text and has been explicitly referred to in the given list of references. This paper has not been submitted in any form for another degree or diploma at any university or other institute of tertiary education.”

Graz, 25 March 2014

MÜLLNER Patrick, BSc

***“Learn from yesterday, live for today, hope for tomorrow.
The important thing is not to stop questioning.”***

Albert Einstein (1879 – 1955)

The statements made in this work represent the opinion of the graduand and do not reflect the opinion of the ASFINAG in all aspects.

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An era comes to an end, and a new one begins.

For me personally, my student days have been a very intense but at the same time beautiful period of my life. At this point I would like to take this opportunity to thank all people who accompanied and supported me along my way.

This time provided me with new knowledge, information and experiences which made me more mature. In addition, I got to know a lot of nice people. We spent many beautiful moments together and I learned to appreciate them.

I am looking back with one smiling and one crying eye, but I am certainly ready and motivated for new challenges.

Special thanks are directed to my advisors Mr. DI Sämi Behnam and Mr. FH-Prof. Dr. DI Rainer Stempkowski for their active support. They encouraged me to take the topic of this master thesis for elaboration, without them I would not have been able to overcome this challenge.

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1 Introduction

This master thesis is supervised and commissioned by the Austrian Road Administration (*ASFINAG*) and it is part of the research project *Evolution of the Mission and Structure of Road and Transport Administrations*. This project is carried out by the Technical Committee (TC), called *Performance of Transport Administrations*, of the *World Road Association (PIARC)*, which has the general purpose to exchange knowledge among countries around the world about roads and road transportation.

The scope of this research project is to examine recent trends towards multi-modal integrated transport authorities across the world. In particular this project looks at the reform aims of future developments in order to understand the reasons for their creation, to assemble evidence of costs as well as benefits, and to make recommendations for relevant officials and decision makers.¹

The purpose of the master thesis is to research **multi- and intermodal transport activities of road and transport organizations** with competence in the areas of **road, railway, water, and aviation**. Except for the fields of transportation of data and resources in pipelines, the topic covers the full spectrum of transport facilities.

General subjects include current missions and responsibilities of the organization, predecessor organizations and reasons for changes, political control and responsibilities as well as delimitation and interfaces to other organizations. In addition this thesis contains an analysis of intermodal transport missions and activities as well as an analysis of the junctions between the different transport carriers. The elaboration also covers boundaries between local and national responsibility, intersections between design – delivery – maintenance and operation, points of contact to stakeholders and interfaces to agencies. An analysis of organizational key data, current policies of the organization for future developments and an evaluation of possible development policies are topics, which are also part of this work.

The study analyzes the transport organizations of the following countries Austria, Australia, Germany, Belgium, Canada, Spain, Finland, France, Hungary, Italy, Japan, Lithuania, Malaysia, Romania, Sweden, United Kingdom, United States and South Africa.

To obtain the necessary information from the selected road and transport administrations, a tailor-made questionnaire survey was prepared to help collect data and was distributed among the transport agencies. This survey is based on organizational parameters, the current position on multi-modal planning or delivery, past or current reforms along with the prior objectives and outturn costs, as well as on the benefits of these reforms. The questionnaire survey includes open and closed questions. This question technique makes it possible to get basic information for a statistical analysis in every field of the research. Mainly members of the *World Road Association* took part in this survey.

During the course of this master thesis, the questionnaire will be evaluated and the results will be presented and interpreted. The aim of the work is to analyze best practice examples, as well as to give recommendations for multi modal activities in different organizational forms based on the questionnaire results.

¹ cf. WORLD ROAD ASSOCIATION MONDALE DE LA ROUTE AIPCR PIARC (ed.): STRATEGIC PLAN 2012-2015, TC 1.1 – Evolution of the Mission and Structure of Road and Transport Authorities – WG 1 – Initial Brief and Scope

The study is divided into three main parts: **Development of Questionnaire**, **Presentation of the Results**, and **Analysis of the Results and Summary**.

Before turning to the main part, the following subchapters deal with the background and origins of this work. Starting with a presentation of the **World Road Association – PIARC**, this master thesis deals with the so-called **Research Project Evolution** or rather, this paper is part of it. PIARC is also the organization that has set up the aforementioned project. This first overview is followed by an explanation and delimitation of the topics covered in the **Scope of Work**. An expansion of the introductory words is made in the sub item **Definitions** which includes a summary and explanation of the most important terms.

The chapter **Development of Questionnaire** deals with the preparation of the questionnaire. It shows the development and structure of the whole process, starting with the survey in the chapters **Methodology** and **Theses** and going on with the resulting **Questions**.

After that, the chapter **Presentation of the Results** represents selected results by using diagrams on the following topics: **Part 1 – Context**, **PART 2 A – Multi-modal Activities**, **Part 2 B – Multi-modal Organizations**, and **Part 3 – Proposals, Plans and Discussions for Future Change**.

The interpretation of the analysis and a summary is shown in the chapter **Analysis of the Results and Summary**. For this part of the work, it becomes necessary to examine the project from two perspectives. One part deals with **Single-modal Organizations** and the other with **Multi-modal Organizations**.

To gain an overview, the chapter **Conclusion and Lessons Learned** provides a summary and illustrates a few **Best Practice** examples.

1.1 World Road Association – PIARC

As a starting point of the topic covered in this paper, the following pages of this chapter deal in detail with the World Road Association. Following the introductory words, a specific presentation is made in the subchapter **Structure of the World Road Association**. As part of that general structure of the organization, the subitem **Strategic Theme 1: Management and Performance** goes into more detail. The subchapters **Technical Committee 1.1 – Performance of Transport Administration** and **Issue 1.1.1 – Evolution of Structures and Missions of the Administrations** represent again subcategories of their respective subordinate level.

The reflected content in this chapter is based on the facts published by the **World Road Association**.



Figure 1: World Road Association



Figure 2: PIARC

(Reference: World Road Association (PIARC))

(Reference: World Road Association (PIARC))

The World Road Association (**Figure 1: World Road Association**), as it is known today, is a nonprofit organization that is engaged very closely in the international development of the road section. First created under the name Permanent International Association of Road Congress (**Figure 2: PIARC**), the organization was established over a century ago on April 29, 1909 in France. In the beginning, the subject of the organization was focused on the design and the functional capability of the infrastructure for motorized vehicles. But over the time the key issues and demands have changed and were adjusted in line with the actual situation nowadays.² Anne-Marie Leclerc, past President (2009 to 2012) of the World Road Association, describes these tasks as “[...] access to safe, environmentally-friendly and sustainable mobility for all.”³

1.1.1 Structure of the World Road Association

The structure of the World Road Association is generally composed of the following four levels: **Council**, **Executive Committee**, **General Secretariat** and **National Committee**. A detailed explanation of these subcategories is found below.⁴

Council

The **Council** stands at the top of the organizational structure and has the ultimate responsibility of the association. It consists of delegations of the country members and is lead by a delegation with a leadership role.⁵

² cf. WORLD ROAD ASSOCIATION MONDIALE DE LA ROUTE AIPCR PIARC (ed.): STRATEGIC PLAN 2012-2015, Anne-Marie Leclerc World Road Association President (2009 to 2012), www.piarc.org 2012, p.3

³ *ibid.*, p.3

⁴ cf. *ibid.*, p.6

⁵ cf. *ibid.*, p.6

Executive Committee

At the second level, the **Executive Committee** has the responsibility for the administration of the organization. The committee ensures the implementation of the policy approved by the council and consists of the President, the past President, three Vice Presidents, three commission chairs, the representative of the national committees and of the members of the World Road Association. The concerned parties are supported by three Commissions: Strategic Planning, Finance, and Communication, in addition to the General Secretariat.⁶

General Secretariat

The **General Secretariat** has its residence in Paris, France. Its mission is to ensure the execution of the daily management in accordance with the resolutions and decisions made by the Council. In addition to that, it supports the Council, the Executive Committee and the Technical Committees with their service.⁷

National Committees

The **National Committees** are situated in the 37 member countries and make a contribution to the distribution of the generated results achieved by the organizations. Another task includes the organizing of local activities such as meetings, conferences and seminars. Within the member countries, the National Committees pursue the accomplishment of their membership service and administration tasks.⁸

The structure just discussed, is also shown in the diagram of **Figure 3: Structure of the World Road Association**.

The **technical work** of the World Road Association is carried out by the Commission of the Strategic Planning. This field of work is divided into the following four strategic themes:

- Strategic Theme 1: Management and Performance
- Strategic Theme 2: Access and Mobility
- Strategic Theme 3 Safety
- Strategic Theme 4 Infrastructure⁹

These four subject areas again consist of 17 Technical Committees, who each work on one theme, and of two task forces that are working on different topics in the field of the road and transport sector.¹⁰

Due to the fact that for the topic of the paper the **Strategic Theme 1: Management and Performance** is relevant, the following chapter contains a detailed explanation of this subject area.

⁶ cf. WORLD ROAD ASSOCIATION MONDALE DE LA ROUTE AIPCR PIARC (ed.): STRATEGIC PLAN 2012-2015, Anne-Marie Leclerc World Road Association President (2009 to 2012), www.piarc.org 2012, p.6

⁷ cf. *ibid*, p.6

⁸ cf. *ibid*, p.6

⁹ cf. *ibid*, p.6

¹⁰ cf. *ibid*, p.6

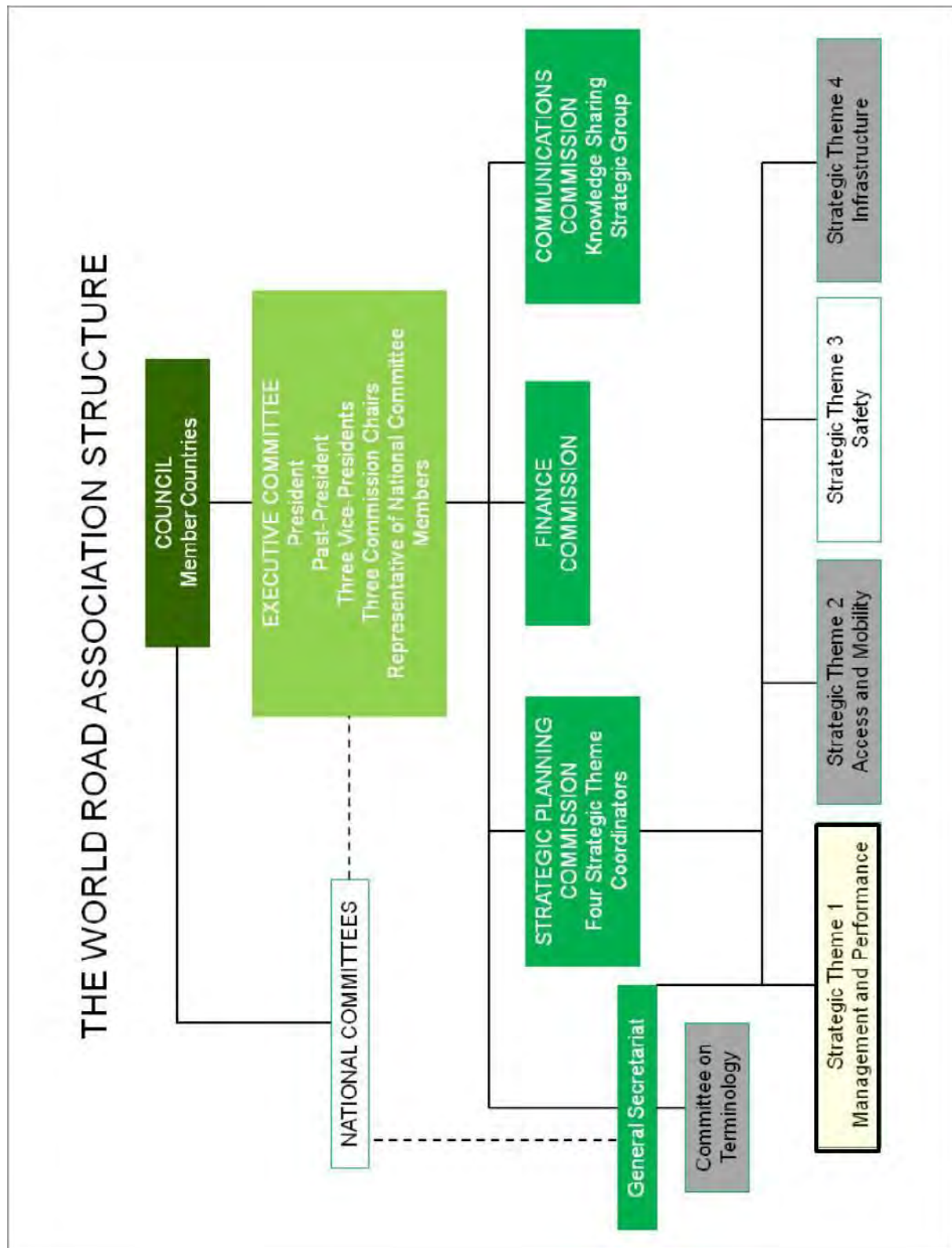


Figure 3: Structure of the World Road Association¹¹

¹¹ cf. WORLD ROAD ASSOCIATION MONDALE DE LA ROUTE AIPCR PIARC (ed.): STRATEGIC PLAN 2012-2015, Anne-Marie Leclerc World Road Association President (2009 to 2012), www.piarc.org 2012, p.7

1.1.2 Strategic Theme 1: Management and Performance

The subject area Strategic Theme 1 is divided into five Technical Committees that are explained in the following subchapters: 1.1 Performance of Transport Administrations, 1.2 Financing, 1.3 Climate Change and Sustainability, 1.4 Road Transport System Economics and Social Development, 1.5 Risk Management.¹²

The **aim** of Strategic Theme 1 is to support the transport policies and strategies of well-functioning and sustainable road and transport administrations. This is done by providing examples of reasonably funded governance and transport administrations. In this context, best practice initiatives regarding climate change (including the treatment with corresponding and other forms of risk) contribute to achieve the declared objective.¹³

Strategic Theme 1 brings together development and enacting of road and transport administrations in policy and strategy issues.¹⁴

The present topic that the paper deals with, is under the subject of the **Technical Committee 1.1 – Performance of Transport Administration**. A more detailed explanation of this Technical Committee can be found in the following chapter.

1.1.3 Technical Committee 1.1 – Performance of Transport Administration

The unification of road administrations and other transport providers to one road and transport administration represents a challenge but also a great opportunity. New structures can increase the performance of stakeholders and ensure high media attention. This increased attention also means that good governance and anti-corruption measures remain very important. The Technical Committee is going to publish a guideline that is based on the experiences of member states concerning this topic.¹⁵

The Technical Committee has the task to investigate the three following issues: 1.1.1 Evolution of structure and missions of the administrations, 1.1.2 Assessment of administrations' performance and 1.1.3 Good governance and anti-corruption measures.¹⁶

In this subchapter, the topic of this paper is covered by the issue **1.1.1 Evolution of structures and missions of the administrations**. This field is explained in more detail in the next chapter.

¹² cf. WORLD ROAD ASSOCIATION MONDALE DE LA ROUTE AIPCR PIARC (ed.): STRATEGIC PLAN 2012-2015, Anne-Marie Leclerc World Road Association President (2009 to 2012), www.piarc.org 2012, p.13

¹³ cf. *ibid.*, p.13

¹⁴ cf. *ibid.*, p.13

¹⁵ cf. *ibid.*, p.13

¹⁶ cf. *ibid.*, p.13

1.1.4 Issue 1.1.1 – Evolution of Structures and Missions of the Administrations

The **strategy** of issue 1.1.1 – Evolution of Structures and Mission of Administrations, is to investigate the recent changes within the road and transport administrations. Thereby, the emphasis is placed on the integration of the transport modes, the scope of responsibilities, the characteristics and size of the road networks and the increasing performance and involvement of the stakeholder. In addition, changes and rethinking processes of decision makers are analyzed to be able to understand the following points: the implementation of the challenge, the expectations of the instituted changes and the identification of the resulting effects.¹⁷

The **output** of this issue is defined in the chapter Lessons Learned and provides a guidance report for changes in road and transport administrations.

1.2 Research Project Evolution

The research project, which is done by the field of the already mentioned Issue 1.1.1– Evolution of Structures and Mission of Administrations, is called: **Evolution of the Mission and Structure of Road and Transport Administrations**.

In order to manage the transport sector, the effective coordination of planning, delivering and operating across different transport modes and networks is necessary to ensure effective customer service, the efficient use of resources and to achieve general political goals regarding the economy, society and the environment.¹⁸

In this content, a trend has been developing since the 1990s. It is marked by the development of large multi-modal and integrated transport agencies. Thereby, the responsibility of these modified organizations extends over the entire range of transport modes on land. This structural change becomes evident on the national, regional and metropolitan level. The result of this trend is a government for road infrastructure, operation and asset management in context with long strategic planning. In addition to that, other transport modes, especially the public transport based on rail and road, are influencing the market.¹⁹

In conjunction with this ongoing process, predecessor road organizations have been analyzed and it seems that separated organizational forms no longer exist. In the case of developing countries the situation is quite different. Multi-modal lead facilities are less obvious, but they are still emerging.²⁰

¹⁷ cf. WORLD ROAD ASSOCIATION MONDALE DE LA ROUTE AIPCR PIARC (ed.): STRATEGIC PLAN 2012-2015, Anne-Marie Leclerc World Road Association President (2009 to 2012), www.piarc.org 2012, p.14

¹⁸ cf. WORLD ROAD ASSOCIATION MONDALE DE LA ROUTE AIPCR PIARC (ed.): STRATEGIC PLAN 2012-2015, TC 1.1 – Evolution of the Mission and Structure of Road and Transport Authorities – WG 1 – Initial Brief and Scope

¹⁹ cf. *ibid.*

²⁰ cf. *ibid.*

In the advanced developing countries, public officials and decision makers have expressed their agreement with the development of multi-modal and integrated modes and structures. There are good arguments indicating that this trend leads to a higher economic efficiency. Nevertheless, there are many important things to consider. This new organization form needs even more fair competition conditions for decision makers across modes, an equitable and transparent allocation of resources, strong finance management and the ability to implement them. In addition, it is necessary to have the focus on customers and to save cost through organizational rationalizing. At the adoption of new systems, it is always important to make an extensive analysis to be able pointing out the advantages and disadvantages. Furthermore, it is necessary to understand the consequences of recent reforms in their entire range. This also includes unintended consequences that can upset the balance between strategic and local priorities in addition to the effective investment and management of individual modes and networks.²¹

At the same time, there are still national road administrations with less structural changes. To meet their targets and achieve their sector tasks successfully, they have to install extensive organizational measures. In addition, these organizations have to try and record the best possible result by simultaneously managing the challenge of coordinating the different modes of transport.²²

1.3 Scope of Work

This paper covers a very extensive subject in the field of transportation. It deals with an international analysis of trends regarding organizational enhancement within selected road and transport administrations. In this context, a special focus is directed to multi-modal networks.

The area of transport infrastructure is to be regarded as one section of the entire infrastructure. The infrastructure refers to the basic equipment of a country. On the one hand, it exists for the benefit of the population, on the other hand, it can be responsible for boosting the economy. Therefore, a distinction is made between those infrastructures that exist for the traffic-bound transport of people and goods and those designed for the supply and disposal of various media (energy, water and communication). The analysis in this thesis will deal exclusively with the former.

The transportation of people and goods is based on various transport facilities. Transport and road administrations are using the given natural resources of ground, air and water for locomotion. In this regard, the focus is on the four main modes of transport with their suitable means of transportation on road, air and water and the related intermodal activities.

Now the situation is such, that there are single-modal organizations that act only for one transport mode and multi-modal organizations operating over several types. Accordingly, the scope of work focuses on the multi-modal organizations as well as on the intermodal activities of single-modal organizations to other transport modes.

²¹ cf. WORLD ROAD ASSOCIATION MONDALE DE LA ROUTE AIPCR PIARC (ed.): STRATEGIC PLAN 2012-2015, TC 1.1 – Evolution of the Mission and Structure of Road and Transport Authorities – WG 1 – Initial Brief and Scope

²² cf. *ibid.*

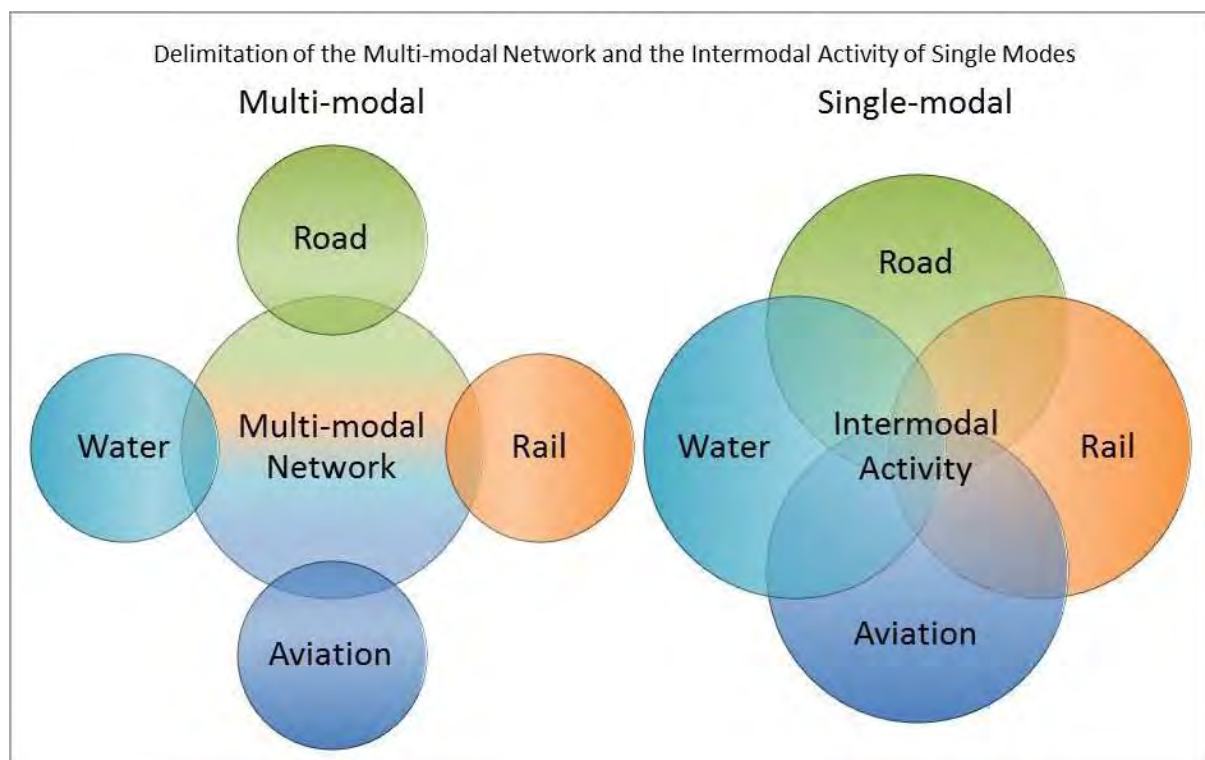


Figure 4: Delimitation of the Multi-modal Network and the Intermodal Activity of Single Modes

To enable the reader to understand the subject of the research paper, the graphic above (**Figure 4**) represents the general structure of multi-modal networks and intermodal activities. The figure illustrates the multi-modal network as the major configuration parameter of the four essential transport methods road, rail, aviation and water. The intermodal activities are also illustrated in the middle of the single transport modes, but the areas are overlapping, which means that they influence each other in every situation.

1.4 Definitions

General

The road and transport organizations that are used in the survey are named as organization or mode throughout the course of this paper.

Single-modal organization

Infrastructure companies, operators and public transport authorities: a single-modal organization is exclusively responsible for one transport mode. In this paper, the single-modal organizations are purely responsible for road transport modes.

Multi-modal organization

Integrated transport authorities: a multi-modal organization operates over several transport modes (Road, Rail, Shipping, or Aviation) simultaneously.

Multi-modal

Whole network for transport covering all modes e.g. road, rail, bus, etc.

Intermodal

Interfaces and interactions between modes

Overall Infrastructure

The overall infrastructure includes the complete transport types: road, rail, waterway, aviation, etc.

Transport

The term transport means, to move persons and goods from the place of departure to their destination.

Transport Mode

A transport mode describes an organization that provides infrastructural facilities.

Stakeholder

A Stakeholder indicates a person, a group or an organization that has an interest in the development or results of a process or project.

Local Level

The local level refers to a small sized area of the spatial scale. Accordingly, the responsibility is extended over the direct sphere of influence, e.g. city.

Regional Level

The regional level refers to a middle sized area of the spatial scale. Accordingly, the responsibility is extended over selected sections of a land, e.g. state, province.

National Level

The national level refers to a large sized area of the spatial scale. Accordingly, the responsibility is extended overall the state or provinces of the nation, e.g. country.

Units

[km]	..... kilometer
[km/y]	..... kilometer per year
[mo vh km/y]	..... motor vehicle kilometer per year
[trakm/y]	..... transit-kilometer per year
[to/y]	..... tons per year
[tokm/y]	..... tonne-kilometers per year

2 Development of Questionnaire Survey

Before explaining in depth the questionnaire survey in a general and project specific part below, first of all, have a short look on the subject *research*. What is a research exactly and why do we do that:

*“Research has one end: the ultimate discovery of truth. Its purpose is to learn what has never been known before; to ask a significant question for which no conclusive answer has been found and, through the medium of relevant facts and their interpretation, to attempt to find the answer to that question.”*²³

In addition to the first topic which deals with the methodology, the chapter development of questionnaire survey includes subsequently the developed hypothesis and the resultant particular questions are presented at the end.

2.1 Methodology

The topic methodology is separated into a general and a project specific section. The purpose of the first one is to point out the different available methodologies for surveying data in general in a quick overview. In addition, the subsequent second part demonstrates types of questions that have applied in the design of the questionnaire. Furthermore, basic information of the questionnaire is being reported.

2.1.1 General Part

Because of the fact that *“The researcher soon learns that the nature of the data dictates the research methodology that must be employed in the processing of those data.”*²⁴ a wide range of different methods were used to design the research. In the present paper, we use a descriptive survey method. *“The descriptive survey method, sometimes called the normative method, is employed to process the data that come to the researcher through observation. These are discrete data [...]”*²⁵

The purpose of a designed **survey** is to collect data that is not available to the public with regards to the present subject the research deals with. To specify the meaning of the term *survey*, a definition follows:

*“The word survey is composed of two elements that indicate precisely what happens in the very process. Sur- is a derivative of the Latin super, meaning “above,” “over,” or “beyond”; the element -vey comes from the Latin verb videre, “to look” or “to see.” Thus, the word survey means “to look or to see over or beyond” the casual glance or the superficial observation.”*²⁶

In the following, a short look is taken at the essential subjects for explaining the methodology of a survey including the possible survey methods, the question and the data types.

²³ Leedy, Paul D.: Practical Research Planning and Design Fifth Edition. New York: Macmillan Publishing Company, a division of Macmillan, Inc. 1993, p.4

²⁴ *ibid.*, p.185

²⁵ *ibid.*, p.185

²⁶ *ibid.*, p.186

Survey Methods²⁷

To design a survey, different types of methods can be used by the researcher. Roughly, we can distinguish between **interviewer-administered interviews** and **self-completion surveys**. A further distinction can be made for these two main types. However, this is not part of this work.

Interviewer-administered interviews:

This form of survey method has the particular advantage that the researcher is always able to answer questions and clarify misunderstandings. If the situation requires, it is possible to force a deeper response of the interviewee. Either this kind of survey can be hold with **face-to-face** interviews or **telephone-administered questionnaires**.

Self-completion surveys:

Turning to the self-completion survey, the researcher is, in comparison to the interviewer-administered form not immediately able to respond to questions regarding any misunderstandings. In order to get data in high quality, the questions have to be clear to understand. This form of surveying data either uses **paper questionnaires** or **web-based self-completion**.

Question Types

In a first step, the questions can be classified according to their different matters whereby the key topics are:

- questions of fact
- questions about opinions, beliefs, judgments
- questions about behavior (what people do)²⁸

In addition, the form of the questions can lead the interviewee to the particular objective of the researcher regarding the type of response, key topics are:

- Open and closed questions
- Spontaneous questions
- Prompted questions
- Open-ended questions
- Pre-coded questions²⁹

²⁷ cf. Brace, Ian: Questionnaire Design How to Plan, Structure and Write Survey Material for Effective Market Research. Lonon & Sterling, VA: Kogan Page 2009, p.24-37

²⁸ cf. Graham, Bill: Developing a Questionnaire 2nd Edition. London, New York: Continuum International Publishing Group 2007, p.26

²⁹ cf. Brace, Ian: Questionnaire Design How to Plan, Structure and Write Survey Material for Effective Market Research. Lonon & Sterling, VA: Kogan Page 2009, p.55-65

Data Types³⁰

- Nominal

For this kind of data it is only possible to select between two particular answer options. For example, gender: male / female, or the form of organization: single- / multi-modal.

- Ordinal

By handling with ordinal data, a ranking of several different items is revealing. For example, fruits ranked accordingly to ones preference: (1) apple, (2) pear, and (3) banana.

- Interval

The interval data is the result of an evaluation. For example, the quality assessment of a product: Evaluation from very good (1) to very bad (6). The particular relevance of an interface to other transport provider, rated from very (1) to not at all (6) relevant, represents also an example for an interval data. On the basis of the examples it is obviously that the interval extends from one (1) to six (6), accordingly there is no zero in the interval data. Attention should be paid to the selected numbers of response options. In the case of choosing an even number of options, it is not possible for the interviewee to take the middle. Consequently, the result becomes clearer.

- Ratio

To conclude with the data types, the ratio is a value of a number whereby the value starts at zero. For example, the age or the expenditure budget (million per year) in new construction.

2.1.2 Project-Specific Part

Goals of the Questionnaire Survey

The objective of the questionnaire was to survey not publically available data about selected road and transport administrations regarding the organizational enhancement of multi- and intermodal activities. More precisely, the aim is to learn about current multi- and intermodal activities as well as about multi-modal planning and delivery. A further goal is to obtain information about planned developments in the future. To put this data in context, it is also necessary to gain knowledge of general organizational information.

Target Audience

The questionnaire survey was directed at selected road and transport administrations around the world, especially focusing on the organizations responsible for roads. In addition, other significant organizations that are working within the transport sector were examined. For example, the government ministries, the regional and local authorities, with responsibilities in this area, who keep tabs on the multimodal transport in metropolitan areas and on sub-national level, were analyzed precisely.

³⁰ cf. Brace, Ian: Questionnaire Design How to Plan, Structure and Write Survey Material for Effective Market Research. Lonon & Sterling, VA: Kogan Page 2009, p.77

Methodology

The applied method for surveying the selected road and transport administrations was based on a paper questionnaire, although the creation was computer-aided with the help of the program Microsoft Office. As already shown when giving the examples for the different data types, the questionnaire is the result of various survey methods. Almost all of the data types mentioned above have been used.

Questionnaire

The questionnaires structure is based on the goals of the survey and consists of the following four parts:

- Part 1 (A/B/C) requests information on the context of the organization and is to be filled in by all organizations
- Part 2A requests information on multi-modal and inter-modal activities and should be filled in by all organizations
- Part 2B requests information on multi-modal planning and delivery and should be filled in only by organizations responsible for multiple transport modes
- Part 3 requests information on future developments and should be filled in by all organizations

Pretest

Before sending the questionnaire to the whole target group, a test run has been carried out by the organization *ASFINAG*. Due to resulting questions, an adaptation of the questionnaire has been carried out. In addition the questionnaire has been presented to the members of WG 1.1 the findings of which have also been integrated in the final version of the questionnaire.

2.2 Theses

Based on the objective of the research project, the following theses have been developed and are presented below.

2.2.1 Context

The following theses of the context reflect the general framework and the structure of road- and transportation infrastructure organizations. Thereby, the relevance is based on significant correlations of basic conditions and on the way the organization is run. As a result, these basic conditions relating to the developments and activities can be pointed out.

Thesis:

Frame conditions (policy, system size and finance) have an impact on the operation and development of the organization.

Thesis:

Organizations that are operating across all transport modes (multi-modal) are more often in action on the local and regional levels.

Thesis:

Organizations that are responsible for single transport mode operate on the national level.

Thesis:

Larger networks (road, rail, other) are operated by single-modal organizations.

Thesis:

Multi-modal organizations exist more commonly in countries or areas where the politically responsible entity (e.g. Ministry) has combined overview of the overall infrastructure.

Thesis:

Tasks of supervising out of the policy responsibility are outsourced partially to other organizations. This has an impact on the focus of the road and transport organizations.

Thesis:

High investment (new construction) requires an organization that enables coordination between the transport modes.

Thesis:

High investment indicates new developments within the existing transport and road organization.

2.2.2 Analysis of Interactions between Modes, Functions, Spatial Tiers and Stakeholders

The following hypotheses relate to the **joint working** of different transport carriers concerning **multi modal outcomes**.

Thesis:

The interfaces to other traffic carriers depend on the responsibility of the policy supervisory and the level of development of the organization.

Thesis:

In cities with large harbors the waterway transport mode is mainly used for international transport.

Thesis:

In cities located on the water (sea or river) the waterway transport mode is also used for local transport activities.

Thesis:

The relevance of the different customer groups (goods, persons) for the organization depends on the task of the organization.

Thesis:

Media serve as multipliers for information and as opinion formers. They are considered to be important stakeholders.

Thesis:

An implementation of intermodality within the whole company requires the organizational integration of all departments from planning to operation.

2.2.3 Analysis of Multi-modal Activities (Internal, External)

The following hypotheses relate to **existing structures, processes and systems** of multi modal activities.

Thesis:

Multi-modal organizations set more measures regarding intermodal activities than single modal organizations.

Thesis:

Single-modal organizations install a specific function in the organization for intermodal issues to have a contact person for external stakeholders.

Thesis:

Intermodal activities do not have their own budget within the organization, unless there is a particular policy focus which supports this.

Thesis:

Intermodal coordination and information for the user requires the aid of IT applications.

Thesis:

There are additional measures to specific topics (e.g. P&R) in the organization which are directly targeted at coordination with other transport modes or providers.

Thesis:

There are external processes / coordinations with a different "level of maturity" regarding the organization, regularity and binding of the results.

2.2.4 Multi-modal Organizations

In addition to the activities above, the theses below are especially concerned with multi-modal organizations in regard to their specified areas and organizational divisions.

Thesis:

Multi-modal organizations more commonly operate in the sections of strategic planning and project planning.

Thesis:

The strategic planning is situated on the same level as the policy responsibility (e.g. ministry).

Thesis:

In multi-modal organizations road and rail activities are separated into organizational units.

Thesis:

In multi-modal organizations shipping traffic is organized as an independent part of the company.

Thesis:

Air traffic is not integrated in multi-modal organizations.

2.2.5 Proposals, Plans and Discussions for Future Change

The following theses cover proposals, plans and discussion for a possible future change. They have been formulated in a way, so that it was possible to analyze these subjects.

Thesis:

Structural developments of the organizations are in discussion. However, these developments, discussions and plans depend on the current organizational status and context.

2.3 Questions

The World Road Association's (PIARC) Technical Committee on Performance of Transport Administrations is undertaking a 4-year research program into the evolving mission of analyzing functions and structures of road and transport administrations. This includes recent, current and planned changes to the governance of roads within the context of multi-modal transport policy, planning and delivery (e.g. alongside rail, local transport, ports and aviation). The research program is also interested as to whether these changes are accompanied by closer multi-agency working across the transport sector; or whether they go along with the centralization or other structural changes to road and other transport administrations and agencies.

In order to inform its work, the Committee wishes to establish a baseline of current organizational structures, working processes and systems within the roads and transport sector.

The questions were derived from the developed theses, and in order to provide a clear structure the survey was afterwards divided into the following three essential parts:

- Part 1 (A/B/C) requests information on the context of the organization and is to be filled in by all organizations
- Part 2A requests information on multi-modal and inter-modal activities and should be filled in by all organizations
- Part 2B requests information on multi-modal planning and delivery and should be filled in only by organizations responsible for multiple transport modes
- Part 3 requests information on future developments and should be filled in by all organizations

2.3.1 Part 1 – Context

Question 1:

Is your organization a single or multi modal organization?

2.3.1.1 Current Organizational Jurisdictions, Tasks & Responsibilities

Question 1:

Describe briefly the general tasks and responsibilities of your organization.

Question 2:

For which spatial scale (local, regional, national) is your organization responsible?

Question 3:

What network/traffic is your organization responsible for (road, rail, other)?

2.3.1.2 Political Control and Accountabilities

Question 1:

Which political body (e.g. ministry) is responsible for your organization?

Question 2:

On which level (local, regional, national) does this political body set?

Question 3:

For which areas (overall infrastructure, transport, road, rail, waterways, other) is this political body responsible?

Question 4:

Are there additional political supervisory or regulatory authorities with oversight or influence of your organization (e.g. organizations working on behalf of policymakers / administration)?

2.3.1.3 Matrix - Initial Classification of Road and Transport Institutional

The matrix provides data regarding initial indications of how road and other transport infrastructure networks and services are organized at national, regional and local level. Together with the subjects of longevity and status of these organizational arrangements, the overview is rounded off.

A draft of the matrix can be found in the appendix (**5.1 Draft of Questionnaire**).

2.3.1.4 Establishment of the Institutional Arrangements

Question 1:

When were the institutional arrangements set out in the matrix established?

Question 2:

If there have been recent significant reforms to institutional arrangements for the planning, delivery and operation of roads and transport at national or regional level, please briefly indicate what these developments are (Write Not Applicable if there have been no significant reforms).

2.3.1.5 Analysis of key organizational data

Question 1:

Please fill out the data gaps regarding expenditure, income and employees of your organization.

2.3.2 Part 2 A – Multi-modal Activities

2.3.2.1 Analysis of Interactions between Modes, Functions, Spatial Tiers and Stakeholders >> Joint Working towards Multi Modal Outcomes

Question 1:

Which interfaces to other transport providers are relevant to your organization?

- Which interfaces are working particularly well?
- For which interfaces does the potential for further development exist?

Question 2:

Which stakeholders does your organization have in terms of multimodality / intermodality and how relevant are the individual stakeholders for the organization?

- Politics and administration
- Traffic carrier /operator
- Customer
- Media
- Internal stakeholders – organizational
- Other

**2.3.2.2 Analysis of Multi Modal Activities (Internal, External)
>> Existing Structures, Processes and Systems****Question 1:**

Are there any activities already in place with regard to multimodality / intermodality? What are these measures, and how successful are they?

- Organizational measures within the organization, e.g. informal contacts, working groups
- Own plan of action for intermodal / multimodal measures
- Joint technical resources for planning and design (e.g. transport model)
- Technical resources (e.g. information systems for customers)
- Analysis of the stakeholders for multimodality / intermodality
- Explicit definition of the interfaces to all relevant stakeholders

Question 2:

How are multimodal and intermodal issues organized (internal processes) within your organization?

- What internal processes and systems are there regarding the topic of intermodality / multimodality?
- Who is responsible for multimodal and intermodal issues within the organization?
- With which internal resources (staff and budgets) are the issues organized?

Question 3:

Are there any operational systems (e.g. traffic control systems, web-based traffic information systems, intermodal project platforms, etc.) in place within your organization for supporting multimodal and intermodal objectives?

- Which?

Question 4:

What multimodal / intermodal activities and projects have you implemented for external organizations?

- For which organizations / transport providers are measures put in place?
- Which specific measures or projects have been implemented?

Question 5:

Are external processes incorporated into the organization?

Question 6:

Are the results or decisions arising from these processes/agreements (e.g. plans of action) binding?

2.3.3 Part 2 B – Multi-modal Organizations

2.3.3.1 Is your organization a multimodal organization (and for which areas)?

2.3.3.2 Which interfaces or organizational divisions exist within the organization between transport networks and modes and how are these defined?

2.3.3.3 What was the rationale for creating the multimodal organization?

2.3.3.4 Describe the success of the multimodal delivery since the organization was established.

2.3.4 Part 3 – Proposals, Plans and Discussions for Future Change**2.3.4.1 Current Strategies for Future Development****Question 1:**

Which strategies for implementation in the future are currently being discussed?

- Higher-level organization / ministry for strategic planning
- Improvement to the formal collaboration between transport providers
- Binding results of the existing agreements with transport providers
- Common organization / financing for all transport modes and networks

Question 2:

On which level are these strategies being discussed?

- Legislature level
- Ministry
- Public debate / media
- Internally within the organization
- Further stakeholder

Question 3:

Are there any considerations on structural development of your organization especially concerning multimodal / intermodal activities?

- Which?
- Are these already concrete plans?
- In which area the developments are taking place and which tasks are included?.
- When will the implementation start?
- When will the implementation be completed?

2.3.4.2 Evaluation of Possible Enhancement Strategies**Question 1:**

What benefits are expected from the planned changes?

Question 2:

Are there any disadvantages and challenges also being discussed, which?

2.3.4.3 Other Comments

The final survey can be found in the appendix under the chapter **5.1 Draft of Questionnaire**.

3 Presentation of the Results

The following chapter concentrates on the **presentation of the results**. It reflects the collected data of 18 countries and gives an overview about **multi-modal** and **single-modal organizations** concerning their transport facilities. The results are based on the **evaluation of the questionnaire survey** arising from the theses made in chapter **2 Development of Questionnaire Survey**.

To put it simply, the presentation of the results deals in accordance with the questionnaire's structure. According to that, the relevant data in regard to the **context** of the organizations is treated first. Afterwards, the evaluation is continued by having a closer look on **multi-modal activities** before the specific part concerning **multi-modal organizations** is presented. To conclude, the **proposals, plans and discussions for future change** are finally demonstrated.

For the sake of completeness it should be mentioned that all information collected and shown in the graphs refers to the year **2013**, in which this master thesis was written.

As already mentioned **25 organizations** from a total of **18 different countries** have participated in this survey. The investigated countries are **Austria (AT)**, **Australia (AU)**, **Germany (DE)**, **Belgium (BE)**, **Canada (CA)**, **Spain (ES)**, **Finland (FI)**, **France (FR)**, **Hungary (HU)**, **Italy (IT)**, **Japan (JP)**, **Lithuania (LT)**, **Malaysia (MY)**, **Romania (RO)**, **Sweden (SE)**, **United Kingdom (UK)**, **United States (US)** and **South Africa (ZA)**.

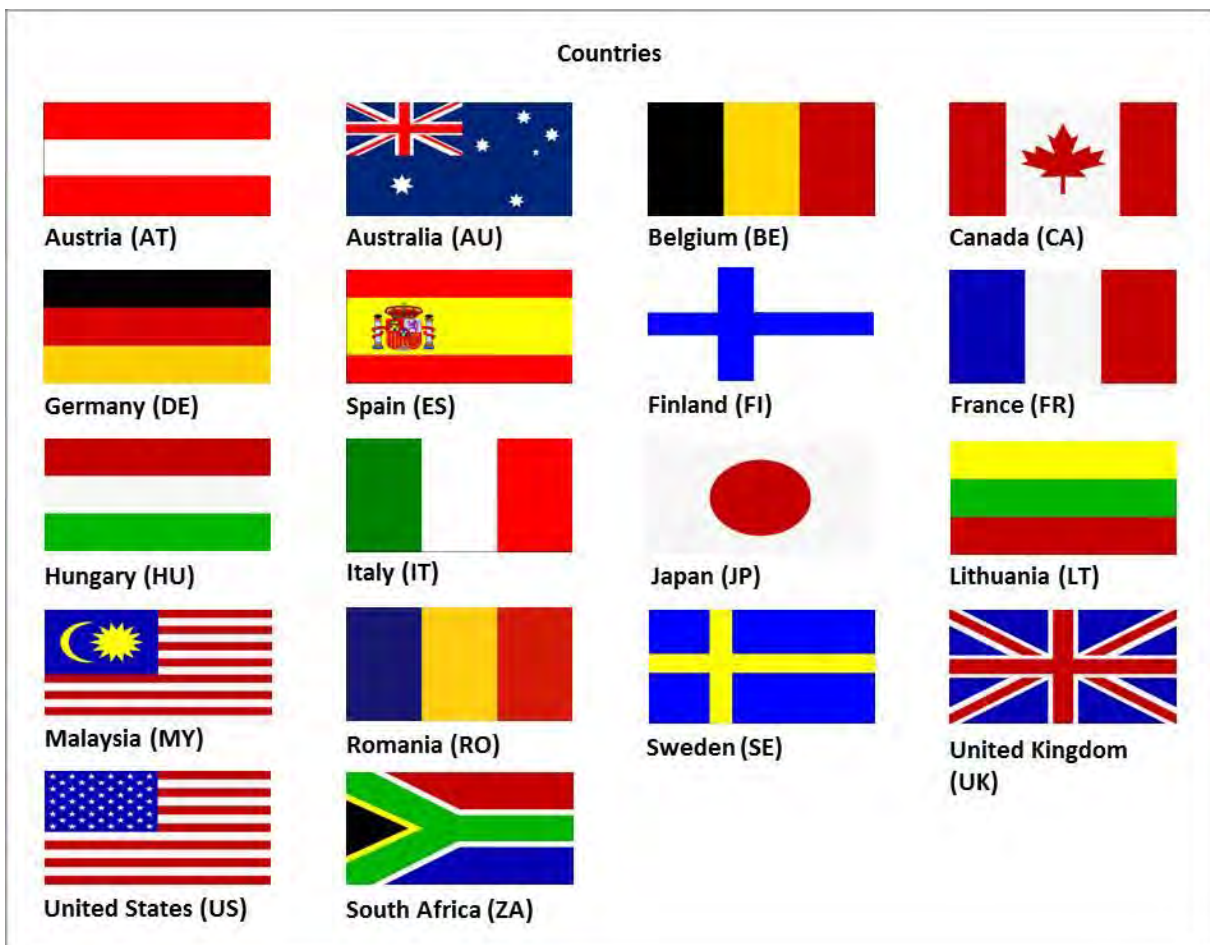


Figure 5: Countries

To gain an overview the following table (**Table 1**) provides a concise presentation of the participating countries and their transport organizations.

It should be noted, that for the presentation and documentation of the results the shortened form of the organizations in addition to the country of origin is given in most cases. For that reason the following list explains the international country codes and code names of the particular organization that were used in alphabetical order.

List of Country Codes and Code Names of the Organizations

Country Code	Code Name	Country	Name of Organization
AT	ASFINAG	Austria	ASFINAG
AU	MRWA	Australia	Main Roads Western Australia
AU	NSW	Australia	Transport for NSW
AU	VicRoads	Australia	VicRoads
BE	AWV	Belgium	Agentschap Wegen en Verkeer / Agency for Road and Traffic
CA	MTQ	Canada	Québec Ministry of Transportation (MTQ)
DE	BMVBS	Germany	BMVBS
ES	CF – JE	Spain	Consejeria de Fomento – Junta de Extremadura
ES	Ministry	Spain	Ministry of Development
FI	ELY	Finland	ELY Centre
FI	FTA	Finland	The Finnish Transport Agency (FTA)
FR	DIT	France	DIT (Transport Infrastructures Department)
HU	ÁAK zrt.	Hungary	ÁAK zrt. (State Motorway Management Co. LTD.)
HU	HPR	Hungary	Hungarian Public Roads Non-profit PLC
HU	HTA	Hungary	Hungarian Transport Administration
IT	ANAS S.p.A.	Italy	ANAS S.p.A.
JP	MLIT	Japan	Ministry of Land; Infrastructure, Transport and Tourism (MLIT)
LT	LRA	Lithuania	Lithuanian Road Administration
MY	PWD	Malaysia	Public Works Department
RO	RNCMNR	Romania	Romanian National Company of Motorways and National Roads
SE	Trafikverket	Sweden	Trafikverket
UK	TS	United Kingdom	Transport Scotland
US	FHWA	United States	Federal Highway Administration
US	MoDOT	United States	Missouri Department of Transportation
ZA	SANRAL	South Africa	The South African National Roads Agency (SOC) Ltd

Table 1: List of Country Codes and Code Names of the Organizations

Note: the particular results cover only the organizations that have given an applicable answer.

3.1 Part 1 – Context

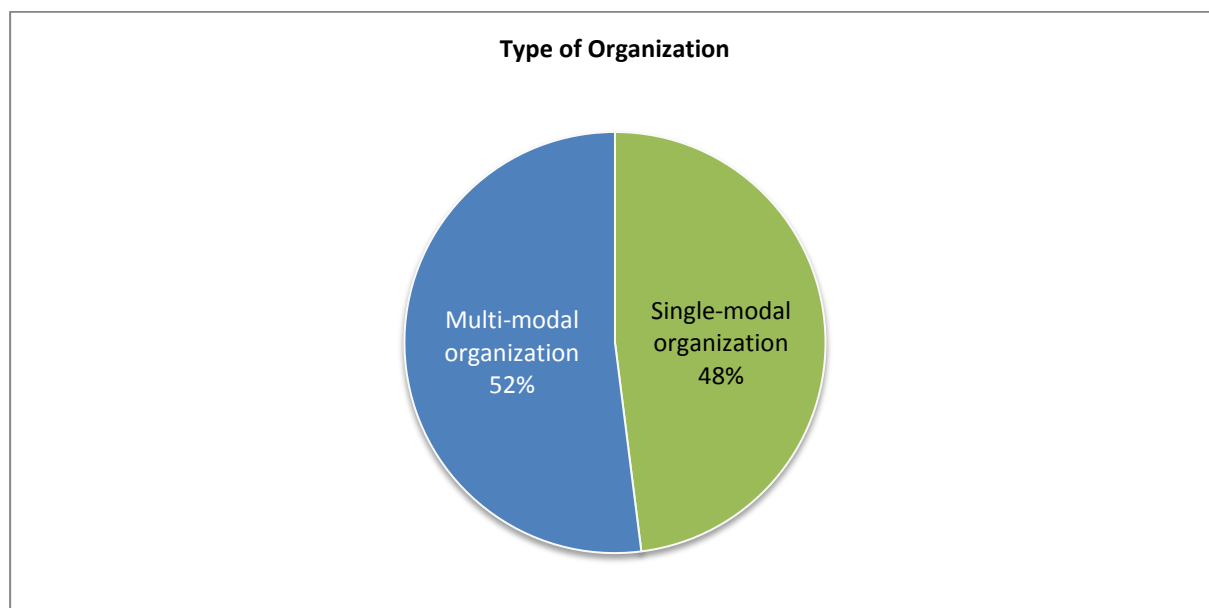


Figure 6: Type of Organization

To start with the presentation of the results, the pie chart above (**Figure 6**) deals with the two different **types of organizational forms**. A distinction is made between *multi-* and *single-modal organizations*. The presentation is carried out in percentages of the total surveyed organizations.

The percentage of the multi-modal organizations constitutes just over the half of the total quantity (52%). This means that this percentage is only marginally bigger than the percentage of organizations that operate in a single-modal way (48%). As a result, it can be said that there is a balanced distribution of these kinds of organizational types within the survey.

3.1.1 Current Organizational Jurisdictions, Tasks and Responsibilities

The following text represents the results of **the general tasks and responsibilities of the organizations** regarding the questionnaire survey. The explanation of the statements is clustered content-wise and distinguished in multi- and single-modal organizations.

Single-modal Organizations

The collected data reveals that almost all of the single-modal organizations, which participated in the survey, are only responsible for road networks. A clear result is obtained in the field of maintenance. It has become evident that all organizations see this area as one of their main tasks. A further significant number of organizations are additionally responsible for construction and operation (including management and administration activities). To summarize, it can be said that the majority of the single-modal organizations have the following three central points in common: the operation, the construction and the maintenance. A small minority of the single-modal organizations are also responsible for other general tasks including the fields of planning, financing, charging tolls and safety issues.

When having a closer look at the Austrian transport mode *ASFINAG* several further noteworthy results concerning the general tasks and responsibilities of the organizations have been observed. The current remit and company structure can be divided into the three core areas of operation, construction and tolling arrangements. In addition to these main tasks the organization is fulfilling other

important services which include the fields of planning, financing and maintenance on the entire Austrian motor- and expressway.

The Australian *MRWA* only focuses on the operation, construction and maintenance of the state road network. As can be seen, the central tasks are mostly those of the single-modal organizations like it was mentioned in the introductory sentences of this chapter. The situation is different with the Australian *VicRoads* that have mentioned an extensive range of functions for which their organization is responsible. Firstly, they operate the road system by managing the access and controlling use in addition to constructing and maintaining roads and roadsides. Secondly, the organization does the planning for the road system as a part of an integrated transport system. Another area of their responsibility is leading the development and implementation of strategic and operational policies; as well as making plans to improve the safety of the road system for all users. They provide registration, licensing and accreditation, as well as technical, project management, consultancy and information services for the transport system. Furthermore *VicRoads* is also developing and implementing effective environmental policies, strategies and management systems. To complete their general tasks and responsibilities the transport organization also provides and disseminates information to the population about the road system.

The *ELY* Centre promotes regional development by implementing government initiatives and development tasks in the regions. They are responsible for three areas: firstly the business and industry, the labor force, competence and skills plus cultural activities. Secondly, they are involved in the transport and infrastructure and thirdly, they mentioned the fields of environment and natural resources as one of their tasks. The target of the transport and infrastructure responsibility area is to ensure the efficiency and safety of everyday travel and transportation in a sustainable manner. Tasks and services include road maintenance, road construction projects, transportation systems, transportation safety, ferry traffic, transportation management and transportation customer service.

The Hungarian transport organizations *ÁAK zrt.* and *HPR* operate and maintain the state highways and expressways or rather national roads. In addition to this, the *ÁAK zrt.* is responsible for charging tolls.

In Italy the road network of national interest is administrated by the *ANAS S.p.A.* Their main responsibilities include the areas of construction, management and maintenance.

For the Romanian *RNCMNR*, the main responsibilities refer to the operation and construction of highways and bypasses which also includes the field of road rehabilitation. In order to assure that the road network is fully operational, in addition to the complying with the road user requirements, the main tasks include road motorway construction, rehabilitation programs, traffic safety plans and so on. Another part of their current activities is the area of road maintenance. Therefore, management systems for pavements and bridges are used as basic tools to improve the quality or to maintain the general conditions.

The *FHWA* is an agency within the United States Department of Transportation that supports the state and local governments in the areas of design, construction and maintenance of the nation's highway system (Federal Aid Highway Program) and works also for various federally and tribal-owned lands (Federal Lands Highway Program). Through financial and technical assistance to the state and local governments, the *FHWA* is responsible for ensuring that America's roads and highways are safe and the most technologically advanced systems. With about four million miles of public roads within the United States, the primary focus of the agency lies on a subset of about one million miles referred to as Federal-aid highways. In addition, there is a federal interest in highway and bridge safety on the entire road network. Roads and bridges in the United States are owned by the state (regional) and

local governments. So it can be said, that the *FHWA* provides financial and technical assistance to the owners in making capital improvements.

In South Africa the national road network (highways, freeways, etc.) is managed, administrated, maintained and as well financed through the organization *SANRAL*.

Multi-modal Organizations

When analyzing the surveyed information, it is apparent that a significant proportion of the multi-modal organizations, is responsible for the area of planning or rather design as well as for the field of maintenance. Moreover, it can be stated that approximately half of the organizations are constructing and operating (including management and administration). On the basis of the analysis it is obvious that the majority of transport organizations, except for a few outliers, are performing simultaneously in those common fields that have been mentioned above.

Turning in more detail to the presented general tasks and responsibilities of multi-modal organizations, the Belgian *AWV* state that they want to realize a secure, easy and sustainable mobility for all road users in Flanders. To this end, the road and traffic agencies take the responsibility of managing, maintaining and optimizing the entrusted patrimony and its assigned roads, including electromechanical and telematic equipment. Furthermore, the traffic is organized by the transport mode of the road network, as just one part that shapes and influences the policy. To achieve these goals, the road and traffic agency wants not only to ensure correct information and timely communications, to make balanced and objective programs, to manage the available knowledge but it also tries to work in high-quality as well as acting in a professional and innovative manner.

The mission of the Canadian *MTQ* is to ensure the sustainable mobility of people and goods throughout Québec through a safe and efficient transportation system that contributes to the development of Québec. Their fields of action include the planning and the area of designing and they are also responsible for carrying out construction, improvements, repair work, maintenance and operating activities on the road network and other transportation infrastructures. The organization provides technical and financial support to municipalities for maintenance services and repair work on the local road network. Furthermore, the organization supports passenger transportation systems, in particular urban public transit, paratransit, marine and air transportation within the regions. Another field of action, in which *MTQ* is engaged, includes the development and implementation of transportation safety programs. They also support the transportation of goods by encouraging intermodality and the use of different transportation modes (road, rail, water and air). Finally, the organization uses its budget to support the following two agencies: the *Commission des transports du Québec* and the *Société des traversiers du Québec*. The first is an agency whose activities are intended to increase public safety in road, marine and rail transportation and to ensure the preservation of the road network. In addition the *Commission des transports du Québec* regards it as its duty to regulate economic activity in several fields of transportation, as well as to ensure the availability and quality of services. The second considers ensuring of transportation services by ferry for passengers and vehicles as one of their main tasks.

With regard to the general tasks and responsibilities of the Spanish Ministry, it can be observed that their fields of action include carrying out proposals and implementing government policy. They accomplish their activities across the areas of state transportation infrastructure including transport systems on land, air and sea. Furthermore, they are involved in the areas of control, management and administrative regulation for the transportation services. Finally, the ministry is also responsible for the fields of housing, building, urban planning, land and architecture. In the specific case of the area of roads, they manage the state roads network, including the fields of planning, design, execution of works and maintenance and operation of the road network, always with the aim to ensure road safety.

The focus is now turning to the French *DIT* that is primarily responsible for infrastructure planning regarding roads, railways and waterways. The organization is involved in some major projects for coastal and inland ports in addition to national airports. *DIT* is also responsible for the public financing of the projects. The organization makes sure that the road network is consistent and is in charge of policy development, modernization, maintenance and reliability for national roads and motorways.

The *HTA* is the headquarters for the coordination of traffic develop passing the results on to the Ministry of National Development. On the grounds of scientific preparatory activity, the organization navigates not only infrastructure development projects but also the activity of the intermediate and implementing bodies. For this purpose, *HTA* provides the conditions for the success of the infrastructure development projects.

The Japanese organization *MLIT* did not give a very detailed overview of their main tasks, their mission is to create the basis for enjoying a lively life, a vibrant economy, everyday safety, a beautiful environment, and diversity in all regions.

In Malaysia the *PWD* plans, designs and constructs public infrastructure projects. They are involved in the work for roads, airports, ports, government building and so on.

Trafikverket is the Swedish Transport Administration and is responsible for the long-term planning of the transport system for road traffic, rail traffic, maritime shipping, and air traffic; as well as for construction, operation and maintenance of the state road network and national railway network.

The situation is similar with the American *MoDOT*. This organization is also responsible for the planning, construction and maintenance of the state transportation system. In addition, it supports regional planning and administers federal funding for air, water, rail, bus and truck transportation. It also has a regulatory and enforcement role with the trucking industry within the state.

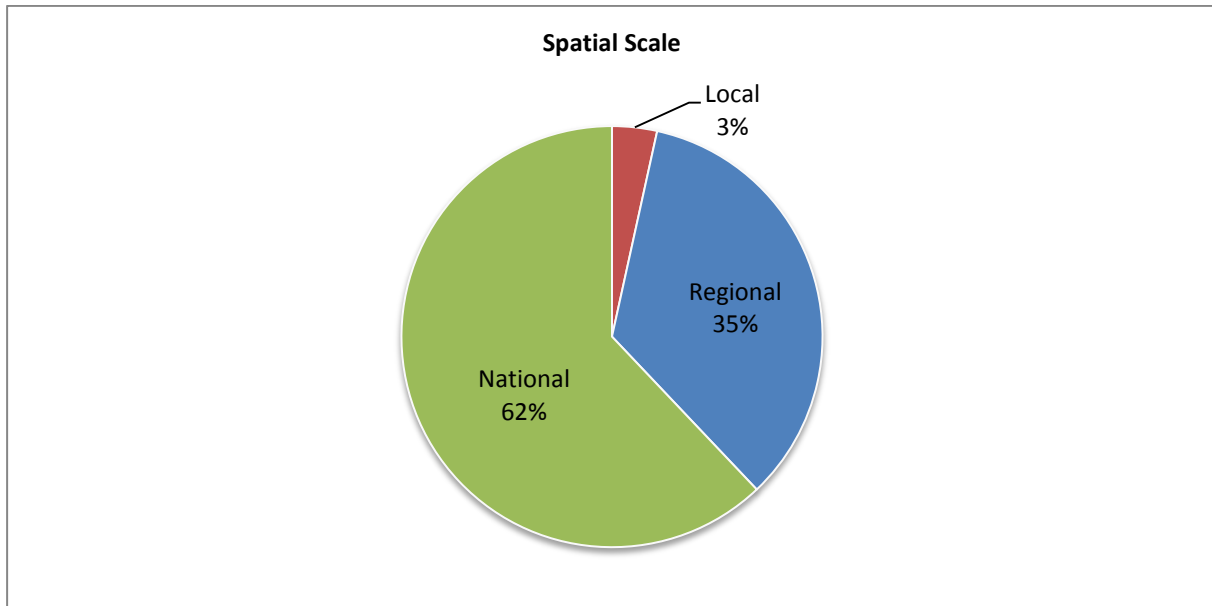


Figure 7: Spatial Scale

The above pie chart (**Figure 7**) deals with the different **spatial scales** of infrastructure regarding the responsibility of the organizations. On the basis of the scales *local*, *regional* and *national* it is obvious for which areas the organizations are responsible. It is possible that there are dedicated organizations that have responsibilities in only one area and other superior organizations that are involved in two or even in all three areas. However, a distinction is made between the scales *local*, *regional* and *national*. The presentation is carried out in accordance with the percentages of the total surveyed organizations, whereby the responsibility of an organization can be located on several levels at once.

As the results show, the percentage of the organizations that operate on the national level is the dominant percentage rate at just over three-fifths (62%). In the second place, with more than a third (35%), come the organizations with responsibility on the regional level. The local level brings up the rear with the lowest percentage of 3% - i.e. just under one in twenty.

The following charts (**Figure 8** to **Figure 11**) deal with specifications of the road and transport administrations. Therefore the sector of traffic, for which the organizations are responsible, is distinguished between road and rail networks.

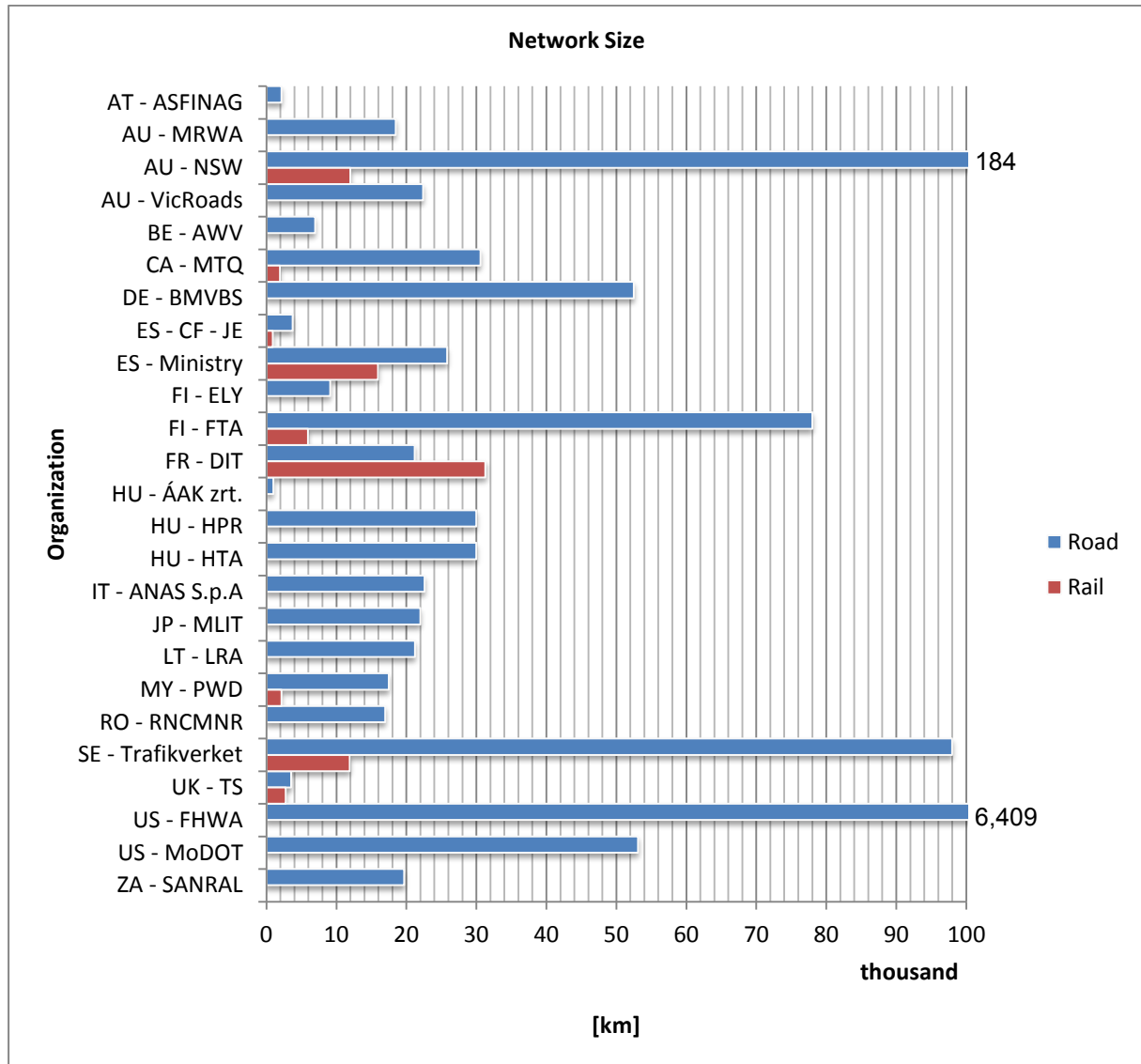


Figure 8: Network Size

This bar chart (Figure 8) presents the network size of the selected road and transport administrations. The red bars describe the size of the rail and the blue bars that one of the road network. On the vertical axis you can see the country codes including their code names which represent the organizations. The horizontal axis indicates the length of the entire network size in kilometers [km] x1000. Organizations that have no bar for rail recorded in the chart, are just responsible for road networks.

For a better presentation of the results, the chart ends on the horizontal axis at the value one hundred thousand. Although the two blue bars of the organizations **AU – NSW** and **US – FHWA** end at that axis each of them has a value of **184,760 km (NSW)** and **6,409,115 km (FHWA – all public roads in the United States)**.

The table below contains **additional data of the organizations regarding the road- and rail network plus further possible infrastructure networks**. Since not all of the organizations have the same kind of information available, the data is first grouped according to the transport mode and afterwards listed by the means of transport. For a clear presentation the data is defined in tabular form.

Additional Data of the Organizations regarding the Transport Network

Transport Mode	Organization	Data	Unit*	Description
Road				
Bike	BE – AWW	7,575	[km]	Network bicycle paths
Bike	UK – TS	47,000,000	[km/y]	Pedal cycles
Passenger	FR – DIT	815,000,000,000	[trakm/y]	Passengers (national data)
Freight	CA – MTQ	140,000,000	[to/y]	Interurban freight traffic (excluding short distance movements and distribution) according to National Roadside Survey 2006-2007 (not published)
Freight	FR – DIT	283,400,000,000	[tokm/y]	Freight (national data)
Passenger and Freight	DE – BMVBS	3,340,000,000	[mo vh km/y]	Passenger traffic and freight traffic
Passenger and Freight	ES – CF-JE	2,049,065,593	[mo vh km/y]	Total traffic
Passenger and Freight	US – MoDOT	209,214,200	[km]	For all vehicles
Rail				
Passenger	FR – DIT	104,300,000,000	[trakm]	Passenger traffic
Freight	CA – MTQ	76,000,000	[to/y]	Freight moved by rail with origin or destination in Québec - all jurisdictions. Source: Multi-modal Study on freight Transport in Québec, to be published. (2010)
Passenger and Freight	CA – MTQ	6,596	[km]	Network size, rail: all jurisdictions
Waterway				
Passenger	FI – FTA	16,200	[km]	Waterways and canals
Passenger	FR – DIT	8,500	[km]	Network size, inland waterways
Freight	ES – Ministry	417,790,000	[to/y]	Sea transport
Freight	FR - DIT	7,400,000,000	[tokm/y]	Freight traffic, transported tokm per year
Aviation				
Passenger	ES – Ministry	203,291,000	[pax/y]	Air transport
Passenger	UK – TS	22,100,000	[pax/y]	Passenger traffic
Freight	UK – TS	45,162	[tokm/y]	Freight traffic

Table 2: Additional Data of the Organizations regarding the Transport Network

* A detailed explanation of the used units is given in the previous chapter called Definitions (1.4).

In order to assess the network size by also being able to evaluate the particular volume of traffic at the same time, the motor vehicle km per year figures have been requested separately for passenger and freight traffic. The chart below (**Figure 9**) summarizes the results of this survey. In this context, it should be pointed out that only half of the surveyed organizations provided relevant data. In conclusion, it can be said that except for JP – MLIT and ZA – SANRAL the bigger part of motor vehicle km on road results through passenger traffic.

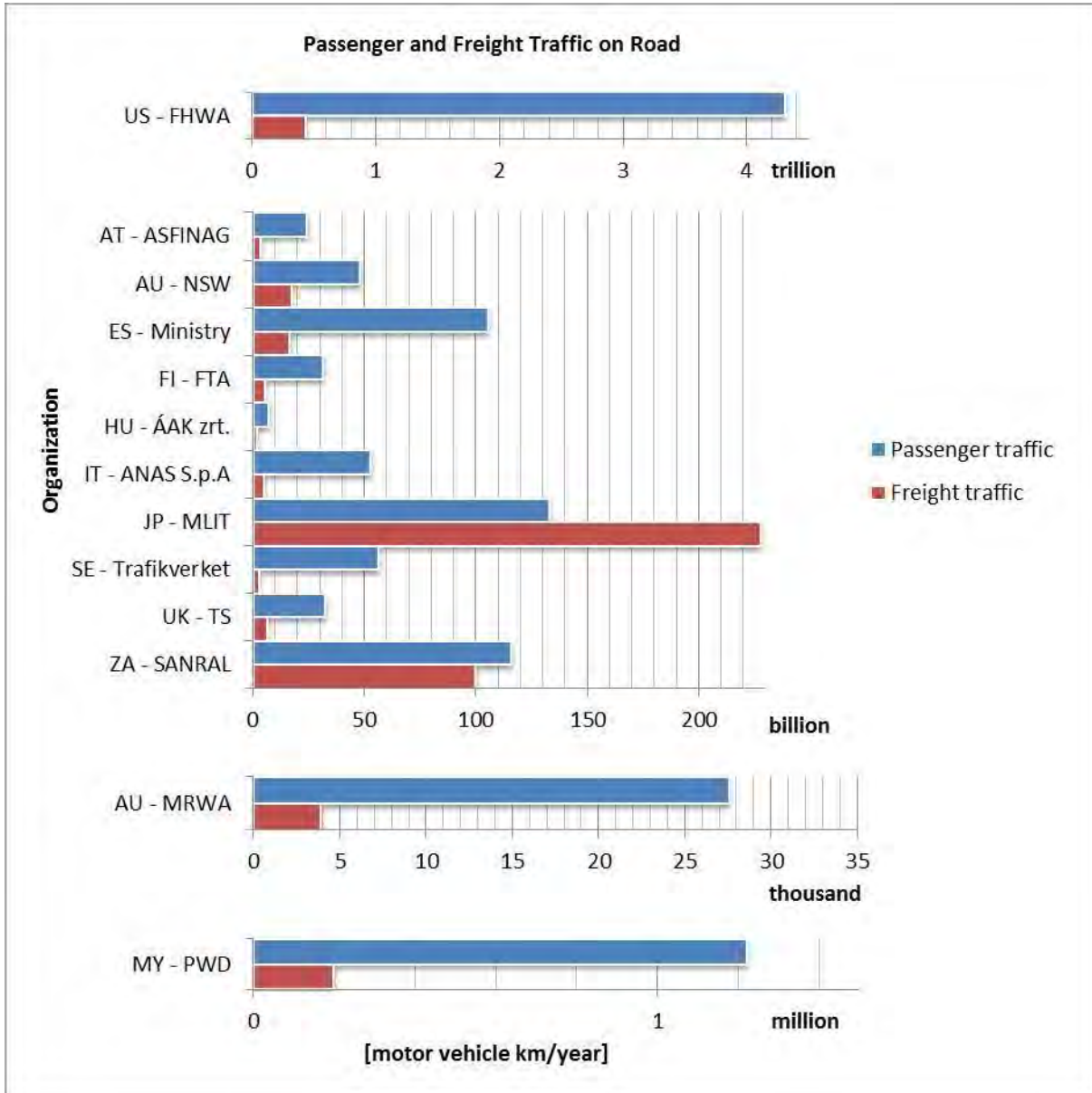


Figure 9: Passenger and Freight Traffic on Road

The volume of traffic on rail is illustrated in the bar graphs below. The first figure (**Figure 10**) contains a compilation of the passenger traffic specified in the average transported passengers per day throughout the public transport sector, and the second one (**Figure 11**) demonstrates an overview of the freight traffic surveyed in the unit of transported tonne-kilometers per year.

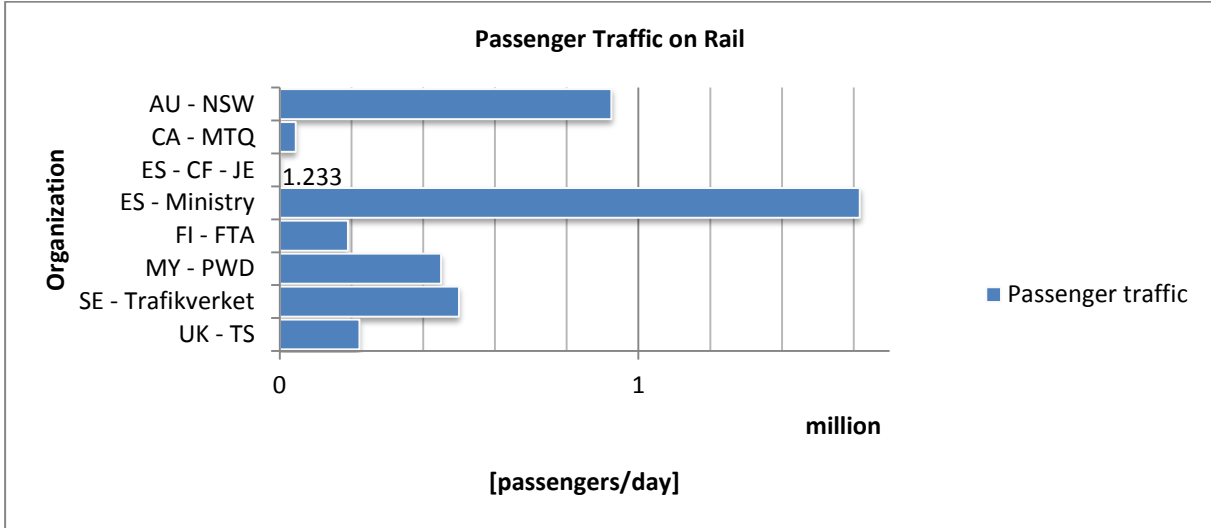


Figure 10: Passenger Traffic on Rail

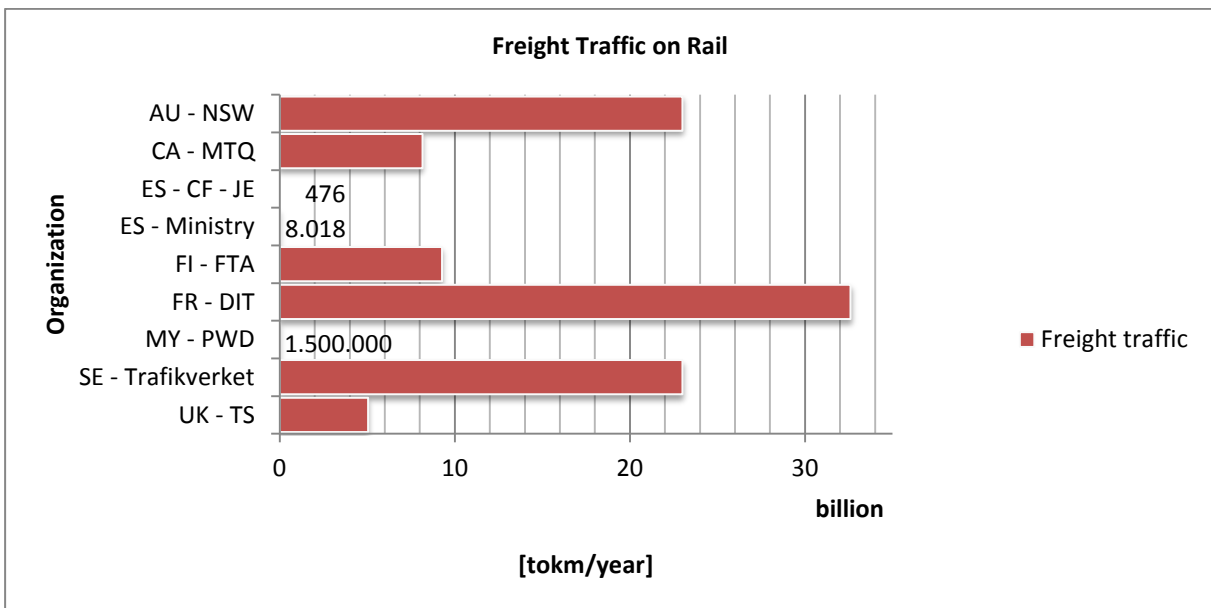


Figure 11: Freight Traffic on Rail

3.1.2 Political Control and Accountabilities

This chapter concentrates on the evaluation of the responsibility and accountability of political entities.

Responsible Political Body

The table below (**Table 3**) shows the **responsible political body** of the surveyed organizations. They are separated into three possible levels: *national*, *regional* and *local*. The first column of each table includes the country code and the code name of the organization. The name of the ministry is given in the second one, and the area of activity is listed in the third column.

Organization	Name of Ministry	Area of Activity
National Level		
AT – ASFINAG	Ministry of Transport, Innovation & Technology (BMVIT)	Overall infrastructure, telecommunication, post (mailing), innovation (R&D), technology
DE – BMVBS	German Federal Government	Road
ES – Ministry	Ministry	Overall infrastructure, transport, housing
FI – ELY	Ministry of Transport and Communications	Overall infrastructure, transport
FI – FTA	Ministry of Transport and Communications (MINTC)	Overall infrastructure, transport, aviation, communication agencies
FR – DIT	Ministry for Ecology, Sustainable Development and Energy	Overall infrastructure, transport, ecology and energy
HU – ÁAK zrt.	Ministry of National Development (NFM)	Overall infrastructure
HU – HPR	Ministry of National Development	Overall infrastructure
HU – HTA	Ministry of National Development	Overall infrastructure, transport, bicycle infrastructure network
IT – ANAS S.p.A	Minister of Infrastructures and transport	Road, rail, waterways
JP – MLIT	Minister	Overall infrastructure
LT – LRA	Ministry of Communications	Overall infrastructure
MY – PWD	Ministry of Works	Road
RO – RNCMNR	Romanian National Company of Motorways and National Roads is under the authority of the Department for Road Infrastructure and Private Investment.	Road, public- private partnership; National: Department for Road Infrastructure and Private Investment is under the governmental General Secretariat
SE – Trafikverket	Ministry of Enterprise, Energy and Communications	Transport, road, rail, waterways and aviation (only long term planning)
UK – TS	Scottish Ministers	Overall infrastructure, transport, aviation
US – FHWA	U.S. Department of Transportation	Overall infrastructure, transport, pipe lines
ZA – SANRAL	Ministry of Transport	Transport, road, rail, waterways, airports

Regional Level		
AU – MRWA	Ministry for Transport	Overall infrastructure, transport, port authority
AU – NSW	Ministry for Transport, Ministry for Roads and Ports	Overall infrastructure, transport
AU – VicRoads	Victorian State Government, Ministry for Roads	Transport, road, trams, bicycle and pedestrian paths; Regional: responsibility for planning, delivery and operation of arterial network
BE – AWW	Flemish Ministry for Mobility and Public Works	Transport, road, waterways, aviation (national and regional), rail (national)
CA – MTQ	Québec Ministry of Transportation	Transport, road, rail, owner ports, airports and a rail company
ES – CF-JE	Gobierno de Extremadura. Consejería de Fomento, Vivienda, Ordenación del Territorio y Turismo	Road
RO – RNCMNR	Department for Road Infrastructure and Private Investment	Road, public- private partnership
US – MoDOT	The Missouri Highways and Transportation Commission (six-member, non-partisan commission appointed by the state's governor and confirmed by the legislature's upper body)	Overall infrastructure, primarily responsible for roads and bridges
Local Level		
AU – VicRoads	Victorian State Government, Ministry for Roads	Transport, road, trams, bicycle and pedestrian paths; Local: Road safety for whole road network

Table 3: Responsible Political Body

In order to reflect the results, the following pie chart (**Figure 12**) shows the different **levels on which the political body of the organization sets**. A distinction is made between *local*, *regional* and *national* levels. The presentation is made in percentages of the total surveyed organizations, whereby the political responsibility of an organization can be located on several levels simultaneously.

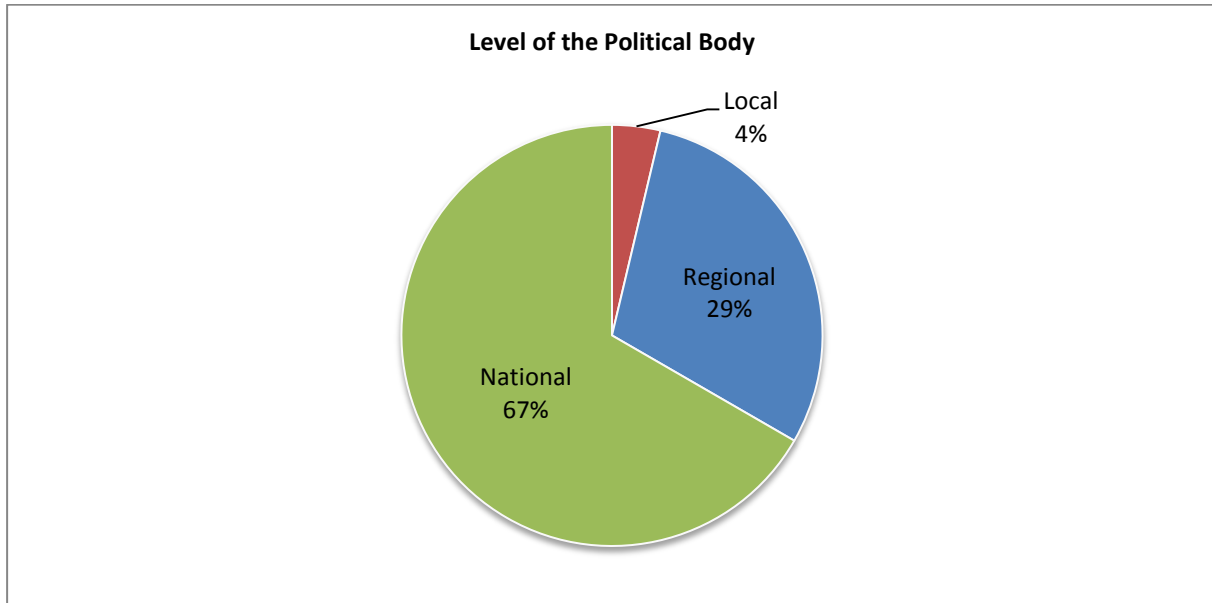


Figure 12: Level of the Political Body

The percentage of political responsibility located on the national level, is just over two-thirds (67%) of the total the dominant percentage rate. Ranked second, with less than a third (29%), are the organizations with political responsibility on the regional level. With a percentage of just under one in twenty (4%) the local level has the lowest rate.

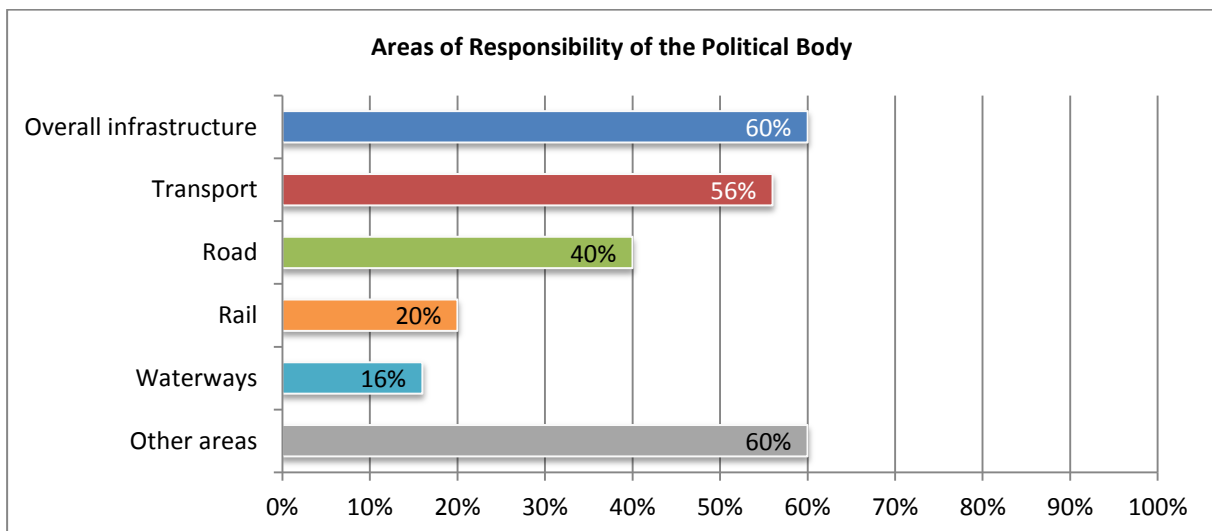


Figure 13: Areas of Responsibility of the Political Body

The bar chart (**Figure 13**) deals with the **areas for which the political body of the organizations is responsible**. On the one hand the political body can be responsible for capitalized areas like for the *overall infrastructure* which includes the category groups of *road*, *rail*, *waterways*, *aviation*, etc. On the other hand the responsibility of the political body can be also graded into the category *Transport* which includes public and freight transport. Another possibility is that the political administration is only

responsible for one field which can either be the category *road, rail or waterways*. Accordingly a distinction is made between the following areas: *overall infrastructure* (road, rail, waterway, aviation, etc.), *transport* (public and freight), *road, rail, waterways* and *other areas*.

The presentation is carried out in percentages of the total surveyed organizations. The political responsibility of an organization can be located on several levels simultaneously, except in cases where the responsibility lies with the area of the overall infrastructure. In that case the individual areas of road, rail and waterways are not shown separately in the chart.

The proportion of the category of overall infrastructure is with three-fifths (60%) the main percentage rate, closely followed by the area of transport with approximately half (56%). After those areas the separated areas are placed, the category of road with two-fifths (40%), the area of rail with a fifth (20%) and finally the responsibility for waterways with an approximately percentage rate of less than a fifth (16%).

Additionally, three-fifths (60%) of the transport organizations mentioned that their political body is also responsible for other areas. In particular the following list (**Table 3**) presents in detail the given information or rather the further activities of their political bodies. It becomes obvious that a significant proportion of those, is responsible for the field of aviation. This is followed by the categories of responsibility for ports, telecommunication, bikes and pedestrians etc.

Other Areas of Responsibilities of the Political Body

Responsibility of the Political Body	Organization
Aviation	BE – AWV (national + regional), CA – MTQ, FI – FTA, SE – Trafikverket, UK – TS, ZA – SANRAL
Ports	AU – MRWA (authority), CA – MTQ (owner)
Telecommunication	AT – ASFINAG, FI - FTA
Bikes and Pedestrians	AU – VicRoads, HU – HTA
Post (Mailing)	AT – ASFINAG
Innovation (R&D) and Technology	AT – ASFINAG
Trams	AU – VicRoads
Housing	ES – Ministry
Ecology	FR – DIT
Energy	FR – DIT
Public- Private Partnership	RO – RNCMNR
Pipe Lines	US – FHWA

Table 4: Other Areas of Responsibilities of the Political Body

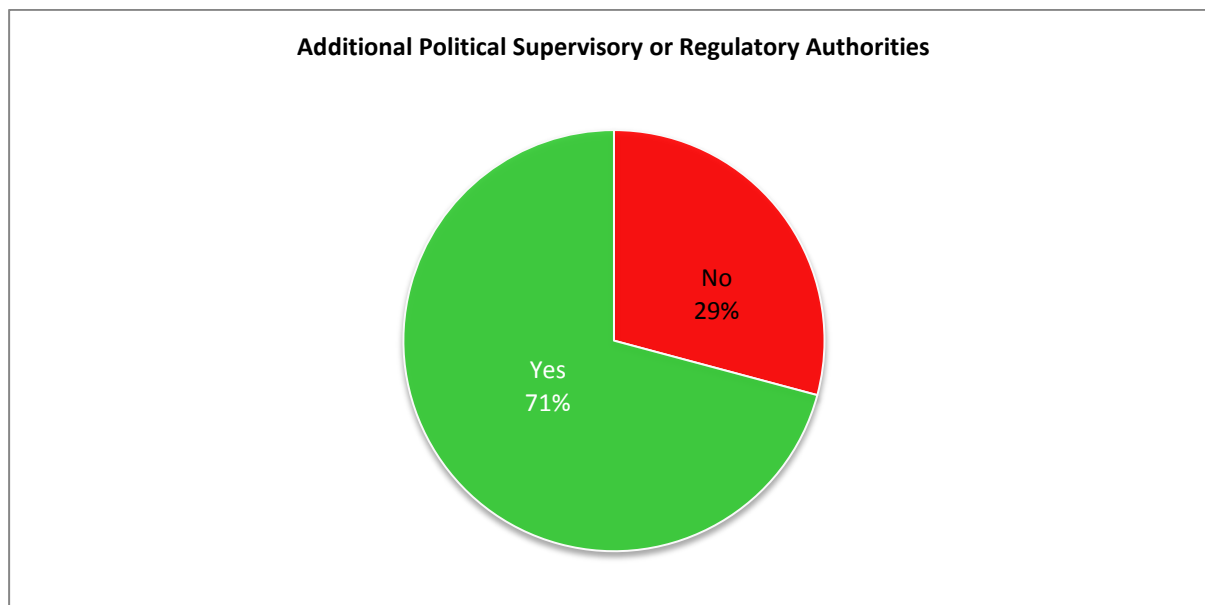


Figure 14: Additional Political Supervisory or Regulatory Authorities

The pie chart (**Figure 14**) gives an overview of organizations which have an **additional supervisory or regulatory authority**. Thus, a distinction is made between organizations with or without an additional supervisory or regulatory authority. They are shown as percentages of the total surveyed organizations.

The results show, that almost three-quarters (71%) of the surveyed organizations have an additional supervisory or regulatory authority. Therefore, the remaining proportion of over a quarter (29%) of the surveyed transport agencies, have no added controlling competences.

In order to be able to look at these additional responsible actors more exactly, the following list contains the names together with an explanation of the **additional political supervisory or regulatory authorities**.

The Australian *MRWA*, the Canadian *MTQ* and the Romanian *RNCMNR* mentioned that the government, which the responsible political bodies are part of, has an additional influence on their organizations. The situation is similar in Japan, where the *MLIT* is working on behalf of the policy maker.

For both organizations, the Austrian *ASFINAG* and the Malaysian *PWD*, the Ministry of Finance represents an additional political supervisory authority. The *PWD* is also controlled by two other authorities, namely the Economic Planning Unit and the Implementation and Coordination Unit. As already mentioned, the *ASFINAG* is additionally supervised by the Austrian Court of Audit.

The Finish transport organization *ELY* has its additional authority within the *FTA*, which in turn is supervised by the Finnish Transport Safety Agency. The same applies to the Motor Carrier Safety Administration that is responsible for the American *MoDOT*.

In Hungary the single-modal organizations *ÁAK zrt.* and *HPR* are regulated by the multi-modal operating organization *HTA*.

The Belgium *AWV* and the American *FHWA* both have an additional regulatory authority in the form of a special secretary that has an overarching responsibility of the organizations. In the case of *AWV* this

advisory function is carried out by the Federal Secretary of State for Mobility while the Americans have their Secretary of Transportation.

The American *MoDOT* has its responsible actors in the form of the Federal Administrations which can be broken down by highway, transit, railway and aviation. The organization is under the care of the United States Army Corps of Engineers and Environmental Protection Agency, which represent additional authorities to the ones mentioned above.

Turning to the organizations with one different additional political supervisory or regulatory authority, the control of the Australian organizations *NSW* and *VicRoads* rests with the National Heavy Vehicle Regulator and the Department of Transport, Planning and Local Infrastructure. The Italian *ANAS S.p.A* has an authority for the supervision of public contracts for works, services and supplies. Similarly, in Sweden the organization *Trafikverket* is supervised by the Swedish Transport Agency and finally, the Parliamentary Portfolio Committee on Transport is responsible for the South African organization *SANRAL*.

Further detailed information on the answered question concerning additional political supervisory or regulatory authorities can be found in the appendix (5.2.1.1).

3.1.3 Matrix – Initial Classification of Road and Transport Institutional

In this part of the paper initial indications of road and transport infrastructure networks and services are reviewed through an institutional classification. In this regard, the objective is to get a transparent display of proof for the situation on the particular spatial level (national, regional and local). The main aim of the following chapter, is to get evidence about the longevity and status of the organizational arrangements.

In order to obtain the aforementioned information, the road and transport organizations have been surveyed with the help of a matrix that has been especially developed for this purpose. Within this procedure, the columns show the different traffic modes (road, railway, water transportation and aviation) and the scales of responsibility (national, regional and local). The corresponding key responsibilities are including the fields of strategic planning (policy and regulations), project planning, construction and implementation of infrastructure and services, operation and management, maintenance as well as finance. All these areas are presented in the first column of the matrix.

Turning to the responses of the transport modes, each individual box is composed of the therefore relevant organization. The highlighted color reflects the predominating structure of the institution, which is specified through a predefined color code. If different organizations share responsibilities, the box can be highlighted in different colors. As already mentioned, the relevant organizations are shown in the boxes. In case that only one organization is relevant, the name of it is written in the box. This applies for example to instances on the national level. Conversely, if more organizations, for instance on regional or local level, are relevant, a general term is used and listed in the box. In this case, the number of relevant organizations is stated in the brackets.

The related figures can be found in the appendix under the chapter **5.2.1.2 Matrix – Initial Classification of Road and Transport Institutional**.

3.1.4 Establishment of the Institutional Arrangements

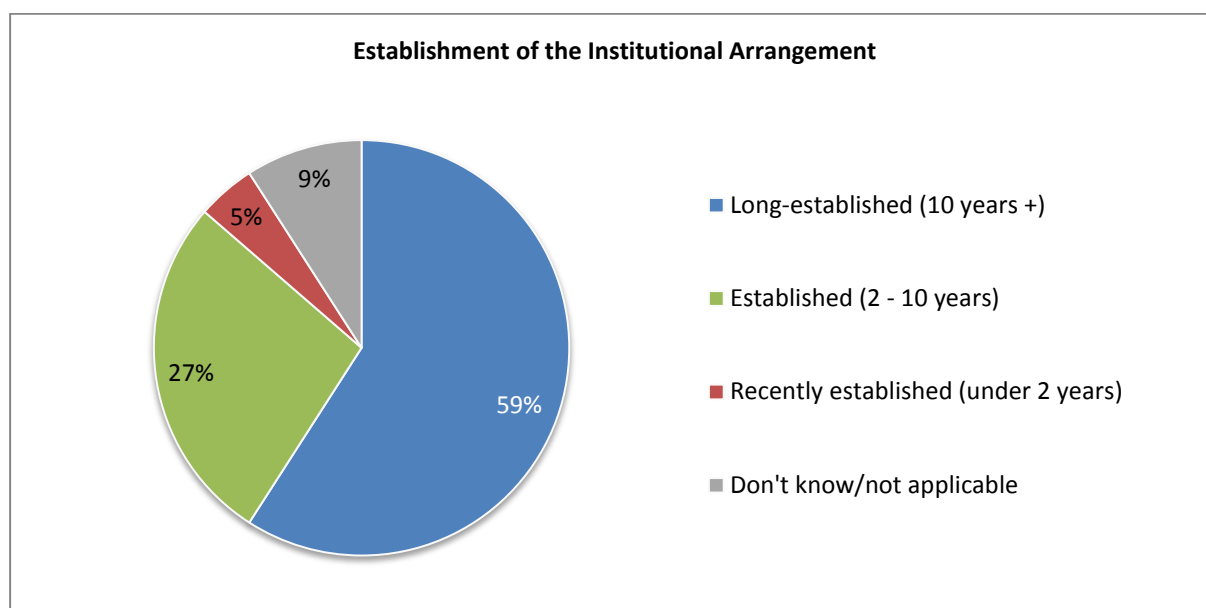


Figure 15: Establishment of the Institutional Arrangement

The pie chart (**Figure 15**) deals with the **establishment of the institutional arrangement**. It presents a distinction between the classifications of *long-established (10 years +)*, *established (2 – 10 years)*, *recently established (under 2 Years)* and *don't know / not applicable*. The presentation is carried out in percentages of the total surveyed organizations.

The chart points out that the long-established organizations with a rate of over ten years of experience form marginally more than half of the total percentage (59%). Placed second, with a rate of just over a quarter (27%), follow those organizations that have been established two to ten years ago. Closely followed by administrations that classified their establishment as not applicable who make up one ten (9%) of the percentage. The smallest share at only one in twenty (5%) of the total amount is reached by those organizations that have been established within the last two years.

Recent significant Reforms to institutional Arrangements for the Planning, Delivery and Operation of Roads and Transport at National or Regional Level

Due to the fact that institutional arrangements for planning, delivery and operation of road and transport at national or regional level result out of a significant reform, it becomes necessary to have a special eye on this development process. To illustrate this trend, the compiled survey provides a short overview of the main reforms that have been implemented in the organizations.

The Australian *MRWA* mentioned that for them it was an influencing development when the roles of head of road, transport and public transport were all transferred to just one new position leaving the operational management in each of the agencies.

Another transport organization from Australia (*NSW*) stated that the establishment of a new, integrated transport authority in November 2011, that combines strategic planning functions within a central organization, represented a significant reform for them. From that moment on this central organization also included subsuming functions that previously rested by the operating agencies.

In Belgium things do not look very different. When examining the reforms described by the *AWV*, the results indicate a trend. Until January 2009 there were three road authorities. From then on the one of

the provinces was transferred to the two others, the regional (*AWV*) and the local authority (cities and municipalities). In addition to that reform, a state restructuring is coming up in Belgium during which powers will be transferred from national to regional level.

Summarizing the above, it can be said that the trend reflects a growing development to organizations that combine into one unit.

But also in Canada (*MTQ*) a similar development can be observed. In 1993 the Ministry transferred the management and operations of many local and regional roads to the municipalities.

Another example for this trend can be found in Finland (*FTA*) where the road, railroad and maritime administrations merged together and the Transport Agency and *ELY* were established.

France had an important reform in the year 2008, when a reorganization of the ministry from a road and land transport department including railways, waterways and sea transport to multimodal departments took place. This new organizational structure now includes a transport infrastructure and a transport service department, each with a multimodal structure, and a maritime affairs department.

Malaysia (*PWD*) established a land public transport commission to supervise all land public transport issues and in Sweden the transport organization called *Trafikverket* was formed in 2010.

All in all it can be concluded that there are definite similarities concerning the structural composition of the organizations in the observed countries. A big affinity can be especially recognized when examining the trend that shows a combining of subgroups of the organizations into one unit.

3.1.5 Analysis of Key Organizational Data

In order to analyze certain parameters and their interrelationships the graphs below (**Figure 16** to **Figure 20**) represent the determined key organizational data, which includes the following: **expenditure, income, total employees** and **operating employees**.

One reason for carrying out an analysis of the key organizational data is that high expenditures for investments in new construction indicate an expansion of the road and transport network of the organization or rather point out interesting developments. Additionally, the number of total employees plus the percentage of expenditure in relation to the number of employees in the particular area demonstrate the implementation of the organization itself.

To define the basic structure of these four bar charts, the surveyed organizations which have given a response are listed on the vertical axis. Except for **Figure 18** the horizontal axis shows a percentage scale from zero to one hundred percent. As a result the particular percentage of each indication parameter of the analyzed data can be seen in relation to the total amount.

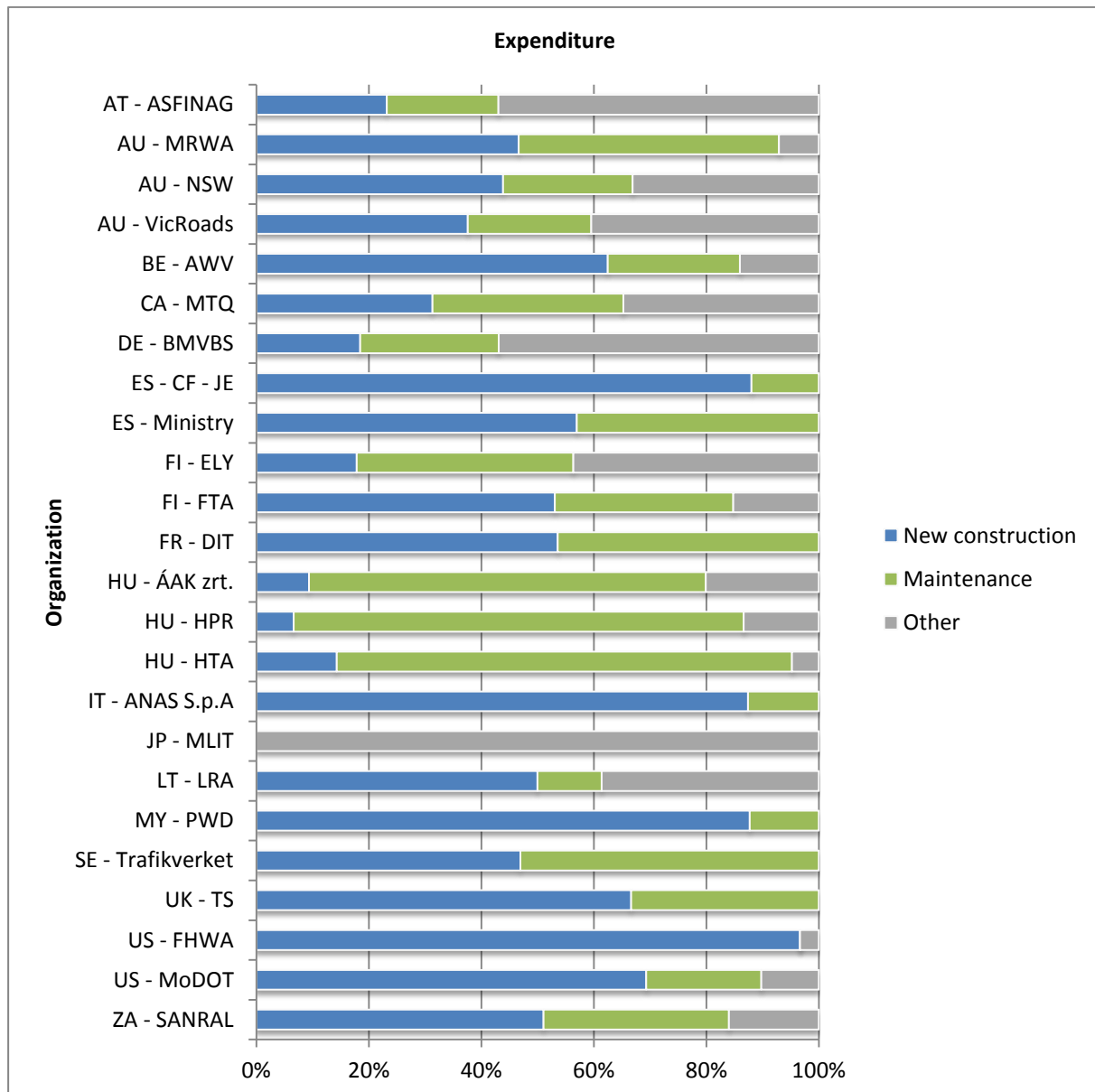


Figure 16: Expenditure

The bar chart (**Figure 16**) illustrates the distribution of **expenditure** of the surveyed organizations in the fields of *new construction*, *maintenance* or *other* incurred expenditures.

It can be seen that a quarter of the organizations that have given a response spend more than 60% of their expenditure on new constructions. This organizations are: BE – AWV, ES – CF-JE, IT – ANAS S.p.A, MY – PWD, UK – TS, US – FHWA, US – MoDOT. Only the road and transport organizations of Hungary which are ÁAK zrt., HPR and HTA spend more than 60% of their expenditure for maintenance. What is striking, is the fact that JP – MLIT have no expenditure for new construction or maintenance activities, only for other investment.

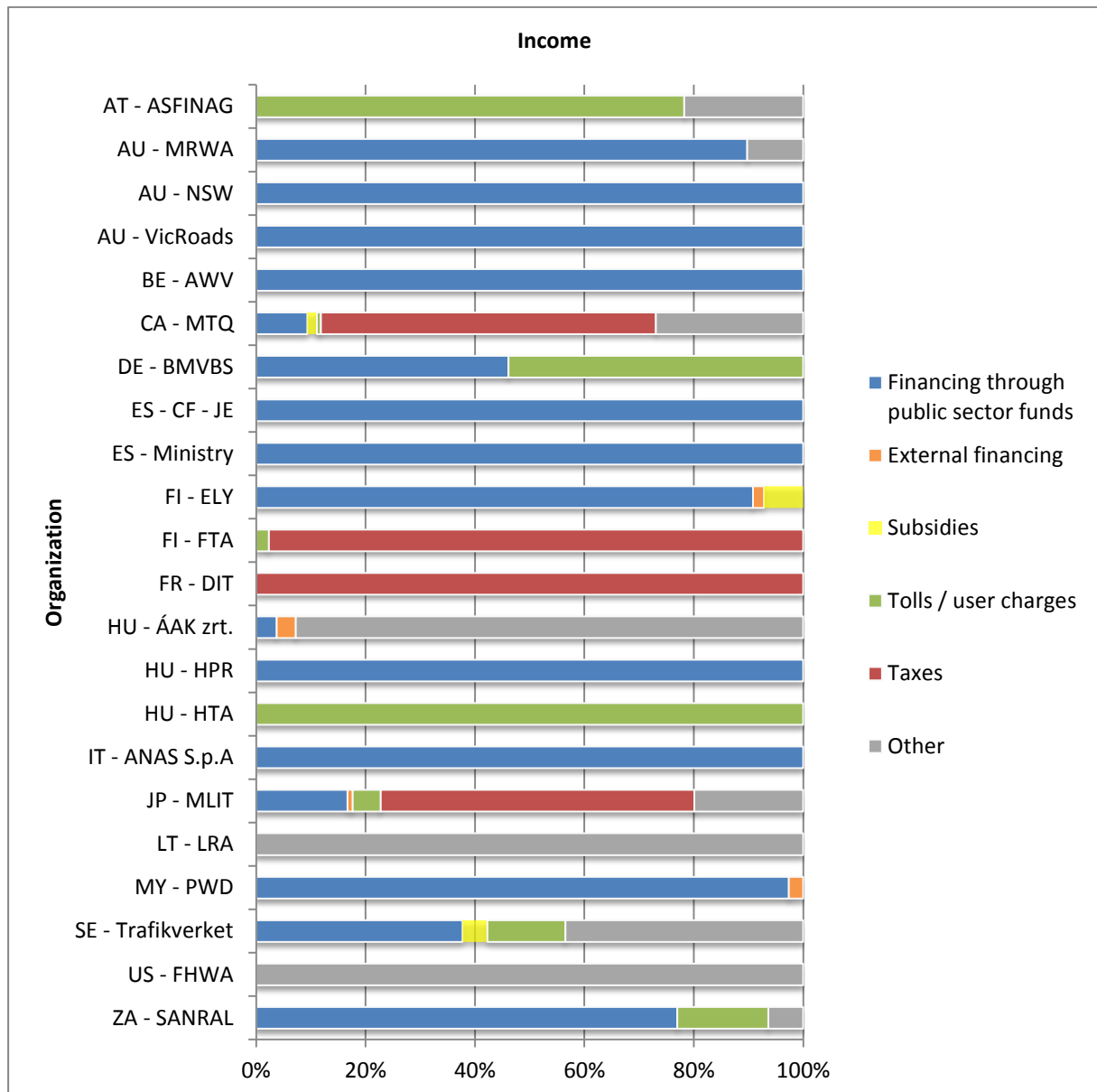


Figure 17: Income

In addition to the expenditure referred to above, the next bar chart (Figure 17) deals with the income of the organizations per year. It is distinguished between the fields of *financing through public sector funds*, *external financing*, *subsidies*, *tolls / user charges*, *taxes* or *other* means of income.

In short, the results show that the majority of the transport organizations, which is exactly half of the organizations that have given a response concerning their financing method, are collecting their money with approximately or more than 80% through public sector funds.

Moving on from financial matters to the human resources, the next bar chart (Figure 18) presents an overview of the **total amount of employees** of the organizations. When looking at this graph the horizontal axis describes the individuals using a scale of tens of thousands.

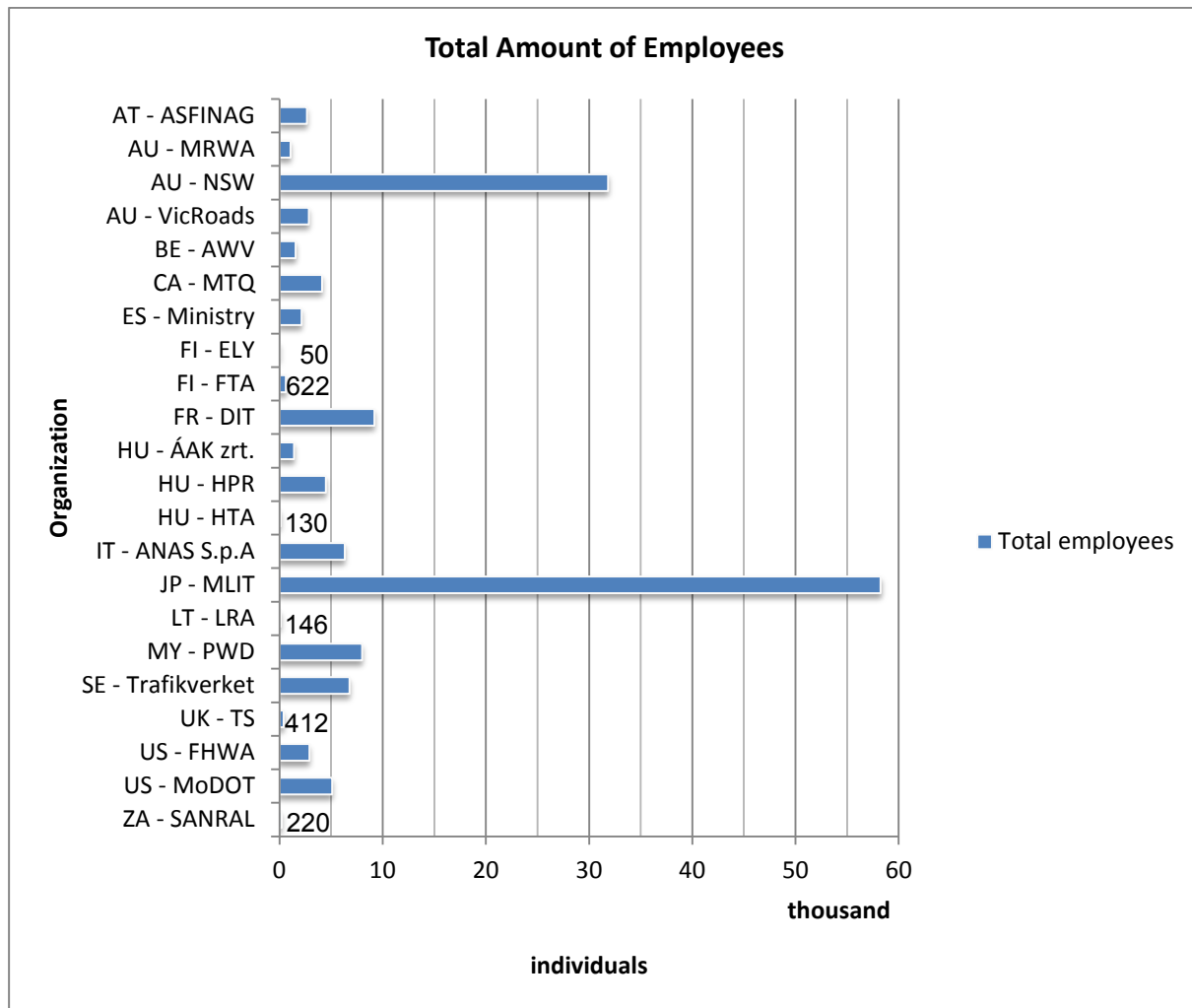


Figure 18: Total Amount of Employees

It becomes obvious that the transport organizations JP – MLIT (58,250) and AU – NSW (31,837) with the biggest number of individuals can be recognized as outliers, breaking away from the other organizations. Far behind, with between five and ten thousand individuals, the five organizations FR – DIT, IT – ANAS S.p.A, MY – PWD, SE – Trafikverket and US – MoDOT are ranked with almost a quarter of the total amount of employees. As a result, the bigger part of the surveyed transport modes with just over two-thirds, have less than five thousand employees.

The result indicates that the two transport organizations AU – NSW and JP – MLIT implement nearly all tasks by themselves compared to the others.

The Australian NSW provides the second largest network size of the surveyed organizations concerning the area of road and the third largest for rail. The quantity of transported passengers and freights by road are ranked both in the upper middle field. The statistics additionally signifies that the capacities on rail for passengers together with the area of freights are in second place.

Contrary to the Australian organization, the Japanese MLIT is only responsible for road, but in comparison to the average network size the field of passenger and freight motor vehicle kilometer per year has the second highest amount out of the examined organizations.

Based on the network size (Figure 9) and the previous presented total amount of employees (Figure 18), the next bar chart represents a key figure regard to the determined **employees per network size** kilometer of the organizations. Thereby the network size includes the areas of road and rail.

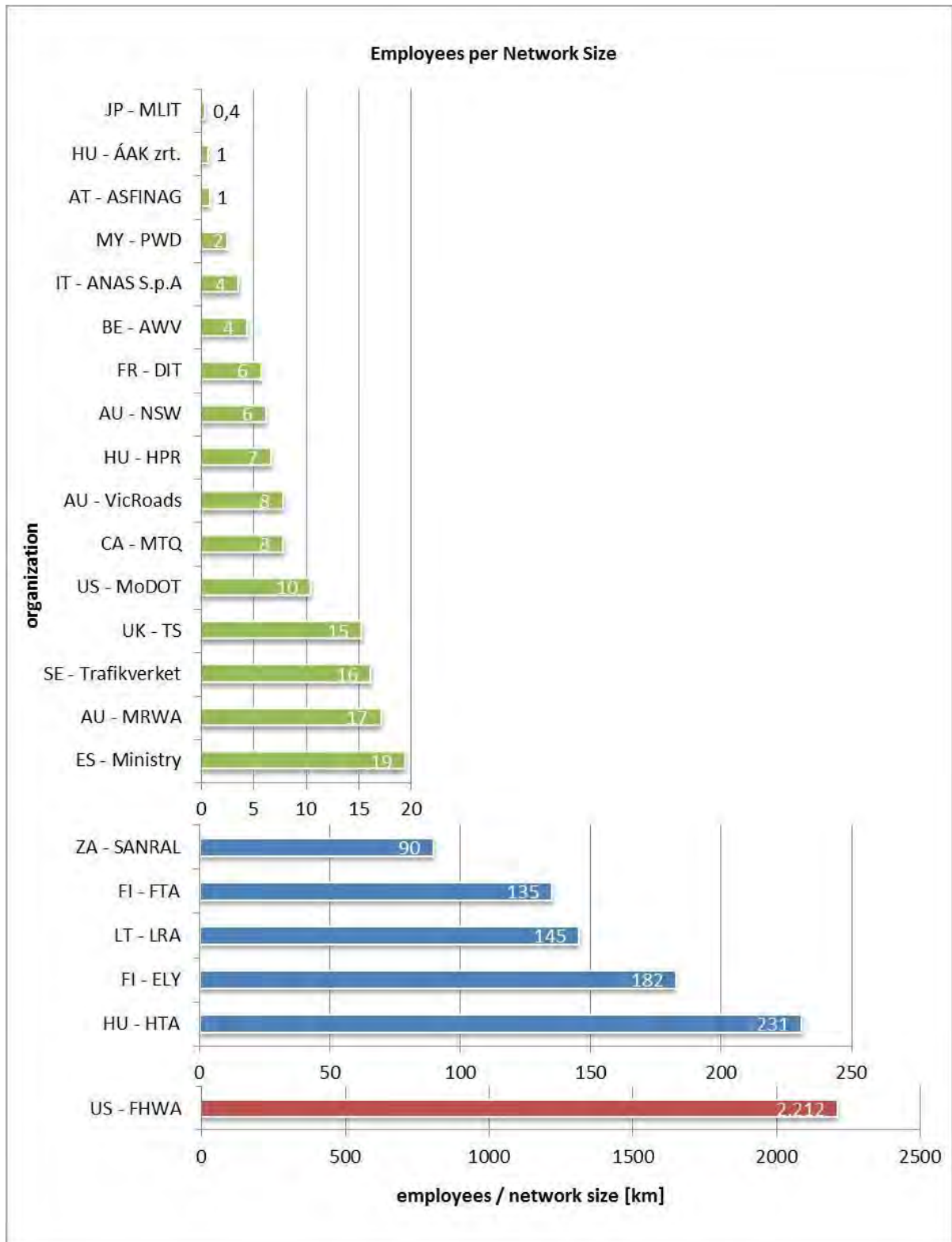


Figure 19: Employees per Network Size

On the vertical axis are shown all surveyed organizations, except for the German *BMVBS*, the Spanish *CF – JE* and the Romanian *RNCMR*. These organizations have not responded to the question regarding the total amount of employees. The horizontal axis is representing the employees in comparison to one kilometer of the network size. Due to the fact that the organizations indicate a wide range and in order to get a better view of the result, the chart is divided into three parts and the organizations are arranged from low to high. The first part (green bars) shows the organizations that do not have more than 20 employees per network size kilometer, the second part (blue bars) shows organizations that have between 20 and 250 people and those with 250 to 2500 employees per kilometer of the network can be seen in the third part (red bars).

Additionally to the previous graph that summarizes the total amount of employees of the organizations and the diagram that shows the relation to the network size of the total employees, the next bar chart (**Figure 20**) represents the amount of operating employees. It distinguishes between the areas of *planning, construction, operation, maintenance* and *other* relevant human resource.

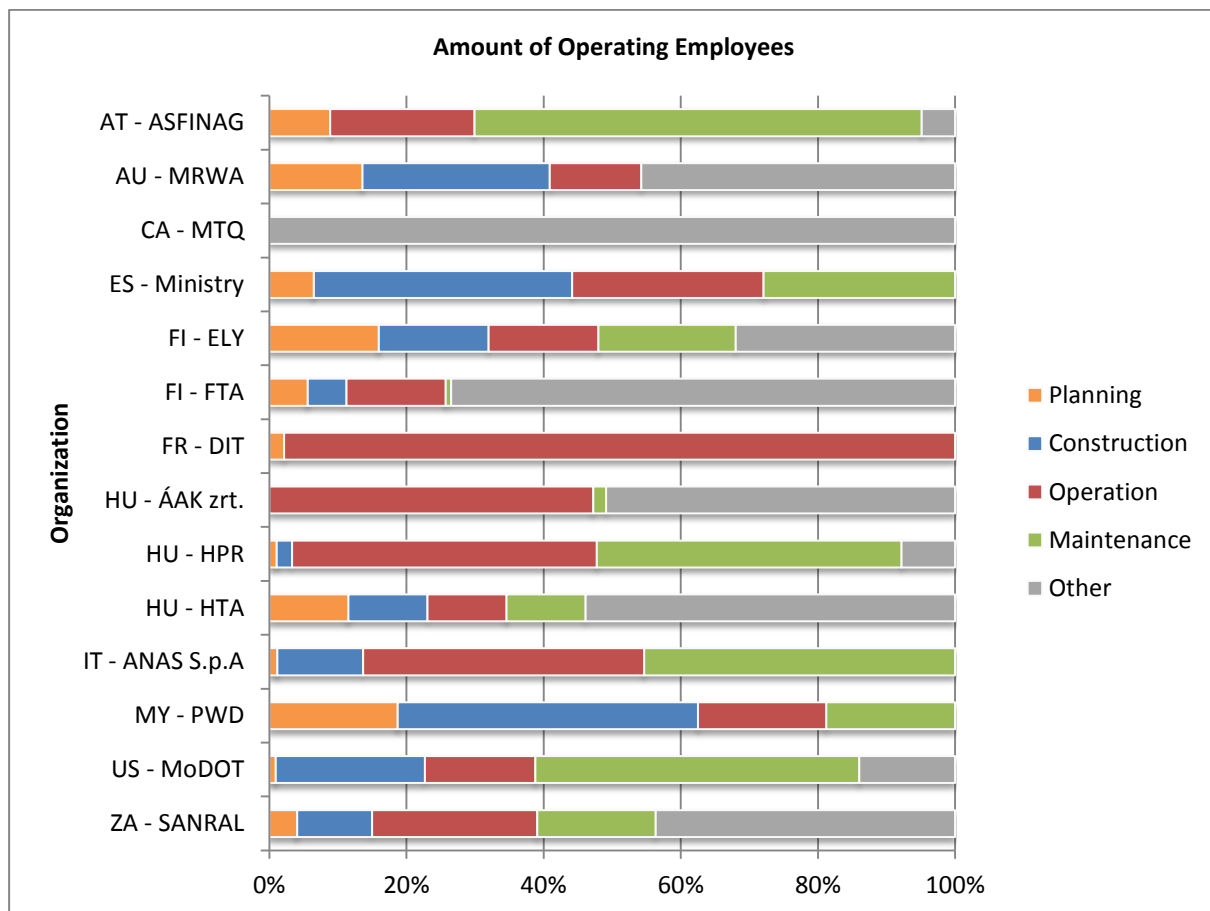


Figure 20: Amount of Operating Employees

When looking at the bar chart it is obvious that the operating employees for the areas of operation and maintenance dominate compared to those of planning and construction. The sub-category of human resources represents the lowest share in the area of planning.

Due to the fact that the Austrian *ASFINAG* has a common company for the areas of planning and construction, the organization referred that the amount of employees (approximately 30) for the construction area is included in the amount of the field of planning.

For the Canadian organization *MTQ* it was not possible to provide information based on the classification mentioned above without carrying out a deep analysis. Instead of giving data for the separate areas they specified their operating employees in central units with 1,339 individuals and in regional units with 2,804 individuals.

Beside the thematic areas of planning, construction, operation and maintenance, the Finnish transport mode *ELY* mentioned the category of transport services with 16 individuals. The American *MoDOT* has also indicated that 713 individuals work in the category of administration.

The other transport organizations that have specified additional individuals for other category divisions have not mentioned the field of their activity. For this reason it is not possible to perform an evaluation with this information in the context.

To summarize the connection between the operating employees that are shown in the previous **Figure 20** and the presented expenditure in **Figure 16** the following statement can be made: it can be seen that except of less than a third of the total amount of all organizations do the maintenance by themselves. In comparison to this fact, the investments in new constructions are largely assigned externally by the transport modes.

3.2 PART 2 A – Multi-modal Activities

The purpose of the following chapter is to survey existing multi-modal activities of the surveyed road and transport organizations. To do this, an analysis of interactions between modes, functions, spatial tiers and stakeholders is carried out. In other words, on the basis of an investigation the joint working activities of the transport organizations towards multi-modal outcomes have been surveyed.

Subsequently, essential internal and external multi-modal activities in addition to existing structures, processes and systems are analyzed.

3.2.1 Analysis of Interactions between Modes, Functions, Spatial Tiers and Stakeholders

Based on the relevance of interfaces to other transport providers of the organizations, not only the interfaces which function particularly well, but also those which have the potential for further development, are shown in the following chapter. In order to get an overview, the stakeholders of road and transport organizations in terms of multi- and intermodality are listed and their relevance is pointed out.

Turning to the bar chart below (**Figure 21**), the **relevance of the interfaces to other transport providers** of road and transport administrations is represented.

The diagram shows the following differentiated relevant interfaces as a list on the vertical axis: *road national, road regional, road local, rail interregional plus national, rail and local traffic, metro and light rail, buses regional, buses interregional, shipping international plus national, aviation international plus national* and *other*. The horizontal axis is scaled from zero to one hundred percent. As a final result, the percentage rates of the particular relevance from very relevant (green) to not at all relevant (red) can be read off.

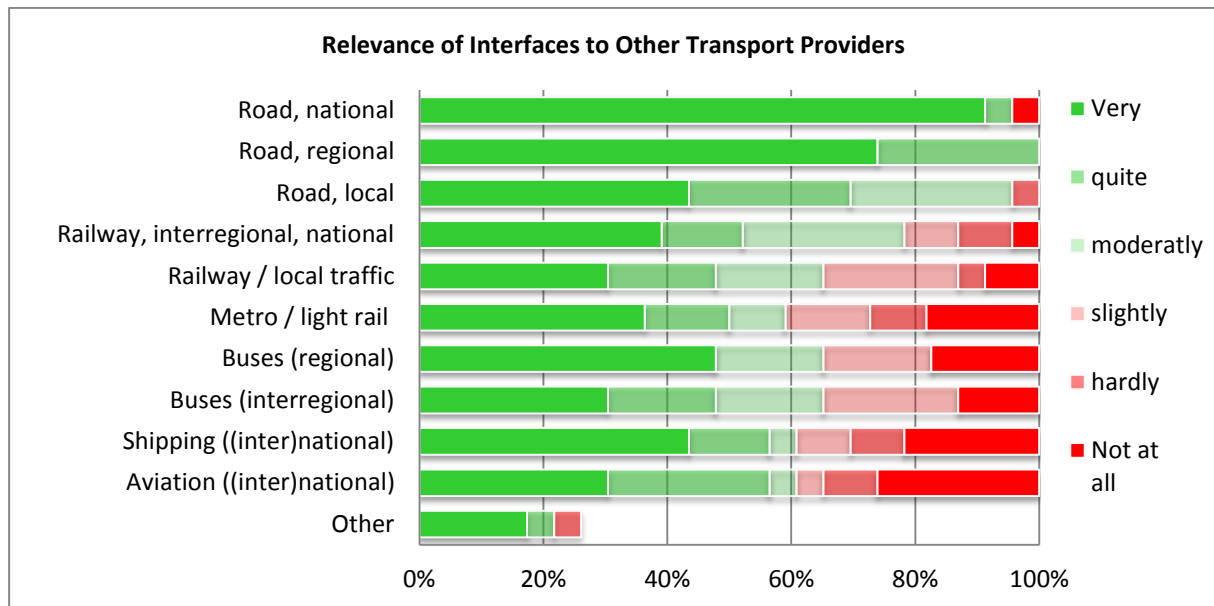


Figure 21: Relevance of Interfaces to Other Transport Providers

According to the statistics, a significantly large number of organizations classify the interface to the transport providers that are responsible for road issues on the national level as very relevant. In addition, a significant proportion is also seen when looking at the relevance of the interface of roads on the regional level. In comparison, the least acceptance of relevance belongs to the transport provider of aviation on a national and international level.

As can be deduced from the diagram, a few organizations mentioned in addition to the specified interfaces one other present kind of interface. For less than a fifth of the organizations, these other mentioned interfaces are very relevant. In Belgium (*AWV*) as well as in Hungary (*HTA*) for example, the connection to the bicycle paths has a very big relevance. Equally the French organization (*DIT*) mentioned waterways as another relevant interface for them and in the United States (*MoDOT*), barges are an issue high on the scale of relevance to other transport providers. Additionally the United States (*FHWA*) classify the national transit traffic on road as quite relevant. Another interface was mentioned by the transport agency of South Africa (*SANRAL*), but with no description.

In order to obtain an accurate overview of the relevant interfaces separated into single- and multi-modal organizations, the following chart (**Figure 22**) illustrates again the priority of **interfaces to other transport providers**, this time with more details. In order to achieve this, an individual examination of the transport agencies was made. The first figure contains a list with single- and the second one with multi-modal organizations.

For declaration reasons, the structure of the following figure is shortly explained in the following sentences. The chart is designed like a barometer of relevance, if there is no bar it means that the organization has given no response. Apart from that the graph is built up on the same interfaces as mentioned in the previous diagram.

When having a closer look at the single-modal organizations, a constant relevance becomes only obvious in connection with the road sector. There are a few exceptions to this, including for instance the Australian *VicRoads* that has focused its relevant interfaces on the regional and local operating transport providers. The relevance of the further interfaces is shown in decreasing order on the chart structure from the top downwards. Contrary to this, a significant proportion of the multi-modal organizations consider almost all interfaces as very to moderately relevant.



Figure 22: Relevance of Interfaces to Other Transport Providers

Particularly well-functioning Interfaces

In order to analyze the previous shown relevance of interfaces in regard to their application, the particularly well-functioning interfaces were requested. As the following overview so obviously shows, a very large majority of well-functioning interfaces results out of the fact having a very high relevance for the transport mode.

According to the graph, the different spatial levels represent an important issue regarding the interfaces to the road. The Austrian *ASFINAG*, for instance, noticed that the interface between their national and other lower ranked road networks that are mainly based on informal activities is functioning well. The situation is similar in Belgium (*AWV*), where the interface of national and regional road networks demonstrates a very well-functioning system, certainly because of the fact that they both are maintained by the same road authority.

The Canadian Ministry (*MTQ*) is responsible for the management of the heavy vehicle traffic on the municipal road network. The goal of the policy is to ensure consistency between municipal and provincial restrictions for the circulation of heavy vehicles and to assign those vehicles to the most appropriate roads in terms of fluidity, road safety and sustainable development. Summarizing, it can be said that the interface between the different mentioned spatial levels is working well.

In Hungary the organization *ÁAK zrt.* that is responsible for the state motorways has a good cooperation to the national roads that are operated by the transport mode Magyar Közút Nonprofit Zrt.. For the organization *HPR* the interface to some municipalities regarding the responsibility area of state motorways, which is within the competence of the organization, is performing well. Finally, the organization *HTA* noticed the road as a well-functioning interface, in particular they are mentioning the motorway facilities. Further organizations that have indicated well-functioning interfaces to the road sector are the Italian *ANAS S.p.A.* and the Malaysian *PWD*.

Turning to the transport organizations with a well-functioning interface regarding the areas of road and rail, the collaboration between the Austrian road network of the *ASFINAG* and that one of the rail at national level is working well. The Swedish *Trafikverket* also indicated a well-functioning interface between the transport modes rail and roads. The same cooperation was mentioned by the South African *SANRAL*, but particularly with the regard to the national and regional level. However, the relevance of the railway sector as an important interface on the national and interregional level is not very high.

Coming now to the Finnish transport organizations *FTA*, it becomes obvious that they have a well-functioning interface between the transport modes road and rail that are operating on the national level and the international maritime. Likewise, the French *DIT* mentioned that the national transport modes railway and shipping are under their supervision. For a well-functioning interface to the regional and local authorities, which are responsible for networks and transport services, the *DIT* has implemented interregional sections within the national road administration. In addition, the Australian integrated transport authority *NSW* mentioned the interfaces between road, rail and maritime transport as well-functioning, either for passenger as well as for freight traffic.

There a few other organizations that have stated other individual interfaces that act well. For example the Spanish Ministry indicates in this context the shipping area. In addition, the Australian *VicRoads* notices the interfaces of tram and bus and in Finland, *ELY* coordinates regional bus interfaces. This has enabled, for example, smooth travel connections when travelling by train and bus.

In Great Britain the agency *TS* engages continually closely with local authorities on all matters affecting the local area. It can also be observed, that the relationship between the national government and the Australian *MRWA* is about financing and the approval of projects related to funding. In

comparison, the relationship with the local government is more like a partnership as both parties are asset owners and service providers.

The relationship between the American *FHWA* and the state highway agencies is a critical and longstanding element of the federal assistance to the individual states for highways and bridges. The federal role of the *FHWA* includes policy, funding and oversight. The individual states are responsible for selecting projects, carrying them out, maintaining and operating the facilities. In comparison to that, the surface transportation planning represents a joint responsibility for state road agencies, metropolitan planning organizations and transit providers. There is significant effort in the United States Department of Transportation to improve the ability to identify mode-neutral and multi-modal solutions to transportation challenges. A special focus lies on the field of freight movement. A special Freight Advisory Committee has been installed that includes experts and stakeholders from outside the Department of Transport. In addition to that, there is a Freight Policy Council chaired by the Deputy Transportation Secretary and including Department of Transport leadership from highways, rail, ports and airports and economic and policy experts from across the administration.

Interfaces with potential for further development

In consideration of a future organizational enhancement of the road and transport modes, the following data provides links to a potential for further development. In anticipation, it can be said that most opportunity appears for the interface with the transportation method of rail. In addition to that, the areas of shipping and aviation are important. The interfaces, that have been mentioned by the organizations as having a potential for further development, are a consistently relevant as can be seen in **Figure 22**.

First, the organizations that mentioned the transport mode rail as a possibility for a further development are described. This is the case for the Australian organization *VicRoads* and for the Spanish *Ministry* that expanded on their answer by highlighting the area of freight traffic. Furthermore, the *NSW* sees an option for improvement in interfaces with regional and federally managed rail infrastructure systems as well as with the aviation sector. Taking a look at the Finnish *ELY*, the mining industry has the potential to affect multimodality planning in regard to the areas of railway and shipping. Because there is a huge potential, international transport corridors in the Barents region have been under discussion (Barents transport system planning). The Hungarian *HTA* mentioned parts of the railway and inland navigation as being interfaces with the potential for further development. In Italy the *ANAS S.p.A* sees a potential for the transport mode railway, but also for the areas of light rail and shipping.

The remaining interfaces with opportunity for a further development, are in Finland (*FTA*) those between ports and aviation as well as for the Swedish *Trafikverket* those between shipping and aviation.

Turning to the road section, the Hungarian organization *ÁAK zrt.* sees a scope for the development of interfaces with motorway concessions and with the capital city Budapest. In addition the *HPR* noticed the road operation including more municipalities as a possibility, which can be taken into consideration.

Another potential is the categorization of the Belgian (*AWV*) roads due to adjustments based on historical growth and new needs, as well as on coordinated insights. In addition to the capability of extending the bicycle path networks regarding functional and recreational perspectives, they want to enable the flow of the public transport. Likewise, the South African *SANRAL* sees a potential for a development for the road on national, regional and local level. Furthermore, the Malaysian *PWD* indicates that the urban public buses represent a potential interface for them.

For the Australian *MRWA* the nature of their new structure seeks to create better coordination between the modes, however an area for improvement would be in relation to land use planning. The American *FHWA* mentioned a potential for a more direct relationship to the nation's largest cities.

To conclude the possibilities for future development, an approach of the Austrian *ASFINAG* is pointed out. In order to bindingly implement intermodal agreements, improved collaboration is required between the carriers (different transport organizations) on the basis of professionally grounded methods and on the clear guidelines of a/the coordinating body (BMVIT). This requires formalized, binding agreements and clear, transparent framework conditions for the creation of constructive intermodal framework plans with the inclusion of objective criteria.

The **relevance of stakeholders** of the surveyed transport organizations in terms of multi- and intermodal activities is represented in the bar chart below (**Figure 23**). Specifically, the following persons of interest are part of this presentation: *politics and administration, traffic carrier and operator, customer, media and internal stakeholder – organizational*. These stakeholders can be seen on the vertical axis of the chart.

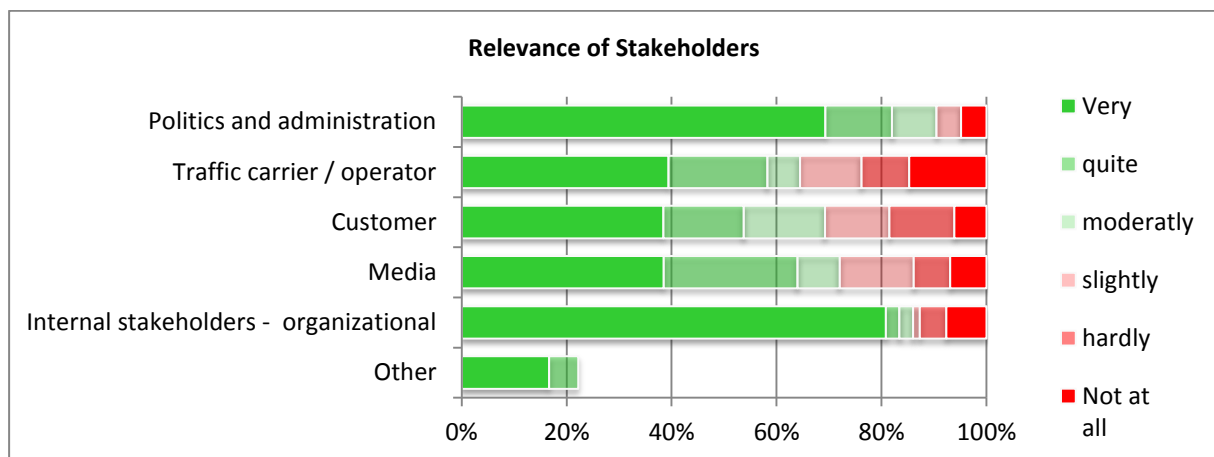


Figure 23: Relevance of Stakeholders

As can be seen in the graph, internal stakeholders or rather the organizational subjects have special relevance for the transport organizations. Also a significant proportion of the organizations classify the politics and administrations as very relevant. Behind them the other specified stakeholders follow with nearly an identical evaluation of the transport modes.

Among the submitted other stakeholders the Technical Coordination Department of the Austrian *ASFINAG* represents a further internal stakeholder, which is classified as very relevant. The stakeholders of the Hungarian *HTA* include cyclists. Another Hungarian transport organization which mentioned for them relevant other stakeholder is the *HPR*. They categorize the road users as a quite relevant group of interest. Finally, the Canadian organization *MTQ* works closely with public transport companies. Specifically, they are consulted in the decision making process for the road network management. Unfortunately, the organization provided no information regarding its particular relevance.

In addition to the previous graph, which represents a summarized result of the total transport organizations, the following charts (**Figure 24** to **Figure 28**) show the relevance of stakeholders in detail. Therefore each of the graphs stands for one of the five stakeholders broken down in specific divided sections. At this point the results of all individual transport modes separated in single- and multi-modal organizations become obvious.



Figure 24: Internal Stakeholder – Organizational Subjects



Figure 25: Stakeholder – Politics and Administration



Figure 26: Stakeholder – Traffic Carrier and Operator

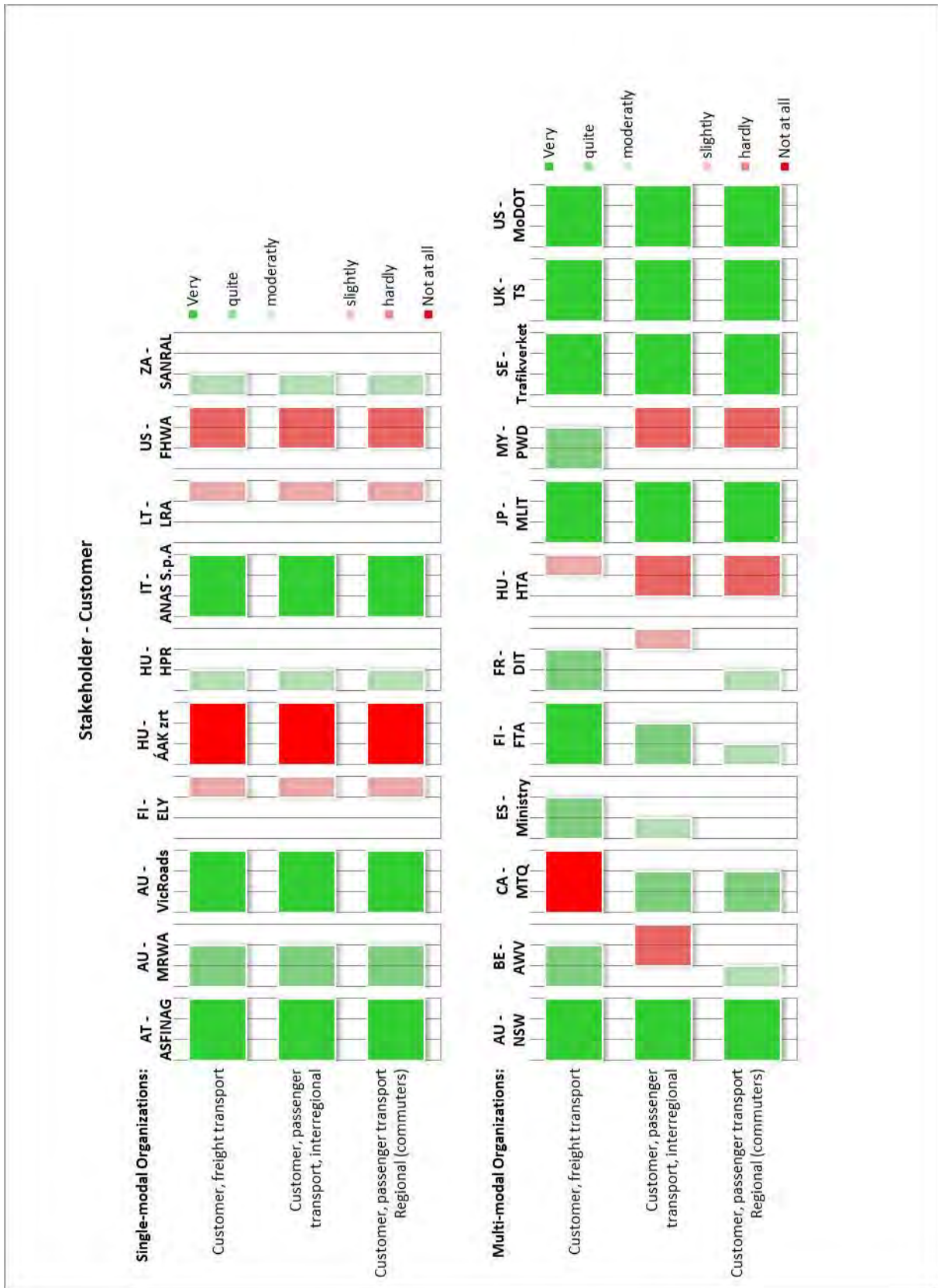


Figure 27: Stakeholder – Customer

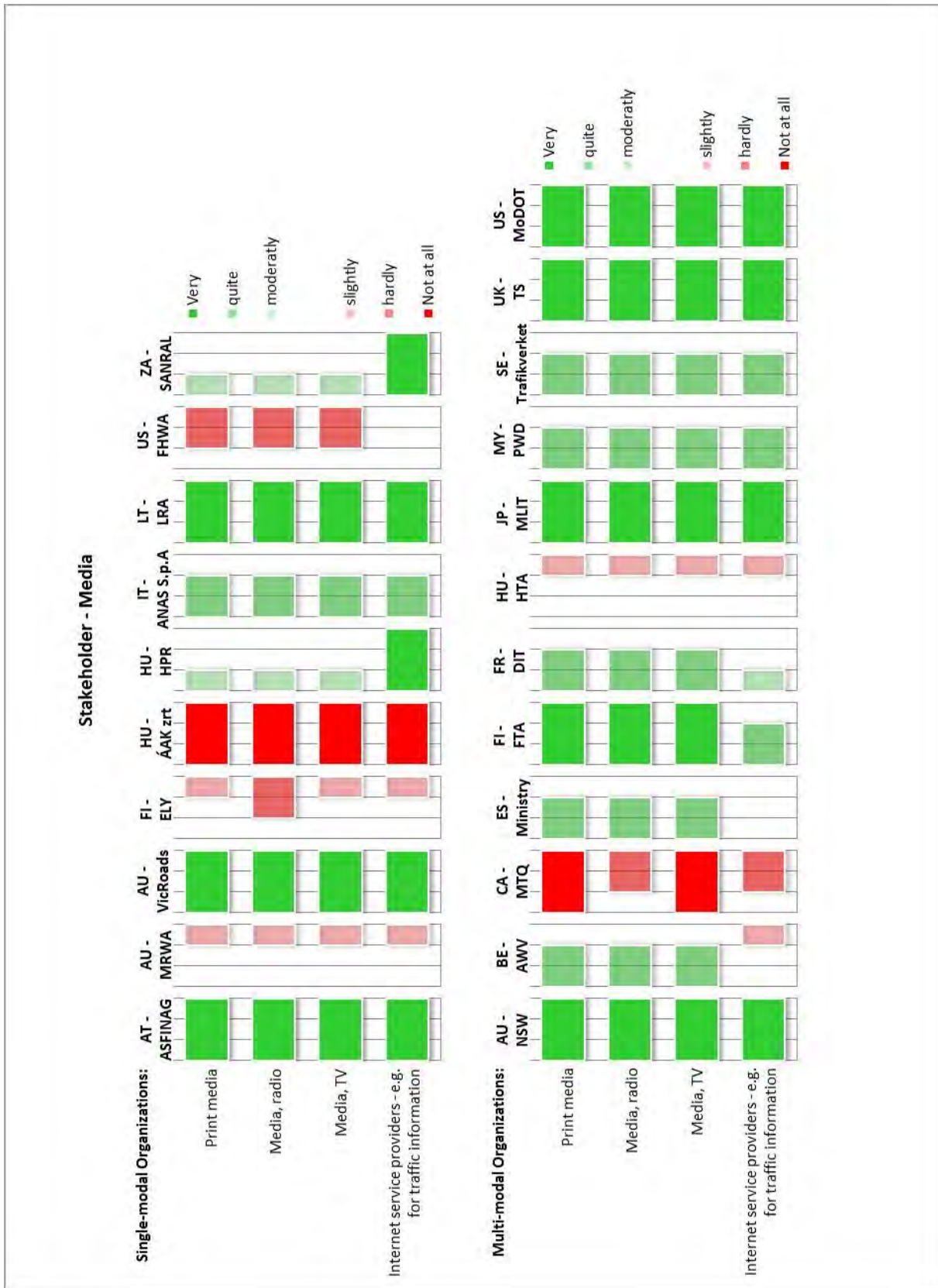


Figure 28: Stakeholder – Media

First of all it should be noted that the Hungarian transport organization *ÁAK zrt.* has indicated that all stakeholders plus their distinguished breakdowns are not as not at all relevant.

Starting with the most relevant stakeholder resulting out of the analysis of all transport organizations, the **Internal Stakeholder** or rather **Organizational Subjects** is presented in **Figure 24**. The structure of the graph is divided into the parts of *planning department, construction department, operation and management* as well as *maintenance*. Except from the Hungarian *ÁAK zrt.* an almost balanced distribution is evident in regard of the relevance for the organizations. A marginal inequality can be noticed between single- and multi-modal organizations in respective of the relevance for the construction department. Therefore, an insignificant proportion with less relevance is apparent when having a look on the organizations which are only responsible for the road section.

With regard to the specific presentation of the stakeholders, the second graph (**Figure 25**) represents an overview of the **politics and administration**. The further breakdown distinguishes the following sectors: *politics - legal guidelines - parliament, politics – budgetary guidelines – finance authority, ministry – e.g. permissions – e.g. ministry of transport, regional and provincial government* as well as *local government*. Especially remarkable is the evaluation of a few multi-modal organizations in the areas of regional and provincial government in addition to the local government. These areas have been classified as less relevant.

Additionally the **traffic carrier and operator** (**Figure 26**) can be divided into the main areas of *road company and authority, railway infrastructure company and authority, railway company (train operator), aviation, waterways operator* as well as *public transport company (operator using roads)*. The results of the graph show a couple of single-modal organizations with less relevance over almost all sections of the traffic carrier and operator.

The penultimate chart (**Figure 27**) deals with the **Customer**. For this presentation, the chart distinguishes between in particular issues including *freight transport, passenger transport interregional* as well as *passenger transport regional (commuters)*. The result reveals a trend of constant relevance in all these sections for every individual single-modal transport organization. Altogether, the single-modal transport modes signify a moderate relevance of the customer. In comparison to the multi-modal organizations, a differentiated relevance for the areas freight and passenger transport (interregional and regional) within the particular organizations becomes obvious. A slight tendency towards freight transport can be identified within this process.

To conclude, the stakeholder **Media** is represented in **Figure 28**. Thereby, the detailed areas of *print media, radio, television* as well as *internet service providers – e.g. for traffic information* are distinguished. To summarize the results that are shown in the graph, the relevance for the stakeholder media prevails clearly among multi-modal organizations. Except for the Canadian transport organization *MTQ*, which has almost no relevance to that stakeholder, all organizations which are operating on several transport modes simultaneously are indicating the media as relevant.

Detailed information concerning the type of interface to the stakeholders can be found in the appendix (5.2.2.1).

3.2.2 Analysis of Multi-modal Activities (Internal, External)

The subsequent chapter of this paper deals with an analysis of multi-modal activities in regard to internal and external issues. In order to focus on those activities the questionnaire survey provides data in respect of whether specific actions with regard to multi- and intermodality are already in place. Along that, the particular measures in addition to the success are examined.

Internal processes demonstrate in detail the organized multi- and intermodal issues. Based on this internal processes and systems, which are topics of multi- and intermodality, the responsible institution for multi- and intermodal issues within the organization in addition to the internal resources for implementation are analyzed.

Additionally operational systems for supporting multi- and intermodal objectives and their implementation within the organization are surveyed.

Furthermore, the results represent the implemented multi- and intermodal activities. In addition to which, projects with external organizations are pointed out. A detailed overview of the external organizations or rather transport providers follows and the measures, that have been put in place are described. In particular, the specific measures or projects which have been implemented are investigated.

Finally, external processes which are incorporated into the organization are treated and the question of whether the results of decisions arising from these processes or agreements are binding, is going to be answered.

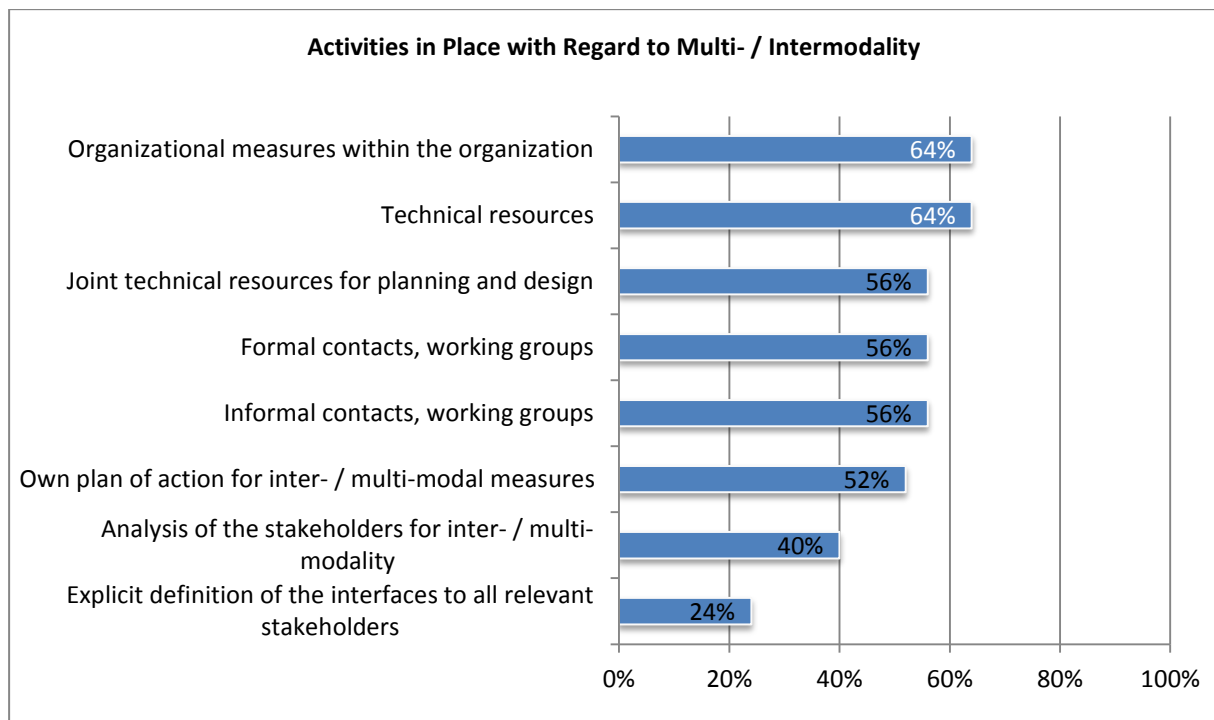


Figure 29: Activities in Place with Regard to Multi- / Intermodality

The bar chart (**Figure 29**) represents the **activities which are already in place with regard to multi- and intermodal activities**. In order to get an overview, the vertical axis is distinguished into the following activities: *organizational measures within the organization*, *technical resources*, *joint technical resources for planning and design*, *formal contacts and working groups*, *informal contacts*

and working groups, own plan of action for inter- and multimodal measures, analysis of the stakeholders for inter- and multi-modality in addition to explicit definitions of the interfaces to all relevant stakeholders. On the horizontal axis a percentage scale from zero to hundred percent can be found. As a result, the graphic contains horizontal bars for each activity which show the percentage of organizations that have already activities put in place with regard to multi- and intermodality.

Resulting from this survey, the organizational measures within the organization as well as the technical resources represent, almost two-thirds (64%) each, the significant activities that have already been put in place within the road and transport organizations. Conversely, the least present activities include the analysis of the stakeholders for inter- and multi-modality at still two-fifths (40%) and an explicit definition of the interfaces to all relevant stakeholders with nearly a quarter (24%). All other actions have been already put in place by approximately half of all road and transport organizations.

In the following two charts (**Figure 30** and **Figure 31**) the already existing activities like the **organizational measures within the organization** in addition to the **own plan of actions for inter- and multi-modal measures** are further specified and a detailed examination has been carried out.

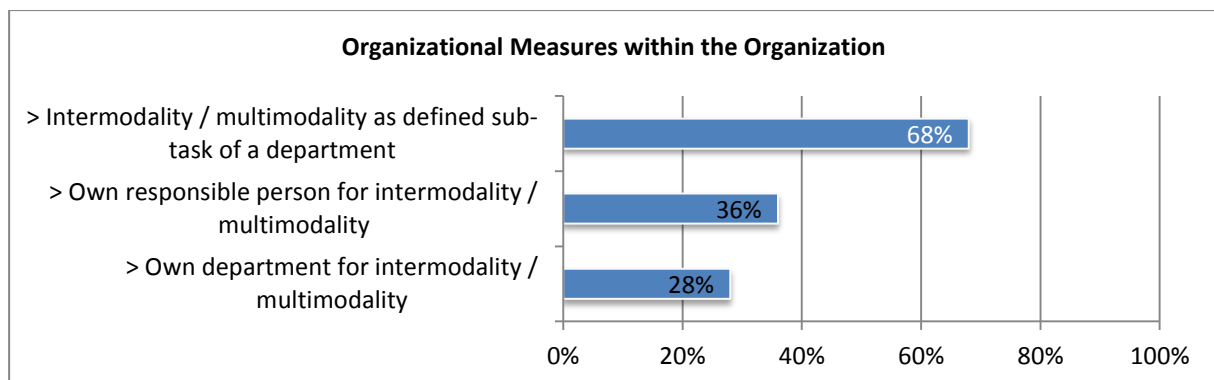


Figure 30: Organizational Measures within the Organization

The **organizational measures within the organization** are divided into: *inter- and multi-modality as defined subtask of a department*, *own responsible person for inter- and multi-modality* in addition to *own department for inter- and multimodality*.

A significant proportion (68%) of the transport modes that have stated organizational measures within their organization, mention the inter- and multi-modality as a defined subtask of a department. Ranked on the second place, with more than a third (36%), the organizations with a specifically responsible person for inter- and multi-modality can be found. Finally with 28% the organizations with an own department for inter- and multimodality.

The **own plan of action for inter- and multi-modal measures** is divided into: *organization-wide coordinated plan of action*, *binding plan of action*, *non-binding plan of action* and *organizational plan of action*.

The first on the list at 40% are the road and transport organizations with an organization-wide coordinated plan of action. Second with each 36% are the organizations with a binding as well as non-binding plan of action. In last, with almost a third (32%) of the percentage rate, are the organizations with an organizational plan of action.

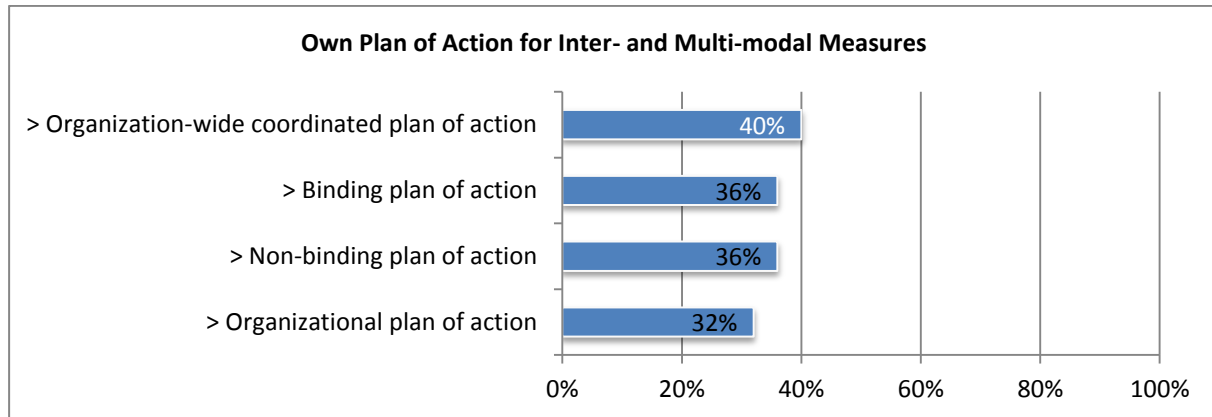


Figure 31: Own Plan of Action for Inter- and Multi-modal Measures

Regarding the presentation of the **activities which are already in place with regard to multi- and intermodal activities**, the following bar chart (Figure 32) shows an overview of the **success of these implemented actions**.

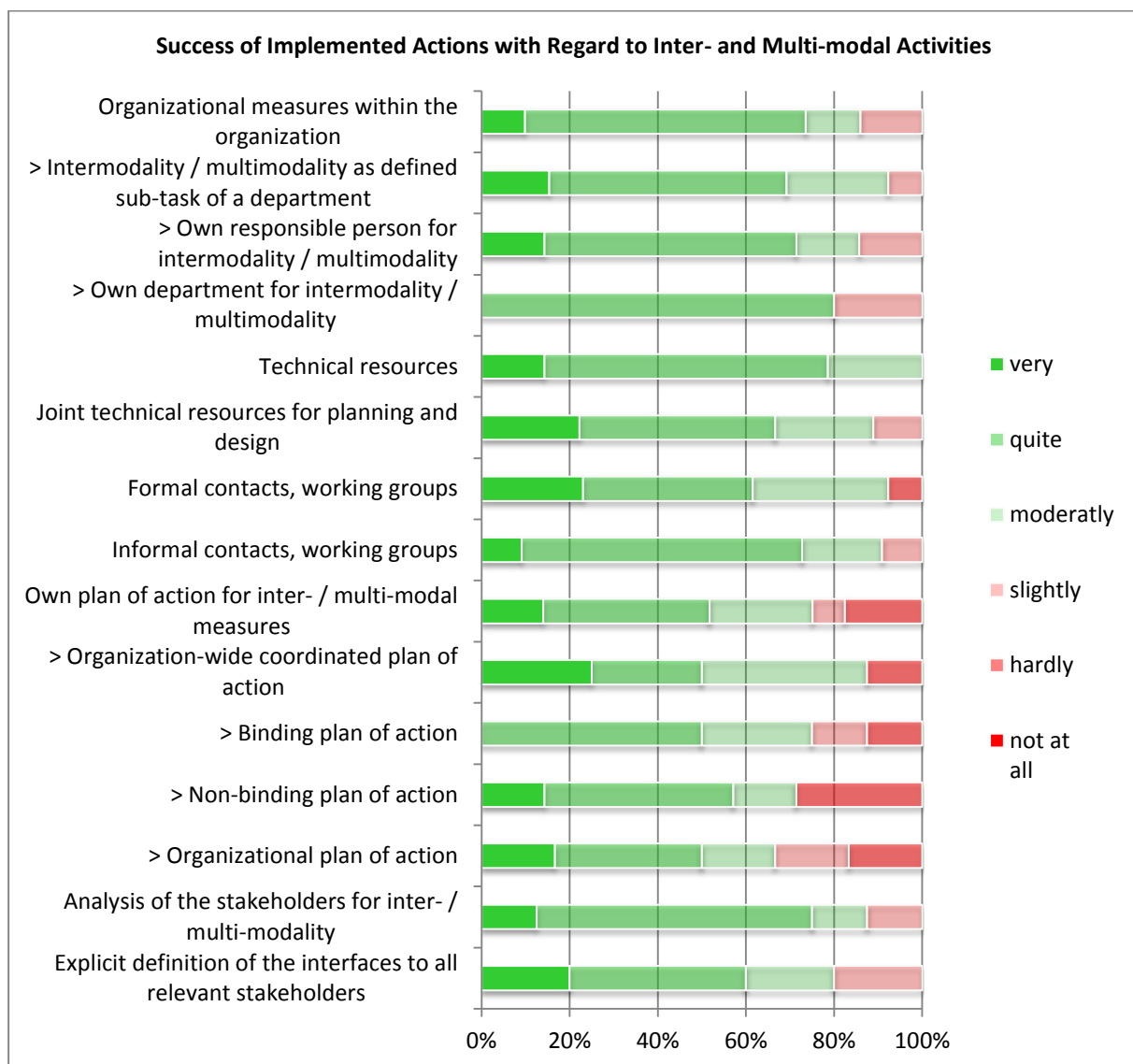


Figure 32: Success of Implemented Actions with Regard to Inter- and Multi-modal Activities

Further detailed information concerning activities which are in place with regard to multi- and intermodal measures can be found in the appendix (5.2.2.2).

Internal Processes and Systems on the Topic of Inter- and Multimodality

In order to understand the organization of multi- and intermodal issues data in regard of internal processes and systems is provided. Based on that information, it is apparent that several organizations see the field of process planning as a foundation stone for a successful inter- and multimodality. Accordingly to that, the detailed reflection of the data of those transport modes is discussed first.

Within the Australian transport organization *MRWA* the planning is all done from a total transport corridor approach in order to determine an appropriate mode including provision for more than one mode. The other Australian transport organization *NSW* has a dedicated unit responsible for integrated transport planning and land use, which provides advice on major land-use developments and supports strategic land-use projects. Beyond this, the organization is responsible for other transport plans including transport interchanges, the Port Botany (freight) precinct strategy, which represents a special approach for handling the harbor, and it supports national transport strategies and plans. In order to conclude with the Australian organizations, the internal systems of *VicRoads* include governance and committee processes, planning and legislation.

When considering Canada, it can be noticed that the planning department of the *MTQ* works for the freight on a profile of multi- and intermodality in collaboration with modal units.

For the Finnish *ELY* the intermodality represents a sub-task of the planning plus management unit. The internal processes of the *FTA* are including the processes of steering, planning and procuring. Another Scandinavian transport organization, the Swedish *Trafikverket*, mentioned that they have installed special processes regarding the field of planning.

Although there are by now no binding processes and findings in Austria, the organization strategy of the *ASFINAG* includes the improvement of intermodality until the year 2020. In order to ensure this, periodical meetings or rather jour fixe with the stakeholders and practical measures are mainly taken as a project basis. The situation looks similar in South Africa where the *SANRAL* discusses the cooperation between modes during meetings which are coordinated by the Department of Transport, or during meetings between the relevant agencies (road and rail).

In Belgium the functional bicycle path network was expanded by the agency for Road and Traffic (*AWV*), by other agencies of the Flemish ministry for Mobility and Public Works, and by funding or rather supporting the local municipalities (by the Flemish ministry for Mobility and Public Works). Furthermore, they are improving the flow of the public transport by installing busses and trolleys along the regional roads.

Within the Hungarian *HTA*, inter- and multimodality is defined as a sub-task of certain departments. Accordingly to that, informal meetings are regular possibilities to exchange information. The situation behaves similarly in the department of the Malaysian *PWD*. In this case, the multi- and intermodal issues are managed by different branches, sections and units.

The Japanese organization *MLIT* has a bureau (Policy Bureau) dedicated to manage interdisciplinary matters involving various bureaus such as those for the areas of roads, ports and harbors, railroads, or civil aviation. One of the directors of the Policy Bureau is responsible for handling matters on promotion of international combined multimodal transportation related to the cargo forwarding business.

Within the British *TS* there are a variety of modals available, including the Traffic Model for Scotland (TMfS) and LATIS.

To finish the topic of internal processes and systems regarding inter- and multimodality, the American *FHWA* has no special single approach, but the organization describes the freight issues as the most structured process.

The Responsibility of Multi- and Intermodal Issues within the Organization

The following sentences treat with the responsibility of multi- and intermodal issues within the organization. In order to receive this information, the specific data is concentrated in the list (**Table 5**) below.

Organization	Responsibility of Multi- and Intermodal Issues within the Organization
AT – ASFINAG	<ul style="list-style-type: none"> • Technical Coordination Department: belongs to the holding company and is a higher level controller and coordinator of the different companies within the ASFINAG (Planning and Building, Tolling, Maintaining and Operation, and International). The project-specific activities are mainly coordinated on project and therefore on company base.
AU – MRWA	<ul style="list-style-type: none"> • Chief Executive Office, responsibility for two areas: <ul style="list-style-type: none"> ○ Long term planning ○ Existing network and retrofitting solutions.
AU – NSW	<ul style="list-style-type: none"> • Planning and Programs Division • Transport Planning Branch • Freight & Regional Development Division • Freight Strategy, Policy and Industry Relations
AU – VicRoads	<ul style="list-style-type: none"> • Executive Directors • Chief Operating Officer • Chief Executive • Several business areas have the responsibility as part of their function
BE – AWW	<ul style="list-style-type: none"> • Engineers: responsible in the various sections for the investments in the roads • Heads of the sections • Head of the agency
CA – MTQ	<ul style="list-style-type: none"> • General Department, which includes: <ul style="list-style-type: none"> ○ Planning Department ○ Marin, Air and Rail Department ○ Trucking Department ○ People Movements Department <p>For freight traffic, the Planning Department is in collaboration with the modal units (air, marine, rail, trucking).</p>
ES – Ministry	<ul style="list-style-type: none"> • Deputy General Director of Planning
FI – ELY	<ul style="list-style-type: none"> • Head of Planning Unit and Director
FI – FTA	<ul style="list-style-type: none"> • All Directors
FR – DIT	<ul style="list-style-type: none"> • Head of the Infrastructures • Transports and Sea General Department (DGITM) • Heads of Infrastructure and Service departments (DIT, DST)
HU – ÁAK zrt.	No responsible person for multi- and intermodal issues
HU - HTA	No dedicated responsible person

IT – ANAS S.p.A	<ul style="list-style-type: none"> • Transportation Planning Office (office within the Design Direction and depends directly on the Director)
JP – MLIT	<ul style="list-style-type: none"> • Policy Bureau and Director
MY - PWD	<ul style="list-style-type: none"> • Director of Road Branch (road development) • Director of Road Facilities Maintenance Branch (road management) • Director of Air and Maritime Base Branch (bus, mass rapid transit, airport, port development)
SE – Trafikverket	<ul style="list-style-type: none"> • Planning Department (responsibility for most issues)
UK - TS	<ul style="list-style-type: none"> • Head of Planning and Design, Mr. David Anderson
US – FHWA	<ul style="list-style-type: none"> • Secretary of Transportation (responsibility through direct cooperative relationships among mode-specific entities)

Table 5: Responsibility of Multi- and Intermodal Issues within the Organization

Internal Resources (Staff and Budget)

Finally, we come to the organizations have been surveyed regarding their internal resources. This includes the question of what staff and budget they have for achieving the multi- and intermodal issues.

Looking at the data received from the organizations regarding personnel resources, the Australian *MRWA* has twelve people for long term planning looking for road components of the future needs. The Finnish *FTA* mentioned a total staff of about 620 people. Perhaps one in ten of this staff is channeled to multi- and intermodal issues. Moreover, seven engineers are responsible for intermodal issues within the Italian organization *ANAS S.p.A*. To round off the topic of the responsible internal staff for multi- and intermodal issues, the Canadian *MTQ* responded by providing a clear overview with the following list:

- General Department (7 people)
- Planning Department (45 people)
 - Direction unit (5 people)
 - Branch of Strategy and Forecast (14 people)
 - Branch of Economy and Sustainable Development (16 people)
- People Movements Department (41 people, including 1 occasional)
- Marine, Air and Rail Department (52 people, including 6 occasionals)
- Trucking Department (40 people, including 2 occasionals)

The following paragraphs provide information concerning the budget of the organizations for multi- and intermodal issues. In this context, the budget of Australian *MRWA* is used for long term planning, excluding the salary, with 500,000 dollar per anno, which varies from year to year. Furthermore, the total budget of the Finnish *FTA* is 1700,000,000 euro. The division of this budget has approximately the same ratio like mentioned before when talking about the amount of staff, with perhaps one in ten channeled to multi- and intermodal issues. With a budget of 300,000 euro per year the Italian *ANAS S.p.A* handles its intermodal issues.

Going on with the investigation concerning internal resources, further detailed information, given by the organizations including also the Austrian *ASFINAG* still needs to be examined. The organization noticed that the activities are a sub-task of the Technical Coordination Department. Therefore, the project specific activities represent a sub-task of the project management. For intermodal activities,

the organization *ASFINAG* has no fixed extra budget. Instead of that, the required budget is gained on project base or is within the Research and Development Budget. In addition to the long term planning budget, the Australian *MRWA* mentioned that the short term planning is on a more ad-hoc basis and for that reason they are not able to declare a specified budget as it is part of overall duties. For the Australian organization *VicRoads* it was not possible to give a precise answer to this question. They only notified that the organization has stuff and some budget available. The French *DIT* mentioned that the resources regarding multi- and intermodal issues belong to the Transports and Sea General Department (DGITM). In Japan (*MLIT*), a number of the 341 employees are working for the Policy Bureau, but it is not possible to identify how many of them are engaged in matters relating to multimodal transportation. The Malaysian *PWD* has its own staff. In addition they get their budget from the client ministries. The same situation occurs with the Swedish *Trafikverket*. The organization also has no specific resources available. Alternatively they are integrated with other tasks.

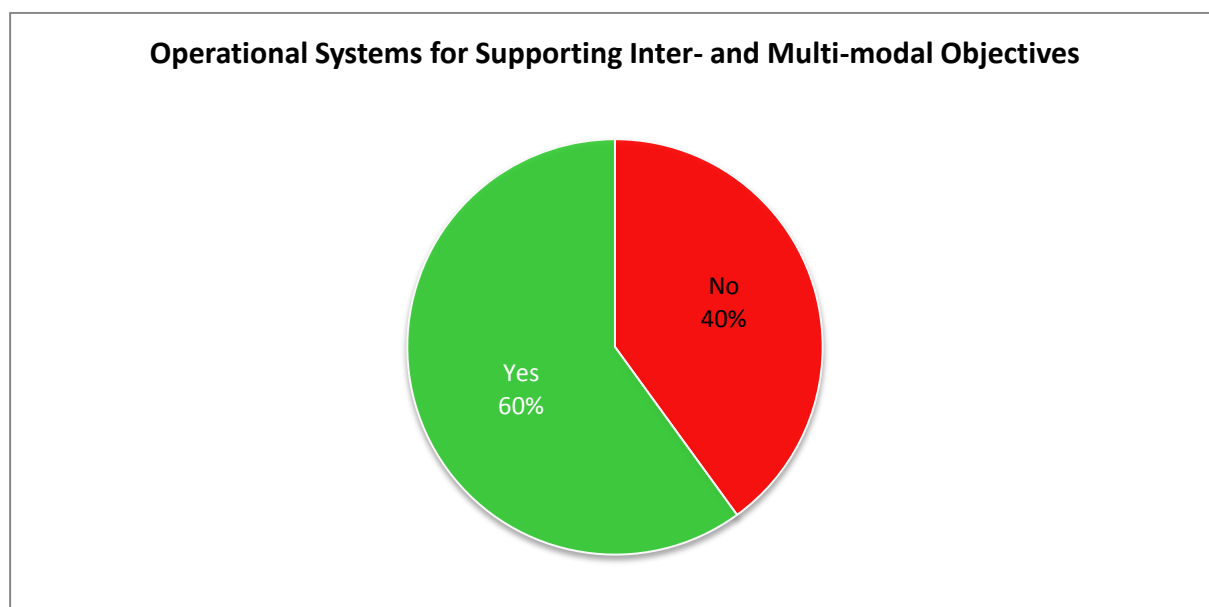


Figure 33: Operational Systems for Supporting Inter- and Multi-modal Objectives

The pie chart (**Figure 33**) illustrates the balance of the road and transport organizations which have an **operational system for supporting inter- and multi-modal objectives** in place. These systems can for instance include traffic control systems, web-based traffic information systems, intermodal project platforms, and so on.

The graph gives evidence that with 60% already more than the half of the interviewed organizations have an operational system for supporting multi- and intermodal objectives. In contrast to that, the remaining 40% has no particular system implemented within the organization.

Systems for Supporting Multi- and Intermodal Objectives

This part of the paper deals with the systems for supporting multi- and intermodal objectives. In order to visualize the responses to the posed question in a clear manner, the data is presented as a list (Table 6), as to be seen below. It has to be mentioned, that the systems of the organizations noted with a star (*) are explained in detail in the appendix (5.2.2.1).

Organization	System for Supporting Multi- and Intermodal Objectives
AT – ASFINAG*	<ul style="list-style-type: none"> • ASFINAG- Unterwegs • Traffic Information Austria • Telematics Testing Ground • Information of availability of Park and Ride-Terminals
AU – MRWA	<ul style="list-style-type: none"> • Systems regarding the area of road
AU – NSW*	<ul style="list-style-type: none"> • SCAT (Sydney Coordinated Adaptive Traffic System) • Public transport ticketing systems (multiple)
AU – VicRoads	<ul style="list-style-type: none"> • Traffic control • Traffic modelling • Road based, intermodal activities
BE – AWW*	<ul style="list-style-type: none"> • Small annual count of users of bicycle paths
CA – MTQ*	<ul style="list-style-type: none"> • Multimodal database for freight by using Excel and TransCAD
FR – DIT	<ul style="list-style-type: none"> • Aid system for combined transport • Public aids for sea, railway and motorways • Development of the French Agency for Multimodal Information and Ticketing (AFIMB)
HU – ÁAK zrt.	<ul style="list-style-type: none"> • Website with the actual traffic information on motorways and live webcams
HU – HPR	<ul style="list-style-type: none"> • Road user information service including some multimodal information as well (www.utinform.hu).
HU – HTA*	<ul style="list-style-type: none"> • Information system and database (KIRA)
JP – MLIT*	<ul style="list-style-type: none"> • National Integrated Transport Analysis System (NITAS)
LT – LRA	<ul style="list-style-type: none"> • Traffic Information Centre
ZA – SANRAL	<ul style="list-style-type: none"> • Intelligent Transport System (roads)

Table 6: Systems for Supporting Multi- and Intermodal Objectives

Implemented Multi- or Intermodal Activities and Projects with External Organizations

In order to analyze implemented multi- or intermodal activities and projects with external organizations the questionnaire provides the related data in the following figures (Table 7 and Table 8). The organizations or transport providers for whom measures have been put in place for are evident in the first table. The second table is addressing specific implemented measures or projects. In this respect it has to be pointed out, that the measures of the transport organizations noted with a star (*) are further explained in the appendix (5.2.2.1).

Organizations, Transport Providers for whom Measures have been put in Place

Organization	Organizations, Transport Providers for whom Measures have been put in Place
AT – ASFINAG*	<ul style="list-style-type: none"> • Railway-Provider (ÖBB) • Regional & local road carriers (Federal States and Communities)
AU – MRWA	<ul style="list-style-type: none"> • Public transport authority • Logistics companies using state owned rail infrastructure
AU – NSW	<ul style="list-style-type: none"> • Federal agencies (e.g. Australian Rail Track Corporation) • Private organizations (e.g. NSW Ports, intermodal operators), and with • NSW transport agencies (e.g. Roads Maritime Services) on a range of infrastructure projects that support intermodal activities
AU – VicRoads	<ul style="list-style-type: none"> • Bus • Tram
BE – AWW*	<ul style="list-style-type: none"> • Agencies of the Flemish Ministry for Mobility and Public Works • Local municipalities
CA – MTQ	<ul style="list-style-type: none"> • Private sector stakeholders
FI – ELY	<ul style="list-style-type: none"> • Regional Councils of Northern Finland • Chambers of Commerce • Other ELY Centres • Finnish Transport Agency • Neighboring countries (Sweden, Norway, Russia) • Traffic carriers/operators
FI – FTA	<ul style="list-style-type: none"> • Municipalities • Regional government • Railroad and bus companies • Harbors and ports companies
FR – DIT	<ul style="list-style-type: none"> • French Agency for Multimodal Information and Smart-ticketing (AFIMB - Agence Française de l'Information Multimodale et de la Billettique) together with the regions and the municipalities • Transport organization authorities (municipalities and the organizing authority of public transport of the Ile-de-France - STIF-)
HU – HTA	<ul style="list-style-type: none"> • Transport service providers and road and railway operators: information exchange in the framework of the KIRA (traffic information system) development - implementations of GIS tools and applications
JP – MLIT	<ul style="list-style-type: none"> • Local governments or public transportation business operators
MY – PWD	<ul style="list-style-type: none"> • Ministry of Finance • Economic Planning Unit • Implementation & Coordination Unit • Ministry of Transport • Road Transport Department • Malaysia Airport Berhad • Port Authority
US - FHWA	<ul style="list-style-type: none"> • Formal advisory group for freight issues (advisory committee is made up of freight experts and stakeholders)

Table 7: Organizations, Transport Providers for whom Measures have been put in Place

Specific Implemented Measures or Projects

Organization	Specific Implemented Measures or Projects
AT – ASFINAG	<ul style="list-style-type: none"> • Improvement and additional Construction of Freight terminals, P&R/P&D-Terminals • Implementation of Traffic Information Austria & Telematics Testing Ground
AU – MRWA	<ul style="list-style-type: none"> • Implementation of dedicated bus lanes • Use of land in motorway reserves to build passenger train lines • Provision of intermodal transport hubs for road and rail
AU – NSW	<ul style="list-style-type: none"> • Development of Port Botany precinct • Development of Moorebank intermodal terminal
AU – VicRoads	<ul style="list-style-type: none"> • Implementation of bus and tram priority lanes during peak times • Construction of cycle paths • Implementation of shared pedestrian cycle paths • Construction of traffic signals for cyclist • Implementation of advanced cycle boxes at intersections • Implementation of tram super stops (additionally stops)
BE – AWW*	<ul style="list-style-type: none"> • Construction of bicycle paths network • Improvements regarding the flow of the public transport by busses and trolleys along the regional roads
CA – MTQ*	<ul style="list-style-type: none"> • Modal Integration Program <ul style="list-style-type: none"> ◦ Assistance program aiming to reduce or avoid greenhouse gas emissions and improving energy efficiency in road, rail and marine transportation
FI – ELY	<ul style="list-style-type: none"> • Joint transport system planning such as joint transport plan for Barents region, Northern Finland logistics strategy etc.; main goal is to join forces
FI – FTA	<ul style="list-style-type: none"> • Implementation of regional transport planning • Working on public transport issues • Development of collaboration
FR – DIT	<ul style="list-style-type: none"> • Financing of the multimodal platforms • Implementation of a carpooling area (developed with the concessionaires): car and buses station alongside a railway station • Modification of the tonnage for heavy goods vehicles around ports (100km) • Access to subsidies for tramways
HU – HTA	<ul style="list-style-type: none"> • KIRA project (traffic information system) • EDITS project (European Digital Infrastructure Traffic System)
IT – ANAS S.p.A	<ul style="list-style-type: none"> • Preliminary Design of the city Rome: Fiumicino Airport Integrated Transport System for the improvement of the airport accessibility in the predicted scenario until the year 2020
JP – MLIT*	<ul style="list-style-type: none"> • Provision of financial support to local governments to cover the expenditure of formulating "regional integrated transportation strategies" and expenditure of implementing related projects
MY – PWD	<ul style="list-style-type: none"> • Construction of airport • Construction of port • Construction of Custom and Immigration Complex (CIQ) • Implementation of Mass Rapid Transit and Bus Rapid Transit

Table 8: Specific Implemented Measures or Projects

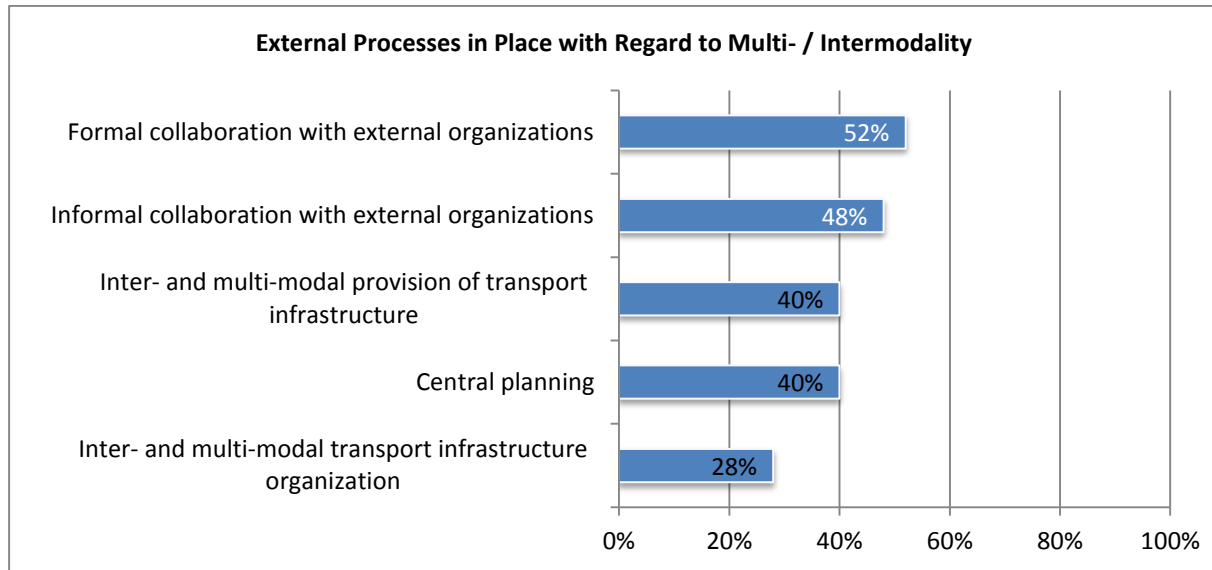


Figure 34: External Processes in Place with Regard to Multi- / Intermodality

The bar chart (Figure 34) presents into the organization incorporated external processes. The presentation is carried out in the percentages of the total surveyed organizations. Some of the surveyed organizations have several incorporated external processes simultaneously.

As can be seen from the graph, the external processes are: *formal collaboration with external organizations*, *informal collaboration with external organizations*, *inter- and multi-modal provision of transport infrastructure* (integrated delivery), *central planning* in addition to *inter- and multi-modal transport infrastructure organization* (integrated transport agency).

As it appears from the figure, approximately the half of the surveyed transport modes have formal (52%) and informal (48%) collaborations with external organizations in action. Additionally, about two-fifths (40%) of the organizations mentions the inter- and multi-modal provision of transport infrastructure as well as the central planning as present activities. Having an inter- and multi-modal transport infrastructure organization gains with just over a quarter (28%) less acceptance.

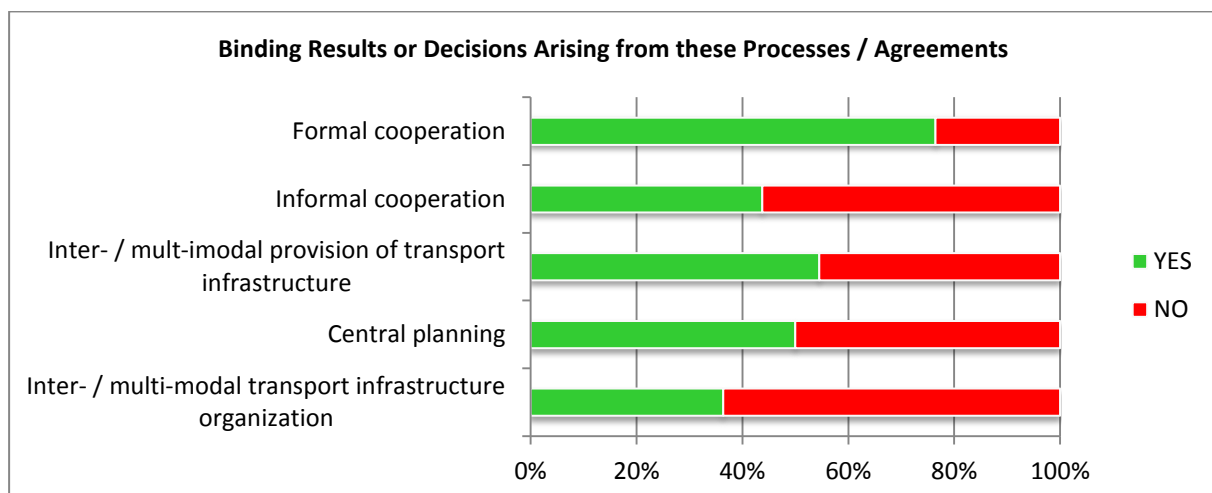


Figure 35: Binding Results or Decisions Arising from these Processes / Agreements

Based on the previous graph the bar chart above (Figure 35) shows now the binding results or decisions arising from these processes and agreements.

As can be seen from the graph, a significant proportion at just over three quarters (76%) of the transport modes see the formal cooperation with external organizations as a binding result or decision. Hence, the result concerning this activity coincides with the one in the previous graph. In comparison to that, the informal collaboration with external organizations is only ranked in fourth place at more than two fifths (44%). Those organizations that see the inter- and multi-modal provision of transport infrastructure as binding have the second largest rating (55%). Almost the same percentage rate (50%) appears for the process of central planning. The lowest acceptance for a binding result or decision is reported for the inter- and multi-modal transport infrastructure organization with nevertheless a percentage rate of more than a third (36%).

Further detailed information concerning external processes which are in place with regard to multi / intermodality can be found in the appendix (5.2.2.2).

3.3 Part 2 B – Multi-modal Organizations

The following part of the presentation of the results is exclusively focused on multi-modal organizations. Accordingly to that, the questionnaire separates firstly the multi-modal acting transport organizations from the total. Then, in order to gain an overview about their main operating tasks, the areas of responsibilities are investigated. Further data is also provided in connection with the existence of interfaces or organizational divisions between transport networks and modes within the organization. In addition to that, an explanation of the different figures completes the results. To understand the rationale for creating a multimodal organization in more detail, the questionnaire provides essential data about that. Finally, the success of the multimodal delivery since the implementation within the organization is reflected.

3.3.1 Multi-modal Organizations

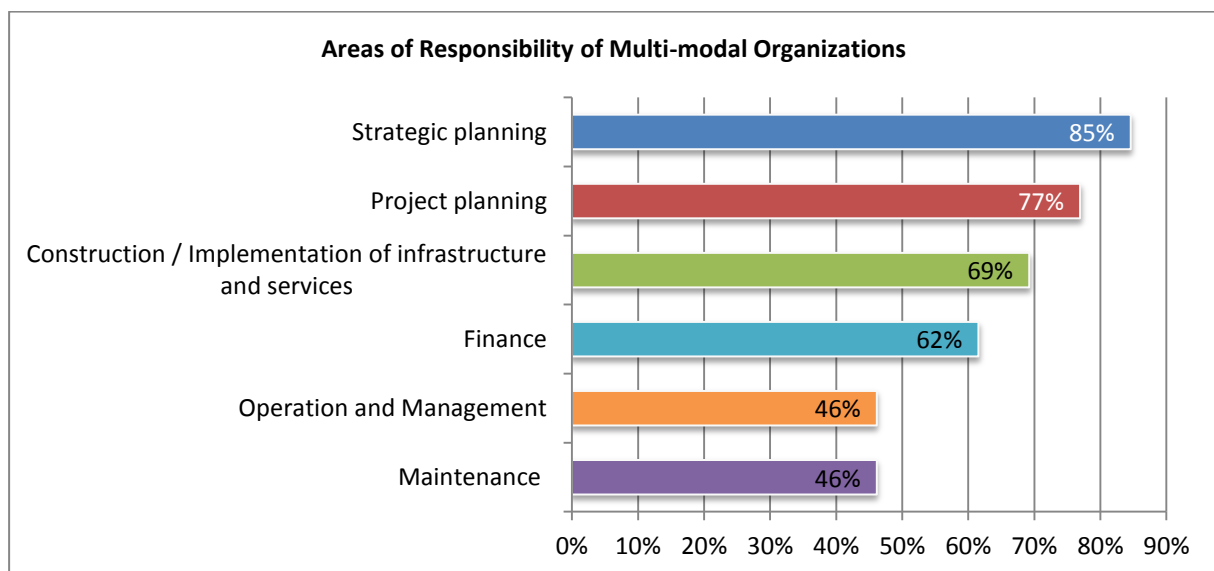


Figure 36: Areas of Responsibility of Multi-modal Organizations

The bar chart (Figure 36) illustrates the different **areas of responsibility of multimodal organizations**. The presentation is carried out in the percentages of the total surveyed organizations. Some of them may have been involved in several areas simultaneously.

In the graph the areas of responsibility of multi-modal organizations are divided into the fields of *strategic planning* (policy and regulations), *project planning*, *construction* and *implementation of infrastructure services*, operation and management, *maintenance* in addition to the area of *finance*.

The largest area with regard to multi-modal activities is taken by the field of strategic planning with over four-fifths (85%). The areas of project planning with just over three-quarters (77%) and construction and implementation of infrastructure service with almost seven in ten (69%) follow on the second place. The field of responsibility of finance is with just over three-fifths (62%) already some way behind. Finally, the areas of operation and management such as the field of maintenance share the smallest percentage rate with approximately more than two fifths (46%).

In conclusion, it is true to say that half of the multi-modal organizations are responsible for all specified areas and the other remaining parts are in particular involved in the fields of planning and construction.

3.3.2 Interfaces or Organizational Divisions and their Definitions

The next two bar charts (**Figure 37** and **Figure 38**) represent the **interfaces or organizational divisions which exist within the organizations between transport networks and modes**. In particular, the first graph deals with the freight transport and the second diagram shows the passenger traffic.

The chart investigates the following interfaces or organizational divisions: *own sub-company*, *own organizational unit (e.g. department)*, *integrated into roads department*, *none* and *other*.

On the vertical axis of **Figure 37** a distinction is made between the following transport networks and modes: *railway interregional and national*, *railway and local traffic*, *buses regional*, *busses interregional*, *shipping*, *aviation* as well as *other*. For **Figure 38**, the *railway interregional and national*, *railway and local traffic*, *local public transport (in towns and cities)*, *shipping*, *aviation* in addition to *other* networks are relevant. The horizontal axis indicates a percentage scale between zero and one hundred percent. As a result, the percentage share of the particular interface or organizational division for each transport network and mode becomes evident in regard of the total amount.

To start with the explanation of **Figure 37** which represents the interface between road and freight, the organizations that have a dedicated organizational unit for **railway** on **interregional** and **national** level have the main proportion with half (50%) of the total amount. Of the remaining half, each have less than one fifth (17%), is divided through the organizations that are either integrated into the road department, have no interface or organizational division, or have other networks for railway on the level mentioned above,

The major proportion of the organizations, with a percentage of almost half (46%), also have designated organizational unit for **railway and local traffic**. In second place, the organizations that have other organizational interfaces or divisions follow with approximately a quarter (23%) of the total amount. A minority (15%) is integrated into the road department and a very small number (8%) are organizations that have an own sub-company or have no interface.

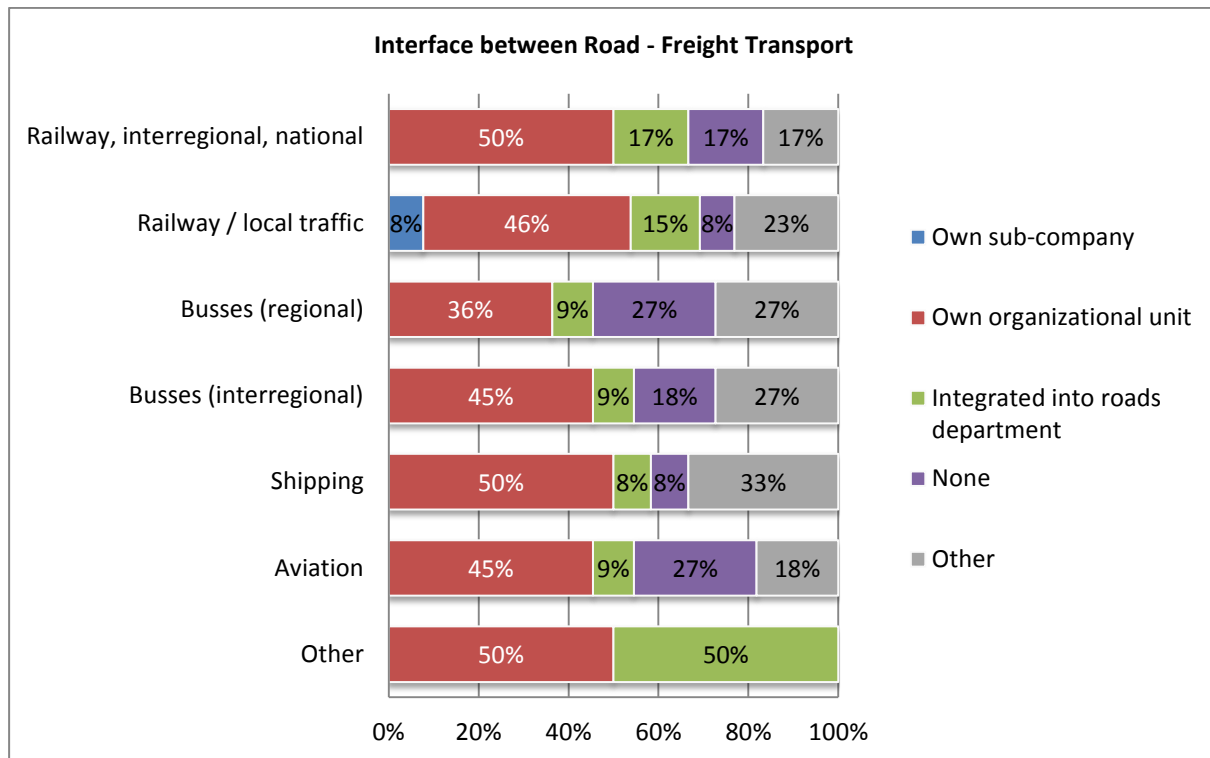


Figure 37: Interface between Road – Freight Transport

The trend of having an separate organization unit for transport modes can also be underscored by the fact that also the **busses** on **regional** level have an own organizational unit with a dominant percentage rate (36%). The remaining proportion, at just over a quarter (27%) each, contains the organizations that have no interface or organizational division. Finally, a very small number with approximately one in ten (9%) have integrated the busses on regional level in the road department.

Turning to the **busses** that operate on an **interregional** level, it appears that more than two-fifths (45%) have a dedicated organizational unit, which represents the main proportion. Actually, the rest of the bar comprises organizations (27%) that have other networks or have no interface or organizational division. These organizations represent almost a fifth (18%) of the total amount. A little percentage rate (9%) is reached by those organizations that have integrated the busses on interregional level into the road department.

Taking a look at the transport mode **shipping**, the decisive proportion consist of half (50%) of the total amount again out of the organizations with an own organizational unit. Further organizational divisions or interfaces are included in the third (33%) of “other” that are not specified networks in the graph. Lastly in terms of proportions we see the organizations that have the shipping integrated into the road department or have no interface at an approximately one in ten ration (8%).

Concerning the interface and organizational divisions of the transport mode **aviation**, the major percentage rate at over two fifths (45%) is reached by the organizations with a separate organizational unit. Followed by the organizations which have no interface or organizational division with a percentage rate of just over a quarter (27%). To conclude, less than a fifth (18%) mentioned also having other interfaces or organizational divisions and one in ten (9%) of the organizations has integrated the aviation into the road department.

What remains to be said is that the proportion of the **other transport networks and modes** reflects particularly the answers given by the French *DIT*. This organization has mentioned another own

organizational unit with the topic “Inland”. Additionally, the American *MoDOT* has integrated the area of barges into the road department.

On the subject of **other interfaces or organizational divisions**, only Belgium (*AWV*) has given information. Briefly summarized it can be said that except from the railway on interregional level and national level having no interface, all other specified transport networks and modes belong to other agencies of the Flemish Ministry for Mobility and Public Works.

By reflecting the total course of the interface between road and freight transport, it becomes obvious that the majority of the organizations have implemented own organizational units for the transport networks and modes. Furthermore, a clear performance is observed against the incorporation of own sub-companies.

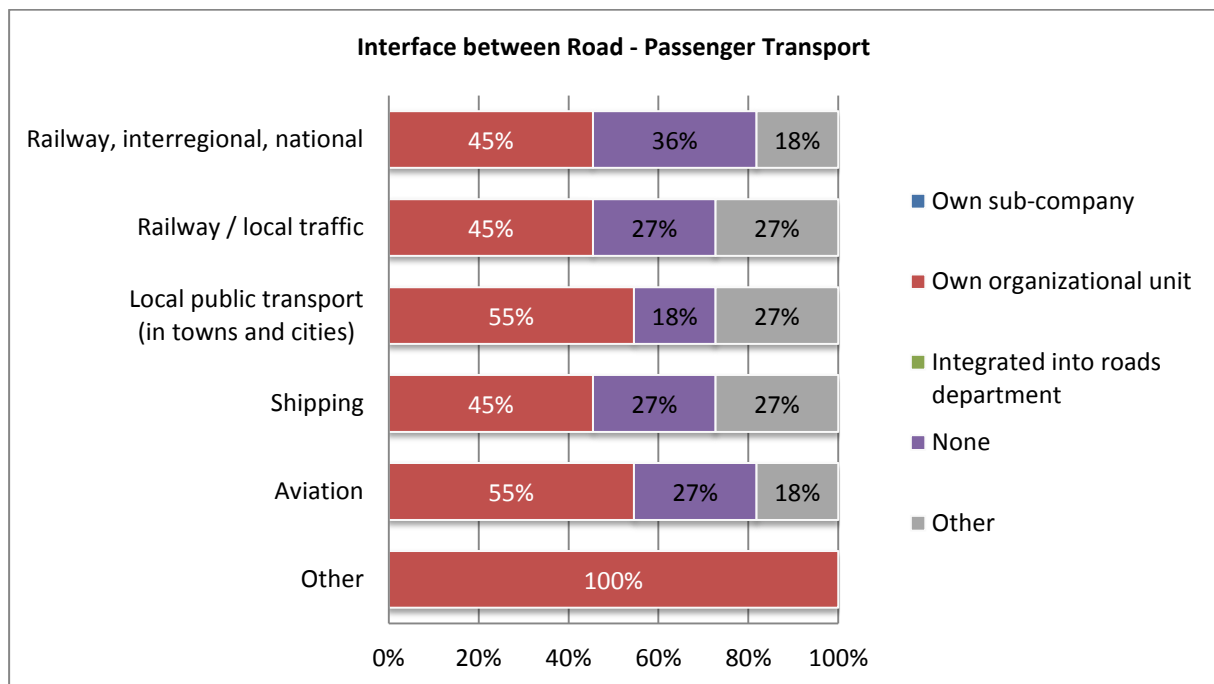


Figure 38: Interface between Road – Passenger Transport

Before continuing with the detailed investigation of **Figure 38**, a distinctive feature should be anticipated. It is interesting to note that concerning the interface between the road and passenger transport, the organizations reveal definitely no behavior in regard of having **own sub-companies** as well as to **integrate** the transport networks and modes **into the road department**.

By comparing the total percentages of the stated interfaces or organizational divisions across all transport networks and modes it is noticeable that the majority of the organizations have implemented a dedicated organizational unit for multi-modal transport activities. In addition to that, it can be said that this majority is followed by institutions which have no installed interfaces or organizational divisions. There are a few more organizations which have established other interfaces or organizational divisions.

Turning to the particular transport networks and modes, it becomes obvious that the organizations have implemented with more than two fifths (45%) the **railway on interregional and national** level through an own organizational unit. The remaining half of the organizations have no interface, representing more than a third (36%), or other organizational divisions with a proportion of less than a fifth (18%).

Likewise, this distribution applies to **railway** and **local traffic**. With a percentage rate of more than two fifths (45%), the majority proportion of the organizations arranges the interface by the implementation of an own organizational unit. The remaining half is splitted into the proportions of organizations that have either no interface or have implemented other organizational divisions. These two possibilities are representing a percentage rate of just over a quarter (27%) each.

By having a look at the **local public transport** in towns and cities it is remarkable that this area is organized with just over a half (55%) by own organizational units. Additionally, just over a quarter (27%) of the organizations has implemented other networks. In addition, less than a fifth (18%) has specified no interface or organizational division.

Due to the fact, that the distribution of the transport mode **shipping** is absolutely identical with that one of the railway sector and local traffic, it is not necessary to explain this field again.

The last mentioned transport mode deals with **aviation**. With for more than a half (55%) this field is managed by own organizational units. Furthermore, a percentage of just over a quarter (27%) of the investigated organizations has no interface and less than a fifth (18%) has other organizational divisions that are responsible for the area of aviation.

Finally, the Hungarian *HTA* has specified **other transport networks or modes**. In this context, they mentioned the field of cycling as its own organizational unit. The British TS mentioned having another transport network as well, but did not name this organizational unit.

The indicated **other interfaces or organizational divisions** of responsibility have only been mentioned by the Belgian *AWV*. As it can be seen by an investigation of the interface between road and freight transport, except from the railway on interregional level and national level that has no interface, all specified transport networks and modes belong to other agencies of the Flemish Ministry for Mobility and Public Works.

3.3.3 The Rationale for Creating a Multi-modal Organization

There can be several different rationales for transport modes to create a multi-modal organization. For this reason, the analysis of the questionnaire survey constitutes the ideal instrument to determine the main causes for this trend. In order to receive a more successful outcome, various pre-formulated answers were offered for the organizations in order to reply the questions. Organizations that did not choose any of these predefined answers, had the possibility to give an alternative response.

The pie chart (**Figure 39**) presents **the rationale for creating a multi-modal organization**. The reasons are represented in the legend of the graph: *strategic leadership and coordination across modes, better use of resources, stronger customer focus, efficiency savings, new organizational culture and values, industrial, supplier relations and other relations*. To be able to compare the individual shares of rationales, the pie-pieces illustrate the individual share of the total (100%). It is possible, that some organizations may have several rationales simultaneously.

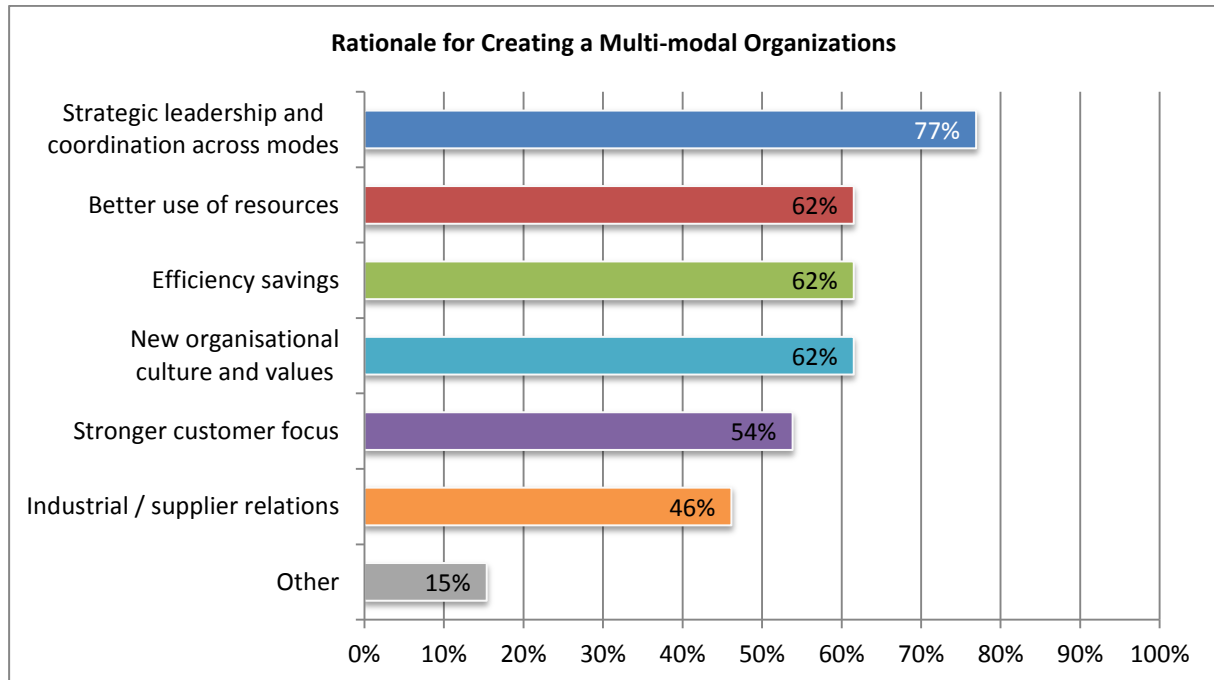


Figure 39: Rationale for Creating a Multi-modal Organization

The major reason for creating a multi-modal organization is for just over a quarter (77%) of the transport agencies, the creation of a strategic leadership and the coordination across the modes. Also important rationales are the better use of resources, the save of efficiency as well as the development of new organizational culture and values, representing a percentage rate of just over three-fifths (62%). Moreover, approximately the half of the organizations wants to strengthen the customer focus (54%) as well as to increase industrial and supplier relations (46%).

A minority (15%) of the transport modes mentioned other reasons for creating a multi-modal organization. In this context, the organization *AWV* in Belgium mentioned a state reform as a rationale and the Spanish *Ministry* indicated historical reasons.

3.3.4 Success of Multi-modal Delivery

In addition to the evaluation of existing multi-modal areas and the survey of interfaces or organizational divisions between transport networks and modes, the organizations have been investigated regarding their achieved success in the area of multi-modal delivery since the establishment of the organization.

In Australia the *NSW* has published in its early stage of development (established November 2011) a **Long Term Transport Master Plan** which sets out a strategic direction for transport infrastructure and planning across all modes within the *NSW*. Similarly the Belgian *AWV* achieved the **integration** of the **bicycle paths** along the roads. Turning to the Canadian *MTQ*, the organization describes its achieved success by the accomplishment of **policies on transit, air, marine and trucking**. In Spain the *Ministry* is managing successfully four **independent transport modes**. Turning to Finland (*FTA*), there is no more arguing in public about **allocation of resources** among **various modes** and they mentioned that their enhancement is still in process. In Japan (*MLIT*) the **development of interdisciplinary plans** and **the necessary implementation**, covering various modes of transportation (**roads, rail, roads, ports, or aviation**), has become easier. These plans include so called **priority** programs in regard of social infrastructure. Finally, the multi-modal operation of the American *MoDOT* is responsible for **supporting alternative transportation programs** within the

state. The division serves to continue the **advancement and strategic planning for aviation, rail, transit, waterways, and freight development** initiatives designed to expand Missouri's **infrastructure and facilitate travel and commerce**. This is done through the integration of various modes, **traveling public** enjoys **greater accessibility to the resources** of the state while **industry capitalizes** on improved transportation efficiencies.

Summarized, there is a quite large range of examples for multi-modal deliveries. For example the field of strategic and interdisciplinary planning, as well as the allocation of resources. With regard to the ministries it can be said, that they are successful in the enhancement of policies and managing of the transport modes. Alternative transport programs and the integration of bicycle paths have also been handled successfully by the organizations.

3.4 Part 3 – Proposals, Plans and Discussions for Future Change

The third and final part of this chapter presents not only the results of further proposals, but also shows plans and discussions for future changes.

In order to learn about those things, the questionnaire survey provides data about current strategies for a future development of the organization. In detail the presentation of the following chapter shows the particular strategies and the levels of responsibility on which they are discussed and carried out. In addition, the considerations on structural development of the organizations especially concerning multi- and intermodal activities are summarized.

To discuss the importance an evaluation of possible enhancement strategies follows. This evaluation reflects on the one hand the expected benefits of the planned changes and describes on the other hand discussed disadvantages or challenges.

3.4.1 Current Strategies for Future Development

As already mentioned, in addition to the determination of the present situation, it is an important objective of this thesis to suggest future developments. In order to base this requirement, it is necessary to draw conclusions of possible organizational reactions regarding current developments and requirements of transport infrastructure organizations.

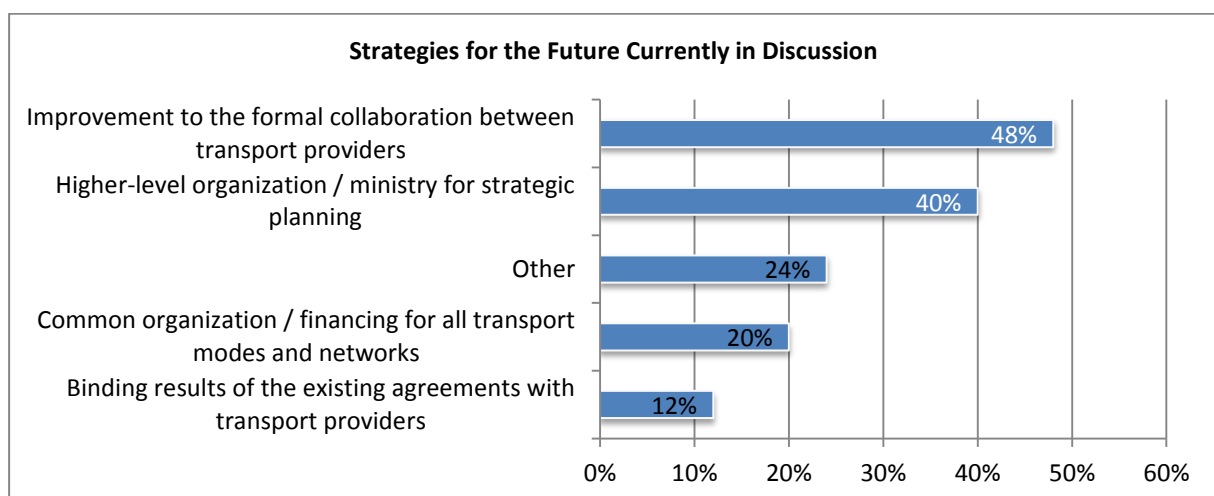


Figure 40: Strategies for the Future Currently in Discussion

Within the bar chart (**Figure 40**) the **current discussed strategies for the future** are contained. To define the scope of the theme, the specified strategies in the questionnaire survey are: *Improvement to the formal collaboration between transport providers, higher-level organization – ministry for strategic planning, other, common organization – financing for all transport modes and networks and binding results of the existing agreements with transport providers.*

Almost half (48%) of the surveyed organizations, discuss the strategy of improving the formal collaboration between the transport providers. Also very relevant for the organizations, with a percentage of two fifths (40%), is the possibility of having a higher-level organization or a ministry for the area of strategic planning. A fifth (20%) of the transport modes voted for the strategy of an implementation of a common organization with the financing for all transport modes and networks. Finally, with a percentage rate of just over one in ten (12%) come the organizations that see their future with binding results of the existing agreements with transport providers as a current strategy.

Additionally, nearly a quarter (24%) of the surveyed organizations mentioned other strategies for the future that are in discussion and described below:

The Austrian organization *ASFINAG* specifies that there are discussions about establishing an infrastructure agency to summarize all infrastructure organizations together. However, these ideas represent informal debates with no official status. In addition to that, some politicians and the *ÖIAG* (public shareholder agency) think that the adoption of this proposal form is not expected at the moment. In Australia the developments have already been carried out. The *MRWA* noticed that they have undergone a change and that no further reorganization processes are proposed at this time. Another method is suggested by the Belgian *AWV*. They indicate a state reform for the transfer of power from the national to the regional level as a current strategy. At the moment the Canadian *MTQ* is creating a transport agency with the objectives of strengthening the state expertise, in a context where the state seeks to curb collusion and corruption in the construction sector with the desire to focus activities on a well circumscribed mission: the management of road infrastructures. The French *DIT* mentioned the creation of a railway committee that drafts a bill to make the dialogue between the stakeholders easier. In addition to that, the organization wants to improve coordination between the different transport organization authorities regarding the possibility of decentralization. In Hungary they do not have any specific strategy yet, but the *ÁAK zrt.* performs feasibility studies and surveys on possible pilot applications about multi-modal route planning tools. In contrast to that, The South African *SANRAL* noticed two points as a strategy for the future. First, they mentioned the implementation of the national development plan which is released by the presidency. And secondly, they want to establish that the Department of Transport has the oversight of activities of the individual organizations and coordinates them.

Related to the obtained data of current discussed **strategies** for the future, the bar chart below (**Figure 41**) represents the **level** on which the organizations consider them being carried out.

On the vertical axis we can see the same present strategies as in the previous diagram. It is also clearly evident where the discussions take place (*legislature level, ministry, public debate / media, internally within the organization, and further stakeholder*). Furthermore the horizontal bars distinguish between the three levels national, regional and local. Depending on which level the organizations discuss the strategies, the shares of the bar reflect that.

The shape of the graph shows at a first glance a general balanced distribution of the discussed strategies on the three levels of all areas. But on closer inspection, the percentages of the national levels dominate a bit and there is rather less discussion on the local level.

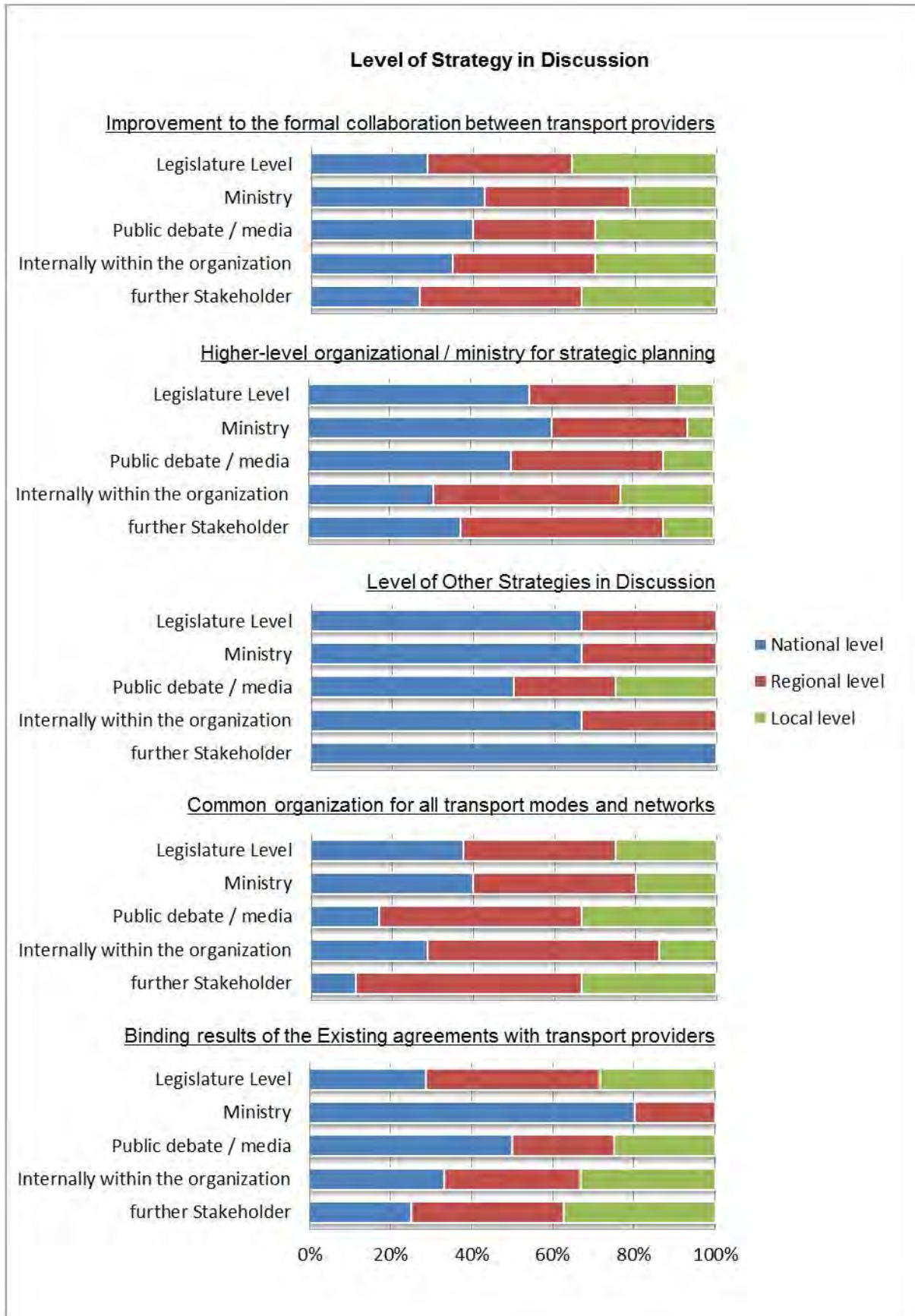


Figure 41: Level of Strategy in Discussion

In order to complete the relevant information about the current strategies for a future development, the next pie chart (**Figure 42**) illustrates the **considerations** of the organizations **on structural development** especially concerning multi- and intermodal activities.

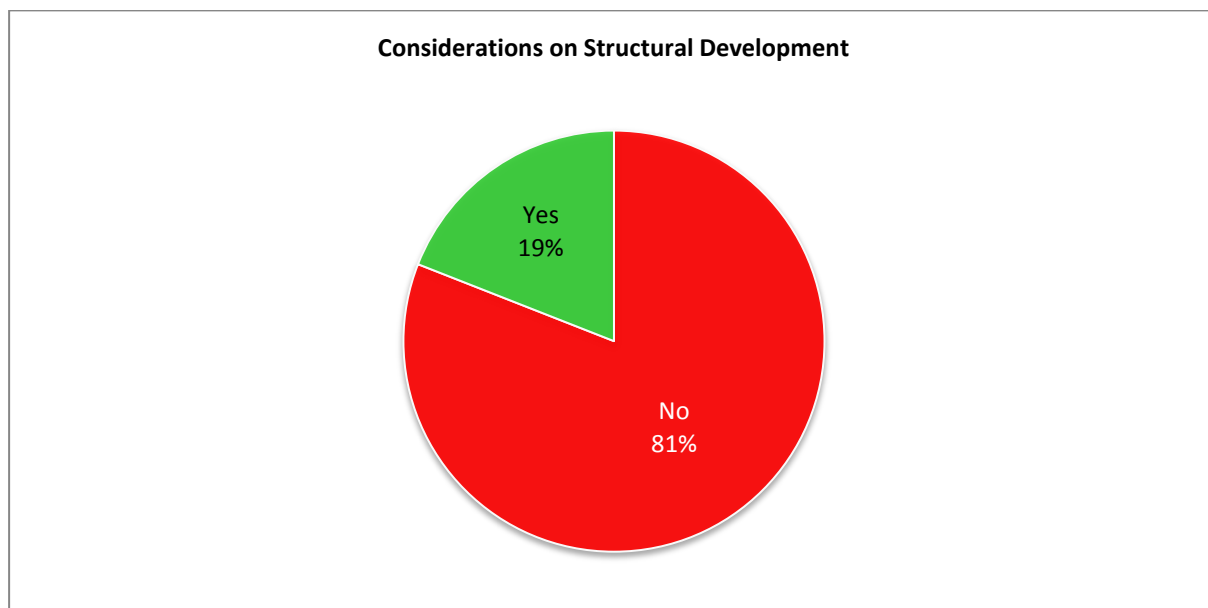


Figure 42: Considerations on Structural Development

On the basis of the graph it is obvious that four-fifths (81%) of the organizations do not take structural development into consideration. As parts of this percentage rate the organizations *VicRoads* from Australia as well as *MTQ* from Canada can be mentioned. Both of these organizations have indicated that they already have accomplished a structural development. The second one adds a more detailed explanation and describes that they have created a planning department in the last year amongst various administrative reorganizations of the ministry.

As a consequence the last fifth (19%) of the organizations have some considerations on a structural development. Two transport modes consider a reinforcing of the interface regarding the railway sector. In particular the Finnish transport organization *ELY* is having the ongoing discussions whether the road authority should be more involved in the railway operations or not. In addition, the Hungarian *HTA* is planning a department for railway transport which is going to be expanded for a better coordination. They are also planning project teams to be established for multimodal activities. Turning to another consideration, namely structural development, the Malaysian organization *PWD* is going to strengthen their capabilities plus their human resources. To complete the evaluation of structural developments which are currently under discussion regarding multi- and intermodal activities, the Australian *MRWA* responded also that they take a restructuring of the organization into consideration even though they did not give further information.

Areas for Implementation of Concrete Plans

Based on this information the organizations were asked whether these considerations on structural developments were already concrete plans or just ideas. The analysis of this question shows for all four organizations a clear result of one hundred percent for having a specific concept. Moreover, the areas and further tasks for these plans are interesting and should receive more detailed consideration. The Australian *MRWA* explained that their change in regard of the structural situation includes the possibility of managing more infrastructure delivery by themselves. Specifically, the organization is very likely to move into the project management of delivery and maintenance of work for other agencies. Actually, small steps have been made already in relation to maritime services but this is in the context of recreational boating, launch ramps and so on and does not include the fields of ports and shipping. The Finnish organization *ELY*, which is going to involve the road authority more in railway operations, states that it has not been fixed yet but the railway law will be revised in the near future. In Finland the plans show a centralized responsibility of handling the compensation requests for damages which are carried out by the transport organization. In addition to this, the transport mode considers that this evolution might be a starting point for a larger structural development. The Malaysian transport organization *PWD* is going to upgrade their structural position for the correct implementation of the plan to strengthen their capabilities and human resources. Only the Hungarian transport mode *HTA* did not give further information for their plan regarding the installation of a railway transport department within their organization.

To draw the analysis of the current strategies for future development to a close, the next two pie charts (**Figure 43** and **Figure 44**) demonstrate the **start** and **completion of implementation of the present plans** which have been treated in the previous presented data. The statements were the response options, chosen to offer an indication of time required to complete: *in the current year*, *in the next year*, *in the next 3 years* or *not yet fixed*. The second diagram shows the time of completion of the implementation. For this figure, the classification is expanded to include the option *in the next 5 years or later more*.

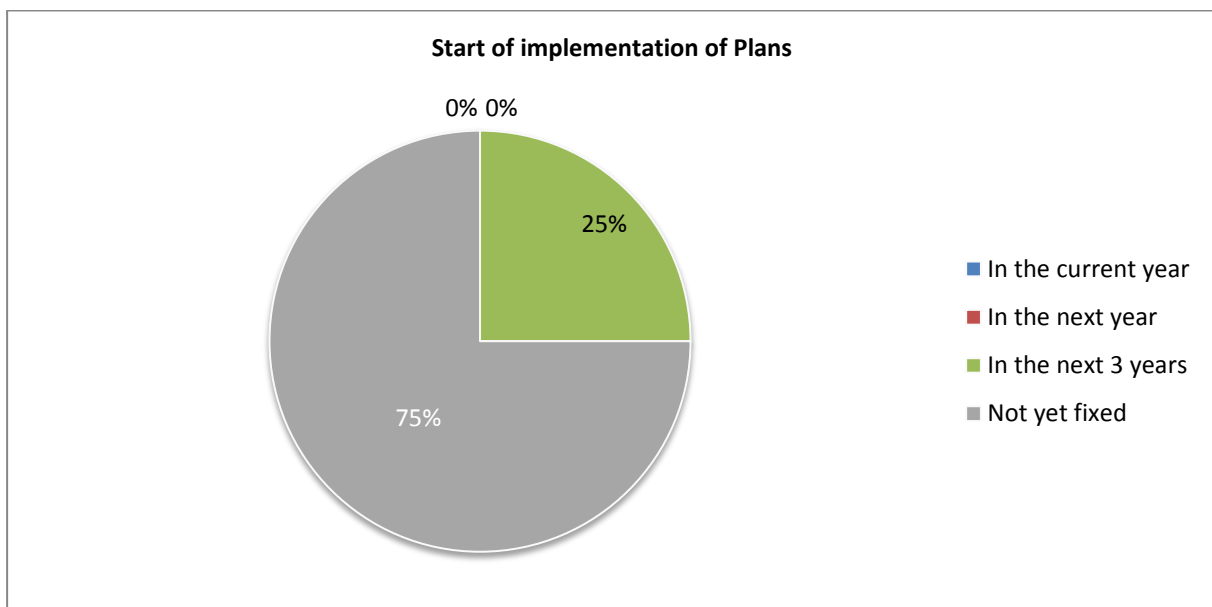


Figure 43: Start of Implementation of Plans

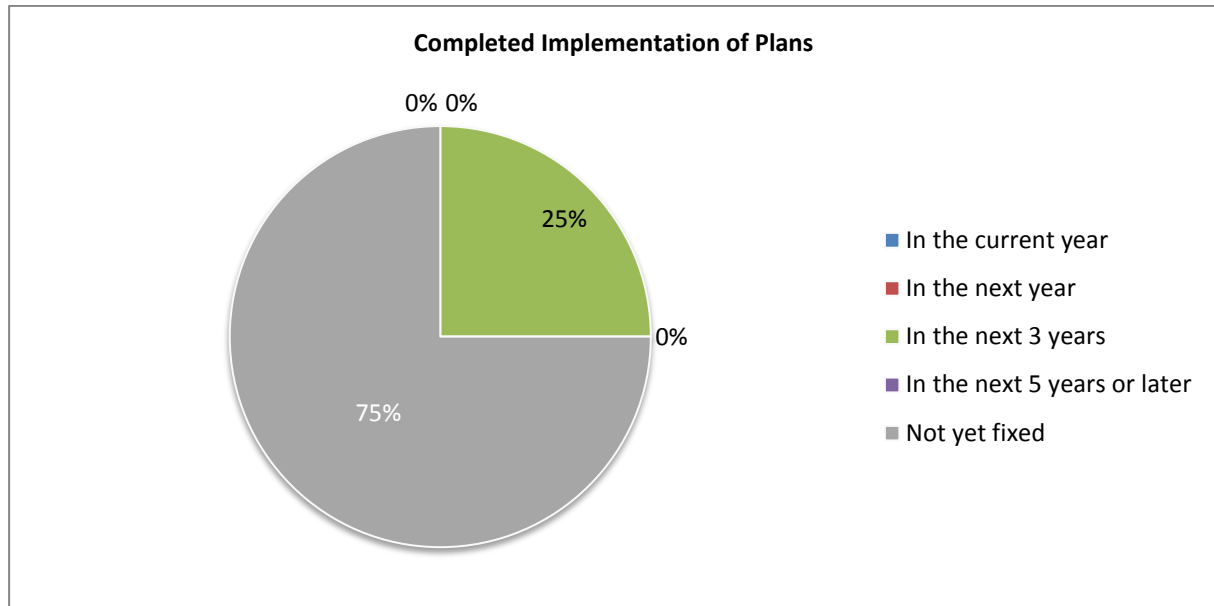


Figure 44: Completed Implementation of Plans

When taking a closer look at both of the graphs, a similar distribution is evident. Both diagrams show that a quarter of all organizations that has already considered concrete plans and will start and complete their plans within the next three years. In both graphs the percentage shows the Australian transport organization *MRWA*. The remaining three-quarters (75%) show the results of the other three transport modes that have not yet fixed a date for their implementation of concrete plans for a structural development.

3.4.2 Evaluation of Possible Enhancement Strategies

To get feedback about the estimated consequences of these possible enhancement strategies, the organizations have been interviewed about their expectations in detail. In this case the primary focus has been placed on the **expected benefits from the planned changes** as well as on the **discussed disadvantages and challenges**.

Expected Benefits from the Planned Changes

The Australian organization *MRWA* mentioned that the benefits to be derived from better outcomes and arising from project and contract management skills and capabilities in the road agency are the most pronounced ones, compared to the capability in other agencies. Similarly the Finnish *ELY* noticed that their transport system planning will make it more effective and more customer orientated. It would also allow for better resource allocation and better synergy within the administration (communications unit, human resources etc.). The Hungarian *HPR* expects a better collaboration between transport providers in the field of informal exchange. For the other Hungarian organization, *HTA*, the benefit is to be determined in accordance of a better use of resources and the change in strategic leadership. The Malaysian *PWD* expects benefits, a better focus and client oriented service is going to be their specific advantage. Last but not least, the American *MoDOT* feels the benefits of installing of freight hubs connecting rail and barge and trucks movements will reduce shipping costs and promote economic development. Furthermore, the transportation hubs will connect travelers to transit, rail and air services which will in turn reduce travel times, congestion and fuel consumption.

Discussed Disadvantages and Challenges

The Australian organization *MRWA* thinks that the only disadvantage is the challenge around managing the prioritization of delivery of works. For the Finnish *ELY* resources in the form of people and financial means are scarce capacities. Accordingly they indicate the risk for low deliveries. Due to having worked for several years using their own resources, without any cooperation between different transport modes, the result would be competition for these resources. The Hungarian *HTA* worries about the additional costs within the organization as well, as it is likely they will have a more complex decision making process, will complicate matters further. The Malaysian organization *PWD* indicates that by implementing their strategy, they will win more contracts and trust from the client, although the challenge for them is to involve foreign projects. As multi-modal hubs can be expensive to construct and operate, the American *MoDOT* is concerned that they will need private companies to invest in joint facilities as well as the challenge of convincing automobile users to consider other forms of transport.

3.4.3 Other Comments

The Finnish transport organization *FTA* mentioned in closing that they were founded in the year 2010 and have since been reorganized two times. As such, their current organization was established in July 2013 and so they have no further plans for changes in the immediate future. *SANRAL* added final comment, stating that the government of South Africa believes that organizations with specific and focused mandates perform well and are able to provide better levels of service.

4 Analysis of the Results and Summary

In order to put the gathered and presented data of the previous section in place, this chapter deals with a detailed analysis of the results and provides a summary regarding this information. To do that, the in the beginning formulated hypotheses are used and examined in terms of their accuracy. Specifically, this investigation includes a presentation of the topic divided into organizational forms of single- and multi-modal. A further classification shows a division of these single- and multi-modal organizations into the individual spatial scales (local, regional and national).

Finally, a conclusion is made in order to summarize and reveal best practice examples of the learned lessons.

As stated in the above presentation of the results in detail, the percentage rate specifies a balanced distribution between the infrastructure organizations that are only responsible for the area of road (single-modal) and the organizations that have their field of actions over several transport modes (multi-modal) within this analysis.

4.1 Single-modal Organizations

As already mentioned, single-modal organizations are pure road infrastructure companies, which are focused with their fields of activity and area of responsibility generally on three main core areas: operation, construction and maintenance. A small number of these organizations have further areas of responsibility which cover the fields of planning, financing, tolls and safety.

Regarding the institutional shape in which the organizations are embedded, three fifths of the surveyed single-modal organizations have mentioned an environment existing for more than ten years. For another fifth of the organizations this statement applies for the last two to ten years and for the rest it was not possible to give a response on this question.

By examining the political responsibility, it is apparent that two thirds, the majority of all single-modal organizations, are responsible for the whole infrastructure area. The organizations ranked second, are those which have their field of activity in the areas of transport and road. Therefore, each of these responsibility areas show a proportion of two fifths. Only a quarter of the organizations are active in the railway sector and almost a fifth is responsible for the shipping traffic.

Among the participants, the main focus of single-modal organizations with regard to the relevance of interfaces to other transport organizations lies clearly on roads at a national, regional and local level. Distance long way behind that, lie busses and railway traffic on an inter-regional and national level and these are only of importance for approximately half of the road infrastructure companies. Metro and trams, the railway sector on local level and the shipping and air traffic are placed far behind in the statistical evaluation. As a result, these areas are classified as being relevant for only a minority of the organizations.

Politics and administration as well as internal stakeholders represent a significant relevance for single-modal organizations. Followed by the areas of media, customers, transport modes and infrastructure operator which are important for approximately one half of the organizations.

By way of a brief reflection of the preceding analysis, the majority of the single-modal organizations mentioned the implementation of information systems for costumers as a measure regarding intermodal activities. Formal and informal contacts and the use of joint planning and design have also been pointed out in this context.

For two thirds of the single-modal organizations the area of responsibility for multi and intermodality is a defined subtask of an existing department. In comparison to that, only one third has put the responsibility on a particular person and almost a fifth has installed an own department for this purpose.

In regard of a future development, one third of the interviewed single-modal companies mentioned an improvement to the formal collaboration between transport providers and another third specified other strategies. With a proportion of one quarter follows the idea of an implementation of a higher-level organization or ministry for strategic planning. A small minority sees the common organization and financing for all transport modes and networks as a possibility for a further future development. Additionally, it can be noted that nobody wants to assume binding results of the existing agreements with transport providers.

4.1.1 Local

When having a look at the formulated hypotheses and the subsequent results, it becomes obvious that the expected situation occurs: there are no single-modal organizations operating on the local level.

4.1.2 Regional

The situation looks a bit different with single-modal organizations working on the regional level. Contrary to the expectations, the two Australian transport modes (*MRWA* and *VicRoads*) as well as the Finnish *ELY* and the Romanian *RNCMNR* represent the few road and transport organizations that are responsible for the regional level. It should be said, the Australian *VicRoads* as well as the Romanian *RNCMNR* also operate on the national level.

Apart from the Australian *VicRoads* and the Finnish *ELY*, which have their political responsibility on local and regional (*VicRoads*) or only on the national level (*ELY*), the political areas of responsibility of all other organizations are situated on regional level.

The following section explores the responsibilities of multi- and intermodal issues within the organizations. The Australian *MRWA* indicates two main areas concerning the responsibility of multi- and intermodal issues, which are a long term planning in addition to the existing network and retrofitting solutions. For both of these areas the Chief Executive Officer is responsible. When having a look on the other Australian organization, *VicRoads*, the responsibility of multi- and intermodal issues rests with the Executive Director, the Chief Operating Officer and the Chief Executive. Moreover, there are several business areas in charge that see the administration as a part of their function. Within the Finnish transport organization *ELY*, the head of planning unit and the director are the persons responsible for these issues. Consequently, the result reveals an allocated responsibility of multi-modal issues on already in the organization existing functions.

Only the Australian *MRWA* has the funds of its own budget for multi-modal issues. This budget is used for the area of long term planning and sits at third tier from the Chief Executive Officer of the organization.

Implemented intermodal measures with external organizations or transport providers are apparent in Australia. The organization *MRWA* puts measures for the public transport authority in place and the logistic companies are also using state owned rail infrastructure. The measures of *VicRoads* also belong into the fields of bus and tram. In addition to that, the organization has activities and projects for cycling in the area of public transport.

4.1.3 National

As predicted, a significant proportion of the organizations, that are responsible for individual transport modes, operate on the national level. These organizations are the Austrian *ASFINAG*, the Australian *VicRoads*, the German *BMVBS*, the Hungarian *ÁAK zrt.* in addition to *HPR*, the Italian *ANAS S.p.A.*, the Lithuania *LRA*, the Romanian *RNCMNR*, the American *FHWA* and the South African *SANRAL*.

Apart from the already mentioned Australian organization *VicRoads*, all political responsibilities are located at the same level (national).

Turning now to the responsibility of multi- and intermodal issues within the organization, the Austrian organization *ASFINAG* starts by demonstrating an example. The aforementioned issues are performed in Austria as a sub-task of a department that is responsible for the technical coordination of the companies within the organization. In Italy, the Transportation Planning Office of the Design Direction of the *ANAS S.p.A.* is in charge of intermodal issues and handles this field of action with a budget of 300,000 euro per year. In America (*FHWA*) some issues are coordinated by the Office of the Secretary of Transportation in addition to others which are handled by direct cooperative relationships among mode specific entities. Due to the fact that the organization *VicRoads* also operate on the regional level, the responsible functions for intermodal issues have been already explained in the section above. Concluding with the Hungarian organization, the *ÁAK zrt.* has no responsible person implemented for multi- and intermodal issues. Apart from the obvious exception of the *ÁAK zrt.* and the organizations that have given no response regarding this topic, it seems that the transport modes handle the multi- and intermodal issues as integrated sub-tasks of already existing functions. In addition to that, they have no own budget for these activities. An exception is provided by the Italian *ANAS S.p.A.*

For the Austrian *ASFINAG*, the focus for intermodal measures lies on the railway-provider (ÖBB). Moreover, there are measures in place with the federal states and communities for regional and local road transport modes. In Italy the *ANAS S.p.A.* is engaged in the preliminary design of the project Rome City – Fiumicino Airport, which deals with an integrated transport system for the improvement of the airport accessibility. This scenario is predicted for the year 2020. Finally, the American organization *FHWA* sets measures through the arrangement of a formal advisory group for freight issues. Thereby the advisory committee is made up of freight experts and stakeholders.

4.2 Multi-modal Organizations

Multi-modal organizations can generally be found in the areas of responsibility for planning and maintenance. Additionally to these mentioned main tasks, around half of the organizations are also involved in the fields of construction and operating.

The statistics shows that a significant proportion of the largest network sizes belong to multi-modal organizations. Although with the American *FHWA* the largest network is placed by far a single-modal organization. This refutes the hypothesis that larger networks (road, rail, other) are operated by single-modal organizations.

By reflecting the establishment of the environment within multi-modal organizations, an almost equal result to the single-modal organizations can be identified. Three fifths of the surveyed multi-modal organizations have mentioned occurring in the same form for over ten years. The rest of the organizations have been established within the last two to ten years and almost one tenth mentioned their implementation being carried out in the last two years.

When one looks at the statistics, it becomes obvious that the combined responsibility of the political body for the whole infrastructure applies as a relevant proportion. In order to obtain a result regarding the corresponding hypothesis which indicates that multi-modal organizations rather exist in countries or areas where the political responsibility (e.g. Ministry) is combined overall the infrastructure, it is necessary to take a closer look on the transport modes separated into single- and multi-modal organizations. According to that, there is no distinctive difference obvious. In fact, there is a balanced distribution for the responsibility of the political bodies on the overall transport with having a proportion of three fifths each. As a consequence, it can be stated that this drafted argument is incorrect. In comparison to that, the transport area seems to be a deciding factor for the organizations. A significant proportion, at one in ten of the multi-modal transport organizations, which is more than the percentage rate in the area of the overall infrastructure, gives the response that their political body is responsible for the field of transport. It has to be mentioned that this percentage rate is significantly higher than that of the single-modal organizations. A further field of activity of the political body is the road for approximately two-fifths of the multi-modal organizations. Finally, the areas rail and waterway are ranked both with less than a fifth, therefore in last place with regard to their importance.

Concerning the interfaces to other transport companies, multi-modal organizations show a high relevance to all transport modes. In detail, it can be stated that the interfaces to the area of road on national, regional and local level and to the railway sector on interregional, national and local level as well as to shipping traffic, are of great importance. Also very relevant for the organizations are the interfaces to busses on interregional and regional level and to air as well as metro and tram traffic.

For multi-modal organizations all stakeholders dealt with in this thesis are of great relevance. So, it can be recognized that internal stakeholders as well as politics and administration are by far the most important ones. Just as significant is the relevance of the transport modes and operators, of media as well as of the customers.

In order to cope with the measures regarding intermodal activities, a significant proportion of the multi-modal transport modes apply organizational measures, technical information systems for customers, joint planning and design and have their own plans of action. Further implementations are formal and informal contacts in addition to an analysis of the stakeholders.

By having a closer look, it can be recognized that three fourths of the multi-modal organizations have implemented multi and intermodal measures as a subtask within an existing department. Furthermore, there are some organizations which have installed a responsible person or specific department for this purpose by taking about another fifth of the total each. For the sake of completeness of the results, it

should be mentioned that in one case the approach to implement a responsible person as well as to establish an own department for multi-modal issues, failed.

Concerning the installed plans of action, there was no significant measure mentioned by the organizations. Half of the multi-modal organizations stated that these activities were not binding, for the other half the measures are binding and are used for a coordination throughout the organization or as organizational plans.

Just over the half of multi-modal organizations are responsible in the areas strategic planning, project planning and construction. The remaining proportion can be attributed to all other specified areas as financing, maintenance, operation and management.

The strategic leadership and coordination across all transport modes, represent about three fourths of the participant multi-modal organizations the essential reason for the development of their organizational form. Other motivations are the better use of resources, efficiency savings und new organizational culture and values. These reasons have reached three fifths each by the participating multi-modal organization.

For three fifths of the surveyed multi-modal organizations the improvement to the formal collaboration between transport providers represents a possible essential strategy for a future development. In addition to that, almost more than the half has mentioned a higher-level organization or ministry for strategic planning as an opportunity. The other strategies including a common organization and financing for all transport modes and networks, binding results of the existing agreements with transport providers as well as other strategies have been mentioned by only one quarter of the participating multi-modal organizations. This picture reflects the results of the single-modal organizations, however the agreement of multi-modal organizations is about twice as high.

4.2.1 Local

With the Swedish *Trafikverket* only a very small number of organizations is responsible for the local level of the spatial scale. Accordingly, the assumption which states that the operating organizations across all transport modes (multi-modal) are rather in action on local and regional levels is not true for the local level. Actually, the Swedish *Trafikverket* is responsible for all the spatial scale and the political body is located on the national level.

4.2.2 Regional

In both theory and practice, the same situation occurs. The regional area is represented by the Australian *NSW*, the Belgium *AWV*, the Canadian *MTQ*, the Spanish *CF – JE*, the Swedish *Trafikverket* in addition to the American *MoDOT*. It can be stated, that the hypothesis which says that multi-modal organizations are rather in action on local and regional level, is true for the regional level. Although, this proportion does not represent the majority of the multi-modal acting transport organizations.

Furthermore, all organizations have their political responsibility at the regional level. One exception is provided by the Swedish *Trafikverket*, which is operating on local, regional and national level and has its political field of competence situated on the national level.

With regard to the interfaces to other transport providers, it can be said that for a very large majority of the on regional level operating multi-modal organizations all of them are absolutely relevant. Moreover, the Spanish organization *CF – JE* shows a remarkable result. This organization is the only one of all transport modes working on regional level that has a political body which is exclusively

responsible for the road. Consequently, the result shows that the organization is just focused on interfaces with transport modes for road on local and regional level.

When we analyze the measures that are in place with other organizations or transport providers, it can be seen that the Australian *NSW* is connected with federal agencies, private organizations and New South Wales transport agencies. This collaboration is based on a range of infrastructure projects that support intermodal activities. Moreover, the Belgian *AWV* is focused with their measures on the public transport, by improving the flow on regional levels through busses and trolleys. In addition, they are expanding the functional bicycle path network. In Canada (*MTQ*) there are many financial assistance programs with the objective to help the private sector in place. Stakeholders should be motivated to start projects in order to reduce greenhouse gas emissions for freight and persons. The Finnish *FTA* is taking in place measures with the municipalities, the regional government, the railroad and bus companies as well as the harbors and ports.

4.2.3 National

Against the expectations, a large number of multi-modal organizations are also operating on the national level. In detail these are the following transport modes: the Spanish *Ministry*, the Finnish *FTA*, the French *DIT*, the Hungarian *HTA*, the Japanese *MLIT*, the Malaysian *PWD*, the Swedish *Trafikverket* as well as the British *TS*. In this respect, the result indicates that the previous view of the hypothesis is accepted with reservation.

Thereby, it can be seen that also the political responsibility of all organizations is situated on the national level.

In detail, half of the multi-modal organizations that act on a national level have a very high relevance of the interface to other transport providers. In comparison to that, the other half provide a very mixed measure of the importance of the interfaces. In this process, the most interesting finding is recognized by the analysis of the Malaysian organization *PWD*. Compared to the other transport modes, this organization has installed a policy authority that is only responsible for the road sector. This is in this case also the expected reason for the obviously severe weakness of the interfaces to other transport modes. Due to the fact that the remaining transport organizations have been just established within the last two to ten years, it is possible that the weakness of some interfaces is based on this fact.

Turning to the implemented multi- or intermodal activities and projects with external organizations, it has been pointed out that the French *DIT* finances multimodal platforms and puts in place carpool areas in addition to car and bus stations alongside the railway stations. This measure is developed in cooperation with the concessionaires. Further measures are the creation of the AFIMB (Agency for Multimodal Information and Ticketing) within the regions and municipalities. In addition to that, there are different activities with the transport organization authorities (municipalities and the organizing authority of public transport of the Ile-de-France - STIF) in place. In Hungary the organization *HTA* provides information exchange between transport service providers as well as road and railway operators in the framework of the KIRA development, which represents an information system and database. Further activities include the development of GIS tools (geo information systems) and applications. In Japan the *MLIT* is operating with the local governments or rather public transportation business operators. To conclude with the summary of the existing activities of the national transport organizations with externals, the Malaysian *PWD* mentioned to have measures in place with a few of organizations and transport providers: Ministry of Finance, Economic Planning Unit, Implementation and Coordination Unit, Ministry of Transport, Road Transport Department, Malaysia Airport and Port Authority.

4.3 Conclusion and Lessons Learned

The aim of this thesis is to provide a detailed analysis of road- and transport infrastructure organizations in regard of multi- and intermodal activities. With the help of a questionnaire, the hypotheses put forward at the start of the preparation of the study has been examined to ensure their accuracy. In this international survey 25 organizations from a total of 18 different countries have participated.

To ensure completeness, the chronological order and the evaluated areas of the analysis are described once more. The hypotheses were tested in connection with the surveyed data covering general frameworks like the organizational jurisdictions, tasks and responsibilities, political control and accountabilities, institutional arrangements and their establishment as well as key organizational data. Furthermore, multi-modal activities and the interactions between modes, functions, spatial tiers and stakeholders have been requested. With regard to multi-modal organizations, interfaces and organizational divisions, the rationales for creating as well as their success have been examined in detail. This study concludes by pointing out proposals, plans and discussions for future change in regard of current strategies and their evaluation.

Based on the questionnaire survey originating from the hypotheses, the general results have been presented in the previous chapter. The data of the suggestions has been subsequently separately prepared for single- and multimodal organizations. On this basis, the following summary thus reflects the elaborated results and represents the final part of this thesis. The preparation of this résumé is broken down in the areas: **context, interaction between modes, functions, spatial tiers and stakeholders, multi-modal activities und organizations and proposals, plans and discussions for future change**. In addition, multimodal activities with well-functioning interfaces, systems, activities or projects are reflected and are rounding off the topic in **lessons learned**.

Context

Based on the point of view that general conditions (policy, networks and finance) influence the activities and developments of the organization, the relating data has been collected by the use of a questionnaire and consequently examined in detail.

In general terms the data concerning this context can be divided up into the following areas: current organizational jurisdictions, tasks and responsibilities including key organizational data and political control and accountabilities.

Current Organizational Jurisdictions, Tasks and Responsibilities Including Key Organizational Data

The results expose, that around half of the investigated road and infrastructure companies appear as single-modal organizations and the other half performs as multimodal ones.

The general tasks and responsibilities of single-modal organizations include operation tasks, construction works and maintenance services. In contrast to that, multimodal organizations are mainly involved in the planning and also in the area of maintenance. Therefore it can be said, that approximately half of the investigated organizations are additionally responsible for operation tasks and construction works.

The organizations have been also surveyed in regard of their spatial area of responsibility (local, regional and national). On the basis of the established thesis, that organizations involved in multimodal activities on the transport sector are likely to operate on the local and regional level, it turned out that this is only one part of the truth. The surveyed multimodal-acting organizations are

working mainly on national and regional level. Thereby, the distribution shows a balanced picture in regard of the appearance.

In addition, it was suggested that organizations with a responsibility for just one transport mode operate on the national level. The review of this hypothesis has shown that this corresponds to the truth for the most part. The results of the single modal organizations show a clear trend towards performing on national level, whereby some single modal companies can also be found on the regional level.

With regard to the differences of the network size (road, rail and others), there is no significant tendency towards one organizational form. Larger networks are operated by single as well as multimodal organizations. With this result the hypotheses that larger networks are operated by single modal organizations is disproved.

In order to get a comprehensive picture of the infrastructural starting position, the organizations have been asked to classify the current institutional structure of their country with the help of a matrix. This reveals whether the primary responsibilities like planning (in regard of strategy and projects), operation, maintenance as well as the financing issues are performed by governmental, state entities or private organizations. Furthermore, it can be seen on which spatial area of responsibility they are situated. What remains to be said, is that the classification includes the entire spectrum of transport modes: road, rail, water and air.

Looking at of the establishment dates, it can be noted that three fifths of the organizations have been in existence in its form for more than ten years. In addition to that, it can be seen that two fifths of the multi-modal organizations and one fifth of the single-modal organizations have been established in the last ten years.

The examination of the organizational indicators provides very different results regarding the invoked amount. A very significant outcome is noticed in the areas of operation and maintenance. In these two fields of activities a higher number of employees can be recorded. Hence, it can be concluded that many organizations are responsible for the implementation of these areas by themselves. In contrast to this result, the figures in the areas of planning and construction reveal, that they are mainly done by external service providers. In this case, the organizations are generally involved in the fields of strategic planning, project management and controlling and the other mentioned areas are outsourced.

Political Control and Accountabilities

As well as the general conditions the political controls and responsibilities have also a great influence on the activities of the organizations. The results show a nearly identical distribution of competence on the political and infrastructural level. In addition to the political control, almost three quarters of organizations have another supervisory authority.

The hypothesis announced at the beginning, that the influence of political controls (for instance ministry) and the settlement of multi-modal organizations in countries or areas with an overall political responsibility for all infrastructural issues, has not been justified. The results of the survey show an almost balanced distribution of the political responsibility for the whole infrastructure for single- and multi-modal organizations. As can be seen when having a look at these findings, these organizations represent three fifths of the total amount.

A trend can be noticed with regard to the political responsibility of multi-modal organizations. With seven tenths their competence concentrated on the transport sector. This share comprises only two tenths of single-modal organizations. This percentage rate represents the same distribution as it can be seen for both organizational forms for the responsibility of the area road.

Almost three quarters of the organizations mentioned to have an additional supervisory authority. This confirms the assumption, that there exist some control tasks of the political responsibility which are outsourced to other organizations. As a consequence, these supervisory authorities can have a great impact on the transport infrastructure companies.

Analysis of Interactions between Modes, Functions, Spatial Tiers and Stakeholders - Joint working towards multi-modal outcomes

In order to obtain information on the respective priorities of the organizations concerning intermodality, the different interfaces and their relevance have been examined. The results of this analysis reflect a high relevance of the interface road on regional and national level. This majority is followed by the relevance of the road on local and the rail on interregional and national level. Busses on regional and interregional level, local traffic with integration of the railway sector and the shipping traffic are given almost equal importance. The relevance of metro and tram as well as the importance of air traffic is bringing up the rear.

Therefore, it has to be considered that the interfaces to metro, shipping and air traffic are depending on institutional conditions and are consequently of no relevance for some organizations.

Concerning the comparison between intermodal acting transport organizations and pure transport infrastructure companies, it can be recognized that most of the multi-modal organizations show a very high relevance to all interfaces. In comparison to that, for single-modal companies the interface of road on the respective lower or higher spatial level is almost of exclusively importance.

In the following sentences, the relevance of the stakeholders is described. It can be seen that the competence includes mainly internal subjects. Looking at the collected information in detail, one can note that by integrating all departments from planning through to operation, the implementation of intermodality within the whole organization can be realized.

A significant relevance for the organizations can be also detected in the areas of policy and administration. The final is made by the transport modes and operators, clients as well as the relevance of media. These areas are of importance for around half of the surveyed organizations. Again, it should be pointed out that the evaluation of the transport modes and operators depends on the institutional environment of the organization. This fact can have a great influence on the result. In detail it can be seen that the focus lies on road and rail infrastructure organizations as well as on public authorities. Furthermore, transport modes and operators can be classified having a higher relevance for multi-modal organizations compared to the importance for single-modal companies. In general, this perspective can be passed on all stakeholders, even though there some on whom this does not occur in such a large extent.

In addition to the above, it was observed that media services primarily serve as dissemination of information to the customer. As a consequence, the hypothesis that the media represents an important stakeholder for the organizations is supported by this fact. The evaluation in regard of the relevance of the different customer groups (freight and persons) in connection with the organizational tasks could not be integrated into a clearly discernible pattern

Analysis of Multi-modal Activities (Internal, External)

With regard to multi-modal activities the transport infrastructure organizations have been asked to give information about the implementation of internal and external measures.

During the analysis the hypothesis has been justified, that multi-modal organizations set more measures concerning intermodal activities than single-modal companies. Moreover, a clear difference between these two organizational forms in the type of implementation can be recognized. While single-modal organizations apply in most cases intermodal measures with the help of formal and informal working groups to provide the coordination to other transport modes or policy makers, multi-

modal organizations put their emphasis on internal organizational activities. Additionally to this, the latter organizations have often integrated an action plan in order to ensure the implementation. In regard of the customer, both organizational forms provide information by using applied technical systems. Planning tasks are carried out over all transport modes by single- as well as multi-modal organizations.

Regarding the installation of an additional function and the related contact person within the organization for external stakeholders, a majority of two thirds of the surveyed single-modal organization have mentioned the multi- und intermodality as being a subtask of an already existing department. Additionally, one third has installed an additional responsible person and less than one fifth of the organizations has implemented an own department for intermodal activities.

It can be also noted that intermodal measures are not financed by a dedicated budget, unless there is a special political focus which supports this. The results of the surveyed organizations have emphasized this statement and underpinned the correctness.

In order to achieve multi- and intermodal objectives regarding coordination and information for the customer, approximately half of all participating organizations use supporting operational systems in form of IT-applications. The same number of organizations mentioned that they have measures for providing a direct coordination concerning specific issues with other transport modes and providers.

External processes and coordination procedures are mainly implemented by the use of formal and informal working relationships. This approach was pointed out by about half of the organizations. What remains to be said, is that only the formal collaborations are primarily seen as binding. Summarizing, it proves true that there are external processes and coordination procedures with different levels of "maturity" of the results concerning the organization, regularity and the liability.

Multi-modal Organizations

In order to gain an overview of the fields of action and the structure of multi-modal organizations, there have been developed certain statements and derived questions for these intermodal acting companies. The correlation between the hypotheses and the collected data is reflected in the following part of this thesis.

In regard of the area of activity of multi-modal organizations the hypothesis in the fields of strategic planning and project planning come true. Furthermore, it can be identified a third important field of action of multi-modal organizations with the area of construction works and the execution of infrastructure projects and the associated services.

An addition to that, in the course of the analysis it was verified whether the areas of road and rail are divided into organizational units within multi-modal organizations. The majority of the surveyed organizations underlines this statement.

With regard to shipping traffic, a trend is observable against the expectations, which contains the implementation of this transport mode as an own organizational unit within multi-modal organizations. A closer look on the air traffic provides identical result. Contrary to the expectations, the majority of the respondents have integrated this transport mode within their multi-modal organization.

In regard to the success of multi-modal organizations, there is a quite large range of examples for multi-modal deliveries. Thereby, the focused issues are including the fields of strategic and interdisciplinary planning as well as the allocation of resources. It can be said, that ministries are successful in the enhancement of policies and managing of the transport modes. To conclude, alternative transport programs and the integration of bicycle paths are also handled successfully by the organizations.

Proposal, Plans and Discussions for Future Change

On account of the hypothesis that structural developments of the organizations are in discussion or in existence and that these evolutions, discussions and plans are depending on the current status of the organization, the formulation of the questions in the questionnaire has been prepared in a way to obtain the relating data. In addition, the current status and implemented measures of the organization regarding intermodal activities have been verified. This includes not only existing measures but also the current implementation and the actual level of planning.

Therefore, the most discussed future strategies include the improvement of the formal collaboration between the different transport modes and the requirement of a superordinated strategic planning in form of an organization or a ministry.

In a further analysis the organizations were requested to formulate considerations in regard of a structural development. In this context, the current status and the expected period of the implementation have been surveyed in detail. One fifth of the organizations has pointed out making observations and have already formulated concrete plans. Half of whom mentioned organizations are multi-modal organizations working on the national level. The other half consist of single-modal organizations acting on the regional level.

One organization mentioned a concrete plan, so to speak the entrance in the **project management of delivery and maintenance of work for other agencies**. This plan is going to be implemented within the next three years. Due to the increased performance in project and contract management, better results are expected. Thereby, the achievement of carrying out these activities in order of their priority is regarded as a challenge for the organizations.

The other plans, whose implementation is not fixed yet, contain amongst other things the strengthening of the interface to transport mode of rail. Thereby, an intense discussion is going on in one case, but even here it is sure that there will be new edition of the railway law. All other organizations are already planning the implementation of a department for railway traffic and are thinking about the development of project teams regarding multi-modal activities. Another structural development includes the enhancement of the efficiency in connection with a reinforcement of staff resources.

Furthermore, it should be noted that two of the organizations have undergone a structural development within the last years. This includes the implementation of a specific department for planning tasks in connection with an administrative reorganization. These aforementioned organizations have also pointed out, that they take no further development into consideration right now.

Other advantages or possible areas of further developments within the organization, are listed below: improvement in efficiency, customer orientation, distribution and usage of resources, cooperation within the organization and with other transport modes (information exchange) as well as the opportunity of a modification of the strategic leadership. Additionally, particular attention is paid to the establishment of multi-modal logistical hubs for freight and passenger traffic.

The expected challenges include the lack of adequate human and financial resources, the risk of low deliveries, the possibility of a competition regarding the resources, additional costs within the organization, difficult decision-making processes as well as the involvement of other projects. Concerning the multi-modal hubs for freight and passenger transport, high costs as well as the operation are also perceived as a challenge. A possible solution for this is to get private investors on board.

Summarized, it can be said that there are many ideas and strategies for a future development, but only some organizations take a structural development into consideration.

Lessons Learned

An aim within the course of this thesis and the related survey was to get **best practice examples** out of the data obtained by the organizations. Based on that, these examples are going to be reflected in this work as **recommendations for multi-modal activities in different organizational forms**.

In detail, the inquired areas which include **particularly well-functioning interfaces, interfaces with potential for further development, technical resources, analysis of the stakeholders and explicit definition of the interface, systems for supporting multi- and intermodal objectives and implemented multi- or intermodal activities and projects with external organizations** are used and analyzed. As a result, well-performing interfaces, systems, activities and projects are demonstrated.

Particularly Well-functioning Interfaces

With regard to the relevance of the particular interfaces to other transport modes, it can be recognized that the majority of well-functioning interfaces have a high relevance for the organizations. As a result, these well-performing interfaces basically occur in road transport. As an explicit example, the interface between the national and regional level was mentioned, because of the fact that they both are maintained by the same road administration. Another example would be the responsibility for heavy traffic. Thereby, it is the objective to ensure the flow of traffic on regional and local level.

Additionally, there are other examples for well-functioning interfaces to other transport modes like the appearance of the organization as a supervisory body of the national rail and shipping traffic. Equally, the implementation of a department for interregional traffic on the national level can also be mentioned in this context. This department ensures the achievement of the cooperation with the authorities on regional and local level, which are responsible for transport networks and services.

One of the surveyed organizations shows its relationship with the political leadership. The government working on the national level is responsible for financing issues and the authorization of projects and supports this. The relationship of the organization to the government on local level is described as a partnership.

Interfaces with Potential for Further Development

By turning to the interfaces with a potential for further development, it should be pointed out that the focus lies in this context on the railway traffic. In addition to that, the transport modes of shipping and air traffic follow by demonstrating expandable interfaces.

Technical Resources

The following list includes activities concerning multi- and intermodal measures in regard of technical and joint technical resources for planning and design.

Freight Analysis Framework: includes a set of data and analysis tools to support freight planning at all levels

Integrated transport model 2015+: the integrated transport model is the basis of the integrated transport planning and is performed in cooperation with the ministry and the rail provider

IMove – Austria: research and development project to create a model for automatically intermodal data-supply concerning freight-traffic-statistics

ASFINAG-ÖBB-Platform: integrated online platform for adjustment of non-project specific tasks/themes between ASFINAG (highway) and ÖBB (railway)

Analysis of the Stakeholders and Explicit Definition of the Interface:

In order to provide an explicit definition of the interfaces to all relevant stakeholders, an annual stakeholder analysis, that show a potential for further development concerning intermodal activities and measures, was carried out.

Systems for Supporting Multi- and Intermodal Objectives

The following section deals with the additional systems concerning multi- and intermodal objectives. By answering the questionnaire, these systems have been described in detail by the organizations.

ASFINAG- Unterwegs: mobile or online application that provides real-time transport information concerning the *ASFINAG* road network as well as partly other national highway

Traffic Information Austria: provision of intermodal traffic information as well as of route planning tools for drivers, public transport facilities, cyclists and pedestrians throughout Austria

Telematics Testing Ground: research project with the aim of a positive influence in the areas of safety, efficiency and sustainability; deals with the development of the design and operation of cooperative executed services

Information of availability of Park and Ride-Terminals: includes the implementation of direction indicators and displays showing the availability with the help of information boards

SCATS (Sydney Coordinated Adaptive Traffic System): Provision of traffic information for dedicated intersections and for all other main transport arteries and highways in New South Wales

Public transport ticketing systems (multiple): Delivery of customers with tickets and provision of information for all transport providers

Multi-modal database for freight on Excel and TransCAD: includes information about tonnages and predicted freight

Information system and database (KIRA): information system, which is currently under development; on completion it will contain data of all transport organizations, except from the air traffic

National Integrated Transport Analysis System (NITAS):

- Evaluation of the current status of multi-modal measures and estimation of influences of planned projects
- Determination of travelling time and costs with the help of an analysis of combined means of transports including road, rail, air and shipping traffic
- Usage of statistical data from industry and trade to carry out a multifaceted analysis and evaluation

In summary, it can be said that further information on multi and intermodal acting systems refers to systems, which are used within the organization and are proposed for the provision of information for the customer. This includes for instance the information provided by websites internet pages.

Implemented Multi- or Intermodal Activities and Projects with External Organizations

In order to provide an overview of the implemented multi and intermodal activities and projects with external organizations, the following paragraphs include a composition of the performed measures divided into the individual areas.

For **public transport** facilities dedicated bus and tram lanes with priority lanes during peak times were implemented. The flow of the public transport was further improved by busses and trolleys along roads. In addition to that, tram super stops were implemented as well as access to subsidies is provided and passenger train lines are built through the use of land in motorway reserves. Summarized, it can be said that the organizations arrange several measures for public transport issues.

Looking at the activities implemented for **cyclists**, we can see that not only were new cycle paths constructed, but also share pedestrian cycle paths. Additionally the construction of traffic signals and the implementation of advanced cycle boxes at intersections are representing positive developments for the mentioned target group.

With regard to the transport facilities, it can be pointed out that **intermodal freight terminals** have been constructed, improved or developed. Additionally, the provision of intermodal transport hubs for road and rail represent another implemented activity and a modification of the tonnage for heavy goods vehicles around ports has taken place.

Further multi- and intermodal measures are have been taken for the development and construction of **ports**.

For the transport mode of **aviation**, a preliminary design of the city Rome is under development: Fiumicino Airport Integrated Transport System is going to be implemented in order to improve the airport accessibility in the predicted scenario until the year 2020. Another organization responded the construction of an airport as an example for one of its projects.

Another important measure of the organizations represents the provision of connections to other transport modes such as **Park and Ride -Terminals**. In collaboration with the concessionaires **carpooling areas** have been implemented in order to provide car and buss stations alongside a railway station.

Turning to the current programs and systems in regard of multi- and intermodal issues, the **modal integration program** is an assistance program with the aim to reduce or avoid greenhouse gas emissions and improving energy efficiency in road, rail and marine transportation. Also, the European Digital Infrastructure Traffic System (**EDITS**) as well as the implementation of **Mass Rapid Transit** and **Bus Rapid Transit** represent other measures in order to improve transport facilities.

Regarding the field of **planning**, the organizations try to work in a joint transport system planning to be able to take all factors into consideration. In this context, the regional transport planning is implemented within a national organization.

Another issue, is that of **financing of the multi-modal platforms** and being responsible for the provision of **financial support to local governments** regarding the expenditure of regional integrated transportation strategies and implemented related projects.

The **construction of a customs and immigration complex** (CIQ) was also mentioned by one organization and represents another field of activity.

Summary

In summary, it can be said that a general trend to the implementation of multi and intermodal activities exists. The organizations have recognized the necessity of measures and have undergone a development within the last years.

It can be noticed that it has no relevance whether the organization is operating on multi or single-modal level. A general change in thinking can be realized in both organizational forms. In this context, an organizational development that is adapted to the system is obvious.

When having a look on single-modal organizations, the focus is primarily concentrated on external processes. This results out of the fact that there is often a lot of coordination necessary with external stakeholders in order to take intermodal measures. But the situation looks not that different with multi-modal organizations. The coordination with superior institutions and transport modes outside the organization is also an important part of their work.

As a result, it can be stated that the development towards a multi- and intermodal transport is not depending on the type of organization. There is a variety of successfully implemented measures, but they are contingent on different topics like the institutional environment, the individual circumstances, the political control and strategic priorities.

Concerning the structural development it can be seen from the results of all organization a rather restrained approach to intermodality. This shows that the international implementation is still at an early stage. For this reason, a progress and a realization of concrete measures is required on all spatial levels in order to achieve a future development.

5 Appendices

The appendix represents on the one hand the **Draft of Questionnaire** and on the other a detailed list of the **Results**, which can be taken if required.

The **Draft of Questionnaire (5.1)** represents the result of chapter **2 Development of Questionnaire Survey** and is divided into the following parts:

- Cover sheet
- Introduction
- Part 1 – Context – All Organizations
- Part 2 – All Organizations
- Part 2B – Multi-modal Organizations
- Part 3 – Proposals Plans and Discussions for Future Change

The **Results (5.2)** provide additional data to chapter **3 Presentation of the Results**, in the areas of:

- **5.2.1** Part 1 – Context 113
 - 5.2.1.1 Political Control and Accountabilities 113
 - 5.2.1.2 Matrix – Initial Classification of Road and Transport Institutional 115
- **5.2.2** Part 2 A – Multi-modal Activities 141
 - 5.2.2.1 Analysis of Interactions between Modes, Functions, Spatial Tiers and Stakeholders 141
 - 5.2.2.2 Analysis of Multi-modal Activities (Internal, External) 146

5.1 Draft of Questionnaire

Evolution the Mission and Structure of Transport Administrations
Questionnaire



Questionnaire

Evolution the Mission and Structure of Transport
Administrations

PIARC TC 1-1 WG 1



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Evolution the Mission and Structure of Transport Administrations Questionnaire



INTRO

The World Road Association's (PIARC) Technical Committee on Performance of Transport Administrations is undertaking a 4-year research program into the evolving mission of analyzing functions and structures of road and transport administrations. This includes recent, current and planned changes to the governance of roads within the context of multi-modal transport policy, planning and delivery (e.g. alongside rail, local transport, ports and aviation). The research program is also interested as to whether these changes are accompanied by closer multi-agency working across the transport sector; or whether they go along with the centralization or other structural changes to road and other transport administrations and agencies. At this stage, the Committee has no view on whether such changes are a positive or negative development and simply wishes to establish the current baseline position.

On behalf of Workgroup 1, we kindly request your cooperation in the survey. By doing so, you will be making a contribution to the success of the project.

THANK YOU VERY MUCH FOR YOUR ASSISTANCE

Contents:

- Part 1 (A/B/C) requests information on the context of your organisation and is to be filled in by all organisations
- Part 2A requests information on multi-modal and inter-modal activities and should be filled in by all organisations
- Part 2B requests information on multi-modal planning and delivery and should be filled in only by organisations responsible for multiple modes
- Part 3 requests information on future developments and should be filled in by all organisations

Terminology

Single-modal organization	Infrastructure companies, Operators and Public Transport Authorities
Multi-modal organization	Integrated Transport Authorities (different transport modes)
Multi-modal	Whole network for transport covering all modes e.g. road, rail, bus, etc.
Intermodal	Interfaces and interactions between modes

Please let us have your contact details so that we can process any queries:

Name:

Position:

Phone:

Email:

Name of the organisation:

Country:

Please send this questionnaire to (also contact in case of questions concerning the questionnaire):

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Evolution the Mission and Structure of Transport Administrations
Questionnaire



Name of the organization:
Country:

1 Part 1 - Context - All Organizations

Your Organization is a?

- Single-modal organization
- Multi-modal organization

1.1 Current organizational jurisdictions, tasks & responsibilities

1.1.1 Describe briefly the general tasks and responsibilities of your organization:

1.1.2 For which spatial scale is your organization responsible?

- Local
- Regional
- National

1.1.3 What network / traffic is your organization responsible for:

Road

Network size, road:	<input style="width: 100px;" type="text"/>	[km]
Passenger traffic:	<input style="width: 100px;" type="text"/>	[motor vehicle km/year]
Freight traffic:	<input style="width: 100px;" type="text"/>	[motor vehicle km/year]
Other:	<input style="width: 100%; height: 15px;" type="text"/>	

Rail

Network size, rail:	<input style="width: 100px;" type="text"/>	[km]
Passenger traffic: average transported passengers per day in the public transport	<input style="width: 100px;" type="text"/>	[passengers/day]
Freight traffic: transported tonkm per year	<input style="width: 100px;" type="text"/>	[tonkm/year]
Other:	<input style="width: 100%; height: 15px;" type="text"/>	

OTHER:

Other:	<input style="width: 100%; height: 15px;" type="text"/>	to/y
Other:	<input style="width: 100%; height: 15px;" type="text"/>	to/y

1.2 Political control and accountabilities

1.2.1 Which political body (e.g. ministry) is responsible for your organisation?

1.2.2 On which level does this political body set?

<input type="checkbox"/> Local:	<input style="width: 100%; height: 15px;" type="text"/>
<input type="checkbox"/> Regional:	<input style="width: 100%; height: 15px;" type="text"/>
<input type="checkbox"/> National:	<input style="width: 100%; height: 15px;" type="text"/>

Comment (if required)

Evolution the Mission and Structure of Transport Administrations
Questionnaire



1.2.3 For which areas is this political body responsible?

Overall infrastructure (road, rail, waterway, aviation, etc.)
 Transport (public & freight)
 Road
 Rail
 Waterways
 Other areas:

1.2.4 Are there additional political supervisory or regulatory authorities with oversight or influence over your organization (e.g. organisations working on behalf of policymakers / administration)?

No
 Yes
Please name them (incl. brief description of responsibilities):

1.3 Matrix - Initial Classification of Road and Transport Institutional

Please complete the matrix in the following worksheet, according to the instructions provided.

Evolution the Mission and Structure of Transport Administrations
Questionnaire

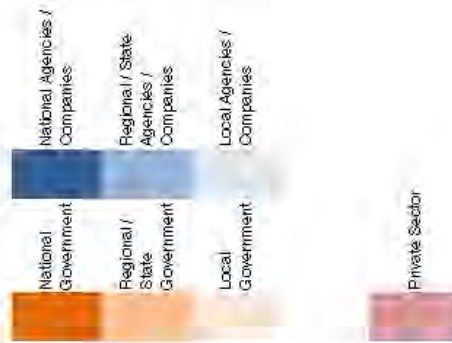
World Road Association Technical Committee on Performance of Transport Administrations Initial Classification of Road and Transport Institutional Arrangements

As part of this research, the Committee is seeking initial indications of how road and other transport infrastructure networks and services are organised at national, regional and local level, together with the longevity and status of these organisational arrangements. To this end, we would be grateful if you could complete the matrix.

INSTITUTIONAL CLASSIFICATION MATRIX

	Road						Railway			Water Transport		Aviation		Infermodal		
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Inquiry and Regional Trains)	National and Regional Freight Transport (Inquiry and Regional Trains)	Island Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Infermodal Terminals	Land Border Crossings
Primary Responsibilities																
Strategic Planning (Policy and Regulation)																
Project Planning																
Construction / Implementation of Infrastructure and Service																
Operation and Management																
Maintenance																
Filiales																

Legend: Ownership / Shareholder Structures and Organizational Structures



How to fill in the form:

Columns show the different traffic modes and scales of responsibility (national/regional/local). Write the relevant organisation in each box and mark it with the correct colour in regard to the colour code shown above. It is possible to use two colours if different organisations share responsibilities. If in doubt use the colour for those organisation who have main responsibility. If only one organisation (national level) is relevant please fill in the name of the organisation. If more organisations are relevant please write the number of organisation in brackets, e.g. municipalities (2007).

Evolution the Mission and Structure of Transport Administrations
Questionnaire



Name of the organisation:
Country:

1.4 After completing the matrix, please respond briefly to the following questions:

1.4.1 Are the institutional arrangements set out in the matrix (Tick one box)?:

- Long-Established (10 Years +)
- Established (2 - 10 Years)
- Recently Established (Under 2 Years)
- Don't Know / Not Applicable

1.4.2 If there have been recent significant reforms to institutional arrangements for the planning, delivery and operation of roads and transport at national or regional level, please briefly indicate what these are (Write Not Applicable if there have been no significant reforms):

1.5 Analysis of key organisational data

1.5.1 Please fill out the following data for your organisation:

Valid data from year:

Currency

Expenditure, budget in Mio. /year

Expenditure, new construction / investments in Mio./year [mio./year]

Expenditure, maintenance in Mio./year [mio./year]

Other expenditure in Mio./year [mio./year]

Income

Financing through public sector funds [mio./year]

External financing [mio./year]

Subsidies [mio./year]

Tolls / user charges [mio./year]

Taxes [mio./year]

Other: [mio./year]

Other: [mio./year]

Total employees: [individuals]

Operational employees

Planning: [individuals]

Construction: [individuals]

Operation: [individuals]

Maintenance: [individuals]

Other: [individuals]

Evolution the Mission and Structure of Transport Administrations
Questionnaire



Name of the organization:
Country:

2 PART 2 - All Organizations

2.1 Analysis of interactions between modes, functions, spatial tiers and stakeholders ->> Joint working towards multi-modal outcomes

2.1.1 Which interfaces to other transport providers are relevant to your organization (please cross as applicable)?

Interface	Very	quite	moder- ately	slightly	hardly	Not at all
	1	2	3	4	5	6
Road, national						
Road, regional						
Road, local						
Railway, interregional, national						
Railway / local traffic						
Metro / light rail (in towns and cities)						
Buses (regional)						
Buses (interregional)						
Shipping ((inter)national)						
Aviation ((inter)national)						
Other:						

Which interfaces function particularly well? (description)

For which interfaces is there potential for further development (please indicate and describe briefly)?

Evolution the Mission and Structure of Transport Administrations
Questionnaire



2.1.2 Which stakeholders does your organization have in terms of multimodality / intermodality and how relevant are the individual stakeholders for the organisation ?

	Very	quite	moder- ately	slightly	hardly	Not at all	Type of Interface (brief description)
	1	2	3	4	5	6	
Politics and administration							
Politics – legal guidelines - Parliament							
Politics – budgetary guidelines - Finance authority							
Ministry – e.g. permissions - e.g. Ministry of Transport							
Regional / provincial government							
Local government							
Traffic carrier / operator							
Road company / authority							
Railway infrastructure company / authority							
Railway company (train operator)							
Aviation							
Waterways operator							
Public transport company (operator using roads)							
Customer							
Customer, freight transport							
Customer, passenger transport, interregional							
Customer, passenger transport Regional (commuters)							
Media							
Print media							
Media, radio							
Media, TV							
Internet service providers – e.g. for traffic information							
Internal stakeholders - organizational							
Internal - Planning department							
Internal - Construction department							
Internal - Operation and management							
Internal - Maintenance							
Other:							
Other:							

Evolution the Mission and Structure of Transport Administrations
Questionnaire



2.2 Analysis of multi modal activities (internal, external)
>> Existing structures, processes and systems

2.2.1 Are activities already in place with regard to multimodality/intermodality? What are these measures, and how successful are they?

	YES	No	Very	quite	moder- ately	slightly	hardly	Not at all	Comment if required
			1	2	3	4	5	6	
Organizational measures within the organization, e.g.									
> Own responsible person for intermodality / multimodality									
> Own department for intermodality / multimodality									
> Intermodality/ multimodality as defined sub-task of a department									
Informal contacts, working groups									
Formal contacts, working groups									
Own plan of action for Intermodal / multi-modal measures									
> Binding plan of action									
> Non-binding plan of action									
> Organizational plan of action									
> Organization-wide coordinated plan of action									
Joint technical resources for planning and design (e.g. transport model)									
Technical resources (e.g. information systems for customers)									
Analysis of the stakeholders for intermodality / multimodality									
Explicit definition of the interfaces to all relevant stakeholders									
Other:									
Other:									
Other:									
Other:									

Evolution the Mission and Structure of Transport Administrations
Questionnaire



2.2.2 How are multimodal and intermodal issues organized (internal processes)?

What internal processes and systems are there on the topic of Intermodality / multimodality?

Who is responsible for multi-modal and intermodal issues within the organization (position, place in organigram)?

With which internal resources (staff and budgets)?

2.2.3 Are there any operational systems (e.g. traffic control systems, web-based traffic information systems, intermodal project platforms, etc.) in place within your organization for supporting multi-modal and intermodal objectives?

- No
- Yes

Which (incl. description)?

2.2.4 What multi-modal / intermodal activities and projects have you implemented with external organizations?

For which organizations / transport providers are measures put in place?

Which specific measures or projects have been implemented?

Evolution the Mission and Structure of Transport Administrations
Questionnaire



2.2.5 Are external processes incorporated into the organisation?

Examples	What processes and systems do you currently have in working with external organizations / networks / modes (please cross)?	Who is responsible for these processes (organization, ministry, etc.)?
Informal collaboration with external organizations		
Formal collaboration with external organizations		
Central planning		
Intermodal / multi-modal provision of transport infrastructure (integrated delivery)		
Intermodal / multimodal transport infrastructure organization (integrated transport agency)		
Other:		
Other:		
Other:		
Other:		
Other:		

2.2.6 Are the results or decisions arising from these processes / agreements (e.g. plans of action) binding (brief explanation, please)?

Examples	YES	NO	Comment
Informal cooperation with external organizations			
Formal cooperation with external organizations			
Central planning			
Intermodal / multi-modal provision of transport infrastructure (Integrated delivery)			
Intermodal / multi-modal transport infrastructure-organisation (Integrated transport agency)			
Other:			
Other:			

Evolution the Mission and Structure of Transport Administrations
Questionnaire



Name of the organization:
Country:

2B Part 2 B - Multimodal Organizations

2B.1 Is your organization a multimodal organization (and for which areas)?

	YES	No
Strategic planning (policy and regulations)		
Project planning		
Construction / implementation of infrastructure and services		
Operation and management		
Maintenance		
Finance		

>> This part is only relevant for multimodal organizations >> if YES, please answer the following questions

2B.2 Which interfaces or organizational divisions exist within the organization between transport networks and modes and how are these defined?

Freight transport

Interface between road - freight transport and:	How is the interface defined?				
	Own sub-company	Own organizational unit (e.g. department)	Integrated into Roads department	None	Other:
Railway, interregional, national					
Railway / local traffic					
Busses (regional)					
Busses (interregional)					
Shipping					
Aviation					
Other:					

Passenger transport

Interface between road - passenger transport and:	How is the interface defined?				
	Own sub-company	Own organizational unit (e.g. department)	Integrated into Roads department	None	Other:
Railway, interregional, national					
Railway / local traffic					
Local public transport (in towns and cities)					
Shipping					
Aviation					
Other:					

Evolution the Mission and Structure of Transport Administrations
Questionnaire



2B.3 What was the rationale for creating the multimodal organization?

Examples	YES	NO	Comment
Strategic leadership and coordination across modes			
Better use of resources			
Stronger customer focus			
Efficiency savings			
New organizational culture and values			
Industrial / supplier relations			
Other:			
Other:			

2B.4 Describe the success of the multi-modal delivery since the organization was established.

Evolution the Mission and Structure of Transport Administrations
Questionnaire



Name of the organization:
Country:

3 Part 3 - Proposals, Plans and Discussions for Future Change

We ask you to report the current facts as you understand them, not to give a political opinion.

3.1 Current strategies for future development

3.1.1 Which strategies for implementation in the future are currently being discussed?

<input type="checkbox"/>	Higher-level organization / ministry for strategic planning
<input type="checkbox"/>	Improvement to the formal collaboration between transport providers
<input type="checkbox"/>	Binding results of the existing agreements with transport providers
<input type="checkbox"/>	Common organisation / financing for all transport modes and networks
<input type="checkbox"/>	Other: <input type="text"/>

3.1.2 On which level are these strategies being discussed? (Please mark)

Higher-level organization / ministry for strategic planning

	Legislature Level	Ministry	Public debate / media	Internally within the organisation	further Stakeholder
National level					
Regional level					
Local level					
Comments					

Improvement to the formal collaboration between transport providers

	Legislature Level	Ministry	Public debate / media	Internally within the organisation	further Stakeholder
National level					
Regional level					
Local level					
Comments					

Binding results of the existing agreements with transport providers

	Legislature Level	Ministry	Public debate / media	Internally within the organisation	further Stakeholder
National level					
Regional level					
Local level					
Comments					

Common organization for all transport modes and networks

	Legislature Level	Ministry	Public debate / media	Internally within the organisation	further Stakeholder
National level					
Regional level					
Local level					
Comments					

Other:

	Legislature Level	Ministry	Public debate / media	Internally within the organisation	further Stakeholder
National level					
Regional level					
Local level					
Comments					

Evolution the Mission and Structure of Transport Administrations
Questionnaire



3.1.3 Are there any considerations on structural development of your organization especially concerning intermodal / multi-modal activities?

- No
- Yes

Which (incl. description)?

Are these already concrete plans?

- No
- Yes

In the area (brief description, in which are, for which tasks, etc.):

When will implementation start?

- In the current year
- In the next year
- In the next 3 years
- Not yet fixed

When will implementation be completed?

- In the current year
- In the next year
- In the next 3 years
- In the next 5 years or later
- Not yet fixed

3.2 Evaluation of possible enhancement strategies

3.2.1 What benefits are expected from the planned changes?

3.2.2 Are disadvantages and challenges also discussed, which?

3.3 Are there any other comments you wish to add?

5.2 Results

5.2.1 Part 1 – Context

5.2.1.1 Political Control and Accountabilities

Additional Political Supervisory or Regulatory Authorities

AT – ASFINAG:

Austrian Court of Audit

The Austrian Court of Audit is a federal body that acts on a national, regional and local level. In line with its independence laid down in the constitution, the ACA verifies that state, federal state and municipal budgets are being spent economically, efficiently and effectively. The main task of the ACA is to perform audits and to consult.

Ministry of Finance

The Austrian Ministry of Finance is the country's highest financial authority. The Ministry's responsibilities stretch from budgetary planning and surveillance, economic policy and financial services to customs and taxation.

Divided into six directorates and with approximately 820 employees, the Ministry of Finance today is a modern service provider, continuously adapting its services to the needs and for the welfare of our citizens.

Since the revolutionary year 1848, the Ministry of Finance has had its seat in the Winter Palace of Prince Eugene in the city center of Vienna. As the palace is currently under restoration, the Ministry has temporarily been relocated into the Vienna Central Station area.

AU – MRWA: Australian Government - Minister for Transport and Infrastructure

AU – NSW:

National Heavy Vehicle Regulator, which sets and manages regulatory frameworks for access by heavy vehicles to the road network, including accreditation of heavy vehicles. The Australian Maritime Safety Authority has a role in promoting safety, combating marine pollution, providing infrastructure and providing a national search and rescue service for the maritime and aviation sectors. The Commonwealth Department of Infrastructure and Transport has influence in terms of funding and management of a range of infrastructure projects, either directly or through national transport agencies.

AU – VicRoads: Department of Transport, Planning and Local Infrastructure

BE – AWV:

Federal Secretary of State for Mobility on the national level (Belgium)

A state reform in process by which powers on mobility will be transferred from the national level to the regional

CA – MTQ:

Québec Ministry of Transportation is part of the Québec Government and is influenced by global policies and directions.

FI – ELY:

Finnish Transport Agency, whose aim is to promote the efficient functioning of the traffic system, to improve traffic safety and to contribute to a balanced and sustainable development of the regions. FTA

is operating under the Ministry of Transport and Communications. Responsibilities are, for example, to maintain and develop the traffic system (government's road and rail network and waterways), implement road projects and to control and develop traffic management.

FI – FTA: Trafi, Finnish Transport Safety Agency for regulating the traffic safety

HU – ÁAK zrt.:

Hungarian Transport Administration – responsible for financing, development, maintenance and operation of transportation networks

HU – HPR:

Hungarian Transport Administration – responsible for financing, development, maintenance and operation of transport networks in Hungary; contract partner for Hungarian public roads

IT – ANAS S.p.A:

The Authority for the Supervision of Public Contracts for Works, Services and Supplies, is an independent administrative authority in charge of supervising public contracts for works, services and supplies in all areas of sorting in order to ensure compliance with the principles of transparency and correctness of calls for tender, as well as to ensure the respect for the rules of competition in tender procedures. Responsible person: Minister of Economy and Finance

JP – MLIT: organization working on behalf of policymakers

MY – PWD:

- 1) Ministry of Finance: providing development and management funds
- 2) Economic Planning Unit: strategic planning of development
- 3) Implementation & Coordination Unit: coordinating implementation of projects and programs

RO – RNCMNR:

The strategy in the road sector is part of the Government strategy; road infrastructure network is considered to be of interest on national level, due to the budget allocation which is needed in order to cover the needs for project implementation.

SE – Trafikverket:

The Swedish Transport Agency is the regulatory body for all transport modes; it develops and enforces rules, issues licenses, register changes in ownership, manages congestion and vehicle taxes.

US – FHWA:

Leadership from the U.S. Department of Transportation, lead by the Secretary of Transportation, a member of the President's Cabinet

US – MoDOT:

Federal Highway Administration, Federal Transit Administration, Federal Railway Administration, Federal Aviation Administration, Motor Carrier Safety Administration, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

ZA – SANRAL:

Parliamentary Portfolio Committee on Transport: established by Parliament to oversee the various transport modes within the Department of Transport.

If there are outsourced tasks, it can be possible that this political supervisory will have an important impact on the organization.

5.2.1.2 Matrix – Initial Classification of Road and Transport Institutional

On the following pages the institutional classification of the surveyed organizations is shown in form of a matrix. To get an overview the content is listed below.

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Institutional Classification Matrix Legend

Legend: Ownership / Shareholder Structures and Organizational Structures			
	National Government		National Agencies / Companies
	Regional / State Government		Regional / State Agencies / Companies
	Local Government		Local Agencies / Companies
	Private Sector		

Figure 45: Institutional Classification Matrix Legend

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	BM/VT	federal states (9)	municipalities (2,357)	BM/VT, federal states	BM/VT	BM/VT	municipalities (2,357)	municipalities (2,357)	BM/VT, federal states	BM/VT	BM/VT	BM/VT	BM/VT	BM/VT	BM/VT	BM/VT
Project Planning	ASFNAG	federal states (9)	municipalities (2,357)			ÖBB	municipalities (2,357)	municipalities (2,357)			Via Donau	regional, local agencies (7)	AustroControl	regional, local agencies (8)	ASFNAG, ÖBB, harbours, airports	ASFNAG, ÖBB, Via Donau
Construction / Implementation of Infrastructure and Services	ASFNAG	federal states (9)	municipalities (2,357)			ÖBB	municipalities (2,357)	municipalities (2,357)			Via Donau	regional, local agencies (7)	AustroControl	regional, local agencies (8)	ASFNAG, ÖBB, harbours, airports	ASFNAG, ÖBB, Via Donau
Operation and Management	ASFNAG	federal states (9)	municipalities (2,357)	Postbus, federal states, private sector	private sector, ÖBB	ÖBB	municipalities (2,357)	municipalities (2,357)	ÖBB, federal states, private sector	ÖBB, federal states, private sector	Via Donau	regional, local agencies (7)	AustroControl	regional, local agencies (8)	ASFNAG, ÖBB, harbours, airports	ASFNAG, ÖBB, Via Donau
Maintenance	ASFNAG	federal states (9)	municipalities (2,357)			ÖBB	municipalities (2,357)	municipalities (2,357)			Via Donau	regional, local agencies (7)	AustroControl	regional, local agencies (8)	ASFNAG, ÖBB, harbours, airports	ASFNAG, ÖBB, Via Donau
Finance	ASFNAG (toll)	federal states (9)	municipalities (2,357)			ÖBB (earnings + public)	municipalities (2,357)	municipalities (2,357)			Via Donau (public)	regional, local agencies (7)	AustroControl	regional, local agencies (8)	ASFNAG, ÖBB, harbours, airports	ASFNAG, ÖBB, Via Donau

Figure 46: Institutional Classification Matrix AT – ASFNAG

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Road Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Inter-city and Regional Trains)	National and Regional Freight Transport (Inter-city and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	national and state government	national and state government	national state and local government	national and state government	national and state government	national and state government	n / s	Department of Transport and PTA	Department of Transport and PTA	not applicable	national and state government	national and state government	national and state government	national and state government	Department of Transport and Main Roads	not applicable
Project Planning	Main Roads	Main Roads		Public Transport Authority	Department of Transport and Main Roads		not applicable			not applicable		Department of Transport and port authorities		national and state government	Department of Transport and Main Roads	not applicable
Construction / Implementation of Infrastructure and Services			local government and private sector				not applicable			not applicable	not applicable					not applicable
Operation and Management	Main Roads	Main Roads		Public Transport Authority	Main Roads	Public Transport Authority	not applicable			not applicable	not applicable	port authorities			Department of Transport and Main Roads	not applicable
Maintenance	Main Roads	Main Roads		Public Transport Authority	Main Roads	Public Transport Authority	not applicable	Public Transport Authority	Public Transport Authority	not applicable	not applicable	port authorities			Department of Transport and Main Roads	not applicable
Finance	national and state government	national and state government	national and local government	Public Transport Authority	Main Roads	Public Transport Authority	not applicable	Public Transport Authority	Public Transport Authority	not applicable	not applicable	port authorities			Department of Transport and Main Roads	not applicable

Figure 47: Institutional Classification Matrix AU – MRWA

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Department of Infrastructure and Transport	Transport for NSW	TNSW, local government areas (154)	Transport for NSW	National Heavy Vehicle Regulator, Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	Transport for NSW	Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	Australian Maritime Safety Authority, Roads Maritime Services	Transport for NSW	Department of Infrastructure and Transport	Department of Infrastructure and Transport, private sector	Department of Infrastructure and Transport, NSW	not applicable
Project Planning	Department of Infrastructure and Transport	Transport for NSW	TNSW, local government areas (154)	Transport for NSW, private sector	Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	Transport for NSW	Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	Australian Rail Track Corporation, Transport for NSW	Roads Maritime Services	port authorities (3), NSW Ports	Department of Infrastructure and Transport	Department of Infrastructure and Transport, private sector	Department of Infrastructure and Transport, NSW, private sector	not applicable
Construction / Implementation of Infrastructure and Services	state agencies (7)	Roads Maritime Services, private sector	local government areas (154)	private sector	Roads Maritime Services	Department of Infrastructure and Transport, private sector	Transport for NSW	Transport for NSW	Transport for NSW	Australian Rail Track Corporation, Transport for NSW	Roads Maritime Services	port authorities (3), NSW Ports	private sector, local government areas	private sector, local government areas	private sector	not applicable
Operation and Management	state agencies (7)	Roads Maritime Services	local government areas (154)	state agencies, private bus operators	Roads Maritime Services, National Heavy Vehicle Regulator	state authorities (4), private operators (4)	Sydney Trains, NSW Trains	NSW Trains	NSW Trains	Australian Rail Track Corporation, Transport for NSW	Roads Maritime Services	port authorities (3), NSW Ports	private sector, local government areas	private sector, local government areas	private sector	not applicable
Maintenance	state agencies (7), private sector	Roads Maritime Services, private sector	local government areas (154)	state agencies, private bus operators	Roads Maritime Services, private sector	Australian Rail Track Corporation	Sydney Trains, NSW Trains	NSW Trains	Sydney Trains, NSW Trains	Australian Rail Track Corporation, Private sector	Roads Maritime Services	port authorities (3), NSW Ports	private sector, local government areas	private sector, local government areas	private sector	not applicable
Finance	Department of Infrastructure and Transport	Transport for NSW	Department of Infrastructure and Transport, local government areas (154), TNSW	Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	Transport for NSW	Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	Department of Infrastructure and Transport, Transport for NSW	TNSW, port authorities (3), NSW Ports	private sector, Department of Infrastructure and Transport, local government areas	private sector, Department of Infrastructure and Transport, local government areas	private sector, Department of Infrastructure and Transport, local government areas	not applicable

Figure 48: Institutional Classification Matrix AU – NSW

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Inter-city and Regional Trains)	National and Regional Freight Transport (Inter-city and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)		VicRoads		Public Transport Victoria	VicRoads - Australia is in the process of negotiating a national heavy vehicle regulator.											
Project Planning																
Construction / Implementation of Infrastructure and Services																
Operation and Management																
Maintenance																
Finance																

Figure 49: Institutional Classification Matrix AU – VicRoads

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal		
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	very divers	very divers	very divers	very divers	very divers	very divers	very divers	very divers	very divers	very divers	very divers	very divers	very divers	very divers	very divers
Project Planning	Road and Traffic Agency	Road and Traffic Agency	towns and municipalities in Flanders (308)	public transport company De Lijn		NMBS Holding (3)	NMBS Holding (3)	public transport company De Lijn	NMBS Holding (3)	agencies in Flemish Ministry of Mobility and public works (3)	agencies in Flemish Ministry of Mobility and public works (3)	national (Zaventem) and regional (local airports in Flanders (3))		agencies in Flemish Ministry of Mobility and public works (all)	
Construction / Implementation of Infrastructure and Services	Road and Traffic Agency	Road and Traffic Agency	towns and municipalities in Flanders (308)	Road and Traffic Agency + public transport company De Lijn		NMBS Holding (3)	NMBS Holding (3)	public transport company De Lijn	NMBS Holding (3)	agencies in Flemish Ministry of Mobility and public works (3)	agencies in Flemish Ministry of Mobility and public works (3)	national (Zaventem) and regional (local airports in Flanders (3))		agencies in Flemish Ministry of Mobility and public works (all)	
Operation and Management	Road and Traffic Agency	Road and Traffic Agency	towns and municipalities in Flanders (308)	public transport company De Lijn		NMBS Holding (3)	NMBS Holding (3)	public transport company De Lijn	NMBS Holding (3)	agencies in Flemish Ministry of Mobility and public works (3)	agencies in Flemish Ministry of Mobility and public works (3)	national (Zaventem) and regional (local airports in Flanders (3))		agencies in Flemish Ministry of Mobility and public works (all)	
Maintenance	Road and Traffic Agency	Road and Traffic Agency	towns and municipalities in Flanders (308)	public transport company De Lijn		NMBS Holding (3)	NMBS Holding (3)	public transport company De Lijn	NMBS Holding (3)	agencies in Flemish Ministry of Mobility and public works (3)	agencies in Flemish Ministry of Mobility and public works (3)	national (Zaventem) and regional (local airports in Flanders (3))		agencies in Flemish Ministry of Mobility and public works (all)	
Finance	Road and Traffic Agency	Road and Traffic Agency	towns and municipalities in Flanders (308)	public transport company De Lijn		NMBS Holding (3)	NMBS Holding (3)	public transport company De Lijn	NMBS Holding (3)	agencies in Flemish Ministry of Mobility and public works (3)	agencies in Flemish Ministry of Mobility and public works (3)	national (Zaventem) and regional (local airports in Flanders (3))		agencies in Flemish Ministry of Mobility and public works (all)	

Figure 50: Institutional Classification Matrix BE – AWW

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Inter-city and Regional Trains)	National and Regional Freight Transport (Inter-city and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	MTQ, Transport Canada (TC)	MTQ	MTQ	MTQ	MTQ	Transport Canada (TC), MTQ	VIA Rail (interurban), AMT (urban transit)	Transport Canada (TC)	Transport Canada (TC)	Transport Canada (TC)	Transport Canada (TC)	Transport Canada (TC)	Transport Canada (TC)	Transport Canada (TC)	Transport Canada (TC)	Canada Border Service Agency (CBSA)
Project Planning	MTQ	MTQ	municipalities (111)	municipalities (buses), private sector (coaches)	trucking companies	freight rail companies	VIA Rail, AMT	freight rail companies	freight rail companies	St. Lawrence Seaway Management Corporation (SLSMC)	port authorities, private companies	port authorities	Transport Canada (TC)	airport authorities	rail companies, port authorities	Canada Border Service Agency (CBSA)
Construction / Implementation of Infrastructure and Services	MTQ	MTQ	municipalities (111)	municipalities (buses), private sector (coaches)	trucking companies	freight rail companies	VIA Rail, AMT	freight rail companies	freight rail companies	St. Lawrence Seaway Management Corporation (SLSMC)	port authorities, private companies	port authorities	Nav Canada	airport authorities	rail companies, port authorities	Canada Border Service Agency (CBSA)
Operation and Management	MTQ, private sector (PPF)	MTQ	municipalities (111)	municipalities (buses), private sector (coaches)	trucking companies	freight rail companies	VIA Rail, AMT	freight rail companies	freight rail companies	St. Lawrence Seaway Management Corporation (SLSMC)	port authorities	port authorities	Nav Canada	airport authorities	rail companies, port authorities	Canada Border Service Agency (CBSA)
Maintenance	MTQ, private sector (PPF)	MTQ	municipalities (111)	municipalities (buses), private sector (coaches)	trucking companies	freight rail companies	Freight Rail companies, VIA Rail	freight rail companies	freight rail companies	St. Lawrence Seaway Management Corporation (SLSMC)	port authorities	port authorities	Transport Canada (TC)	airport authorities	rail companies, port authorities	Canada Border Service Agency (CBSA)
Finance	MTQ	MTQ	municipalities (111)	MTQ, municipalities	trucking companies	Freight Rail companies, TC / MTQ	VIA Rail, AMT	freight rail companies	freight rail companies	SLSMC, TC	Port authorities, TC / MTQ	Port authorities, TC / MTQ	Transport Canada (TC)	airport authorities, Transport Canada (TC)	rail companies, port authorities	Canada Border Service Agency (CBSA)

Figure 51: Institutional Classification Matrix CA – MTQ

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Dark Orange	Light Orange	Light Orange	Dark Orange	Dark Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Project Planning	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Construction / Implementation of Infrastructure and Services	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Operation and Management	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Maintenance	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Finance	Dark Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange

Figure 52: Institutional Classification Matrix DE – BMVBS

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)		Consejería de Fomento. Gobierno de Extremadura														
Project Planning		Consejería de Fomento. Gobierno de Extremadura														
Construction / Implementation of Infrastructure and Services		Consejería de Fomento. Gobierno de Extremadura														
Operation and Management		Consejería de Fomento. Gobierno de Extremadura														
Maintenance		Consejería de Fomento. Gobierno de Extremadura														
Finance		Consejería de Fomento. Gobierno de Extremadura														

Figure 53: Institutional Classification Matrix ES – CF – JE

Primary Responsibilities	Road					Railway				Water Transportation		Aviation		Intermodal		
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Ministry of Development	Region Authorities (17)	municipalities (8,117)	Ministry of Development	Ministry of Development	Ministry of Development	Ministry of Development, several region authorities	Ministry of Development, several region authorities	RENFE, others	RENFE, others			Ministry of Development	AEVA		
Project Planning	Ministry of Development	Region Authorities (17)	municipalities (8,117)			Railway Infrastructure Administrator (ADIF)	ADIF, several region authorities	ADIF, several region authorities								
Construction / Implementation of Infrastructure and Services	Ministry of Development	Region Authorities (17)	municipalities (8,117)			ADIF	ADIF, several region authorities	ADIF, several region authorities								
Operation and Management	Ministry of Development	Region Authorities (17)	municipalities (8,117)			ADIF	ADIF, several region authorities	ADIF, several region authorities								
Maintenance	Ministry of Development	Region Authorities (17)	municipalities (8,117)			ADIF	ADIF, several region authorities	ADIF, several region authorities								
Finance	Treasury	Region Authorities (17)	municipalities (8,117)			Treasury	Treasury, Several Region Authorities	Treasury, Several Region Authorities								

Figure 54: Institutional Classification Matrix ES – Ministry

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Ministry of Transport and Communications	ELY Centre	municipalities (22)	private companies	private companies	Finnish Transport Agency	Finnish Transport Agency	do not exist in North- Finland	VR Group	VR Transport	Finnish Transport Agency	limited company	Finnish Transport Safety Agency	Finavia	cargo companies	The Finnish Border Guard
Project Planning	Finnish Transport Agency	ELY Centre	municipalities (22)	private companies	private companies	Finnish Transport Agency	Finnish Transport Agency		VR Group	VR Transport	Finnish Transport Agency	limited company	Finnish Transport Safety Agency	Finavia	cargo companies	The Finnish Border Guard
Construction / Implementation of Infrastructure and Services	Finnish Transport Agency	ELY Centre	municipalities (22)	private companies	private companies	Finnish Transport Agency	Finnish Transport Agency		VR Group	VR Transport	Finnish Transport Agency	limited company	Finnish Transport Safety Agency	Finavia	cargo companies	The Finnish Border Guard
Operation and Management	Finnish Transport Agency	ELY Centre	municipalities (22)	private companies	private companies	Finnish Transport Agency	Finnish Transport Agency		VR Group	VR Transport	Finnish Transport Agency	limited company	Finnish Transport Safety Agency	Finavia	cargo companies	The Finnish Border Guard
Maintenance	Finnish Transport Agency	ELY Centre	municipalities (22)	private companies	private companies	Finnish Transport Agency	Finnish Transport Agency		VR Track	VR Track	Finnish Transport Agency	limited company	Finnish Transport Safety Agency	Finavia	cargo companies	The Finnish Border Guard
Finance	Finnish Transport Agency	ELY Centre	municipalities (22)	private companies and ELY Centre	private companies	Finnish Transport Agency	Finnish Transport Agency		VR Group	VR Transport	Finnish Transport Agency	limited company	Finnish Transport Safety Agency	Finavia	cargo companies	Ministry of the Interior

Figure 55: Institutional Classification Matrix FI – ELY

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal		
	National/ Strategic Network	Regional/ Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National/ Strategic Network	Regional/ Secondary Network	Local Network	National and Regional Public Transport (Inter-city and Regional)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulation and Safety)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	mintc, FTA	mintc, FTA, ELY-centers	mintc, municipalities	mintc, FTA	mintc, FTA	mintc, FTA	mintc, municipalities	mintc, FTA	mintc, FTA	mintc, FTA	mintc, private	mintc, Finavia	mintc, Finavia	mintc, municipalities	mintc, The Finnish Border Guard
Project Planning	FTA, ELY-centers	ELY-centers	municipalities	municipalities, private	private sector	FTA	municipalities, private sector, FTA	private sector, FTA, municipalities	private sector, FTA, municipalities	FTA	private sector, municipalities	Finavia	Finavia	municipalities, private sector	mintc, The Finnish Border Guard
Construction / Implementation of Infrastructure and Services	FTA, ELY-centers, private sector	ELY-centers, private sector	municipalities, private sector	municipalities, private sector	private sector	FTA, private sector	municipalities, private sector, FTA	private sector, FTA, municipalities	private sector, FTA, municipalities	FTA, private sector	private sector, municipalities	Finavia	Finavia	municipalities, private sector	The Finnish Border Guard, private sector
Operation and Management	FTA	FTA	municipalities, FTA	municipalities, private	private sector	FTA	municipalities, private sector, FTA	private sector, FTA, municipalities	private sector, FTA, municipalities	FTA	private sector, municipalities	Finavia	Finavia	municipalities, private sector	The Finnish Border Guard
Maintenance	ELY-centers, FTA, private sector	ELY-centers, private sector	municipalities, private sector	municipalities, private sector	private sector	FTA, private sector	municipalities, private sector, FTA	private sector, FTA, municipalities	private sector, FTA, municipalities	FTA, private sector	private sector, municipalities	Finavia	Finavia	municipalities, private sector	The Finnish Border Guard/private
Finance	FTA, ELY-centers, mintc	ELY-centers, FTA, mintc	municipalities, ELY-centers, FTA, mintc	municipalities, private, FTA, mintc	private sector	FTA, mintc	municipalities, private sector, FTA	private sector, FTA, municipalities	private sector, FTA, municipalities	FTA, mintc	private sector, municipalities	Finavia, mintc	Finavia, mintc	municipalities, private sector	mintc, The Finnish Border Guard

Figure 56: Institutional Classification Matrix FI – FTA

Primary Responsibilities	Road					Railway					Water Transportation		Aviation		Intermodal	
	National/ Strategic Network	Regional/ Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National/ Strategic Network	Regional/ Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	DIT	department	municipalities (36,600) or group of municipalities	MEDEE (regulation) department for non urban lines municipality for urban lines	MEDEE (regulation)	MEDEE	MEDEE RFF Region	MEDEE municipality	MEDEE SNCF region	MEDEE SNCF	MEDEE VNF	MEDEE	MEDEE	MEDEE region others	MEDEE region others	not relevant for France
Project Planning	DIT	department	municipalities (36,600) or group of municipalities	department for non urban lines municipality for urban lines		MEDEE RFF Region	MEDEE municipality	MEDEE SNCF region	MEDEE SNCF	MEDEE VNF	MEDEE GMP	MEDEE	MEDEE	MEDEE region CCI	MEDEE region others	not relevant for France
Construction/ Implementation of infrastructure and services	DIT concessions/maires	department	municipalities (36,600) or group of municipalities	department for non urban lines municipality for urban lines		RFF, SNCF PPP Region	municipality	RFF, SNCF SNCF	SNCF	VNF	GPM	MEDEE	MEDEE	MEDEE region Others	MEDEE region Others	not relevant for France
Operation and Management	DIT	department	municipalities (36,600) or group of municipalities	department municipality		RFF, SNCF PPP Region	municipality	RFF, SNCF SNCF	SNCF	VNF	GPM	MEDEE	MEDEE	MEDEE region Others	MEDEE region Others	not relevant for France
Maintenance	DIT concessions/maires	department	municipalities (36,600) or group of municipalities	department municipality		RFF, SNCF PPP Region	municipality	RFF, SNCF SNCF	SNCF	VNF	GPM	MEDEE	MEDEE	MEDEE region Others	MEDEE region Others	not relevant for France
Finance	AFITF concessions/maires	department	municipalities (36,600) or group of municipalities	MEDEE department municipality		MEDEE AFITF RFF region department municipality	MEDEE region department municipality	MEDEE SNCF region municipality	SNCF region municipality	AFITF VNF	GPM	MEDEE	MEDEE	MEDEE region municipality	MEDEE region others	not relevant for France

Figure 57: Institutional Classification Matrix FR – DIT

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal		
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Ministry for National Development	Ministry for National Development	municipalities (3,200)	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	local companies	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development
Project Planning	Hungarian Transport Administration	Hungarian Transport Administration	municipalities (3,200)	regional public bus agencies (7)	local companies	Hungarian Transport Administration	Hungarian Transport Administration	local companies	Hungarian State Railways Raaberbahn	RSOE	RSOE	Hungarocontrol	private companies	regional freight companies	Hungarian Transport Administration
Construction / Implementation of Infrastructure and Services	National Infrastructure Development PLC	National Infrastructure Development PLC	municipalities (3,200)	regional public bus agencies (7)	local companies	National Infrastructure Development PLC	National Infrastructure Development PLC	local companies	Hungarian State Railways Raaberbahn	Water Management Directorates (9)	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin
Operation and Management	Hungarian Public Roads PLC, State Motorway/PLC, PPP companies (4)	Hungarian Public Roads PLC	local infrastructure operators	regional public bus agencies (7)	local companies	Hungarian State Railways Raaberbahn	Hungarian State Railways Raaberbahn	local companies	Hungarian State Railways Raaberbahn	Water Management Directorates (9)	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin
Maintenance	Hungarian Public Roads PLC, State Motorway/PLC, PPP companies (4)	Hungarian Public Roads PLC	local infrastructure operators	regional public bus agencies (7)	local companies	Hungarian State Railways Raaberbahn	Hungarian State Railways Raaberbahn	local companies	Hungarian State Railways Raaberbahn	Water Management Directorates (9)	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin
Finance	Hungarian Transport Administration	Hungarian Transport Administration	municipalities (3,200)	regional public bus agencies (7)	local companies	Ministry for National Development	Ministry for National Development	local companies	Ministry for National Development	Ministry for Internal Affairs	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin

Figure 58: Institutional Classification Matrix HU – ÁAK zrt.

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Ministry for National Development	Ministry for National Development	municipalities (3,200)	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	local companies	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development
Project Planning	Hungarian Transport Administration	Hungarian Transport Administration	municipalities (3,200)	regional public bus agencies (7)	local companies	Hungarian Transport Administration	Hungarian Transport Administration	local companies	Hungarian State Railways Raaberbahn	regional/rail freight companies	RSOE	RSOE	Hungarocontrol	private companies	regional freight companies	Hungarian Transport Administration
Construction / Implementation of Infrastructure and Services	National Infrastructure Development PLC	National Infrastructure Development PLC	municipalities (3,200)	regional public bus agencies (7)	local companies	National Infrastructure Development PLC	National Infrastructure Development PLC	local companies	Hungarian State Railways Raaberbahn	regional/rail freight companies	Water Management Directorates (9)	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin
Operation and Management	Hungarian Public Roads PLC, State Motorway/PLC, PPP companies (4)	Hungarian Public Roads PLC	local infrastructure operators	regional public bus agencies (7)	local companies	Hungarian State Railways Raaberbahn	Hungarian State Railways Raaberbahn	local companies	Hungarian State Railways Raaberbahn	regional/rail freight companies	Water Management Directorates (9)	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin
Maintenance	Hungarian Public Roads PLC, Motorway/PLC, PPP companies (4)	Hungarian Public Roads PLC	local infrastructure operators	regional public bus agencies (7)	local companies	Hungarian State Railways Raaberbahn	Hungarian State Railways Raaberbahn	local companies	Hungarian State Railways Raaberbahn	regional/rail freight companies	Water Management Directorates (9)	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin
Finance	Hungarian Transport Administration	Hungarian Transport Administration	municipalities (3,200)	regional public bus agencies (7)	local companies	Ministry for National Development	Ministry for National Development	local companies	Ministry for National Development	regional/rail freight companies	Ministry for Internal Affairs	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin

Figure 59: Institutional Classification Matrix HU – HPR

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Ministry for National Development	Ministry for National Development	municipalities (3,200)	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	local companies	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development	Ministry for National Development
Project Planning	Hungarian Transport Administration	Hungarian Transport Administration	municipalities (3,200)	regional public bus agencies (7)	local companies	Hungarian Transport Administration	Hungarian State Railways	local companies	Hungarian State Railways	regional/rail freight companies	RSOE	RSOE	Hungarocontrol	private companies	regional freight companies	Hungarian Transport Administration
Construction / Implementation of Infrastructure and Services	National Infrastructure Development PLC	National Infrastructure Development PLC	municipalities (3,200)	regional public bus agencies (7)	local companies	National Infrastructure Development PLC	National Infrastructure Development PLC	local companies	Hungarian State Railways	regional/rail freight companies	Water Management Directorates (9)	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin
Operation and Management	Hungarian Public Roads State Motorway/PLC, PPP companies (4)	Hungarian Public Roads State Motorway/PLC	local infrastructure operators	regional public bus agencies (7)	local companies	Hungarian State Railways Raaberbahn	Hungarian State Railways Raaberbahn	local companies	Hungarian State Railways Raaberbahn	regional/rail freight companies	Water Management Directorates (9)	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin
Maintenance	Hungarian Public Roads State Motorway/PLC, PPP companies (4)	Hungarian Public Roads State Motorway/PLC	local infrastructure operators	regional public bus agencies (7)	local companies	Hungarian State Railways Raaberbahn	Hungarian State Railways Raaberbahn	local companies	Hungarian State Railways Raaberbahn	regional/rail freight companies	Water Management Directorates (9)	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin
Finance	Hungarian Transport Administration	Hungarian Transport Administration	municipalities (3,200)	regional public bus agencies (7)	local companies	Ministry for National Development	Ministry for National Development	local companies	Ministry for National Development	regional/rail freight companies	Ministry for Internal Affairs	private companies	Hungarocontrol	private companies	regional freight companies	National Tax and Customs Admin

Figure 60: Institutional Classification Matrix HU – HTA

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Orange	Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Project Planning	Dark Blue	Light Blue	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Construction / Implementation of Infrastructure and Services	Dark Blue	Light Blue	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Operation and Management	Dark Blue	Light Blue	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Maintenance	Dark Blue	Light Blue	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
Finance	Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange

Figure 61: Institutional Classification Matrix IT – ANAS S.p.A

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)						not applicable					not applicable					not applicable
Project Planning						not applicable					not applicable					not applicable
Construction / Implementation of Infrastructure and Services	national government + private sector										not applicable	national government + local government		national government + private sector		not applicable
Operation and Management	national government + private sector										not applicable	national government + local government		national government + private sector		not applicable
Maintenance	national government + private sector										not applicable	national government + local government		national government + private sector		not applicable
Finance	national government + private sector										not applicable	national government + local government		national government + private sector		not applicable

Figure 62: Institutional Classification Matrix JP – MLIT

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Orange	Blue	Light Orange	Light Orange	Dark Blue											
Project Planning	Blue	Blue	Light Orange	Light Orange												
Construction / Implementation of Infrastructure and Services	Light Orange	Light Orange	Red	Light Orange												
Operation and Management	Blue	Light Blue	Light Blue	Light Orange												
Maintenance	Light Blue	Light Blue	Light Blue	Light Orange												
Finance	Orange	Light Orange	Light Orange	Light Orange												

Figure 63: Institutional Classification Matrix LT – LRA

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Economic Planning Unit, Ministry of Works, Public Works Department	State Economic Planning Unit, State PWD	State Economic Planning Unit	Ministry of Transport, Land Public Transport Commission	Ministry of Transport, Road Transport Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Drainage and Irrigation Department, Sarawak Rivers Board	Ministry of Transport, Marine Department, Local Port Authority	Ministry of Transport, Civil Aviation Department	Malaysia Airport Berhad	Ministry of Transport, Land Public Transport Commission	Custom, Immigration Department
Project Planning	Economic Planning Unit, Ministry of Works, Public Works Department	State Economic Planning Unit, State PWD	State Economic Planning Unit	Ministry of Transport, Land Public Transport Commission	Ministry of Transport, Road Transport Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Drainage and Irrigation Department, Sarawak Rivers Board	Ministry of Transport, Marine Department, Local Port Authority	Ministry of Transport, Civil Aviation Department	Malaysia Airport Berhad	Ministry of Transport, Land Public Transport Commission	Custom, Immigration Department
Construction / Implementation of Infrastructure and Services	Public Works Department	State PWD	State PWD, Local Council	Land Public Transport Commission, Public Works Department	Public Works Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Drainage and Irrigation Department, Sarawak Rivers Board	local port authority	Public Works Department, Malaysia Airport Berhad	Public Works Department, Malaysia Airport Berhad	Ministry of Transport, Land Public Transport Commission	Public Works Department
Operation and Management	Public Works Department	State PWD	State PWD, Local Council	Land Public Transport Commission	Public Works Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Drainage and Irrigation Department, Sarawak Rivers Board	local port authority	Malaysia Airport Berhad	Malaysia Airport Berhad	Ministry of Transport, Land Public Transport Commission	Custom, Immigration Department
Maintenance	Public Works Department	State PWD	State PWD, Local Council	Land Public Transport Commission	Public Works Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Ministry of Transport, Railway Department	Drainage and Irrigation Department, Sarawak Rivers Board	local port authority	Malaysia Airport Berhad	Malaysia Airport Berhad	Ministry of Transport, Land Public Transport Commission	Custom, Immigration Department
Finance	Ministry of Finance	State Finance Office	State Finance Office	Ministry of Finance	Ministry of Finance	Ministry of Finance	Ministry of Finance	Ministry of Finance	Ministry of Finance	Ministry of Finance	Ministry of Finance	local port authority, Ministry of Finance	Ministry of Finance	Malaysia Airport Berhad	Ministry of Finance	Ministry of Finance

Figure 64: Institutional Classification Matrix MY – PWD

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Inter-city and Regional Trains)	National and Regional Freight Transport (Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	RNCMNR	RNCMNR	local authorities	local authorities	private sector	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure		Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure
Project Planning	RNCMNR	RNCMNR	local authorities	local authorities	private sector	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure		Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure
Construction / Implementation of Infrastructure and Services	RNCMNR	RNCMNR	local authorities	local authorities	private sector	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure		Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure
Operation and Management	RNCMNR	RNCMNR	local authorities	local authorities	private sector	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure		Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure
Maintenance	RNCMNR	RNCMNR	local authorities	local authorities	private sector	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure		Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure
Finance	RNCMNR	RNCMNR	local authorities	local authorities	private sector	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	CFR, Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure		Ministry of Transport and Infrastructure	Ministry of Transport and Infrastructure

Figure 65: Institutional Classification Matrix RO – RNCMNR

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Busses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Orange	Orange	Orange	Orange	Orange	Orange	Blue	White	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange
Project Planning	Blue	White	White	White	White	Blue	White	White	White	White	White	White	White	White	White	White
Construction / Implementation of Infrastructure and Services	Blue	White	White	White	White	Blue	White	White	White	White	White	White	White	White	White	White
Operation and Management	Blue	White	White	White	White	Blue	White	White	White	White	White	White	White	White	White	White
Maintenance	Blue	White	White	White	White	Blue	White	White	White	White	White	White	White	White	White	White
Finance	Orange	Orange	Orange	Orange	Orange	Orange	Orange	White	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange

Figure 66: Institutional Classification Matrix SE – Trafikverket

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Road Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)																
Project Planning																
Construction / Implementation of Infrastructure and Services																
Operation and Management																
Maintenance																
Finance																

Figure 67: Institutional Classification Matrix UK – TS

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Inter-city and Regional Trains)	National and Regional Freight Transport (Inter-city and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Federal Highway Administration and state government	state and local government	state and local government	Federal Transit Administration	Federal Highway Administration and state government; safety regulation by Federal Motor Carrier Safety Administration											
Project Planning	state government (50)	state and local government	state and local government	state and local government	state government (50)											
Construction / Implementation of Infrastructure and Services	state government (50)	state and local government	state and local government	state and local government	state government (50)											
Operation and Management	state government (50)	state and local government	state and local government	state and local government	state government (50)											
Maintenance	state government (50)	state and local government	state and local government	state and local government	state government (50)											
Finance	Federal Highway Administration states, private sector	state and local government	state and local government	Federal Transit Administration, states, private sector	Federal Highway Administration states, private sector											

Figure 68: Institutional Classification Matrix US – FHWA

Primary Responsibilities	Road					Railway				Water Transportation		Aviation		Intermodal		
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Inter-city and Regional Trains)	National and Regional Freight Transport (Inter-city and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	FHWA	MoDOT, regional planning commissions	regional planning commission, cities, counties	FTA		FRA, Amtrak	Amtrak, MoDOT, private	private, regional planning commission, cities, counties	Amtrak	private sector, FRA	US Army Corps of Engineers	US Army Corps of Engineers	FAA	airport authorities, cities	private sector	not applicable
Project Planning	FHWA	MoDOT, regional planning commissions	regional planning commission, cities, counties	FTA		FRA, Amtrak	Amtrak, MoDOT, private	private, regional planning commission, cities, counties	Amtrak	private sector, FRA	US Army Corps of Engineers	US Army Corps of Engineers	FAA	airport authorities, cities	private sector	not applicable
Construction / Implementation of Infrastructure and Services	MoDOT	MoDOT	cities, counties	cities, counties												
Operation and Management	MoDOT	MoDOT	cities, counties	cities, counties												
Maintenance	MoDOT	MoDOT	cities, counties	cities, counties												
Finance	MoDOT, FHWA	MoDOT	MoDOT, cities, counties	MoDOT, cities, counties												

Figure 69: Institutional Classification Matrix US – MoDOT

Primary Responsibilities	Road				Railway				Water Transportation		Aviation		Intermodal			
	National / Strategic Network	Regional / Secondary Road Network	Local Road Network	National and Regional Public Transport (Buses and Coaches)	National and Regional Freight Transport (Lorries, Vans and Trailers)	National / Strategic Network	Regional / Secondary Network	Local Network	National and Regional Public Transport (Intercity and Regional Trains)	National and Regional Freight Transport (Intercity and Regional Trains)	Inland Waterways	Ports and Harbours	Aviation and Air Traffic Control (Civil Aviation Regulations)	Airport Provision	Intermodal Terminals	Land Border Crossings
Strategic Planning (Policy and Regulations)	Department of Transport (DoT)	provincial, regional authorities	municipalities, local authorities	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)	Department of Transport (DoT)
Project Planning	SANRAL	provincial, regional authorities	municipalities, local authorities	municipalities	private sector	agencies (Transnet, PRASA)	PRASA	PRASA	agency (PRASA)	agency (Transnet)	Department of Transport (DoT)	Department of Transport (DoT)	agency (SACAA, ATNS)	agency (ACSA)	individual agencies	agency (CBRTA)
Construction / Implementation of Infrastructure and Services	contractors	contractors	contractors	contractors	contractors	contractors	contractors	contractors	contractors	contractors	contractors	contractors	contractors	contractors	contractors	contractors
Operation and Management	SANRAL	provincial authorities	municipalities	municipalities	private sector	agencies (Transnet, PRASA)	PRASA	PRASA	agency (PRASA)	agency (Transnet)	Department of Transport (DoT)	Department of Transport (DoT)	agency (ACSA)	agency (ACSA)	individual agencies	agency (CBRTA)
Maintenance	SANRAL plans, contractors implement	provincial authorities and contractors	municipalities and contractors	municipalities and contractors	contractors	agencies (Transnet, PRASA)	PRASA	PRASA	agency (PRASA)	agency (Transnet)	Department of Transport (DoT)	Department of Transport (DoT)	agency (ATNS)	agency (ACSA)	individual agencies	agency (CBRTA)
Finance	government, non-toll roads, toll tariffs, toll roads	government	government	government	private sector	government and user charge	government and user charge	government and user charge	government and user charge	government and user charge	government and user charge	government and user charge	government and user charge	user charge	government	government and tariffs

Figure 70: Institutional Classification Matrix ZA – SANRAL

5.2.2 Part 2 A – Multi-modal Activities

5.2.2.1 Analysis of Interactions between Modes, Functions, Spatial Tiers and Stakeholder

The following section of the appendix provides data in regard of the type of interface and the interactions between:

- Stakeholder – Politics and Administration (**Table 9**)
- Stakeholder – Traffic Carrier and Operator (**Table 10**)
- Stakeholder – Customer (**Table 11**)
- Stakeholder – Media (**Table 12**)
- Internal Stakeholder – Organizational Subjects (**Table 13**)
- Other Stakeholder (**Table 14**)

A description of the existing stakeholders is set up in a matrix. Each organization (thirst column) mentioned the type of interface in regard of the stakeholders (thirst row), which is obvious in the boxes. In the tables are only listed organizations that have given a response to the type of interface. Consequently, the transport mode of the organizations that have not specified their answer or have given a response which is not applicable is not quoted in the table. In addition, the highlighted boxes show the relevance of the stakeholders for the organization. In order to understand this, the color code is explained in the legend below.

Legend

Very relevant	Quite relevant	Moderately relevant	Slightly relevant	Hardly relevant	Not at all relevant
---------------	----------------	---------------------	-------------------	-----------------	---------------------

Stakeholder – Politics and Administration

Organization	Politics – Legal Guidelines – Parliament	Politics – Budgetary Guidelines – Finance Authority	Ministry – e.g. Permissions – e.g. Ministry of Transport	Regional, Provincial Government	Local Government
AT – ASFINAG	Statutory basis for planning, framework guidelines	Regularly audits by Austrian court of audit, no separate budget for intermodal projects	ASFINAG is 100% owned by the ministry Informal framework guidelines for intermodality, annual approval of medium term construction program (railway and roads) with ministry	The federal system gives rise to extensive competences at regional and local level with regard to spatial planning and construction as well as a noticeable political influence concerning the medium term construction program	Project specific adjustments

AU – MRWA	Ultimate stakeholder	All funding from central government	Ultimate stakeholder	Ultimate stakeholder	Close partner
AU – NSW	NSW accountable to NSW parliament and operates under State legislation	NSW accountable to NSW parliament and operates under State legislation NSW budget set through government budget process	NSW is equivalent to Ministry of Transport	NSW is NSW government transport authority	Transport planning, projects, policy and regulation
BE – AWW			Flemish Minister of Mobility and Public Works		
CA – MTQ	Government global policies (e.g. sustainable development)	Budget allowed to the Ministry	MTQ and other ministries policies	Regional planning	Urban planning
FI – ELY			Ministry of Transport and Finnish Transport Agency finance our operations such as enabling smooth travel chains in terms of road transport	Regional Council of Lapland is in charge of transport system planning in Northern Finland	Negotiations with municipalities about bus time schedules etc. so that they support passenger transportation logistics
FI – FTA	Decision maker	Financier	Decision maker	Collaborator	Collaborator
FR – DIT				Planning and financing projects	
HU – HPR	General	Specific yearly contract			Technical
HU – HTA	General	Supervision	Supervision	Specific issues	Specific issues
MY – PWD	Road transport act	Development funds	Enforcement	Land issues	Land issues
US – FHWA	Legislature is the source of authority and funding	Treasury Department and Office of Management and Budget ensure compliance with budget law and policy	Most executive authority for roads rests with the Secretary of Transportation who delegates authority to the Federal Highway Administration for roads programs	Regional governments (States) own and operate the major roads in the United States and are responsible for the use of federal funds for their improvement	Large metropolitan areas have significant planning authority for the use of federal funds.

Table 9: Stakeholder – Politics and Administration

Stakeholder – Traffic Carrier and Operator

Organization	Road Company or Authority	Railway Infrastructure Company or Authority	Railway Company (Train Operator)	Aviation	Waterways Operator	Public Transport Company (Operator using Roads)
AT – ASFINAG	ASFINAG itself	Informal intermodal agreement, partly based on intermodal framework plans of the ministry	Same as railway infrastructure company	Informal intermodal agreement, partly based on intermodal framework plans of the ministry	Informal intermodal agreement, partly based on intermodal framework plans of the ministry	

AU – MRWA	MRWA itself	Mainly on level of the kings				
AU – NSW	NSW and Roads and Maritime Services are strategic partners in delivery of integrated transport services	NSW funds and manages service contracts with Sydney Trains and NSW Trains. It liaises with Australian Rail Track Corporation	NSW funds and manages service contracts with Sydney Trains and NSW Trains	Transport planning, precinct	NSW and Roads and Maritime Services are strategic partners in delivery of integrated transport services	NSW contracts with State Transit Authority and private bus operators
BE – AWW	AWV plus municipalities			National (Zaventem) and regional (3 local airports in Flanders)	3 agencies in Flemisch Ministry of Mobility and public works: Maritime Dienstverlenig en Kust, Waterwegen en Zeekanaal, and De Scheepvaart	Public transport company De Lijn
CA – MTQ	Regulations, freight truck movement policy	Regulations for short lines, financial assistance program	Regulations for short lines, financial assistance program	Air Policy, financial assistance program	Marine Policy, financial assistance Program	People movement policy, financial assistance program
FI – ELY		Discussions about travel chains		Discussions about travel chains	Discussions about travel chains	Discussions about travel chains
FI – FTA	FTA	FTA	Service provider	Colleague	FTA	Service provider
FR – DIT	Motorways concessionaires	RFF	SNCF		VNF	
HU – HPR	Everyday	Technical	Technical			Technical
HU – HTA	Supervision	Control of developments	Specific issues		Specific issues	Specific issues
MY – PWD	Enforcement		Railway crossing		Airport construction	Traffic rules
US – FHWA	Major area of interface is providing seamless connectivity between other modes of transportation using the road system	Major area of interface is providing seamless connectivity between other modes of transportation using the road system	Major area of interface is providing seamless connectivity between other modes of transportation using the road system	Major area of interface is providing seamless connectivity between other modes of transportation using the road system	Major area of interface is providing seamless connectivity between other modes of transportation using the road system	Major area of interface is providing seamless connectivity between other modes of transportation using the road system

Table 10: Stakeholder – Traffic Carrier and Operator

Stakeholder – Customer

Organization	Customer, Freight Transport	Customer, Passenger Transport, Interregional	Customer, Passenger Transport
AT – ASFINAG	Annual customer satisfaction analyses	Annual customer satisfaction analyses	Annual customer satisfaction analyses
AU – MRWA	Heavy vehicles, restricted access	In context of the road user	In context of the road user
AU – NSW	Direct customer	Direct customer	Direct customer
BE – AWW	Enforcement of overloaded vehicles		
CA – MTQ		People movement policy; financial assistance Program	People movement policy; financial assistance program
FI – ELY	Dialogue is mainly done with traffic carriers or operators	Dialogue is mainly done with traffic carriers or operators	Dialogue is mainly done with traffic carriers or operators
FI – FTA	Strategic customer	Key customer	Customer to follow-up
FR – DIT			At regional or city level
HU – HPR	Route permits	Information	Information
HU – HTA	Indirect (overweight tolls)	Specific issues	Specific issues
MY – PWD	Traffic rules		
US – FHWA	Customers of various transportation modes are consulted in the formulation of policies and regulations that would impact them	Customers of various transportation modes are consulted in the formulation of policies and regulations that would impact them	Customers of various transportation modes are consulted in the formulation of policies and regulations that would impact them

Table 11: Stakeholder – Customer

Stakeholder – Media

Organization	Print Media	Media, Radio	Media, TV	Internet Service Providers – e.g. for Traffic Information
AT – ASFINAG	Promotion and marketing activities in general and on project base	Promotion and marketing activities in general and on project base, traffic message channel	Promotion and marketing activities in general and on project base	Promotion and marketing activities in general and on project base, traffic message channel, intermodal route-planning
AU – MRWA	Travel info	Travel info	Travel info	Travel info
AU – NSW	Traffic and public transport service information; campaigns	Traffic and public transport service information; campaigns	Traffic and public transport service information; campaigns	Traffic and public transport service information; campaigns
CA – MTQ		Radio circulation 730 am		Québec 511 for road traffic
FI – ELY	Interviews, stories	Interviews, stories	Interviews, stories	
FI – FTA	Promotion	Promotion	Promotion	Service provider
HU – HPR	Information	Information	Information	Information
HU – HTA	Information	Information	Information	Information
MY – PWD	Information dissemination	Information dissemination	Information dissemination	Information dissemination

Table 12: Stakeholder – Media

Internal Stakeholder – Organizational Subjects

Organization	Internal – Planning Department	Internal – Construction Department	Internal – Operation and Management	Internal – Maintenance
AT – ASFINAG	Binding guidelines and processes	Binding guidelines and processes	Binding guidelines and processes	Binding guidelines and processes
AU – MRWA	Core function	All work contracted out	Core function	Insourced contracts
AU – NSW	Planning approvals, interface with master planning	Internal - transport projects division	Transport operators	Mix of public and private operators
BE – AWW	AWV	AWV	AWV	AWV
CA – MTQ	Studies			
FI – ELY	Intermodality is a sub-task of the unit		Intermodality is a sub-task of the unit	
FI – FTA	Core business	Core business	Core business	Core business
HU – HPR			Everyday	Everyday
HU – HTA	Close cooperation	Close cooperation	Close cooperation	Close cooperation
MY – PWD	Internal process	Internal process	Internal process	Internal process

Table 13: Internal Stakeholders – Organizational Subjects**Other Stakeholder**

Organization	Other Stakeholder	Description of Type of Interface
AT – ASFINAG	Internal - technical coordination department	Located in the holding, responsible for coordination of internal and intermodal belongings
CA – MTQ	The organization works closely with public transport company and they are consulted in decision making for the road network management.	
HU – HPR	Road users	Information
HU – HTA	Cycling	Close cooperation

Table 14: Other Stakeholder

5.2.2.2 Analysis of Multi-modal Activities (Internal, External)

The following section of the appendix provides data about:

- Activities in place with regard to multi / intermodality146
- Systems for supporting multi- and intermodal objectives150
- Organizations of transport providers for whom measures have been put in place151
- Specific implemented measures or projects152
- External processes in place with regard to multi / Intermodality153

Activities in Place with regard to Multi- / Intermodality

The following areas show the given comments concerning activities which are in place with regard to multi- and intermodal measures:

- Organizational measures within the organization (**Table 15**)
- Technical resources (**Table 16**)
- Formal and informal contacts and working groups (**Table 17**)
- Own plan of action for inter- / multi-modal measures (**Table 18**)
- Analysis of the stakeholders and explicit definition of the interface (**Table 19**)

The comments concerning multi- and intermodal activities are set up in a matrix. Each organization (thirst column) that has given a comment can be seen in the boxes in regard to the activities (thirst row). In the tables are only listed those organizations that have given an evaluable comment. Consequently, the transport mode of the organizations that have not given a description or have given a not applicable response is not quoted in the table. Furthermore, the highlighted boxes show whether the activity is in place or not. In addition to that, the success of the organization is classified for the case that the organization has given an answer. In consequence, it can be recognized whether the activity is already in place or not. A box with a classification of the success shows that the activity is in place. In order to understand the following list, the color code is explained in the legend below.

Legend

Yes	No	Very successful	Quite successful	Moderately successful	Slightly successful	Hardly successful	Not at all successful
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Organizational Measures within the Organization

Organization	Organizational Measures within the Organization	> Own Responsible Person for Intermodality / Multimodality	> Own Department for Intermodality / Multimodality	> Intermodality / Multimodality as Defined Sub-task of a Department
AT – ASFINAG				Part of the Technical Coordination Department (coordinates the various activities within an action plan) and project specific activities (as task of project manager)
AU – NSW				Responsibility for interchanges and intermodal planning
BE – AWV			In the ministry of mobility and public works	
CA – MTQ	Planning Department, Modal Departments			
FI – FTA		Unsuccessful attempt	Unsuccessful attempt	Current practice in agency
HU – HPR		Responsible person for cycling at regional level		Operation and maintenance of bicycle roads at regional level
US – FHWA				Mode specific agencies, such as the Federal Highway Administration and the Federal Transit Administration have joint roles in some areas, especially in planning. Other topics are coordinated under the auspices of the Department of Transportation

Table 15: Organizational Measures within the Organization

Technical Resources

Organization	Technical Resources (e.g. Information Systems for Customers)	Joint Technical Resources for Planning and Design (e.g. Transport Model)
AT – ASFINAG	Intermodal routeplanner "traffic platform austria", app "unterwegs" (traffic information concerning asfinag roadnetwork & national highways)	Integrated transport model 2015+: integrated transport model with the ministry & railprovider, as a base of integrated transport planning IMove - Austria R&D Project to create a model for automatical intermodal data-supply concerning freight-traffic-statistics ASFINAG-ÖBB-Plattform integrated onlineplattform for adjustment of non projectspecific tasks/themes between ASFINAG (highways) & ÖBB (railway)
AU - MRWA	Evolving	
AU – NSW	Smartphone apps for way finding with real time information; online journey planners	Shared project management methodologies. Other resources under development
BE – AWW		In other agency of the Flemish Ministry of Mobility and Public Works
FI – FTA	Routine in operations	Maybe in future
FR – DIT		SETRA (national) and in some regional divisions (eg: DREAL Nord)
HU – HPR	Road user information service	
US – FHWA	Freight Analysis Framework - A set of data and analysis tools to support freight planning at all levels	

Table 16: Technical Resources

Formal and Informal Contacts and Working Groups

Organization	Formal Contacts and Working Group	Informal Contacts and Working Group
AT – ASFINAG	Detailed financing contracts at project base	Partly based on intermodal framework plans of the ministry (regular jour fixes, workshops with stakeholders)
AU – NSW	Not really working groups per se - as it part of internal business imperatives	Not really working groups per se - as it part of internal business imperatives
CA – MTQ	Air industry forum Marine industry forum Trucking industry forum	
FI – FTA	Routine	Routine
US – FHWA	Multi-modal Freight Policy Council within the executive branch and a Freight Advisory Committee providing advice from stakeholders and experts.	

Table 17: Formal and Informal Contacts and Working Groups

Own Plan of Action for Inter- / Multi-modal Measures

Organization	Own Plan of Action for Inter- / Multi-modal Measures	> Binding Plan of Action	> Non-binding Plan of Action	> Organizational Plan of Action	> Organization-wide Coordinated Plan of Action
AT – ASFINAG					Summarizes the activities of the Dep. "Technical Coordination", potential for further development
AU - MRWA		State level strategy	State level strategy		
AU – NSW	Under development				Long term transport master plan; interchange strategy under development; Freight & Ports Strategy
BE – AWW		For bicycle paths (functional)			With De Lijn + for bicycle paths (functional)
CA – MTQ	Modal policies (air, marine, trucking and transit)	Trucking policy	Air and Marine policies	Strategic Plan	
FI – FTA		Key performance measures are binding	Some draft plans, not effective	In some issues available	Current practice
FR – DIT			E.g Grenelle de l'Environnement; SNIT; engagement national freight; CPER		

Table 18: Own Plan of Action for Inter- / Multi-modal Measures

Analysis of the Stakeholders and Explicit Definition of the Interface

Organization	Analysis of the Stakeholders for Intermodality / Multimodality	Explicit Definition of the Interfaces to All Relevant Stakeholders
AT – ASFINAG		Annual stakeholder analysis, potential for further development concerning stakeholders for intermodality
AU – NSW	Interchange strategy under development	Interchange strategy under development
CA – MTQ	Financial Assistance program	
FI – FTA	Not systematic	Not systematic

Table 19: Analysis of the Stakeholders and explicit Definition of the Interface

Systems for Supporting Multi- and Intermodal Objectives

AT – ASFINAG:

ASFINAG- Unterwegs

Mobile or online application: real-time transport information concerning the ASFINAG road network as well as partly other national highway.

Traffic Information Austria

In future all transport users will be provided with traffic information and routing

- for the whole of Austria
- for all modes of transport (car, public transport, cyclists, pedestrians)
- in a uniform high quality.

This innovation is a milestone on the way to an even more efficient, ecological, safe and comfortable transport system in Austria. At the end of the project (summer 2013), all road users will have access to a common intermodal traffic information service provided by all participating partners. The results can also be used in the information services of the project partners as well as offered to third-party providers of customer information.

Telematics Testing Ground

Led by ASFINAG, the research project Telematics Testing Ground, a consortium of research, industry and public companies is testing how s cooperative services need to be designed and used in order to make an optimal contribution to greater safety, efficiency and sustainability mobility for our customers. This research project is currently being tested on a triangle of motorways in the greater Vienna region (approximately 45 kilometers of main test route). This individual information should be available to everyone in real time in a few years' time.

Information of availability of P&R-Terminals

Partly digital direction signs/messages concerning availability of P&R-Terminals (mainly in city regions)

AU – NSW:

SCATS (Sydney Coordinated Adaptive Traffic System): provides traffic data from all signalized intersections in New South Wales and from other arterial and motorways.

Public transport ticketing systems (multiple) provide data on patronage across all modes, however rolling out a consistent ticketing platform from 2013-2015.

BE – AWV:

Another agency of the Flemish Ministry for Mobility and Public Works (the Flemish traffic center): uses / operates the different traffic systems that are built and maintained by our agency.

CA – MTQ:

Multimodal database for freight on Excel and TransCAD which includes information on tonnages, O/D, commodities forecast.

HU – HTA:

Information system and database (KIRA) for all transportation modes under development. The software was developed in 2012. Currently data collection is in progress. Aviation is not part of the system.

JP – MLIT:

The National Integrated Transport Analysis System (NITAS) was developed and is used to evaluate the current status of multimodal measures and estimate the effects of the projects that are at the planning stage. A tool to search for travel time and cost by combining means of transportation including vehicles, railroad, aviation and ships, NITAS is capable of conducting multifaceted analysis and evaluation using statistical data of industry and commerce.

Organizations or Transport Providers for whom Measures have been put in Place**AT – ASFINAG:**

- Focus lies on railway-provider (ÖBB)
- Regional & local road carriers (Federal States and Communities)
- Pilot project: underground in the capital city of Austria
- Regional and local public transport/infrastructure providers

BE – AWW:

- Expanding the functional bicycle path network: by the agency for Road and Traffic (ourselves), by other agencies of the Flemish Ministry for Mobility and Public Works, and by funding / supporting the local municipalities (by the Flemish Ministry for Mobility and Public Works)
- Improving the flow of the public transport by busses and trolleys along the regional roads with De Lijn

(+ Unlocking access to ports and airports with three other agencies of the Flemish Ministry for Mobility and Public Works)

Specific implemented Measures or Projects**BE – AWW:**

- Bicycle paths network: a virtual investment of 100 million euro a year by all agencies of the Flemish Ministry for Mobility and Public Works, AWW has the largest part
- a structural meeting between De Lijn and AWW for specific investments by our agency for improvement of the flow of public transport

CA – MTQ:

- Modal Integration (the program ended on March 31st 2011):
www.mtq.gouv.qc.ca/portal/page/portal/ministere_en/ministere/programmes_aide/transport_maritime/integration_modale
- Assistance Program aiming to reduce or avoid greenhouse gas emissions through the implementation of intermodal rail and marine transport projects (the program ended on March 31st 2013):
www.mtq.gouv.qc.ca/portal/page/portal/ministere_en/ministere/programmes_aide/transport_maritime/reduction_ges_transport_marchandises
- Improving energy efficiency in road, rail and marine transportation - marine and rail component (the program ended on march 31st 2013):
www.mtq.gouv.qc.ca/portal/page/portal/ministere_en/ministere/programmes_aide/transport_maritime/efficaciteenergetique_transp_marchand

JP – MLIT:

MLIT provides local governments with financial support to cover the expenditure of formulating "regional integrated transportation strategies" and expenditure for implementing related projects (including development of traffic terminals); Subsidies for survey on city and regional integrated transport strategies or general subsidies for social infrastructure development

External Processes in Place with regard to Multi / Intermodality

The following areas show the given comments concerning external processes which are in place with regard to multi / intermodality:

- Formal and Informal Collaboration with External Organizations (**Table 20**)
- Central Planning (**Table 21**)
- Integrated Delivery and Transport Agency (**Table 22**)

For each process the comments of the organizations can be seen in the rows of the table one below the other. The first one shows whether there are present activities within the company and if so they are also explained. The second row provides information about the binding of these activities. In addition to the comments of the organizations, the box is colored for detecting the type of response. The following legend demonstrates the meaning of each of these colors. What remains to be said, is that only those organizations are shown in the table which have given an additional answer.

Legend

Yes	No	Binding	Not binding
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Formal and Informal Collaboration with External Organizations

Organization	Formal Collaboration with external Organizations	Informal Collaboration with external Organizations
AT – ASFINAG	only on project base (contract-partners)	carriers own initiative & selfinterest => different focus of the individual transport carriers, various plans of action
	only on project base (e.g specific leagal financing-contracts)	providers own initiative & selfinterest => different focus of the individual transport providers, various plans of action
AU – MRWA	Part of our approach to business is governed by a Community Engagement Policy and commitment to work with others.	Part of our approach to business is governed by a Community Engagement Policy and commitment to work with others.
	Decisions made through formal cooperation is binding	Engagement is used to seek community support and "buy in" but not binding
AU – NSW	TfNSW in collaboration with Roads Maritime Services, Sydney and NSW Trains, other Government agencies, industry partners.	TfNSW in collaboration with Roads Maritime Services, Sydney and NSW Trains, other Government agencies, industry partners.
	Sometimes, depending on the organization.	Sometimes, depending on the organization.
AU – VicRoads	Transport Porfolio	Transport Porfolio
BE – AWV		head of agency: contacts with minister (and cabinet), other heads of agencies of the Flemisch ministry for Mobility and Public Works, federal police, ... heads of section: contacts with local municipalities, other agencies of the Flemisch ministry for Mobility and Public Works such as De Lijn, ... engineers: contacts with local municipalities, with other agencies of the Flemisch ministry for Mobility and Public Works, ... heads of district (local section for maintenance): contacts with local municipalities, ...
	Because of the formal character of the meetings	ex. Decisions on the level of the Flemisch ministry for Mobility and Public Works, in order that all the agencies are involved

CA – MTQ	L'AMT (Agence métropolitaine [de Montréal] des transports) is an external organization of MTQ and the responsible is minister	
	L'AMT (Agence métropolitaine [de Montréal] des transports) is a external organisation of MTQ and the responsible is minister	
FI – ELY	Finnish Transport Agency, Ministry of Transport	
	They are binding but, at the same time, only plans and recommendations. To put everything in practice is difficult due to scarce financial resources.	
FI – FTA	FTA/mintc/others	FTA/mintc/others
	usually mintc will supervise them	purpose is to exchange knowledge, not to make binding agreements
HU – ÁAK zrt.		
	information exchange	
HU – HPR		
	information exchange	different issues
HU – HTA	Formal collaboration is less frequent. Ministry of National Development is responsible for the organization of these meetings.	Informal collaboration is regular in several departments of the Hungarian Transport Administration, Ministry of National Development and other stakeholders.
	Legally binding, but implementation is sometimes difficult.	Legally not binding, but results are usually considered.
IT – ANAS S.p.A		ANAS+Minister of transport and Infrastructures
	For the implementation of the National Mobility General Plan	During the prlerimnaty definition of the project
JP – MLIT	Regional development bureaus etc.	Regional development bureaus etc.
	Discussion or review is often made on how to create a preferred mode of regional transportation, and there do not seem to be any major binding conditions on the results of discussion.	Discussion or review is often made on how to create a preferred mode of regional transportation, and there do not seem to be any major binding conditions on the results of discussion.
MY – PWD	Ministry of Finance, Ministry of Transport, Ministry of Works	Ministry of Finance, Ministry of Transport, Ministry of Works
	Authorization Letter	List of project

Table 20: Formal and Informal Collaboration with External Organizations

Central Planning

Organization	Central Planning
AT – ASFINAG	strategic frameworkplans of the ministry - not regulary, long term plans
	longterm strategic frameworkplans of the ministry => based on the inputs of individual transport providers => less superior coordiantion, different focus of indiviaol carriers
AU – MRWA	Department of Transport and Department of Planning set high level decision making, Main Roads then translates into operational need for roads
	Decisions made through formal central planning agencies are binding
AU – VicRoads	Transport Porfolio
FI – FTA	FTA/regional government
	plans are binding depending political decisions based on them

HU – HTA	Hungarian Transport Administration, Ministry of National Development
	Central plans have to be considered in lower levels of planning.
IT – ANAS S.p.A	
	National Mobility General Plan
JP – MLIT	Regional development bureaus etc.
	Discussion or review is often made on how to create a preferred mode of regional transportation, and there do not seem to be any major binding conditions on the results of discussion.
MY – PWD	Economic Planning Unit
	List of project / Authorization Letter

Table 21: Central Planning

Integrated Delivery and Transport Agency

Organization	Intermodal/Multi-modal provision of Transport Infrastructure (integrated Delivery)	Intermodal/Multi-modal Transport Infrastructure Organization (integrated Transport Agency)
AU – MRWA	Department of Transport and Department of Planning set high level decision making, Main Roads then translates into operational need for roads	
	Decisions made through formal central planning agencies are binding	
AU – NSW	TfNSW in collaboration with Roads Maritime Services, Sydney and NSW Trains, other Government agencies, industry partners.	TfNSW in collaboration with Roads Maritime Services, Sydney and NSW Trains, other Government agencies, industry partners.
AU – VicRoads	Transport Portfolio	Transport Portfolio
FI – FTA	FTA	FTA
	internal decisions are binding	internal decisions are binding
HU – HPR		Organisation (Hungarian Transport Agency)
IT – ANAS S.p.A	Minister of transport and Infrastructures	
JP – MLIT	Regional development bureaus etc.	
	Discussion or review is often made on how to create a preferred mode of regional transportation, and there do not seem to be any major binding conditions on the results of discussion.	
MY – PWD	Ministry of Transport, Economic Planning Unit, Implementation & Coordination Unit	Ministry of Transport, Implementation & Coordination Unit
	Malaysia Plan	Act / Ordinance / Rules
ZA – SANRAL	Some - at national and regional level	Some - at national and regional level

Table 22: Integrated Delivery and Transport Agency

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7 List of Abbreviations

BMVIT	Bundesministerium für Verkehr, Innovation und Technologie
LATIS	.....	Land Use and Transport Integration in Scotland
ÖBB	.....	Österreichische Bundesbahn (rail provider Austria)
ÖIAG	.....	Österreichische Industrieholding AG
PIARC	.....	World Road Association
P&D	.....	Park and Drive
P&R	.....	Park and Ride
R&D	.....	Research and Development
TC	.....	Technical Committee
WG	.....	Working Group

Countries

AT	.....	Austria
AU	.....	Australia
BE	.....	Belgium
CA	.....	Canada
DE	.....	Germany
ES	.....	Spain
FI	.....	Finland
FR	.....	France
HU	.....	Hungary
IT	.....	Italy
JP	.....	Japan
LT	.....	Lithuania
MY	.....	Malaysia
RO	.....	Romania
SE	.....	Sweden
UK	.....	United Kingdom
US	.....	United States
ZA	.....	South Africa

Road and Transport Organizations

ASFINAG	.....	Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft (AT)
MRWA	.....	Main Roads Western Australia (AU)
NSW	.....	Transport for New South Wales (AU)
VicRoads	.....	Roads Victoria (AU)
AWV	.....	Agentschap Wegen en Verkeer / Agency for Road and Traffic (BE)
MTQ	.....	Québec Ministry of Transportation (CA)

BMVBS	.....	Bundesministerium für Verkehr und digitale Infrastruktur (DE)
CF – JE	.....	Consejería de Fomento – Junta de Extremadura (ES)
Ministry	.....	Ministerio de Formento / Ministry of Development (ES)
ELY	.....	Elinkeino-, liikenne- ja ympäristökeskus / Centre for Economic Development, Transport and the Environment (FI)
FTA	.....	Liikennevirasto / Finnish Transport Agency (FI)
DIT	.....	Transport Infrastructures Department (FR)
ÁAK zrt.	.....	Állami Autópálya Kezelő Zrt. / State Motorway Management Company Ltd. (SMMC, Ltd) (HU)
HPR	.....	Magyar Közút Nonprofit Zrt. / Hungarian Public Roads Non-profit Pte Ltd Co. (HU)
HTA	.....	Hungarian Transport Administration (HU)
ANAS S.p.A.	.....	Azienda Nazionale Autonoma delle Strade (IT)
MLIT	.....	Ministry of Land, Infrastructure, Transport and Tourism (JP)
LRA	.....	Lithuanian Road Administration under the Ministry of Transport and Communications (LT)
PWD	.....	Public Works Dpartment (MY)
RNCMNR	.....	Romanian National Company of Motorways and National Roads (RO)
Trafikverket	.....	Trafikverket (SE)
TS	.....	Transport Scotland (UK)
FHWA	.....	U.S. Department of Transportation – Federal Highway Administration (US)
MoDOT	.....	Missouri Department of Transportation (US)
SANRAL	.....	South African National Road Agency (SOC) Ltd (ZA)

Units

km	.....	kilometer
km/y	.....	kilometer per year
mo vh km/y	.....	motor vehicle kilometer per year
trakm/y	transit-kilometer per year
to/y	tons per year
tokm/y	tonne-kilometers per year

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