Standing Committee
for Economic and Commercial Cooperation
of the Organization of Islamic Cooperation (COMCEC)

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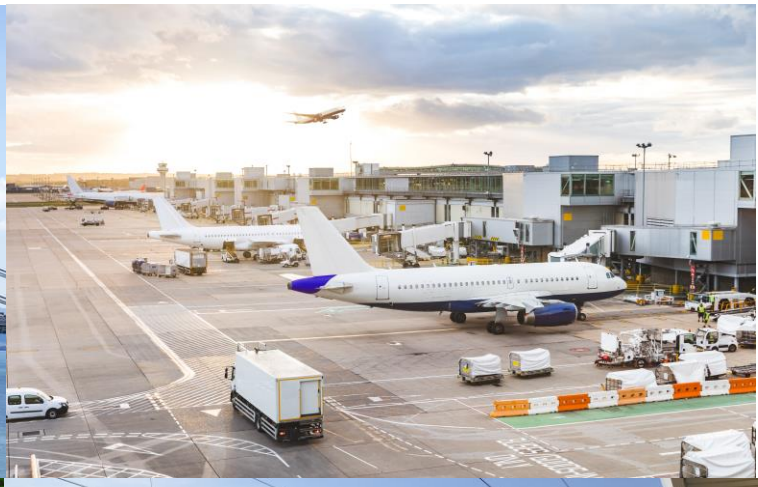
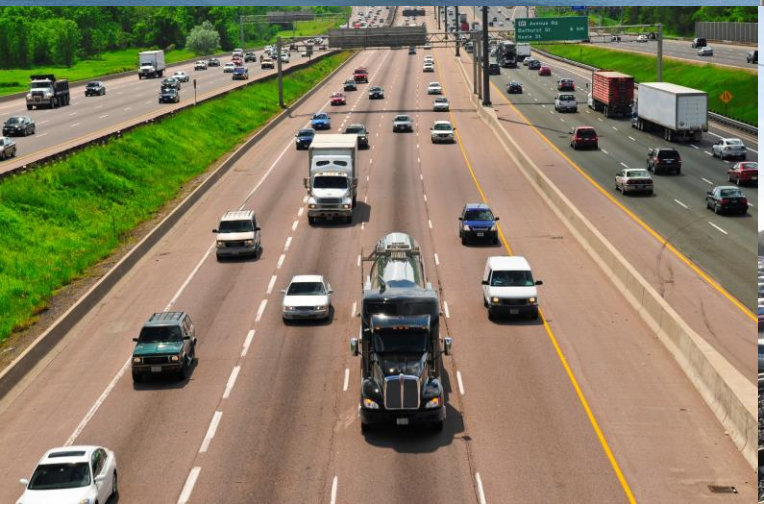
Planning of National Transport Infrastructure In the Islamic Countries


COMCEC COORDINATION OFFICE
September 2018

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List of Abbreviations

AADT	: Annual Average Daily Traffic
AATR	: Autonomous Agency of Road Works
ADB	: Asian Development Bank
AfDB	: African Development Bank
Ageroute	: Road Works and Management Agency
ANACS	: National Agency of Civil Aviation
ANAM	: National Agency of Maritime Affairs
ANAMS	: National Agency of Meteorology of Senegal
ANSD	: National Agency of Statistics and Demographics
APIX	: Development of Government Teleservices
ASEAN	: Association of South East Asia Nations
CAA	: Civil Aviation Authority
CEDEAO	: Community of West African States
CETUD	: Executive Council of Urban Transport of Dakar
CFA Franc	: Monetary unit of African Financial Community
COMCEC	: Standing Committee for Economic and Commercial Cooperation of the Organization of Islamic Cooperation
COMESA	: The Common Market for Eastern and Southern Africa
DDD	: Dakar Dem Dikk
DEEC	: Department of the Environment and Classified Establishments
ECOWAS	: Economic Community of West African States
EIA	: Environmental Impact Assessment
ESMP	: Environmental and Social Management Plan
EU	: European Union
FERA	: Autonomous Road Maintenance Fund
GKMA	: Greater Kampala Metropolitan Area
GoU	: Government of Uganda
HAALSS	: High Authority of the Léopold Sédar Senghor Airport
HACSSPE	: High Authority for the Coordination of Maritime Safety, Maritime Safety and Protection of the Marine Environment
IFI	: International Financial Institution
ICAO	: International Civil Aviation Organization
IMO	: International Maritime Organization
JICA	: Japan International Cooperation Agency
LPST	: Transport Sector Policy Letter
MCA -Senegal	: Millennium Challenge Account Senegal
MITTD	: Ministry of Infrastructure, Land Transport and Disenclavement

MoWT	: Ministry of Works and Transport
MPEM	: Ministry of Fisheries and Maritime Economy
MTTA	: Ministry of Tourism and Air Transport
NEPAD	: New Partnership for Africa's Development
NGO	: Non-Governmental Organization
NMT	: Non-Motorised Transport
NTI	: National Transport Infrastructure
OACI	: International Civil Aviation Organization
PAD	: Autonomous Port of Dakar
PAP	: Priority Action Plan
PATMUR	: Support Project for Transport and Urban Mobility
PE	: Public Establishments
PIDA	: Program for Infrastructure Development in Africa
PPP	: Public-Private Partnership
SEP	: Senegal Emergent Plan
PTF	: Technical and Financial Partners
PTIP	: Public Investment Program
SDG	: Sustainable Development Goal
SDRAN	: National Road and Motorway Master Plan
SN	: National Societies
SPAD	: Land Public Transport Commission
TER	: Train Express Regional
UMIP	: Urban Mobility Improvement Project
UNRA	: Uganda National Roads Authority
URC	: Uganda Rail Corporation
URF	: Uganda Roads Fund
WAEMU	: West African Economic and Monetary Union
WCTR	: World Conference on Transport Research
WEF	: World Economic Forum

Executive Summary

Transport accounts for between 2% and 11% of GDP worldwide and is one of the prime economic sectors. It affects the price of goods, the cost of labour, and the general wellbeing of society. The efficient management of the transport sector by government therefore needs to be addressed appropriately. The importance of transport infrastructure development should not be underestimated and better planning is naturally the first step to achieve a better performance of the transportation system, which will in turn contribute to the economic and social development of the nations.

Objectives of the Study

This Study aims at identifying the basic concepts and steps of the NTI planning and factors affecting their success, investigating the major and successful planning practices regarding NTI outside the OIC geography, analysing the current NTI planning practices and proposing recommendations for better practices in OIC Member States. The literature review and analyses conducted for this study are based on a framework of seven subject areas, in order to better understand the lessons learned from the best practices, and at the same time to identify the main challenges faced by the OIC Member States in practicing their NTI planning. The seven areas of the framework, which were used as a basis for the entire report, are: (1) political and legislation factors, (2) institutional and organizational factors, (3) technical factors, (4) procedural factors and financing, (5) content of NTI planning, (6) data collection method, and (7) monitoring and evaluation system. An in-depth investigation of these framework areas is carried out for NTI planning practices outside and within the OIC geography.

NTI planning practices in OIC geography

The general situation of NTI planning practices in the OIC Member States for each of the seven framework areas is outlined as follows:

Framework area	Aspects of analysis
1. Political and legislation	• The Asian countries tend to not having a long-term national transport master plan (NTMP), but they seem to perform better than their African and the Middle Eastern counterparts who have an NTMP. The NTI planning in Asia is included in a medium-term plan that covers all types of infrastructure, not only transport. • A national transport policy is mostly absent. A policy provides an opportunity for structured stakeholder and transport user engagement to discuss a wide range of issues in the dynamic and rapidly changing transport sector.
2. Institutional and organizational	• An institutional gap between the national and regional governments is very common. • Transport planning agencies are sometimes not multidisciplinary and cross sectoral. They also do not really have adequate capacity to prepare plans relying totally on outsourcing.
3. Technical factors	• Most of the NTI plans focus more on road and rail infrastructure with no attention to non-motorised transport.

	• Very few NTI plans are developed based on an outcome-oriented approach that drives concerted performance measurement efforts at national and local levels. • A national traffic model does not always exist.
4. Procedural factors and financing	• The transport planning approach is mostly top-down with the leader's vision sets the strategic direction. • The involvement of the private sector and academia in the transport planning process is very low. • Public consultation and stakeholder participation have been practiced with different levels of involvement. The procedures however require strengthening. • PPP is being the most common practice of financing although the success rate in increasing project funding from the private sector is low.
5. Content of NTI planning	• Many NTI plans are output based, while good NTI planning practices are outcome based. • Most of the NTI plans are not compliant with or not taking the Sustainable Development Goals into account.
6. Data collection method	• In some cases, data for plans and projects are collects as needed by consultants and research institutes through surveys of various kinds. In other cases, transportation data is collected annually by the government.
7. Monitoring and evaluation system	• Monitoring is being implemented more than evaluation. • In some countries the monitoring process is coordinated by the ministry who developed the NTI plan, while in other countries it is done by a separate agency.

Case studies

Three OIC countries were visited (Kazakhstan, Uganda, and Qatar), for which a detailed analysis of the NTI planning practice in these countries is provided based on the above-mentioned seven framework areas. Additional in-depth analyses are conducted for Malaysia, Senegal and Oman. Furthermore, from the seven framework areas, 10 criteria are chosen. These are:

1. National transport policy
2. NTI plans are comprehensive and horizontally driven
3. Multidisciplinary transport planning agency
4. NTI plans are outcome-based
5. Inclusion of NMT modes
6. Multimodal national transport model
7. NTI plans available in the public domain
8. Public consultation and stakeholder participation
9. Sustainable Development Goals mainstreamed into NTI plans
10. Monitoring and evaluation agency

These criteria are considered as basic criteria that should be addressed by NTI plans. Each case study country is assessed based on these criteria by determining whether each criterion "does not exist", "needs to be improved", or already "developed". Qatar performs best as it "ticks all

the boxes", followed by Malaysia even though Malaysia does not have both a national transport policy and a multimodal national transport model.

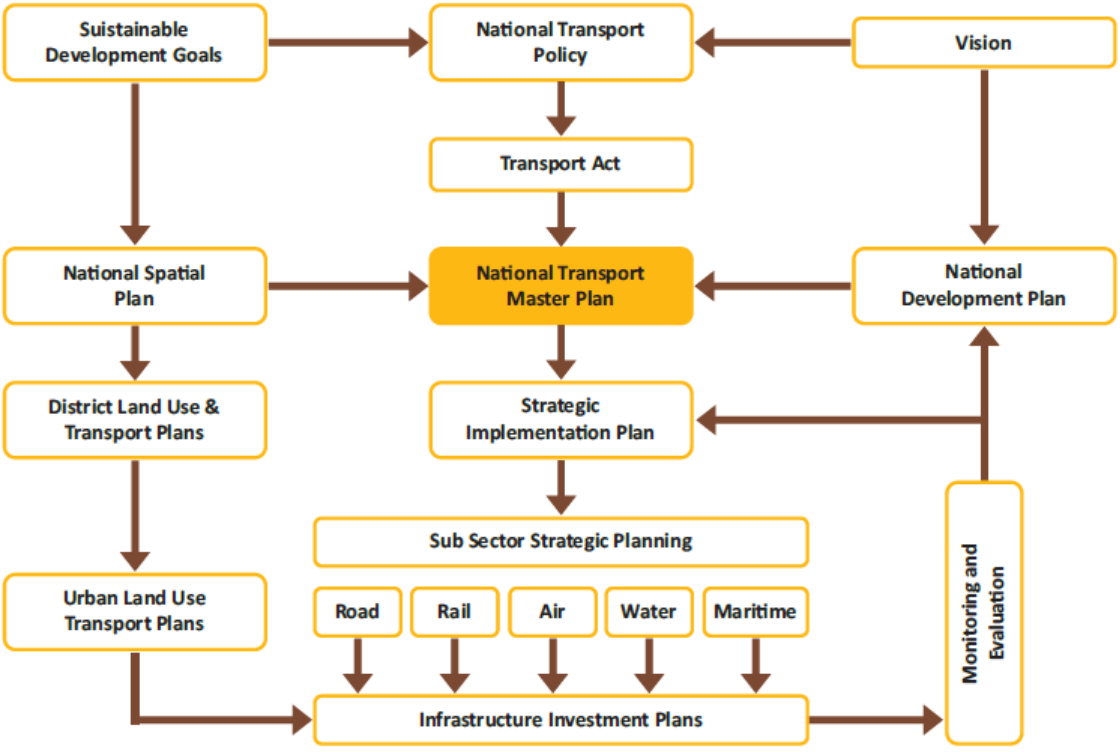
Policy recommendations

Although it is not suggested that NTI planning problems or solutions are the same for all OIC countries, the study comes up with some specific policy recommendations for improving NTI planning based on the findings of the study and good practice examples. The recommendations are summarised below.

Framework area	Policy recommendations
1. Political and legislation	• A national transport policy needs to be developed before developing an NTMP in order to provide a strategic direction towards common objective and goals to be followed by sectoral plans and programs. • Both policy and plans should be developed from within and to avoid outsourcing the entire process to consultants, in order to ensure buy-in and ownership. • Transport plans should be mandatory and have legal force through legislation.
2. Institutional and organizational	• The institutional capacity needs to be built by training or education of government officials and professionals to increase the effectiveness of the current planning procedures and techniques. • The rule of subsidiarity should apply, transport master planning should be centralised and subsector and urban planning decentralised. • Transport planning agencies must be multidisciplinary and cross sectoral to apply a holistic approach, to ensure integration between modes of transport and adequately cover cross cutting issues.
3. Technical factors	• NTI plans should integrate land use planning and multi-modal transport planning including non-motorised transport. • NTI plans should be outcome not output based. • Methods to prioritise project should be in place, such as socio-economic evaluation and cost-benefit analysis. • A national multi-modal transport model should be developed and be robust for external effects and shocks and systemic risks.
4. Procedural factors and financing	• Develop common guidelines for project appraisal and assessment for the OIC members. • Make NTI plans publicly available and communicate them. • Strengthening of procedures regarding public consultation and stakeholder participation. • Improving the transparency of the public consultation process. • Increasing the involvement of private sector by enhancing the market environment for private sector participation. • Ensure that the planning horizon of NTI plans is 15 to 25 years, and that updates come on time. • Apply the use of the pricing instrument in view of optimization, allocation and funding. In order to ensure a sustainable financing, a greater share should be funded from road user charges (user pay principle).

	• Increasing the involvement of academia to gain intellectual views in policy formation. • Aligning NTI plans to fiscal space.
5. Content of NTI planning	• NTI planning should start with problem identification and mapping of needs, and should have concrete achievable goals that fit in the policy context. • NTI plans should include measures as well as projects and provide a comprehensive set of directions that will enable policies to be implemented. • Investments should be optimized by comparing them to the best alternative investment in view of the specific transport objective. • Apply common guidelines for project appraisal and assessment for the OIC members. • Sustainable Development Goals should be mainstreamed into NTI plans. • NTI plans should mention project evaluation criteria and performance indicators.
6. Data collection method	• Develop common guidelines for data collection for the OIC members. • Transportation data should be collected periodically (annually or more frequent) and in a systematic way. • Make use of new technologies and share data with the private domain (open access). • Make use of big data or mobile data in transport planning, real time dynamic planning, the use of swarm intelligence and planning for autonomous vehicles.
7. Monitoring and evaluation system	• Transport plans should be annually revised. • Setting up an independent agency to monitor and evaluate the implementation of the plan. • The focus of the monitoring should include the outcomes instead of only on the achieved target and financial resources allocation. • Plan implementation and performance monitoring could be public domain using contemporary means such as dashboards.

Finally, a large variety of NTI planning practices and procedures exists among the OIC Member States, some deliver an effective planning and some do not. The following diagram shows an ideal NTI planning framework and procedure that would deliver a better performance of NTI plans. This does not suggest that the current practices need to be completely changed. This diagram could be used as a basic guideline instead.


Suistainable Development Goals
National Transport Policy
Vision
Transport Act
National Spatial Plan
National Transport Master Plan
National Development Plan
District Land Use & Transport Plans
Strategic Implementation Plan
Sub Sector Strategic Planning
Urban Land Use Transport Plans
Road
Rail
Air
Water
Maritime
Monitoring and Evaluation
Infrastructure Investment Plans

1. Introduction

1.1. The Context for the Research and Study

Transport accounts for between 2% and 11% of GDP world wide and is one of the prime economic sectors. The efficient management of the Transport Sector by Government is essential, for it affects the price of goods that we buy, the cost of labour as we travel to work and the general wellbeing of society as it demands access to services, education and health. Planning transport systems has evolved incrementally from the casual and ad hoc formation of tracks and trails used by animal drawn transport, through to systematic building of railways, road ways and waterways used by motorised transport that can convey millions of passengers and tons of freight.

The science and some say the art of transport planning has developed in parallel with technology from lines on maps drawn by ambitions of politicians and engineers, to heavily researched and populated computer modelling and simulations to obtain the most optimum solutions to the challenges of providing accessibility and mobility. Education in transport planning has also grown in parallel in most developed countries and a few less developed countries. Academic courses in the subject ensure a universal understanding of the issues, problems and solutions to global challenges in transport provision. Yet, there are variations in practice that have motivated this research. What are the practices in transport planning and in particular those that apply to infrastructure investment decision making, are some of these practises better than others and what lessons can be learnt that might guide transport policy making in the future?

The research comes at a time of great change in transport, some say it is a revolution where less transport and not more transport is the paradigm shift. Smart planning not big planning has become the underlying philosophy. The use of 'online' not 'on way' to achieve connectivity. The impact of artificial intelligence that will replace manual operations in transport within a generation. The need to agglomerate in cities to do business. The need for malls for retailing goods and the need to travel to be supplied with services rather than obtaining them electronically. These all impact on the future in general and in the forecasting of demand for transport infrastructure. Transport investment projects have traditionally protracted lead times, requiring substantial investment and long economic lives. Such a story line is woven into this research.

Recent concerns for the environment have culminated in the Sustainable Development Goals and Agenda 2030. In particular Goal 9 - Build resilient infrastructure, promote sustainable industrialization and foster innovation. Even before the SDGs economists have been arguing for the decoupling of transport and energy from economic growth. Resource consumption should be minimised to achieve maximum economic output. Hitherto, transport demand was religiously welded to economic growth. Efficiency has become the main driver of change. However, Goal 9 states that investments in infrastructure, including transport, are crucial to achieving sustainable development and empowering communities in many countries. Perhaps this may not be so true in the long term. A further major change in thinking is due to slowing down and preventing climate change. Transport accounts from between 10% and 40% of emissions from greenhouse gases that causes climate change and, because of this, has become a major target for mitigation measures, the most important of which is the conversion to electric vehicles, increased use of public transport and also cycling in some countries. None the less, the

importance of transport infrastructure development should not be underestimated and better planning is naturally the first step to achieve the Goal.

The focus of this research is on the planning of National Transport Infrastructure (NTI) and the plans that are commonly used such as national development plans, national infrastructure plans, national transportation plans, investment plans and programs, regional transportation plans and white papers. There exists a large variety of the planning practices and procedures of the nations with respect to the NTI. The underlying reasons behind this variety are many. The different institutional and legal frameworks can be one reason. The availability of necessary financial resources can also lead to different planning behaviours. The geographical (or the topographical) and urbanization characteristics of the countries may also stimulate to prioritize one transport mode over others. Moreover socio economic changes in many OIC countries including the economic diversifications and the need for greater social inclusivity compel the countries to plan the transport infrastructure differently. Despite such deviations in planning practices, there should be some common principles regarding the planning of NTI, which will lead to successful outcomes.

1.2. Scope of Work

The Standing Committee for Economic and Commercial Cooperation of the Organization of Islamic Cooperation (COMCEC) has clearly recognized the above mentioned issues. Therefore the COMCEC Coordination Office (CCO) conducted a research on "Planning of National Transport Infrastructure in OIC Member States" with the following objectives:

1. To identify the basic concepts and steps of the planning of NTI and factors affecting their success.
2. To investigate the major and successful planning practices regarding NTI (outside the OIC geography).
3. To describe the general situation related to the planning of NTI in the OIC Member States and to analyse the NTI planning practices and experiences of the six selected OIC Member Countries as case studies in detail.
4. To propose recommendations for enhancing better planning practices for NTI among the OIC Member States.

The ultimate aim of the study is to establish a conceptual foundation for the planning procedure of NTI in the OIC Member States. The study is also expected to draw attention to the NTI planning implementations among the OIC Member Countries as well as to trigger a serious debate around the issues identified and how to better address them.

1.3. Background to Work Undertaken

A literature review, including desk research of planning procedure of NTI in both OIC and non-OIC regions has been undertaken that examined not only problems and challenges but also success factors with regard to NTI planning. The literature review and the case studies are structured in seven framework areas as outlined in Table 1.

Table 1: NTI Aspects included in the seven framework areas

Framework area	Aspects of analysis
1. Political and legislation	• Regulatory measures, legislative amendments, and organizational changes recommended in the NTIP plans • Degree of harmonization among national/regional governments
2. Institutional and organizational	• Institutional procedures • Division of duties and responsibilities among governmental agencies • Integration with the inter/ trans-national transport networks
3. Technical factors	• Integrated approach regarding transport modality • Evaluation of alternatives between and prioritization among transport modes • Assessments of environmental impact of transport infrastructure • Development of multi-modal transport strategies
4. Procedural factors and financing	• Realization of stakeholder approach and public inquiries and debates • Degree of participation of the stakeholders • Measures/projections on the pricing of transport infrastructure • Utilization of private finance and management to attract private finance, improve the system performance and reduce capacity bottlenecks
5. Content of NTI planning	• Review and evaluation • Financial planning perspective, including cost estimates, annual allocations and sources of finance • The objectives and performance measures on which the NTI plans based on • Incorporation of scenario analyses and forecasts into the NTI plans • Scientific approaches, methods, and techniques used • Typical planning horizons
6. Data collection method	• Data and statistics collection mechanisms and methods • Implementation of household and industry surveys
7. Monitoring and evaluation system.	• Follow-up and monitoring studies • Major obstacles and drawbacks, success and failure factors of the NTI planning implementations • Effectiveness and success of the NTI planning practices

Furthermore, a survey is undertaken where two questionnaires are developed for two target groups: OIC member states and academia/private institutions in order to gather their views on the NTI planning process in their countries. The category private institutions also include state-owned organizations such as railway companies and port authorities. The questionnaire result of each target group is presented in Appendix 2.

2. Literature Review: Conceptual Framework for the Planning Practices Regarding National Transport Infrastructure

2.1. Introduction

NTI planning, being a complex process with multiple interdependencies, has many aspects, elements and options. It consists of policies, goals, objectives, programmes and sets of projects that together provide the planning framework. Within this planning framework, individual projects go through the process of identification, selection, appraisal and approval. The aspect of preparing a National Transport Infrastructure Plan mostly falls into the part of the planning framework known as programming if it is at the level of master planning.

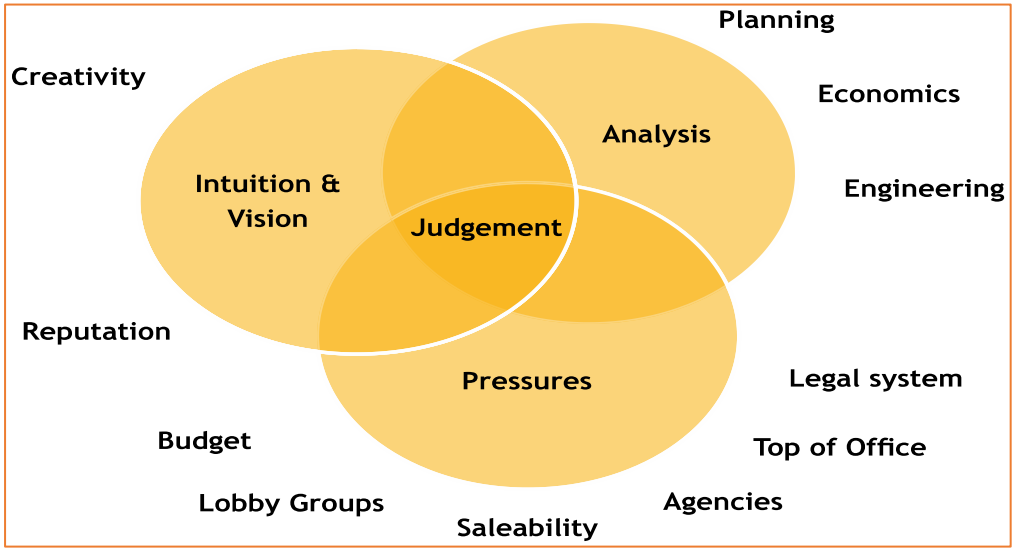
2.1.1. The Aim of Literature Review

The purpose of a literature review is to critically analyse current thinking and research on the topic in question to identify gaps that could be filled through further research. In this case the review is aimed at providing evidence of the state of the art of transport planning to provide a framework to make reasonable recommendations to improve transport planning practices in OIC countries and also identify where further study may be needed.

2.1.2. NTI in Literature

Mackie (2014) refers to the factors influencing NTI planning and groups them into three categories: vision, pressure and analysis, as shown in Figure 1.

Figure 1: Decisions and Judgements are affected by visions, pressures and analyses



Source: Mackie (2014)

From a bottom up perspective, analysis is the field of technocratic assessment, pressure is where public consultation takes place and vision is related to the scene of politics. It is said that projects push the plans as much as plans push the projects. This may certainly be the case for so called mega projects that are large enough to become game changers or scene setters around which new planning paradigms are created. Another dimension is that politicians are in many countries the main clients for projects, even disregarding prevailing plans to achieve their

particular political goals. This scenario speaks to ad-hoc planning. At the opposite extreme is central and top down planning, where a state agency is mandated to prepare national plans that are implemented through force of law. A contemporary compromise is through the application of the theory of subsidiarity (Steiner and Božičević, 2008). Through devolving planning decisions to the lowest level where the greatest interests lay, is considered to best ensure that the most appropriate and hence most sustainable solutions will prevail. However, the down side is that the coordination and integration issues increase as decision making is devolved (Hickman and Banister, 2007). The ideal, as ever, is to obtain balance.

Beyond domestic boundaries, external agendas are increasingly important in influencing the development of transport, such agenda may be driven by the Sustainable Development Goals (SDGs) of which at least 8 out of 17 goals can directly influence the nature as well as the functionality of the transport system. Transport planners have to be very broad minded when it comes to formulating programmes that achieve the national long-term vision with many of the objectives not being transport related at all.

The literature review is structured following the seven framework areas as described in section 1.2. Each framework area in the following sections discusses the development of the particular area in the OIC countries and outside the OIC geography. For the OIC countries, the analyses will be enriched with the questionnaire results that have been filled out by 22 OIC member states and 8 academia/private institutions in OIC countries (see Appendix 2).

2.2. Political and Legislation Factors

'Policy first' is the mantra that should guide everything and that of managing the transport sector is no exception. Yet whilst this is appreciated by transport professionals, politicians remain to be convinced of this, so few transport plans are written within a policy framework. Pragmatism prevails, living and working in a policy vacuum is the norm rather than the exception. This holds for other sectors as well. Examples include enterprise building in UK (Phelps and Tewdwr-Jones, 1998), for foreign relations in the Arctic (Fenge and Penikett, 2009), internet marketing of tobacco (Elkin et al., 2010), for securing student accommodation (Cate, 2006), for immigration (Vidali, 1999) but also in integrating land use with transport planning (Waddell, 2011, Kane and Del Mistro, 2003, Garrison and Levinson, 2014). Without policy, the context within which decisions are rationalised becomes problematic, intervention logic is compromised, and investment risks considerably heightened which has a very big impact on funding.

2.2.1. Political and Legislation Factors in OIC Countries

Evidence exists that OIC Member States desire to move up a level to a more policy driven and spatial approach to transport planning such as Government of Lebanon (2006), Malaysia (SPAD, 2013), Indonesia (Leung, 2016). Nigeria is a perfect case of recognizing the role of transport to provide mobility, rather than building roads. Its Draft Transport Policy aims to stimulate national development and enhances the quality of life for all and recognizes the role of transport as being broadly based, as indicated in the text box.

Nigerian Transport Policy Objectives

1. To promote economic development, expand trade, and improve Nigeria's competitiveness through an efficient and affordable integrated transport system; 2. to encourage and remove all barriers towards the private sector participation in the development, provision, maintenance, operation, and upgrading of transport infrastructure and services; 3. to promote the use of public transport over private cars; 4. to promote a culture of maintenance and continuous upgrading of transport infrastructure and services; 5. to promote competition and efficiency and cost reduction of transport services in Nigeria; 6. to improve the safety, security, reliability, quality, and speed of movement of goods and people, at local, national, and international levels; 7. to develop transport infrastructure that ensures environmental sustainability and internationally accepted standards; and 8. to support States and the Federal Capital Territory in the development and promotion of urban transport systems and local governments in developing and promoting rural accessibility.
(Government of Nigeria, 2010).

The Pakistan Transport Policy and Master Plan 2017[1] also reveals a desire to employ a more contemporary approach to transport planning that requires the fulfilment of a broad set of social and economic objectives, not only those related to transport performance (see text box) and this is true for many OIC countries where the need for both transport policy and master plan is increasingly recognized.

Pakistan National Transport Policy

The policy of well planned, safe, better maintained, and regionally connected transport infrastructure is the key to unlocking the economic growth potential of Pakistan and will complement government efforts to improve transport and trade infrastructure. It will also help enhance local and regional trade.

For many Central and Southern Asian countries, having both transport policy and plans are a rarity that the European Union (EU) and Asian Development Bank (ADB) has sought to change (TRACECA, 2007). In Saudi Arabia there is a well-crafted transport strategy, which is meant to be a proxy for transport policy. The Saudi Arabia Transport Strategy is based on a future vision to provide an integrated transport sector that includes all types of transport means to meet the Kingdom's future needs. The strategy also focuses on safety, effectiveness, efficiency and technological development, and the strategy encourages and promotes the economic development and competitiveness of the country at an international level. The contents of the plan are classical, driven more by vertical approach of developing each mode of transport to be efficient and effective in their own rights rather than as one integrated system. However, the Public Transport Plan for Riyadh reveals more insight into the development of contemporary transport planning practices (Aldalbahi, 2016).

The Government of Turkey has prepared its National Transport Master Plan in 2016 and Afghanistan has also prepared its master plan (ADB, 2017a). Uganda, as well as many other

[1] https://www.adb.org/news/adb-uk-aid-support-pakistan-national-transport-policy-and-master-plan

nations in Africa, has also produced transport plans (MoWT, 2008). The situation in Uganda will be one of the case studies because it is undergoing a Mid Term Review prior to preparing a new plan to 2040. It is to be expected that contemporary transport policies will be prominent in driving the plans.

2.2.2. Political and Legislation Factors Outside OIC Geography

For countries outside the OIC geography, there is an abundance of examples of transport and infrastructure investment planning from which current practices can be observed. South Africa provides one of the best examples of a comprehensive process that considers all the issues (DoT, 2011). Its executive summary sets out the achievement of the national plan and is synthesized in the text box below.

South Africa National Transport Master Plan 2050

The South Africa National Transport Master Plan 2050: 1. is well planned, integrated and aligned across sectors; 2. is responsive to growing passenger and freight customer needs; 3. supports an inclusive spatial vision; 4. is well maintained and preserved and further developed to address/overcome developmental challenges; 5. supports economic competitiveness through seamless multimodal trade corridors; 6. offers safe, affordable and accessible modal options for passengers; 7. preserves the environment; 8. is managed by strong institutions; 9. is supported through effective policy and regulation; 10. is innovative/adaptive and reflects emerging priorities; 11. is sustainably funded; 12. is effectively implemented through accountable delivery mechanisms.

This set of 12 criteria might well be instructive for other countries and one might only add those aspects that relate to technology sustainable development and climate change.

Many plans appreciate the importance of integrated land use and transport plans, typically for Urban Areas (Nairobi City Council, 2014). Naturally North America has many examples, noting that they tend to be city focused (CMAP, 2005, Edmonton, 2009). In Australia planning horizons can be as long as 40 years (New South Wales, 2017), while infrastructure investments are for 5 years in New Zealand (NZ-Transport Agency, 2018). Colombia, where significant investment in public transport has taken place aligned to the policy of reducing climate change (Climate Investment Funds, 2010) as well as in Europe (Transport for Ireland, 2015) provide numerous examples of transport planning good practice.

IFIs insist on there being a transport master plan and even a policy in place before they consider funding projects and helpfully provide guidelines on how to evaluate the transport projects that they fund such as the World Bank (Mackie, 2005), the African Development Bank (AfDB, 2014), and the Asian Development Bank (ADB, 2017b). Failures in planning invariably have arisen, not because the content of the plan was weak, but the processes and resources to implement them were either missing or lacking in capacity. Without rather strict procedure that require the application of master plan content such as objectives and outcome and the monitoring thereof, the risk of failure is high. The linkages between project development and evaluation with policy and objectives is brought out by the European Commission (2014) that advocates the application of continuity to the planning process. In other words, a policy objective in the master plan becomes the programme objective for the plan without any changes in wording. The

outputs required of the projects will deliver outcomes defined in the programme, while most IFIs also process projects using project cycle management/PCM (KFAED, NA, European Commission, 2018). The PCM foresees a self-improving cycle where evaluation of the relevance, efficiency, effectiveness, sustainability and wider impacts of the programmes and projects will feed back into the planning process.

Being more research focussed, but none the less instructive, academia sets outs the environmental, social and economic agenda for contemporary transport planning (Banister and Berechman, 2003) who notes that the belief that public investment in infrastructure will generate economic growth has often been used as a justification for the allocation of resources to the transport sector. Much of the road-building programme in developed and developing countries has been promoted on these grounds, yet the arguments seem far from clear. Issues of equity in transport planning have been considered by Litman (2002), who concluded that equity analysis can be difficult because there are several types of equity, many potential impacts to consider, various ways to measure impacts, and many possible ways to categorize people. Since transport provision is no longer the exclusive domain of the public sector, private funding is an essential component to contemporary transport planning as noted by Koppenjan (2005) and the vital aspect of risk allocation in transport investments must be considered (Medda, 2007). Public participation and consultation is covered by Booth and Richardson (2001) who argues that there is a need for a more nuanced debate over the place of public involvement in transport planning due to changes in governance; the aspect of subsidiarity becomes important. The policy shift towards integrated transport has also been accompanied by significant institutional changes, which has created a new framework for transport planning, with important implications for public involvement. Yet many issues underlying the new participative approach to transport planning have yet to be resolved. Integration with land use is considered by Hull (2005), who explores the need for new planning authorities, practices and structures to accommodate new policy requirements and approaches to urban management. In this context a rhetorical shift in paradigm from provide for road transport to one that addresses sustainable mobility has been very noticeable. Integration between transport and energy has been examined by Birk and Zegras (1993) who observed that traffic congestion in some countries has become so aggravated that urban economies have suffered losses due to the productive time wasted in commuting. These observations being based on transportation systems in four Asian cities: Bangkok, Thailand; Surabaya, Indonesia. Integration between modes of transport by Qun-qi and Qi-peng (2006) made the point that market conditions are very important. Overall, Mackie (2005) noted that there is room for improvement, using better economic appraisal and using macro-economic productivity effects of transport infrastructure investment and not only those of transport efficiency as currently practiced.

Transport planning has thus become one of accessibility planning. For many developed countries *minimizing traffic while maximizing accessibility* has become the mantra. The argument being that transport is a derived demand that needs to be minimized, the consumption of which should be decoupled from economic growth (Banister and Berechman, 2001, McKinnon, 2007). For those committed to constructing infrastructure whose inclination was to happily forecast endless growth in transport demand, this line of thinking was sacrilegious to say the least. But several countries have proactively sought to reduce traffic demand by reducing

vehicle ownership and dependency (He and Thøgersen, 2017, Buehler et al., 2017) and through heavy congestion charging (Sugiarto et al., 2017, Munford, 2017, Olsson and Davis, 2017). Thus, transport policy in developed countries has become one driven by reducing demand rather than the reverse, that is to say building to satisfying increasing demand… and this is significant. The economic and technical aspects of this are covered in subsequent sections of this review.

2.2.3. Sustainable Development

Ultimately sustainability is driving the contemporary transport policy agenda (Schiller et al., 2010). The impact on transport policy is for it to be driven thematically and horizontally to ensure that transport is the servant of the economy and not its master. The old thinking of being vertically driven by its various modes is very useful for developing countries where building up the transport resource is the priority, but not for those with developed transport systems. Horizontal themes may relate to employment generation (Porter, 2014), environmental protection (Bueno et al., 2015), health and safety (Choi et al., 2017) and technology and research (Kottari et al., 2017). For the transport policies of 2050, the impact on the internet of things will be profound, from autonomous vehicles (Fagnant and Kockelman, 2015) to telecommuting (Hirte and Tscharaktschiew, 2015). With perplexing yet-to-be-answered questions that impact on the very nature of transport, land use, employment and even the city region, is it possible to make the right decisions today?

2.2.4. Conclusions

It is apparent that transport policy becomes more relevant to countries with developed transport systems than those that are developing them. This reality leads one to conclude that matters of efficiency and not development, are drivers of policy making. Principle amongst issues of efficiency is that of integration. There is possibly a simple explanation for this and that is the more complex transport becomes, the greater the need for a more holistic and policy driven approach. Possibly, countries may have also experienced that mistakes could have been avoided, if planning was driven more by policy than by politicians. The story of transport policy and planning, its genesis and relevance is well explained by Garrison and Levinson (2014) who draw lessons from especially the USA and UK. The authors set out to demonstrate that the 'story of transportation policy can tell us what transportation, is, does, and might do in the future, and at an even broader level, how society has learned to create, deliver, and operate large, complicated systems.

The need for transport policy is entirely because transport provision has moved well beyond the simple building of roads and railways that cater for ever increasing volumes of traffic, to providing accessibility through the application of complex integrated and highly managed systems of infrastructure and communications. To illustrate and exemplify this point, listed in Appendix 1 is a selection of the main drivers of contemporary transport policy, these are organized by sector and then by sub-sector (Rasbash, 2011). Through those main drivers and indeed other transport policies, the context and relevance of the transport plan is established. Having said that, while the policies are contemporary they are driven by neo-classical theory, that is to say that performance drives choice. But the performance of transport, be it price, time, comfort and safety, is not the only criterion that influences demand. Issues of sustainability have become mainstreamed, as maximizing traffic has been replaced by maximising mobility which

has then been replaced by maximizing accessibility as the overarching driver of transport policy (Litman and Burwell, 2006).

2.3. Institutional and Organizational Factors

2.3.1. Introduction

Governance is a learning process that feeds on the lessons learned within a policy framework (Dolowitz and Marsh, 2000) and that public sector reform is a major driver of policy in developing countries and those in transition. Market liberalization, privatization and decentralization each characterizes the reform process. Reform is therefore at different levels in different countries, where transport planning is highly centralized in less developed countries whilst in most developed countries it is devolved.

Another feature of the institutional response to transport planning is whether the plans may be said to be horizontally or vertically driven, this being argued by Gloersen and Michelet (2014) for the case of land use planning. Horizontal planning is driven thematically, such as "promoting inclusivity through improving accessibility" and vertical planning is typically driven by increasing mobility through "increasing the coverage and performance of the road network". An example of horizontal planning is to 'reduce poverty' and 'increase inclusivity'. This is then applied by all the modes of transport in various ways, all with the same objective of reducing the poverty head count ratio and increasing access and choice of transport to households, importantly both of these are measurable. Again, thematically driven planning is more likely to be developed locally through integrated land use and planning entities while vertically driven planning is driven by central government through its various ministries and departments. An example of vertically driven planning is to improve the road network by x km per year or expand airport capacity. Typically, *vertical planning is output driven* such as km of roads of length of runways, and not outcome driven such passenger and ton km or number of long haul aircraft taking off and landing at airports.

At a more practical level, *horizontally driven planning is less likely to lead to duplication and over*lap (Stead, 2008) as may be the case in transport, environment and health. It should be self-evident that it is better for ministries to work together rather than compete – and yet inter-ministerial cooperation is hardly the norm. Ministries of transport are not the only government administration that plans transport. Lands and Housing also seriously consider transport in spatial planning and Local Government clearly covers the delivery of local roads and public transport. In freight transport and logistics a more horizontal approach is also needed for supply chain management (Mason et al., 2007).

Extremely well-formed boundaries between different ministries are in evidence in most developing and also developed countries. Single purpose ministries do not work so well in a multi-purpose world of mixed policy objectives. The continued reinvention of ministry portfolios evidences this realization. Examples may include trade and investment, water, energy and natural resources, environment and tourism and, of course, transport post and telecommunications. Transport has also been paired with works, energy, petroleum and infrastructure in various countries. The effectiveness of restructuring of reformed government agencies shows that there are also strong socio-cultural reasons that drive collaborative effort, as well as thematic (Christensen and Lægreid, 2006). These may include having common

educational backgrounds and professional alliances. What is certain, is that governance of the transport sector is in transition constantly aiming to take on board contemporary issues such climate change, demography, technology and trade.

Beyond planning per se, regulatory issues are pertinent in determining technical standards of design and of operation. They can and do impact on planning as they provide constraints of which planners must cognoscente, for example roads require to be user friendly offering drivers rest areas. Network nodes, links and intermodal interchanges must be designed to provide certain levels of service. In the regional context, such technical standards do require harmonization. Lack of intermodality is a serious issue affecting the efficiency of regional transport and communications systems.

2.3.2. Institutional and Organizational Factors in OIC Countries

At the high end of successful transport sector governance in OIC countries must be the Roads and Transport Authority (RTA) in Dubai, United Arab Emirates[2]. It was founded in 2005 and is responsible for planning and executing transport and traffic projects, along with legislation and strategic plans of transportation in the city. Having described the RTA as being independent in the official description it then goes on to state that RTA is in fact a department of the Government of Dubai. The RTA is divided into five different agencies or departments namely i) The Public Transport Agency, ii) Traffic and Roads Agency, iii) Rail Agency, iv) Licensing Agency and v) Dubai Taxi. The RTA is undoubtedly successful in delivering the ultimate in transportation services to the residents of Dubai.

Though not exactly at the other end of the scale, Indonesia characterises a less progressive style of transport sector governance where the Ministry of Transport is responsible for policy, the Ministry of Public Works and Housing for toll roads and Sea Transport comes under the Ministry of Maritime Affairs and Fisheries. Aviation and Railways are autonomous but wholly state-owned organizations. Despite the portfolio of being responsible for transport policy, no evidence has been found of there being a National Transport Policy for Indonesia. Surely, Indonesia, more than most countries, due to its dense population and small but highly complex geography, would benefit from a much more holistic and integrated approach with a national transport authority. This is exemplified by Joewono and Kubota (2005) who argue for more broader approach to non-motorised transport (mainly rickshaws) and Dimitriou and Gakenheimer (2011) that speak to the need for an urban transport and planning authority and then Nugroho et al. (2016) advocates for a more multimodal approach to freight and logistics arguing for greater use of rail in the freight transport mix. These and other issues would be better addressed in Indonesia if transport came under one roof. At the level of infrastructure provision however, Indonesia ranks 52 out of 1373. So in the case of the quantum of infrastructure in relation to the population and economy is reasonable. The issue is not the scale of the transport network but its effectiveness in delivering accessibility.

Underlining the need for more integrated approach to transport sector government, Achour and Belloumi (2016) discuss the inextricable linkages between transport, energy, environment and

[2] Available from https://www.rta.ae/wps/portal/rta/ae/about-rta
[3] World Economic Outlook Database, International Monetary Fund, April 2017.

economic growth in Tunisia. The authors recognizing that transport and energy intensity minimization may best be done under the direction of a single transport sector management entity. In conclusion, *very few OIC Member States have transport policies* and do not exercise a holistic approach to transport sector management.

2.3.3. Institutional and Organizational Factors outside OIC Geography

In a well entitled paper 'Planning more to travel less', Banister (1999) underlines that land use and transport are inextricably linked. That the work of the transport planner and indeed the transport policy maker is to maximize accessibility while minimizing mobility. Clearly the spatial dimension is key to driving transport demand. The institutional response to this in developed countries is to establish multi-dimensional entities that are variously called transport authorities or land use and transport agencies. A transport authority is a pseudo government agency that is empowered to regulate and administer transport and sometimes land use, in, normally, metropolitan and urban areas. Examples are set out in Table 2.

Table 2: National and Urban Transport Authorities – Small Sample

Name of Organisation	Country	Function	URL
Transport for West Midlands	United Kingdom	Planning regulating public transport, Road provision and management	https://www.tfwm.org.uk/
Transport for London	United Kingdom	Planning regulating public transport, Road provision and management	https://tfl.gov.uk/
Los Angeles County Metropolitan Transportation Authority	United States	Public Transport Provision, road rail, BRT, bike share and car pool, freeway and expressway projects	http://www.erha.org/mta2.htm
New York Metropolitan Transport Authority	United States	Road Rail Water Transportation planning maintenance operation and user information	http://www.mta.info/
Ireland National Transport Authority	Republic of Ireland	SPSV services PT control / services, information, infrastructure, policy, planning, land use, parking and enforcement	https://www.nationaltransport.ie/
Beijing Municipal Commission of Transportation	China	Transport Sector Policies and regulations, Studies and Plans, macro city planning, road layouts, funding, technical standards, traffic management.	[4] URL in footer.
New Zealand Transport Agency	New Zealand	National Land Transport Programme, Vehicle Licensing and Control, Walking, Cycling and Public Transport, road rail commercial driving	https://www.nzta.govt.nz/

[4] Available from http://www.ebeijing.gov.cn/Government/Departments/t1024857.htm

Transport authorities may be responsible for both the transportation network and operation. Transport authorities can also have powers to impose taxes, collect fees and impose fines. All the transport authorities in the sample are controlled by locally elected officials and some with users and private sector represented. Probably Beijing and New Zealand Authorities have the most comprehensive mandates.

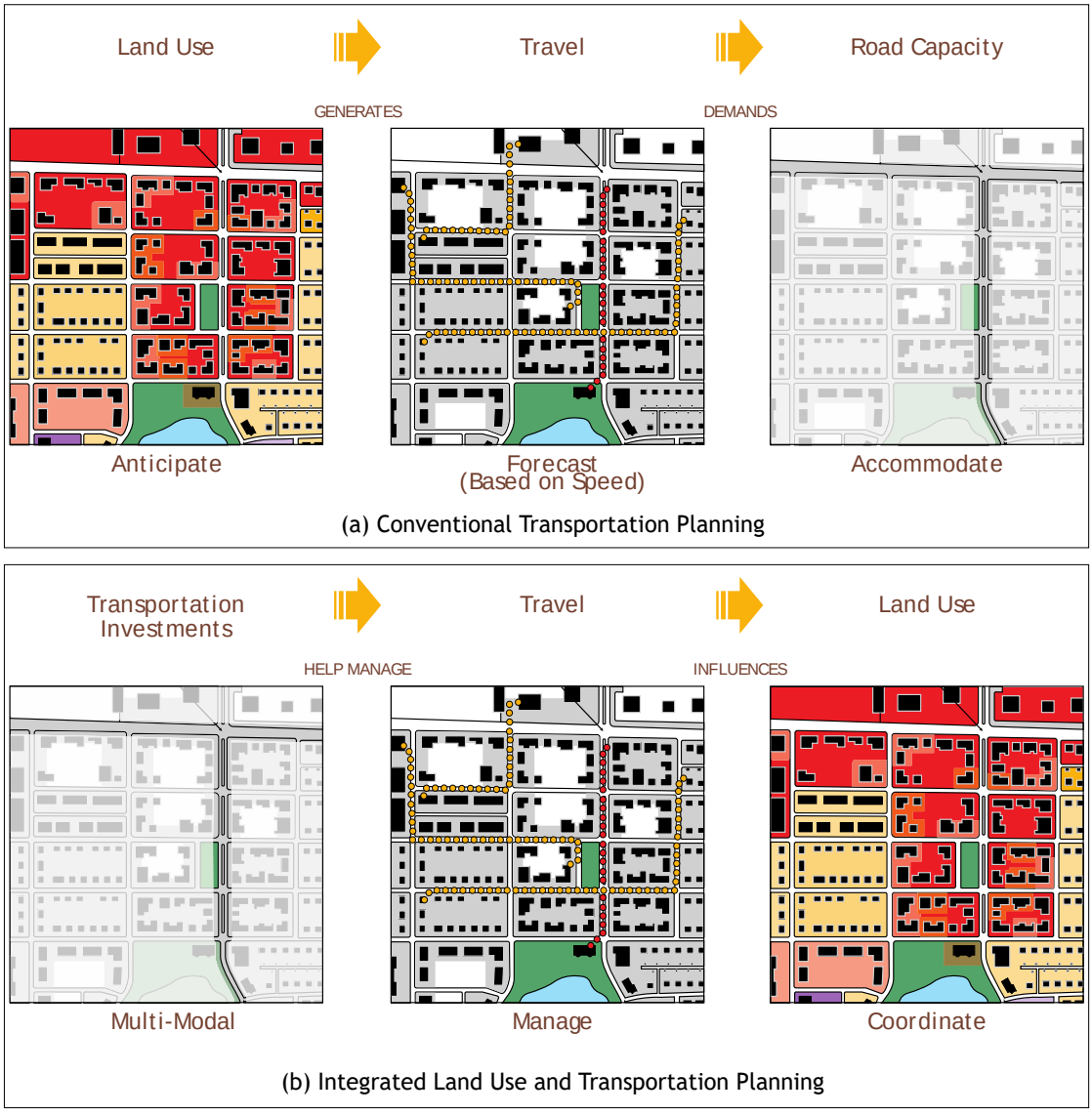
National, but also regional transport authorities play a key role, both in the planning and in the operational phase. With such a wide choice of integrated land use and transport planning entities to look at and the continued favour that such organizations are given by professionals, the question is whether there has been any objective assessment of their performance. In other words, are they achieving the results that were expected of them and is the paradigm better than the vertically established systems that transport authorities replaced. If such an assessment was made, that would be very instructive to the OIC Member States. Literature however has not revealed such ex-post evaluations of transport authorities, which is surprising given their significance in the governance of public transport and the very large sums of funding that is channelled through them. However Cameron (2005) does critically review the establishment of transport authorities in the Republic of South Africa. The weakness of the transport authority regime that he noted was i) cost, ii) legality, iii) bureaucratic inclinations, iv) leadership, v) low priority for transport, vi) capacity, vii) legality of councillors to make decisions. Whereas the compelling reasons for transport authorities were identified as being i) overcoming the fragmentation of transport planning and management, ii) limiting jurisdiction of individual local authorities, iii) improving accountability and iv) improving coordinating and marketing of services. It can be deduced from his critique that Cameron (2005) was not a supporter of transport authorities. However, evidence suggests from the number of successful transport authorities in Table 2 that none of the issues raised are unsolvable.

2.4. Technical Factors

Technical factors in NTI planning deal with an integrated approach of policy and transport modes. The integration of policy aspects such as land use and multi-modal transport logistics is crucial for more resilient and sustainable planning outcomes (Arts, Hanekamp and Dijkstra, 2014) as sustainability has been strongly driving the transport policy agenda in the last decade (see section 2.2.3).

National Center for Transit research (2014) suggested that conventional transportation planning treats future land use plans largely as a “given” and attempts to solve anticipated traffic congestion resulting from these plans primarily by increasing roadway capacity. Contemporary transportation planning practice explicitly recognizes the interrelationship of transportation and land use planning, the importance of multimodal investments in managing travel demand, and the need for coordinating land use strategies with modal investments (see Figure 2).

Figure 2: Conventional vs Integrated Planning Process



Source: State of Florida (2010)

National Center for Transit research (2014) also suggested that a contemporary transportation planning process has the following characteristics:

- Context-sensitive: looks at the broader context rather than focus on solutions within the right-of-way, a single roadway, or a few intersections;
- Holistic: identifies transportation solutions that address broader land use issues and integrates land use and transportation for long term viability of a corridor and community;
- Collaborative: forms intergovernmental partnerships to identify and implement strategies that leverage the full value of all infrastructure investments; and

- Multimodal: examines pedestrian, transit, bicycling, and automobile, as well as rail (freight and passenger), air, and water modes of transportation and identifies supporting land use and programmatic strategies.

Furthermore, technical factors in NTI planning also deal with the extent of complementarity of road, rail, air, and water based transport modes. Complementarity should be interpreted in the way that these transport modes do not primarily compete with each other's. Modern societies experience a growing demand for passenger and freight movement. Accurate forecasting of the total passenger and freight demand and the competitive (or substitutive) and complementary relationships among transport modes are necessary inputs in planning, designing, evaluating and regulating transport and supply chain systems (Tsekeris and Tsekeris, 2011).

Mapping the environmental burden as an effect of implementing transport infrastructure projects and the associated changes in transport use, the so-called Environmental Impact Assessment, is ideally being part of a national transport plan. Together with a socio-economic evaluation, these assessments are mostly used to compare and prioritize projects, corridors, and transport modes. The monetary and the non-monetary impacts are compared and weighed in a systematic way for different alignments as a basis for recommending a specific alignment. This is especially of importance for road projects that often involve issues of conflicting interests (Fischer, 2006).

The identification of the impacts of a road project is based on the analysis of the possible conflicts between the environment surrounding and the infrastructure to be implemented. This analysis allows to link associate the sources of the impact with the different phases of the infrastructure, namely pre-construction, construction and operation. To do so, there can be distinguished two different levels of environmental consequences:

- The primary impacts directly caused by the realization and implementation works and that physically affect the natural and human heritage that create the environment of the areas concerned.
- Secondary impacts resulting from the primary ones. They can be perceived through their impact reducing the environmental capital by destruction, removal or degradation of the five main resources: soil, water, air, flora, and wildlife.

On a human level, these impacts are those that will affect the living conditions on the three levels: economic activities, socio-cultural activities and quality of life.

In terms of assessment, López et al. (2009) argue that traditional transport infrastructure assessment methodologies rarely include the full range of strategic benefits for the transportation system. One of these benefits is the contribution to cross-border integration. This is a critical issue for the integration process of countries with international transport corridors.

Finally, a national transport master plan covers mainly transport infrastructure and investments related to passenger transport and less on freight transport. Planning on multimodal freight transport is mostly documented in a multimodal freight transport master plan (or Road Freight Strategy as in the case of South Africa) to address the unique characteristics, needs and impacts of freight movement.

2.4.1. Technical Factors in OIC Countries

In its strategy for the period 2012-2016, the Ministry of Equipment and Transport of the Kingdom of Morocco took into account the guidelines of the government program, such as the competitiveness of the national and regional economy, integrated and harmonious development balanced transport infrastructure, pursuing an aggressive investment policy with complementary modes of transport and the promotion of intermodal transport as well as the adjustment of the planning, programming and funding, in addition to increase the level of supply and quality of services5.

The same goes to the Republic of Uganda, where Establishing a long-term master plan to guide rational and complementary development of all modes was one of the key features of policy and strategy in its National Transport Master Plan 2008-2023.

Abu Dhabi has the Surface Transport Master Plan that includes projects to improve road, rail, and public transport infrastructure. The Abu Dhabi Multimodal Freight Master Plan focuses on the major forms freight transport (air, rail, road and sea) as well as other issues such as sector governance and ensuring efficient multimodal connections.

Based on the questionnaires filled out by 23 OIC Member States, 57% of the respondents ascertain that the level of holistic planning in the transport sector in their countries is high and this was also confirmed by 38 % (the largest) of academics that expected their plans covered all modes of transport. This shows that the various transport related aspects such as land use and multimodal transport logistics are well integrated. The importance of multimodal freight logistics in the NTI planning of the OIC countries is also shown by the fact that 70% of the surveyed countries are signatory parties to international transport corridors.

An Environmental Impact Assessment (EIA) has obviously been playing an important role in the transport investment projects and is mandatory to undertake, as stated by 91% of the surveyed Member States. It means that no transport project can be implemented before the EIA of the particular project is accepted by the related environmental agency. Academics were less certain with 25% believing that EIAs were not efficiently carried out and effectively monitored.

In terms of the application of socio-economic evaluation or cost benefit analysis (CBA) to prioritize projects, it varies among the countries. 92% of the surveyed countries states that they are applying this method when developing their NTI plans, while the application in the rest of the surveyed countries is low. 87% of Academia believed that socio-economic criteria was at least partially used to prioritise their national plans. Considering these survey results, it can be concluded that the application of socio-economic evaluation and CBA to prioritize projects in the NTI planning in OIC countries is going in the right direction.

2.4.2. Technical Factors Outside OIC Geography

Even though the importance of integration of land-use planning and transport planning is acknowledged in policy documents in various developed countries, such integration is scarcely present in practice (Te Brömmelstroet & Bertolini, 2009, Heeres et al., 2012 in Arts et al, 2014).

[5] Official website of the Ministry of Equipment and Transport, Kingdom of Morocco, http://www.equipement.gov.ma

Arts et al. (2014) also observed that spatial development and transport infrastructure development are traditionally planned in different sectors, by different authorities in different institutional settings.

According to OECD/ITF (2017), France has successfully replaced its strategic planning from sub-sectoral transport master plans with a multimodal approach. This approach is not only shown in the attention to multimodal interchanges and interconnections and the impact of, for example, rail projects on the road network, but also in the emphasis on value-for-money in projects across the modes. The transport master plan also facilitates decision making on territorial and urban development that is dependent on the transport network and enables forward planning of dependent and complementary infrastructure, e.g. in the case of high-speed rail, associated development or redundancy of the conventional network. These objectives are clearly set out in the master plans.

One of the strengths of the French planning system is the requirement to undertake *systematic ex-post assessments of public infrastructure investments*. This yields the results in Table 3. The high-speed lines were built in order of expected rate of return. Ex-post yields are systematically lower but essentially in the same order. The two projects that break the pattern both saw passenger numbers affected by the later-than-expected construction of the Channel Tunnel rail link, HS1, in the UK.

Table 3: Ex-ante/ex-post comparisons of socio-economic rates of return for high-speed rail lines

Year opened	Project	Economic internal rate of return		Principal Explanation
		Ex-ante	Ex-post	
1992	Atlantique	23.6%	14.0%	Traffic and revenues higher than forecast, but heavy cost overruns (more than 20%).
1993 Extended to Belgium 1996	Nord-Europe	20.3%	5.0%	Traffic below forecasts largely due to late development of HS1 in the UK; revenues close to forecast thanks to increased fares, but 20% infrastructure cost overrun.
1994	Interconnexion Ile-de-France	14.1%	6.9%	Traffic increases below forecast and overruns on rolling stock and operatinfg costs.
1994	Rhône-Alpes (Valence)	14.0%	10.6%	Benchmark traffic below forecast and overruns on rolling stock and operating costs.
2001	Méditerranée	11.0%	8.1%	Traffic close to forecast but overruns on rolling stock and operating costs.
2007	Est	8.5%	4.2%	Cost overruns (+20.2%) partially offset by higher-than-expected traffic

Source: Bilans LOTI, http://www.developpement-durable.gouv.fr/Bilans-LOTI.html

In EU Member States, Strategic Environmental Assessment is a formal requirement, based on Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (known as the SEA Directive). Another good practice outside Europe is the guideline for Planning and EIA of Road Infrastructure that was produced by the Government of Botswana in 2001. The guideline provides a comprehensive technical basis for decision making

through integrating EIA into the planning process. It also provides transparent procedures that are followed when deciding on the choice of alignments.

Sweden has the national freight model, called Samgods, that is used specifically in the national plan for breaking down the economic forecast to regional transport growth numbers used in sub models or and for making sensitivity analysis of different scenarios. Samgods is modelling the national level with transport solutions for domestic, import, export and transit for all transport modes.

It is also important to note that Tanzania has several "international corridors" connecting its east coast to neighbouring inland countries, and that development in such infrastructure has a great impact not only on Tanzanian economy but also on the economic growth in the rest of the East Africa region. In that sense, transport infrastructure in Tanzania (both hard and soft) needs to be designated not only as a domestic asset but also as a common asset shared with the neighbouring economies. As is the case for one of the TAZARA (Tanzania Railway Company) railway lines that links the Copper Belt in Zambia to the port of Dar es Salaam.

It is worth noting that integrating international transport networks, that passing through a country, into its transport master plan is of importance since such infrastructure has a great impact not only on the economy of the particular country but also the economic growth in the rest of the region. An example of this is the Tanzania Comprehensive Transport and Trade System Development Master Plan 2030 that incorporate the development of international corridors that connect the East Africa region.

2.5. Procedural Factors, including Financing

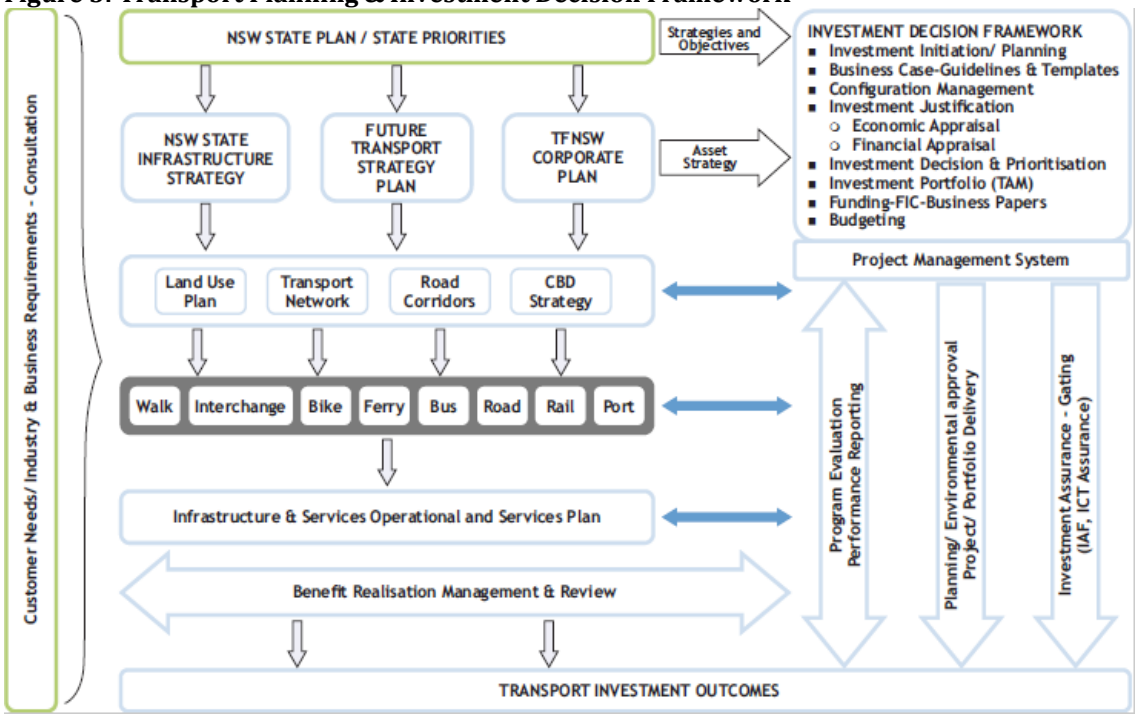
NTI plans are complex and have a long duration, from conception to realisation. They require large sums of investment, along with considerable risks. They have an impact on society, the economy and on the landscape. The group of potential users is large and geographically spread. Therefore decision-making is often *paved with procedures*.

Ideally, decision hierarchy starts at the *strategic* level and ends at a *pragmatic* and detailed level. Strategic questions relate to policy objectives (What is our goal?), to options (What are the various ways to reach our goals?) and to means and restrictions (What are the means available?).

NTI planning can be the choice of one decision maker, or involve many professionals and civilians, and follow a series of procedural phases. NTI plans often include a *wide range of documents*, ranging from country development plans, transport investment plans to lists of approved projects for public investment and project appraisal documents.

Figure 3 illustrates the NTI decision framework as applied in New South Wales (Australia).

Figure 3: Transport Planning & Investment Decision Framework



Source: Australia (2016)

Generally speaking, one can distinguish three levels of NTI planning:

1. NTI planning is limited to a chapter or a paragraph of the National Development Plan;
2. National transportation plans and master plans play a leading role in NTI planning;
3. NTI planning is integrated in land use, where policy and competition for finance are key drivers.

Most of the OECD countries range in the third category, whilst many developing countries can be found in the first category. Examples of countries that fall under the second category, are:

- Africa: Angola, Botswana, Nigeria, RSA, Uganda, Zimbabwe.
- Asia: Afghanistan, Malaysia, Nepal, Oman, Singapore.
- Europe: Austria, Belarus, Germany, Netherlands, Norway, Romania, Spain, Sweden, United Kingdom.
- Oceania: Australia, Cook Islands, Micronesia, Vanuatu.
- The Americas: Canada[6].

[6] Transportation 2030: https://www.tc.gc.ca/eng/future-transportation-canada.html

Only a fraction of the plans mentioned as examples is publicly available. The others are not published in a public domain. This holds both for countries within and outside the OIC geography.

When comparing formal procedures to isolated decision making, Mackie (2014) refers to psychological reasons that apply to humans in general. This is when he explains why *formal* and procedural *selection and appraisal* guidance in NTI planning is to be preferred to *isolated decisions* by decision makers:

- We are not good at considering many variables and aspects simultaneously; instead we tend to focus on one or very few aspects and are often unaware that we do this;
- We usually reach decisions very rapidly based on gut instinct or subconscious analogy. Then we tend to look for evidence and arguments which support the decision;
- We are prone to wishful thinking, optimism bias and loss aversion, so we have difficulties in abandoning an idea or a decision once we have settled for it;
- We tend to over-generalize, turning anecdotes or single cases into general rules;
- We are not good at understanding or comparing different orders of magnitude;
- Moreover, we are not aware of these processes and if made aware of them can find them quite threatening.

We are also prone to making assumptions, which once made tend to be forgotten and not followed up. Keeping track of assumptions and managing them properly is one of the single biggest weakness in planning. If the assumptions were seriously monitored then the probability of outcomes being achieved will be more realistically assessed.

OECD (2017) in its review of infrastructure planning strategies in the transport and energy sectors identifies three similarities in how OECD countries do their planning, being that

- the assessment of need for infrastructure investment is predominantly driven by population and economic growth rates;
- scenarios are used to consider different possible outcomes;
- different forms of stakeholder consultation are part of the process.

In the following sections, the procedural aspects of NTI related to finance, stakeholder consultation and planning horizon, are elaborated.

2.5.1. Procedural Factors in OIC Countries

Funding

Funding in OIC countries is predominantly following the conventional routing of public finance or tax funding. Alternative funding is private funding. User-based funding can be combined both with public and private funding. According to the survey that has been undertaken within the framework of this study, only 34% of the OIC member states indicate that the level of private funding is high, and the rest indicated that the level of private funding is between mediocre to very low. Similarly Academics indicated that they agreed.

The first meeting of the COMCEC Transport Working Group, held in March 2013, was on "Transport Infrastructure Financing Modalities: Public Private Partnerships (PPPs) in the OIC Member States".

Examples of OIC countries that explicitly mention private finance in their NTI plans are Afghanistan, Morocco, Qatar, Saudi Arabia, Senegal, Tajikistan, Turkey, Uganda.

Involvement of stakeholders

Public consultation is an important element of the NTI process in order to measure user needs, to assess users' affordability and to guarantee a smooth implementation. According to the survey that has been undertaken within the framework of this study, more than half of the OIC member states indicate that the level of consultation and stakeholder participation in NTI planning, that involves other sectors other than transport planning institutions, is (very) high. 75% of Academics thought public participation was good. However, more than half of the surveyed countries stated that there is no legal basis that enforces public consultation.

63% of the surveyed academics and private (or state-owned) institutions indicated that their participation in the NTI planning process in their countries is high, and all respondents indicated that they are willing to be more involved in the process.

Time perspectives

Time and timing plays a key role in NTI planning. Time related aspects are distinguished into four:

- The planning horizon of the national plans;
- Intervals between subsequent editions of the national plans;
- The valuation of distant future versus short term effects via the discount rate;
- The time horizon required or applied in the project appraisal.

The *planning horizon* of the national plans is 4 to 15 years for most of the OIC countries. Some countries apply a longer planning horizon, with outliers to 30 years. For non-OIC countries, the horizons applied are 10 to 20 years with outliers to 5 and to 40 years. Below is a list of OIC countries and the planning horizons related to specific national plans:

- Afghanistan National Development Strategy 5 years;
- Albania National Transport Strategy 20 years;
- Bangladesh National Skills Development Policy 10 years, Five Year Plan 5 years;
- Comoros Country Strategy Paper 4 years;
- Iraq National Development Strategy (Iraq, 2005) 3 years;
- Malaysia National Land Public Transport Master Plan 8 years, 5 year plans; Vision Plan 20 years;
- Morocco National Development Plan 4 year;
- Nigeria National Integrated Infrastructure Master Plan 30 years;
- Qatar Transport Master Plan 20 years, National Vision 20 years;

- Saudi Arabia National Development Plan (2016)[7] and Vision 2030 14 years;
- Senegal National Transport Plan and Country Programme 4 years;
- Tajikistan National Development Plan (Tajikistan, 2016) 14 years;
- Turkey National Development Plan (Turkey, 2014) 5 years;
- Uganda National Transport Plan[8] 15 years, NDP (Turkey, 2016) 4 years, including 30 year vision.

For developing countries, long term planning horizons might constitute a problem, as their available capacities are limited. Under non-stable conditions the accuracy of long term planning is rather low and might not act as a reliable guidance to the future. Large investments (mega projects) involving long distances do require long term planning, due to the funding challenge of both the investment and the operations and maintenance (New Zealand, 2014).

Some countries apply a 4 or 5-year cycle to publish a national development plan or strategy, and do this in a well-structured and consequent way. It is part of their administrative standard procedure. Although well structured, a specific attention to national transport infrastructure in most cases is rather limited. This would not constitute a problem, when a country publishes a national transport infrastructure (master) plan, which is rarely the case.

In other cases, the intervals between subsequent editions of the national plans are non structured or unknown. This holds especially for national transport infrastructure (master) plans. Many of the plans are not publicly available, and if they are, it is limited to only one edition. Previous or next editions are rarely mentioned.

2.5.2. Procedural Factors outside OIC Geography

Funding

NTI projects have a wide multidimensional impact over a long timespan. In order to make investments in NTI attractive and sustainable, forecasting and identification of effects is important, although it is a challenge to do this accurately (Alasad, 2012). At the same time public budget are always under pressure, and it is a challenge to align the annual funding cycle with the multi-year planning horizon of NTI plans. An example of this friction plays between the German Federal Transport Infrastructure Plan and the Investitionsrahmenplan, or framework investment plan. (Emberger, 2017, Roland Berger, 2013).

The Financier has a big stake in determining the investment, the project design, and in the project selection. "Without funding no project" is often heard.

Public budgets, being the traditional type of funding, play a key role. National plans are the key to this important source of finance. In many countries requirements for projects to enter the plan and to reach final approval have legal status (Emberger, 2017, Roland Berger, 2013, New Zealand, 2014).

[7] Available from https://www.stats.gov.sa/en/page/72
[8] document not yet found.

In the Netherlands, United Kingdom and France, procedural steps in NTI projects have legal foundation and are concluded with official ministerial decisions. In Denmark and Austria the national parliament provides legitimacy for NTI projects. This clearly communicates a strong political commitment and backing.

Many other EU Member states, like Bulgaria, Germany, Italy Romania and Spain, closely follow EU guidelines that provide a detailed methodology and procedure. This is directly related to the TEN-T network, through which EU Member States mutually connect and extend their NTI networks.

In most OECD countries the Ministry of Finance (MoF) plays a decisive role in NTI planning by providing mandatory instructions regarding discount rate, and planning horizon, to be applied in project appraisal. Examples of these legally based instructions are the Green Book (United Kingdom, 2018, the formal version is the online version)[9] in the United Kingdom and CPB (2013) and Commission on Discount Rate (Werkgroep Disconotvoet, Netherlands, 2015, the formal version is the online version)[10] in The Netherlands, following MoF guidelines.

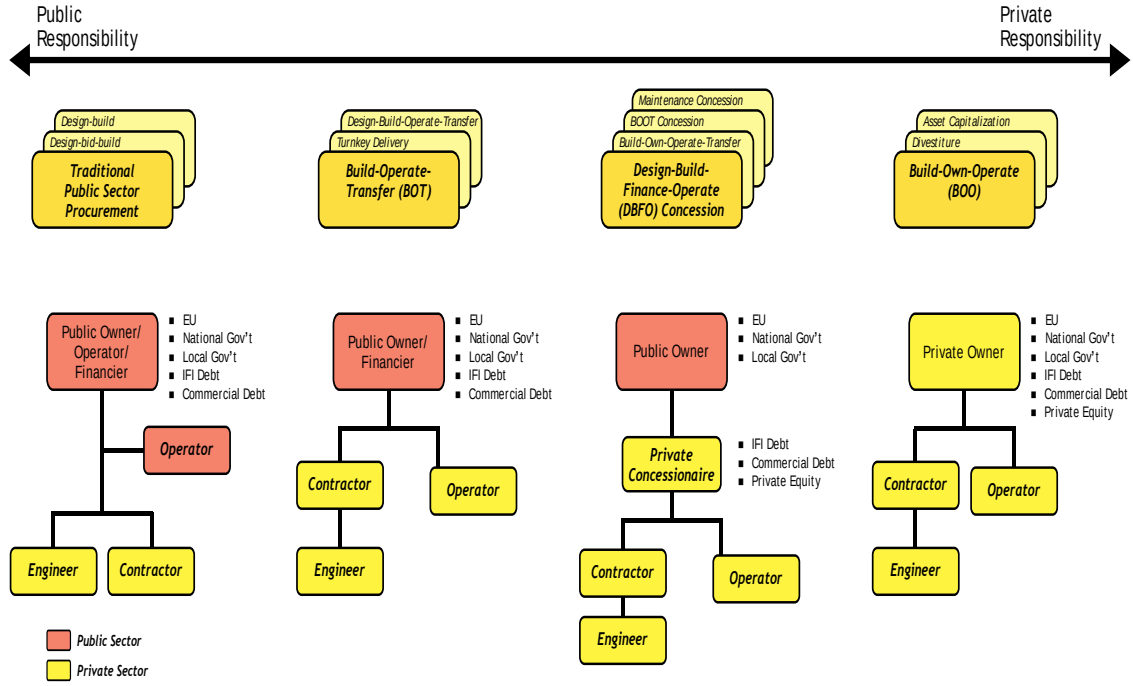
Many IFIs, like the ADB, World Bank and Asian Infrastructure Investment Bank that provide *soft finance*, have very detailed formal procedures for *project approval*. Equally most OECD countries have formal description of project appraisal (guidelines) methods. NTI planning and project appraisal are strongly interlinked, as NTI plans consist of projects, and projects form an NTI plan. The guidelines not only include procedures and methodology, but often prescribe parameters and ways to price project effects that are not market-price (see also section 2.6).

Apart from national and international public finance, there are *private sources of finance and user-based finance*. These tend to play an increasing role in financing of NTI (OECD, 2014 and OECD, 2015).

Private finance via public–private partnerships (PPP) is extensively used in Australia, Canada, India, the Netherlands, and the UK. PPP is a way to relieve annual state budgets from sudden financial shocks and to manage risk. PPP is a form of procurement and contracting and has various formulas: Build-Operate-Transfer (BOT), Design-Build-Finance-Operate (DBFO), or Build-Own-Operate (BOO) (European Commission, 2003). The figure below illustrates the various PPP constellations.

[9] Available from https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent
[10] Available from https://www.rwseconomie.nl/discontovoet

Figure 4: Project Procurement Options



Source: European Commission (2003)

Pricing and finance are inter-tangled via user-based finance, where, in contrast to tax financing, the user of the infrastructure pays directly for its use. This requires a balance between services rendered and services received, the so-called principle of equivalence (Roland Berger, 2013).

The options of private and user-based finance directly relate to key issues of access to utilities (who, when, under which conditions) and view on the role of the government versus the private sector. Pricing measures are also a means to have control over utilization (value and affordability).

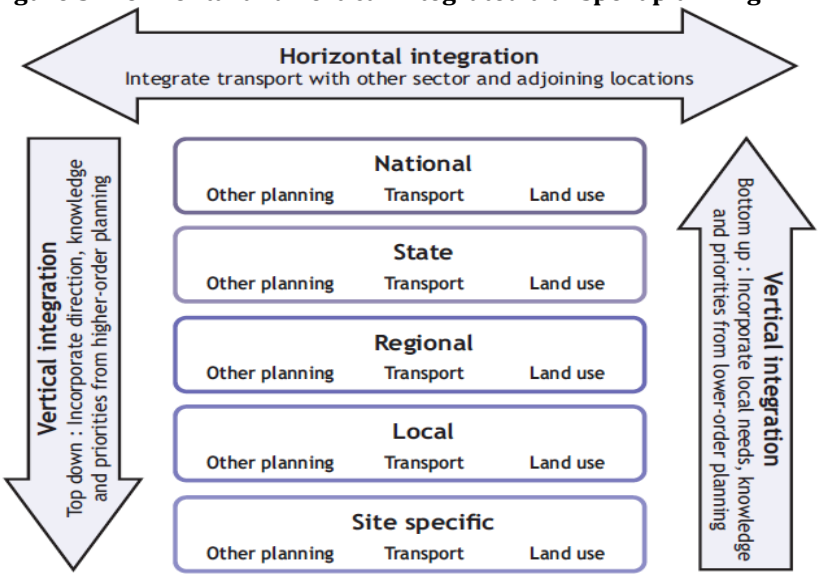
Earlier in this section it is substantiated that *stakeholder involvement* is preferential to isolated decision making (Mackie, 2014). Involvement of stakeholders and public consultation is instrumental to identify problem and needs, and to make inventory of solutions (Roland Berger, 2013, KPMG, 2016). Public is demanding participation, and in most countries consultation is legally prescribed, often during the first identification phases, before formal decisions have taken place. In some other countries this only takes place after formal decision making, in order to inform larger groups.

Where issues extend beyond spatial and conceptual boundaries for an integrated transport plan, linkages must be established with appropriate external stakeholders (Australia, 2012).

Interest or pressure groups play a role in the formal decision hierarchy or in the implicit 'licence to operate' (support). Their lobby can be in favour of project (elements) or against specific activities or investments. In most countries there is a legal base for public hearing regarding individual projects, less for larger national infrastructure planning.

Another scope of realising broad involvement is at the administrative level: at the regional or local level needs and opportunities can be identified early, and projects can be submitted into the NTI process (Australia, 2012). In section 2.3 horizontal and vertical integration in terms of transport modes is discussed. The principle of vertical integration also applies to the various levels of government and private organisations (Western Australian Planning Commission, 2012), see Figure 5. NTI planning needs to get the lower administrative levels involved both in the phase of conceptualisation, and realisation (bottom-up and top-down).

Figure 5: Horizontal and vertical integrated transport planning



Source: Western Australian Planning Commission (2012)

OECD (2017) notes that: "it is relatively uncommon for infrastructure plans to be developed using both bottom-up and top-down approaches. Most planning is driven by a bottom-up process to assess the need for specific sectors or locations. This also means that detailed assessments of the location of population and economic growth are relatively uncommon."

Most European countries have legal bound rules on public involvement in NTI planning. Since 1995 France has a Commission National du Débat Public/CNDP (in English: National Commission of Public Debate). Both Netherlands and France apply public consultation in the study phase, before approval (Roland Berger, 2013).

The NTI plan of Romania provides us with a concrete example of public consultation (Romania, 2014). Romania has asked for feedback on its working draft of the Master Plan via public consultation. Over 100 meetings have been held with representatives from the ministry, operating companies and other stakeholders. The outcome was the identification of the root cause of problem. Another benefit of the consultation was that additional data have been received.

Planning horizon

Time and timing play a key role in NTI planning. Time related aspects are distinguished into four:

- The planning horizon of the national plans;
- Intervals between subsequent editions of the national plans;
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- The time horizon required or applied in the project appraisal.

The planning horizon of the national plans is 10 to 20 years for most of the non-OIC countries. Some countries apply a longer planning horizon, with outliers to 5 and to 40 years. For OIC countries the horizons applied are 4 to 15 years with outliers to 30 years. Below is a list of non-OIC countries and their NTI planning horizons:

- Australia generally 30 years, 10 years for Intelligent Transport Systems, 30 years for road, 50 years for rail;
- Belarus National Infrastructure Plan 15 years;
- Belgium Long term transport prognosis 20 years;
- Netherlands 30-35 years;
- Norway National Transport Plan 13 years;
- South Africa National Transport Master Plan11 40 years;
- Singapore National Land Transport Master Plan 20 years;
- United Kingdom National Transport Plan12 10 years.

Many EU countries do have a *multiannual-planning horizon*. This results in relatively high efficiency and low expenses, enabling operational planning for all involved. Disadvantage however is rigidity. As plans do stretch over many years changes are hard to make. Changes can be required due to technological change (IoT, block chain), demographic, climate or economic developments. In 2017, the Netherlands Central Planning Bureau has developed a set of measures aiming at creating agility and flexibility (dynamic or *adaptive programming*), to be incorporated in the planning and selection procedures (Netherlands, 2017). This agility allows for changes in timing, in scaling and in configuration, and allows for new insights.

Many countries regularly publish national plans, visions and strategies. However, only few of them do this in a well-structured way and with consequent *time intervals*. It is part of their administrative standard procedure. The number of countries that publish national transport infrastructure (master) plans tends to decrease. NTI plans are being more and more replaced by a variety of integral plans and visions with a national scope. While most of transport infrastructure (master) plans are of regional scope.

Discount rate, revealing the orientation or valuation of present versus future: There is a distinction between financial discount rate and social discount rate (European Commission, 2014).

[11] The discount rate is an important element outside OIC Geography. In OIC Countries it is merely not applied.
[12] The time horizon in project appraisal is an important element outside OIC Geography. In OIC Countries it is merely not applied.

Financial discount rate (FDR) equals the opportunity cost of capital of an alternative investment with a comparable risk profile. It is used to attract both public and private financial commitment to a specific investment opportunity.

Social discount rate (SDR) equals the opportunity cost of capital. The difference with FDR is that SDR is valuated for society as a whole and from an inter-temporal perspective. In other words, it reveals society's orientation or valuation of present versus future costs and benefits.

For NTI planning, FDR is relevant when it comes to financial planning, while SDR is relevant when it comes to socio-economic assessment (see section 2.6).

(Social) discount rates are formally set between 2% to 6% with outliers to 10%. The rate depends on the country, the sector, the time horizon, the definition (risk premium), and they do change over time. The recent (2008-2012) turmoil on the financial markets and the resulting low interest rates have had their effect on the SDR's, even on long-term rates. An overview of a selection of examples:

- Australia: 7% real discount rate, plus a 4% and 10% sensitivity (Douglas, 2013);
- Denmark: 3%, 2,5% for 36-70 years, 2% for >70 years (Denmark, 1999 and Mouter, 2015), was 7% for 0-20 years, 6% for >20 years;
- European Bank for Reconstruction and Development: 10% (European Commission, 2014).
- France: 2,5% for <50 years, 1,5% for >50 years risk free discount rate, plus risk premium 2,0% for <50 years, 3,0% for >50 years (France, 2013);
- Norway: 4%, 3% for 40-75 years, 2% for >75 years (Norway, 2012) and risk free discount rate 2.5% for 0-40 years 2% for >40 years (Mouter, 2015);
- Spain: 6% for transport, 4% for water supply projects (European Commission, 2014);
- United Kingdom: 3,5% Ramsey formula based, 1% for long term (France, 2017), was 3,5% for 0-30 years, 3% for 31-75 years, 2.5% for >75 years Mouter, 2015);
- World Bank: 10% (European Commission, 2014).

Regarding the time horizon required or applied in a *project appraisal*, HEATCO (2006) recommends the use of a 40-year appraisal period as a default evaluation period. A finite evaluation period requires the residual effects to be indicated. Projects with a lifetime shorter than 40 years should use their actual lifetime of the main asset. Several OECD countries apply a standard time span that goes well beyond the recommended 40 years. The Netherlands applies 50 years for urban projects and 100 years or infinite for project appraisal related to green and water related projects.

2.6. Content of National Transport Infrastructure Plan

NTI planning involves a high strategic level and often also touches the pragmatic project level. The typical content of NTI plan is structured along the following line:

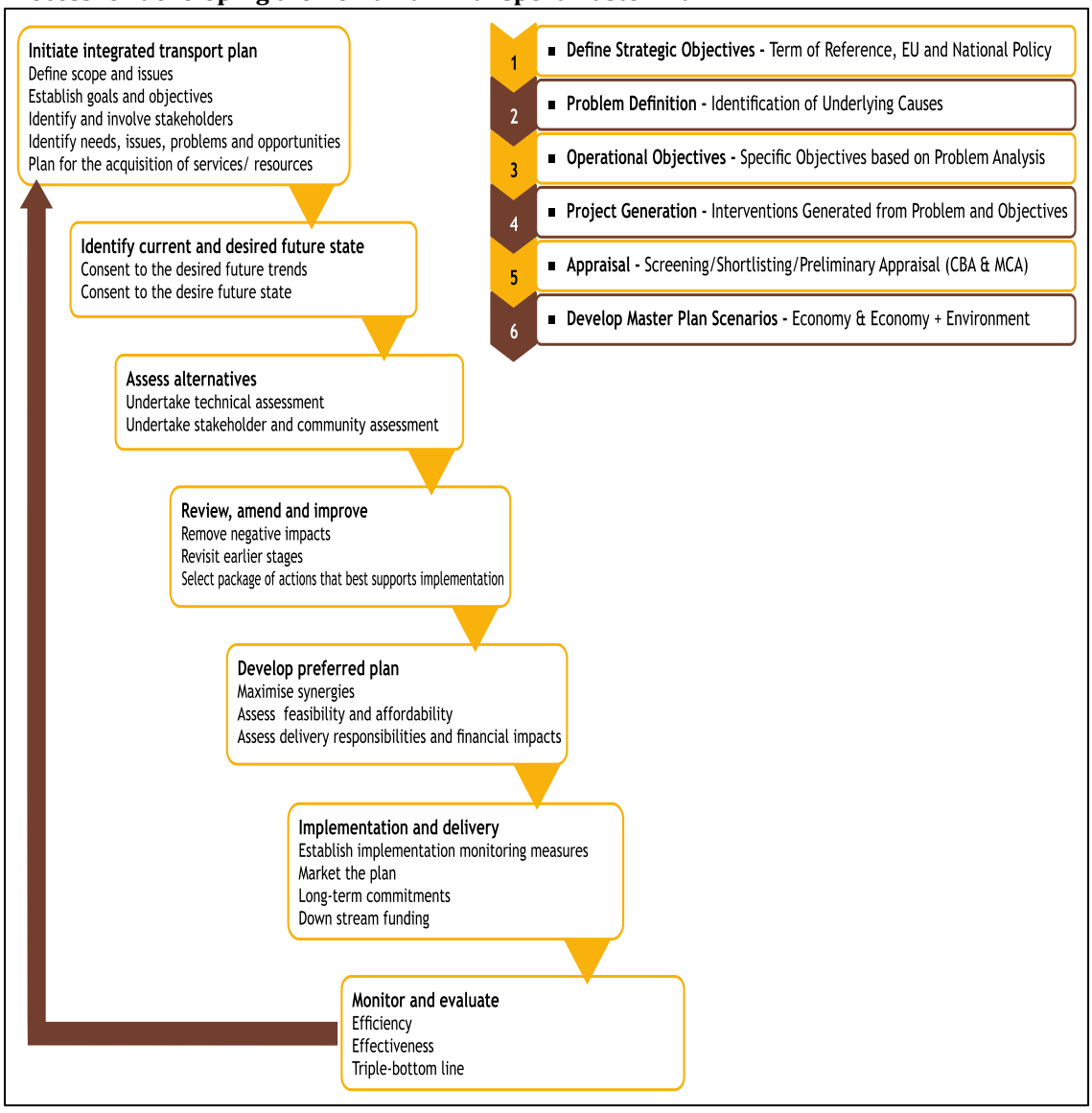
1. Identification of problem and needs;
2. Problem analysis including description of status quo;
3. Policy context and policy objectives;
4. Project formulation and appraisal;

5. Political choice between short listed options;
6. Implementation;
7. Monitoring and evaluation.

These seven steps, including a feedback loop from 7 back to 1, comply with project cycle management approach (European Commission, 2004). The two figures below reflect how Western Australia and Romania structure their NTI plans.

In this section these steps will be illustrated, while implementation, monitoring and evaluation will be further described in section 2.8.

Figure 6 (Left): Template for developing an integrated transport plan; (Right): Overall Process for developing the Romanian Transport Master Plan



Source: Romania (2014) & Australia (2012)

2.6.1. Content of National Transport Infrastructure Plan in OIC Countries

Very few NTI plans of OIC countries are accessible and made public. They are prepared within and for a narrow circle. The value of stakeholder and public consultation is endorsed, but rarely being practiced.

Most countries do have national strategies and development plans. In many cases security and basic utilities are of high priority. In many of these documents, NTI plays a minor role. Exceptions seem to be Afghanistan, Malaysia, Senegal, Turkey, Qatar and Uganda.

National Transport Master Plan for the Republic of Turkey

Aim: improving transport being a priority for Turkey's economic and social development.

Activities to develop the plan include:

(1) collecting traffic data across the country;

(2) developing a transport model which will be used to forecast travel projections;

(3) identifying key transport infrastructure investment projects over a period of 30 years

Funded by EuropeAid, the Master plan Strategy will focus on Intelligent Transport Systems and Air Transport and Navigation. The Master Plan will be used to inform the development of guidelines for Urban Transportation Plans.

2.6.2. Content of National Transport Infrastructure Plan Outside OIC Geography

Identification of problem and needs

At the start, being the strategic level, the issue has not necessarily been typified as an infrastructural project. *Identification of the problem* comes first (limited access, high transportation costs, lack of competitiveness, congestion, new housing schemes leading to non accommodated demand, …). This problem will be analysed along the policy context (see section 2.2 on political and legislation factors). In order to reach the objectives, a *set of project solutions* will be selected and identified, after being compared to alternatives. The project solution can be in terms of construction, development, renewal, enlargement of infrastructure, but can also have a different shape, for example reduce demand for transport and mobility and supply of multi modal solutions. The final choice for the project(s) will not be made by technique and analysis, but by political decision-making.

Romania National Transport Master Plan

Romania National Transport Master Plan is a high-level planning instrument, refers to major objectives of national transport system, being large sized projects and actions. It aims to "identify the projects and policies which will best meet Romania's National transport needs over the next 5-15 years, for all modes of transport, and providing a sound, analytical basis for the choice of those policies and projects" (Romania, 2014).

Problem analysis including description of status quo

- Problem analysis

- Identify and involve stakeholders. Identify needs, issues, problems and opportunities. Plan for the acquisition of services and resources.
- Identify current and desired future state
- Consent to the desired future trends.
- Requires being informed, having data (see section 2.7 on data collection).

Policy context and policy objectives

See section 2.2 on political factors.

Project formulation and appraisal

On the basis of the problem analysis combined with the policy context, a *proposed solution* and a set of alternatives will be developed. This set will be reviewed, amended and improved. Technical solutions will require a package of actions that best supports implementation. The next step is to compare the proposed solution with alternatives, in order to optimise.

In order to develop the *preferred plan*, the investment options need to be prioritised by maximising synergies. In this phase it is important to assess feasibility and affordability and to assess delivery responsibilities and financial impacts.

Criteria are financial *feasibility*, economic sustainability and social and regional *inclusion* and access. The proposed solution and the alternatives will enter a "beauty contest". Depending on the need for finance and the size of the project, this contest will be regional, national or international. Competition for finance (via overarching project appraisal frameworks) is dominant in NTI planning.

Project appraisal takes place in one or in two phases of NTI planning. NTIs developed at a high abstraction level often require high-level project appraisal. Individual projects require detailed feasibility analysis before final approval and implementation (Romania, 2014).

Many countries have developed *comprehensive guidelines* of project assessment that describe the major part of the decision process (see also section 2.5.2). They include design, including financial and economic optimisation (benchmarking with project alternatives). They allow for additional finance (to public means of finance) and lay the foundations for a KPI structure to be used during ex-post evaluation. These approaches have been developed and used during the reconstruction efforts that followed the Second World War. The methods are also used to allocate international donor funding and project monitoring.

In many countries the procedure and or the method of *appraisal has a legal basis*. In many countries approved plans will enter the national transport infrastructure program or national transport master plan. Often this equals the reservation of or a claim on the financial budget.

There are *three groups of methods of project appraisal*: Cost Benefit Assessment (CBA), Multi Criteria Analysis (MCA) and Economic Impact Assessment (EIA). CBA is a more technocratic instrument, in which researchers play a larger role, while MCA leaves more space for political preferences. EIA is simpler than CBA, makes use of primary data and can be done with an existing Input-Output model. CBA requires a sophisticated set of information and project definitions. MCA is a technique that does not require monetisation of the effects, in contrast to

the CBA and EIA approaches (European Commission, 2014, Furberg, 2014, Kamis, 2014, Mackie, 2014, New Zealand, 2014, Schutte, 2012, Taks, 2011).

Complementary to monitoring and CBA is the impact evaluation, already applied in the context of transports and infrastructures by the Inter-American Development Bank (2017). In particular, it differentiates from the formers as it assesses projects considering costs and outputs in case of implementation of the project itself and in the case it had not been taken place. This latter scenario is defined by the Inter-American Development Bank as counterfactual, and, unlike the CBA where the counterfactual is simulated, here it is empirically computed. The final output of an impact evaluation could find concrete application in CBAs themselves or serve as "input for ex-ante cost-benefit analyses of similar projects" (Inter-American Development Bank, 2017).

Financial analysis measures a project in nominal monetary values, at market prices, reflecting the viewpoint of the owner of the asset, with expenditures on the one side (investment, operational expenses, maintenance and working capital) and revenues on the other side (cash income from sales or toll levies).

When implementing an assessment of a project, may it be through CBA, MCA or EIA, it is needed to take into consideration the role that optimism in forecasting can play. Flyvbjerg (2014) and Zembri-Mary (2017) study this case for mega infrastructure projects. In this context, behavioural economics has a significant relevance, whereas optimism in costs budgeting leads to an underestimation of them with respect to the concrete ones and an actual excess. The immediate consequence is the failure in assessing correctly a project. On the other hand, the optimism in benefits estimation would lead to a deficiency in tangible benefits. Megaprojects are particularly subject to optimism bias and in the moment in which there is emergence of the bias between reality and optimistic estimates, the megaproject can "break". In this regard, Hirschman (1967) provides the principle of the hiding hand for which optimistic underestimated costs should be balanced by underestimation of benefits.

Another important aspect is the delay in the realization of transportation infrastructure projects. These projects are, in fact, very vulnerable to this risk due to its complexity and its dimensions, as seen in the case of megaprojects above. Roland Berger (2013) analyses the case of delays in Germany and how they can seriously undermine the realization of the project itself and an adequate delivery that meets demand requests. Delays could be intended in administrative framework, but also due to legal procedures and there could be a link with the aspect of optimism bias in a sense of unavailability of funding not foreseen in the phase of evaluation.

Socio-economic analysis measures a project in real monetary values, at shadow prices, reflecting the viewpoint of society (country or region) of the asset. The analysis includes the same elements as in the financial analysis, including the costs to society (pollution, degraded standard of living, biodiversity, sub standard labour condition) and benefits to society (more equal distribution of wealth, improved environment, wider access to utilities (e.g. infrastructure). In Germany, Italy and Spain, NTI projects that reduce regional disparities have a formal priority. In socio-economic analysis a social preference plays a role, which is less objective, and can differ from society to society.

As a consequence researchers play an influential role in CBA both in determining the (prescribed) parameters, pricing, and other assumptions, and in doing the CBA analysis where they have their responsibility of estimation, forecast, and other degrees of freedom.

The European Commission has undertaken several efforts to *harmonise methods*, forced by the fact that many infrastructural projects have a transnational character. Apart from its advantages, the harmonisation has made the decision process more rigid and standardised, taking away space for other decisive arguments (non-priced effects, hard to quantify effects, political or social preferences) and moving away from scientific dilemmas (European Commission, 2014, Mackie, 2013, HEATCO, 2006).

There are several *project evaluation criteria* used to profile individual projects. The most used criteria are net present value (NPV), internal rate of return (IRR), and benefit-cost ratio (BCR) (World Bank, 2013b, Mackie, 2014, Mackie 2013, European Investment Bank, 2013, Bourguignon 2008, Canada, 2007, France, 2013).

For a complete and overall assessment of transportation infrastructure projects, Brown (2015) suggests three more aspects to be considered

- role of infrastructure in economic growth
- sustainable development and climate concerns
- timing of investment decisions

Regarding the first two bullet points, there is a growing awareness and concern around the green topic and Brown (2015) provides the definition for the term green infrastructure that includes "infrastructure that preserves or increases the productivity of natural resources, including reducing emission intensity". Green infrastructures are believed to be essential to "expand the frontier of the […] trade-off between environmental/climate sustainability and economic growth". Given the definition, an immediate example are renewable energy systems including wind farms and solar power plants.

As described above, transport policy affects economic growth through its impact on services such as health, education and provision of new jobs. Transport network, and implicitly NTI planning, can therefore have influence on existing economic imbalances. The Royal Town Planning Institute (2014) describes this effect both at a national level – in the United Kingdom, focusing on London – and generally in Europe. There is found to be a correlation at both stages between how much higher than the average the GDP is and the ease with which people can move from a region to another. As an example, in the UK, government funded infrastructure investments are still mainly devoted to London and its surroundings, where projects and programs in that region are at their highest in £ per capita, ranked between £4,001 and £4,333.

Transport planning, furthermore, has to be connected to land use planning to avoid excessive expansion of cities, as documented by the Royal Town Planning Institute (2014), where due to long distance the main mean of transport would become the private car and public transport system would not be efficient. An immediate consequence is the increase in traffic, congestion and consequently pollution.

In practice the financiers determine the format to be used for the feasibility study. In the case of public funding the legal authorities are the financiers and determine the format.

Performance measurement –KPI

Performance can be measured via the following indicators:

- Present Value of Benefits (PVB) – total discounted benefits during the appraisal period
- Present Value of Costs (PVC) – total discounted economic costs incurred during the appraisal period
- Economic Net Present value (ENPV) –the absolute size of the project net benefits.
- Benefit to Cost Ratio (BCR) – the ratio between total benefit and costs. This gives the relative size of the project net benefits but is independent of project size
- Economic Internal Rate of Return (EIRR) – Similar to BCR it is independent of project size and gives an indication of the scale of benefits relative to the investment cost.

Scenarios

In many countries, planning bureaus have developed long term scenarios, in line with national and international policies and developments. These scenario are incorporated in the NTI plans and result in various sets of prognoses.

The use of scenarios is widely diffused because it allows to compare systemically different possible outcomes. They are part of a top-down planning approach showing how different alternatives perform under important future constraints. In the Strategic Infrastructure Planning of 2017, OECD reports the case of scenario planning adopted by Australia. Despite the fact of not being a common procedure for this country, the Australian Infrastructure Audit implemented this strategy to manage the uncertainty around infrastructure planning over a long period of time (IA, 2015). There had been three different scenarios involved varying on productivity and population keeping in consideration – but not undertaking economic analysis of additional uncertainties – among which are the climate change, the implications of demographic change and changes in local and global economy (IA, 2015: 40).

It is however necessary to mention also that scenarios analysis is not very popular yet among policy makers. OECD (2017) reports as main reason that policy makers have a wide range of targets and need to consider multiple aspects of the decision with its trade-offs. The example provided is economic growth against environmental impacts.

Political choice between shortlisted options

The technical, financial and economic assessments provide the decision maker with a lot of information. However, not all effects can be quantified or monetized. An MCA can be helpful to the decision maker to make a choice that fits into the long term vision and policy objectives.

Romania National Transport Master Plan

Structure of the master Plan: Methodology – Present situation and trends – Per mode (also intermodal): strategy operational CBA, MCA, interventions – Funding analysis – Overall strategy 2020-2030, including scenario's

Objective: Master Plan is a high-level planning instrument, refers to major objectives of national transport system, being large sized projects and actions. Aim to "identify the projects and policies which will best meet Romania's National transport needs over the next 5-15 years, for

all modes of transport, and providing a sound, analytical basis for the choice of those policies and projects"

Appraisal for the sake of project selection versus the objectives, and to assess value for money

Public consultation: feedback on working draft of the Master Plan. Over 100 meetings have been held with representatives from ministry, operating companies and other stakeholders. Outcome was identification of root cause of problem. Additional data received.

Strategic Environmental Assessment included in final version of Master Plan

Method: Reference case (p3) for the purpose of the computer based National transport Model (EMME) with forecast years 2015, 2020, 2030 and 2040.

Cost estimates: high-level estimates, high-level uniform assumptions have been made on the project costs (based on average values per km/type of infrastructure/type of terrain). Maximum difference with detailed estimates of feasibility study: 25-30%

Estimates of economic benefits: high level, excluding intra zone impacts

Forecast method: following parameters from National Committee of Prognosis, EIU, IMF, OECD. The main drivers of forecast demand are GDP, population, employment, economically active population, and car ownership.

CBA methods: following European Commission guidelines, UNITE conventions and WebTAG methodology. Threshold: economic discount rate (EIRR) of 3%, due to high level assessment, normally 5%.

Time horizon is 15 years (2015-2030), except for airports, being 5 years (2015-2020), due to higher uncertainty.

Prioritizing projects using CBA and MCA.

Compliance: Check whether MP meets the ex-ante conditionalities defined in the reference document EUROPEAN COMMISSION, Directorate-General- Regional and Urban Policy, DRAFT -"Guidance on Ex ante Conditionality for the European Structural and Investment Funds", PART II, "Criteria for fulfilment"

Two scenarios: "Economically Sustainable" Scenario, and an "Economically and Environmentally Sustainable" Scenario.

Interventions resulting from the Master Plan include: a) Large infrastructure projects, b) National Maintenance Programmes, c) New Rolling Stock and Locomotives, d) Large Scale Rehabilitation projects, e) National Policies such as Rail Reform

Phase after Master Plan: detailed project feasibility studies for final decision (including option analysis, cost, capacity economic and environmental impact analysis), also need of reconfirmation of technical solutions, due to generic high level of master plan. Recommended approach is that design should be such to allow for future developments.

2.7. Data Collection Method, including Statistics and Surveys

Data is necessary to make sound choices in NTI planning. Data are the eyes of the driver. However, data collection is very expensive. It is one of the largest expenses of statistical programs. Issues related to data collection are the identification of:

- key data related to NTI;
- Key Performance Indicators related to NTI;
- ways to apply new technologies for data collection;
- ways to disseminate data in order to improve decision making both by public and private decision makers.

There are several reasons to collect data. Aspects of the planning and operations process that make use of data are among others:

- design and dimensioning of infrastructure (Who uses it, and for what purpose?);
- cash revenues and non-cash benefits (What are the benefits of the existing infrastructure?);
- maintenance and operations (What are the costs of the existing infrastructure?);
- asset management (What is the state of the stock of infra assets?);
- adequateness of the infrastructure (What is the need for additional infrastructure? Is there a policy to influence efficient use of infrastructure?);
- competitiveness (How would this affect the costs of transportation and international competitiveness?).

There are several methods to collect data:

- Automated data collection, via cameras, sensors, registering devices, transponders in or aside the infrastructure, mobile telephone data;
- Household and industry surveys, zoning, census information;
- Forecasting (data science and data analytics), big data, modelling.

Data collection can be institutionalized with a role for statistics bureaus or done on a project basis by other organizations. An advantage of structured and institutionalized data collection is that definitions, unit of account, techniques of collection, sample size, and reporting periods are harmonized. In data collection professionalism reigns. The advantage of a constant collection is that it results in longitudinal data sets.

Other aspects to pay attention to when collecting data are:

- access and ownership of data (public data versus private data);
- data sources;
- data storage.

2.7.1. Data Collection Method in OIC Countries

In most OIC countries' NTI planning documentation, there is little information on data collection, definitions and methodologies. Unlike for example EU countries, OIC countries do not use common and specific guidelines of (appraisal and) data collection in order to make collected data mutually comparable. According to the survey that has been undertaken within the framework of this study, 70% of the surveyed OIC Member States indicated that comprehensive land use and transport data collection take place periodically.

22% of the OIC Member States indicated that the adequacy of information to formulate the NTI plan was insufficient. The remaining 78% indicated that information to formulate the NTI plan was (very) adequate, whereas 50% of academics did not agree that data collection was adequate. This discrepancy might be explained by the way the academics view the importance of comprehensive data. They are more rigorous with data than government officials who consider budget constrains, as data collection is very costly.

2.7.2. Data Collection Method Outside OIC Geography

Among data required in NTI planning, the forecast of demand volumes is elementary. This is important to determine the dimensions of the infrastructure and to estimate the revenues in case of a PPP construction.

To estimate a realistic figure for the demand of services offered by the facility, Alasad (2012) suggests a system dynamics-based approach. This would overcome the problem with the conventional methods employed for demand forecasting, being statistical and artificial intelligence methods. Both approaches have their weakness: most statistical methods cannot accommodate interrelations between factors, while the artificial intelligence method requires large amounts of data. Making realistic projections is a challenge. According to Flyvbjerg et al. (2005), over 50% of transportation projects average a 20% discrepancy between actual and forecasted demand. In addition, the study suggests that this inaccuracy in demand forecasting is common across the different types of transportation infrastructures (highways, tunnels and bridges).

Canada's Compendium (Canada, 2016) points at the optimization of the use of resources in order to attain high quality timelines. They suggest to make the collection operations organized, planned and conducted as efficiently as possible. Furthermore they point at the burden for respondents, and that this should be minimized. Regarding the *interviewing practices*, they stress the importance of consistency across statistical programs in order to attain the highest quality standards possible.

In the context of modernization, Canada (2016) identifies *increased demand for statistics* and parallel declining response rates. This puts pressure on Statistics Offices to take full advantage of *new technologies* to gain efficiency while improving the quality of the data collected.

When conducting surveys, it is very important that the interest of respondents is safeguarded and protected, especially when government agencies or national institutes are the ones conducting surveys. In its "Compendium of Management Practices for Statistical Organizations […]" Canada (2016), acknowledges "moral, ethical and professional obligation […] toward respondents […] protecting the confidentiality of the information collected".

In addition to the protection of its content, also the way how surveys are carried out can have an impact on the final output of the collection of data. In fact, we all are aware of the possible biases that could be generated due to the sample size and the sample population in which surveys are conducted. It is also interesting to stress on the relevance that the collection tools can have. As an example, sentences of a questionnaire must be clear, concise and terminology must be plain and easy-to-understand. It has also to be kept in consideration that too long sentences will divert the attention of the respondent and it could be the case to face a boredom bias that will not reproduce reliable results.

Furthermore, it is necessary to consider carefully the willingness of the respondents to take part in the surveys – mainly due to lack of interest or time - which allows to keep acceptable response rates, especially for voluntary surveys. This is one of the most challenging issues in conducting surveys due to the increasing difficulty in reaching respondents through digital campaigns (e.g. number blocking), but also the very actual concern of respondents with privacy.

Canada's Compendium (2016) reports how it is necessary making sure that the above-mentioned criteria are respected. To do so, it recommends testing in advance the set of these tools on "a representative sample of respondents (individuals, households or businesses)."

Statistics Canada is working towards the direction to maintain or improving participation rates in surveys to help enhancing the quality of the results. The key-points through which Statistics Canada will pursue this target is improving reminder and refusal strategies, increasing the number of online questionnaires for data collection, implementing persuasive techniques and interactive communication strategies with the respondent and strengthening the use of administrative data to "support the survey process and reduce the response burden" (Canada, 2016).

For the survey to be effective, it is necessary to devote time to plan correctly and consistently the investigation. Canada's Compendium (2016) clearly states what the objectives for a successful survey are, starting from valid tools for the collection that respect the requirements reported above, a settled governance structure and a plan of awareness for the respondents in a way that they feel involved in the survey and they are aware of their importance in the program. Staff should also aim to maintain the relationship with respondents.

There are however some challenges that collection tools have to face. Pushing them through the process of modernization to improve the efficiency of collection operations implies also costs for National Statistic Offices, such as the adoption and implementation costs of the technology. There are mainly solutions to face this challenge that are highlighted in the Compendium: the first one is to adopt a single versatile collection tool, Integrated Collection and Operation Systems Initiative (ICOS), that would help to achieve the highest grade of functionality and employment of internet in e-questionnaires. The other possibility is implementing a "coordinated approach to the acquisition and implementation of a new technology". This solution is embodied in the experience of Cape Verde who adopted personal digital assistants (PDAs) in the 2010 General Population and Housing Census and the south-south co-operation between Brazil, Cape Verde, Côte d'Ivoire and Senegal.

In that context, the National Institute of Statistics (INE) of Cape Verde used mobile devices in the collection of data. This was a key-event as it was the first case in Africa of a digital census that helped both in reducing costs and time for the collection itself and the publication of results, but

also allowing for further analysis in high-quality data. This innovative procedure led to a restructuring of all the collection operation phases: cartography, survey design, public-relations (awareness) phase, pilot census, collection, processing, and dissemination. Because of its nature, the data procession phase was easier, since it was done in the field, and the data entry phase was entirely eliminated.

This procedure saw the essential support of the Brazilian Institute of Geography and Statistics (IBGE) with technical expertise and provision of equipment used for data collection. This experience had been shared in terms of the south-south co-operation. In 2013, INE and IBGE supported the National Statistics and Demographic Agency of Senegal providing technical collaboration and mobile devices to conduct a General Census of Population, Agriculture and Cattle.

It is also interesting to see how the mobile devices is used after census rounds: in fact, some of them are retained by the institutions for future survey needs, but the remainders could be beneficial for the whole continent developing further technical expertise as supported by the INE of Cape Verde in Fifth Africa Symposium on Statistical Development held in Senegal in 2009.

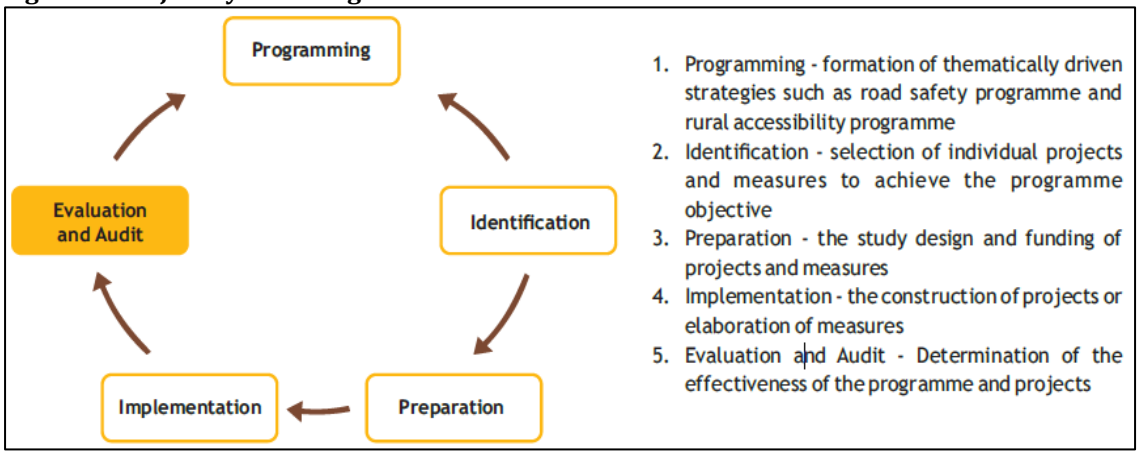
2.8. Monitoring System

2.8.1. Introduction

Monitoring, evaluation and audit (M&E) is an essential component to the project cycle as shown in Figure 7. Monitoring is a procedure that is applied during the preparation and implementation phase of the project cycle, evaluation after the project is completed to see if it is achieving the results expected and audit is applied to the entire cycle to test compliance with its various procedures (DEVCO, 2008).

Whilst all international funding agencies have very active M&E functions because they are owned and funded by nations to whom they are accountable, those same nations are less enthusiastic about monitoring and evaluating their own performance. M&E is variously discussed by Casley and Kumar (1988) who show how data is to be collected and analysed, Kusek and Rist (2004) who explain how M&E contributes to producing more sustainable projects and Stem et al., (2005) report on the trends in M&E techniques.

Figure 7: Project Cycle Management



Source: EUROCO

2.8.2. Types of Evaluation and the Criteria Used

There are three types of evaluation that are commonly used:

1. **Ex-ante Evaluation**, that is applied before implementation to review the solutions being proposed especially in mega projects as discussed by Priemus et al., (2008) and ethical considerations (Van Wee and Roeser, 2013) also refer to Table 3 where ex-ante and ex-post evaluation results are compared for the French TGV system.
2. **Mid-term Evaluation**, that reviews the results of the project a few years after it is open for business including environmental and economic impact (Tsamboulas and Mikroudis, 2000) and of absorption of structural funding (Eser and Nussmueller, 2006).
3. **Ex-post Evaluation**, that looks back after many years on the performance of an entire programme such as BRT in Bogota (Hidalgo et al., 2013) and EU Cohesion Funding (Kelly et al., 2015).

The most common criteria used in evaluation are as follows (OECD, 1991):

The application of weighting to the above criteria is a common sophistication. The main issue is one of quantification and measurement of the criteria, resulting in the scoring on a rating scale.

Table 4: Criteria used in evaluation

Criteria	Measurement of the Criteria	Scoring
Relevance	Is the rationale for the intervention still adequate (priority and validity)?	Use the Likert scale[13] 1 - Not relevant or aligned to policy any more: 5 - Highly relevant and fully aligned to policy. Average scores for all parameters
Efficiency	Has the project been cost-effective? Has implementing the intervention/s been as expected?	<10% of targets score 5, ie. of budget, time line or km planned If > 100% score 1. Average score for all efficiency attributes to provide the total score.
Effectiveness	Have the project goals / results expected being achieved?	Use Likert Scale: If meeting achieving result score 5 if not 1. Average for all results.
Sustainability	Are these results able to be obtained over time, are they likely to endure?	If budget, resources and capacity adequate score 5: if not at all score 1… scale in between. Average for all attributes.
Wider Impacts	Has the intervention positively influenced cross cutting issues?	Use Likert scale, strongly agree that project has created wider impact 5: strongly disagree that it has not 1. Average for all impacts.

[13] Developed in 1932 by Rensis Likert to measure attitudes, the typical Likert scale is a 5 point ordinal scale used by respondents to rate the degree to which they agree or disagree with a statement

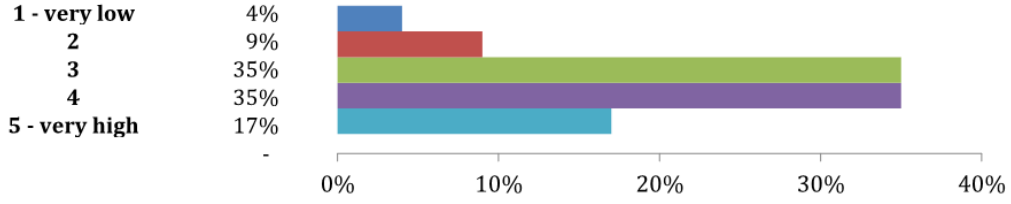
2.8.3. Evaluation Processes and Participation

In its formative years evaluation was seen as kind of independent audit carried out by shadowy figures working in secret, but significant development in the field of evaluation research shows that a more participatory approach is much more effective in engendering the self-improvement that project cycle management aims to inculcate. The concept arose through research on the utility and use of evaluation findings. In cases where the primary function of evaluation is formative, it was found particularly useful to involve various stakeholders/participants in the process of defining questions, developing methods, collecting data and drawing conclusions. Such an approach is now considered to be preferable because the process is meant to be a leaning one for the project owner and when there is a stronger sense of ownership of the intellectual outcome of the process, it is more likely that stakeholders will act on the recommendations (DEVCO, 2008).

2.8.4. Monitoring System in OIC Countries

The Kuwait Fund for Arab Economic Development, the OPEC Fund, The Saudi Fund for Development or the OIC who are key stakeholders in OIC countries seem not to evaluate projects after they are completed, at least no reference can be found in their internal manuals and guidelines. Similarly, it is hard to find any OIC country that pro-actively carried out ex-post evaluations unless they are borrowing from the ADB or from the AfDB. Evidence from the surveys supports that 87% of the surveyed OIC Member States believe improvement in the monitoring and evaluation system is needed, as shown in Figure 8. The surveyed academics also agreed with this as 50% of them are unsure whether the evaluation process in their countries was working well.

Figure 8: OIC Member States agreeing that improvement is needed



Only 38% of the surveyed Academics believed that plan implementation was efficient. This low confidence might be caused by the fact that most academics are more involved in the Planning than the Implementation phase.

2.8.5. Monitoring System Outside OIC Geography

Evaluation is mandatory for most developed countries and for IFIs, being considered both necessary for technical advancement and improvement and also for good governance by improving accountability and transparency. As regards specific non-OIC countries, those that are in the EU, associate to the EU or in receipt of EU Aid Funding will be familiar with EU Evaluation procedures.

A significant exercise was carried out over 12 months for the European Investment Bank (EIB) covering 11 countries to which reference is made (Horsch_Rasbash_AlAraby_Schniter, 2003). This evaluation covered the EIB's portfolio of completed transport projects in Central and Eastern Europe (11 countries) financed between 1990 and 1999. During this period, the Bank financed 58 projects for a total disbursed amount of some EUR 4.9 billion. Of this, approximately

65% went to roads, 27% to railways, 6% to air transport and 2% to ports. The distribution between countries reflected their size, population and economic importance, with most funding going to the Czech Republic, Poland and Romania. The work was carried out in two phases:

1. A desk review of 25 completed transport projects in the four transport sub-sectors: roads, railways, air transport and maritime transport, in 10 Central and Eastern European (CEE) countries. This was based on available internal documentation and interviews with members of operational staff;
2. A subsequent in-depth analysis phase, including field investigations, of 10 of the original 25 projects.

The main evaluation criteria and their definitions were in line with the standards of the Bank, the European Commission and other IFIs. The main evaluation criteria used are Relevance, Effectiveness (Efficacy), Efficiency, Sustainability, Institutional Development Impact, and the EIB's Performance. Individual projects were rated in four categories: "Good", "Satisfactory", "Unsatisfactory", and "Poor", in accordance with the Bank's evaluation procedures.

While most of the projects were successful, there were a number of measures which were recommended to increase the Bank's added value, improve project efficiency and sustainability, and maximize the contribution of projects to EU and national policy objectives.

The ADB also puts a lot of emphasis on ex-ante and ex-post evaluations based on relevance, effectiveness, efficiency, and sustainability. The ADB also uses the international criteria of Relevance, which refers to the adequacy of the design and the consistency of the project's impact and outcome with the government's and donor's development strategies at the time of approval. Effectiveness, which refers to the extent to which the project outcome as designed and approved, has been achieved. Efficiency which refers to how economically resources have been converted to results, typically expressed as the economic internal rate of return or cost-effectiveness indicators and sustainability that ADB states as referring to the likelihood that human, institutional, financial, and other resources are sufficient to maintain the project outcome over its economic life.

The ADB also applies impact evaluation which involves systematic identification of a given development activity's effects—positive or negative, intended or not—on individual households, institutions, and the environment. It helps to better understand the extent to which activities reach the poor and the magnitude of their effects on people's welfare. Tools for impact evaluations can be large-scale sample surveys in which project populations and control groups are compared before and after the intervention and possibly at several points during it. Evaluations can also be done through small-scale rapid assessment and participatory appraisals where estimates of impact are obtained from combining group interviews, key informants, case studies, and available secondary data. There are two basic approaches to impact evaluation: non-experimental and random experimental. The non-experimental approach uses statistical techniques to construct the counterfactual outcome. These techniques, though frequently used, are often subject to biased results that may lead to incorrect development impacts. Random experimental methods are common in the pharmaceutical and other industries but are new to the economic development field. In the medical field, random assignment to treatment and control groups (also called a "randomized control trial") is implemented depending on the

nature of the medical intervention, who the beneficiaries are, or what the benefits are. Spatial analysis is also a useful tool that compares the changes in the zone of influence of a transport project from before to after the project is completed. A range of parameters may be chosen for the evaluation pertaining to land use such as property development, agricultural change and also topics like deforestation and land degradation and this has been carried out in Kenya and is also applied in Uganda. Ultimately, wider impact evaluation of transport and other public sector investment projects will be guided by the Sustainable Development Goals.

3. Case Studies Review

This chapter reviews the NTI planning in six specific countries that are selected as case studies. Each major OIC region (Asia Africa, and the Middle East) is represented by two case studies; one case study is developed based on a study visit and the other one is based on a desk research. The purpose of the case study is to review the NTI planning process in each case study country. The structure of the case study follows the overall structure of the research. Questionnaire responses will be slotted into the analysis as it proceeds.

Table 5: Selected countries as case studies

OIC region	Country	Research Methodology
Asia	Kazakhstan	Study visit
	Malaysia	Desk research
Africa	Uganda	Study visit
	Senegal	Desk research
Middle East	Qatar	Study visit
	Oman	Desk research

3.1. Kazakhstan

With a population of 17.8 million people in 2016[14], Kazakhstan is the second most populous country in Central Asia (after Uzbekistan) and has Central Asia's largest area and economy. Given the size of its territory (2.7 million km^2), the country's population density of 7 people/km2 is the lowest in the region.

Located at the centre of transcontinental routes between Europe and China, Kazakhstan is an important transit country for cargos travelling between the two continents and an important stronghold of one of the most ambitious initiatives in the world: 'One Belt, One Road' initiative. Currently there are 5 railway and 6 road corridors that passing through the Kazakhstan's territory.

3.1.1. Political and Legislation Factors

The Kazakhstan's transport infrastructure development strategy is driven not only by the potential and challenge faced by the country due to its position as a transit and landlocked country, but also by disparities in social and economic welfare among the various regions. Transport planning is expected to play a prominent role to provide an enabling environment for social and economic development by creating efficient infrastructure and coherent policy and institutional measures.

These views are shared by Nurly Zhol (in English: Bright Path), the State Program of Infrastructure Development for 2015-2019 (hereinafter referred to Program) which is developed to implement the Address of the President to the citizens of November 11, 2014 "Nurly Zhol – the path to the future" and to complement the Kazakhstan 2050 Strategy. It is a medium-term state program with a purpose to create a single economic market of Kazakhstan through:

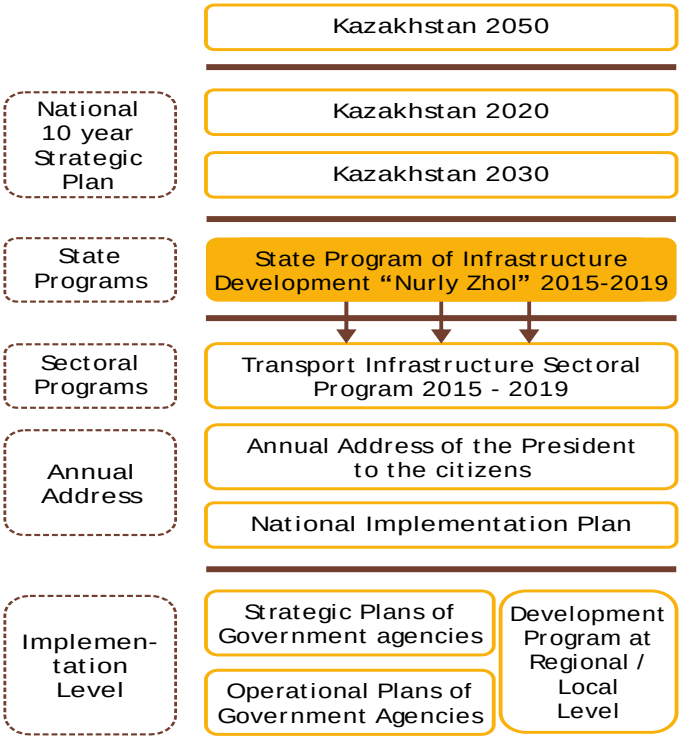
[14] World Bank Open Data

1. The establishment of the cities of Almaty, Astana, Aktobe, Shymkent and Ust-Kamenogorsk as national and international hubs equipped with modern infrastructure;
2. The integration of the transport infrastructure of the country into the international transport system.

The Program targets seven areas of infrastructure investment with Transport and Logistics as the first area. The Program provides the framework in which decision-making on transport investments is made, including those of the international financial organizations. The government places high priority on realizing all the projects in the Nurly Zhol before 2019.

The diagram below shows the position of the State Program (Nurly Zhol) in relation to other planning and programs in Kazakhstan.

Figure 9: The State Program (Nurly Zhol) in relation to other plans and programs



The Strategy Kazakhstan 2050 itself provides the implementation of seven long-term priorities. The first one is "The economic policy of the new course – all round economic pragmatism based on the principles of profitability, return on investment and competitiveness". Infrastructure development falls under this priority with a focus on developing Kazakhstan's transit potential towards the goal of promoting exports to world markets. Building ports and developing transport and logistic hubs at nodal transit points are mentioned in this strategy document.

In conclusion, Kazakhstan does not have a National Transport Policy nor Master Plan that normally provides the blueprint for the development of the sector over at least a 10-year period. As a state program, Nurly Zhol has an intersectoral and interdepartmental character and addresses the needs of infrastructure development in various sectors. The Transport

Infrastructure Sectoral Program 2015 – 2019, is a document that specifically addresses the NTI planning in Kazakhstan (see Figure 9). Unfortunately, this is not available in the public domain.

3.1.2. Institutional and Organizational Factors

In terms of institutional capacity, the ministries related to transport infrastructure planning in Kazakhstan have sufficient qualified and skilled transport professionals both in planning and monitoring (Ministry for Investment and Development, 2018). However this does not say that no support is needed from other parties like the development banks. The ADB, for example, provides technical assistance from time to time also in their capacity as the lead international agency under the CAREC framework. With ADB assistance, the government also made progress on institutional development and policy reforms. The role of the related ministries and other institutions in NTI planning in Kazakhstan is outlined in Figure 12, where it can be seen that the the Ministry of Investment and Development (MID)[15] is not the only government administration that plans transport. Ministry of National Economy (that developed Nurly Zhol) clearly considers transport in its planning, and local public authorities monitor the target achievement of development of regional roads and public transport infrastructure.

The national (hereafter called republican) road sector in Kazakhstan falls under the responsibility of the MID through its Committee of Roads (COR), while the railway sector falls under the responsibility of the national railway company Kazakhstan Temir Zholy.

The government institutions at the regional level might be less capable than the national government and need technical backup. This institutional gap needs to be addressed as it can affect the development of rural and provincial road network.

The government institutions at the national and regional levels work together through a working group, which also involves private sectors and NGOs in reaching an agreement for each transport infrastructure project that is planned to be realized. This process is as a matter of fact applied to all development sectors in Kazakhstan.

Public-Private Partnership

The involvement of private sector in the development programs of Kazakhstan is being done in the form of PPP. It is regulated by the Law of the Republic of Kazakhstan "On Concessions" passed in 2006 that defines the legal conditions of the concession, the types of state support for the concessionaire and regulates the social relations arising from concluding, execution and termination of contracts with both foreign and local investors. Moreover, Kazakhstan adopted the Program for Public-private Partnership for 2011-2015 in order to provide the institutional framework for investment in PPP projects.

Kazakhstan Public-Private Partnership Centre, with the Government of Kazakhstan as the sole shareholder, is operating on behalf of the Ministry of National Economy to provide an expert advice to the topical issues of PPP. It aims at creating the conditions for successful partnership

[15] Kazakhstan does not have a Ministry of Transport, but a Ministry foInvestment and Development instead

between government and private sector, development and consolidation of their capacity to implement PPP projects and increasing private investment in the national economy.

One of the programs described in the Program is to increase the interest of the private sector by finalizing the layout of the prospective service facilities along the national and international roads and investigating the possibility of simplifying procedures for issuing permits. Within the framework of the road development, the government also considers the possibility of introducing toll-road payment for 7,000 km of national roads until 2020.

3.1.3. Technical Factors

Nurly Zhol is primarily a list of approved infrastructure projects. Therefore, it is not a visionary document that sets a framework for the sector to develop.

As the largest landlocked country in the world, developing transport infrastructure is crucially important for Kazakhstan. All NTI related plans and program in Kazakhstan stress the importance of the development and further diversification of transport corridors due to the need to build the transit traffic, where the containerisation transport plays an important role. However, each subsector in the planning documents seems to be considered on its own merits with little consideration given to the integration among transport modes.

Here below is the focus for each transport sector as suggested by the Nurly Zhol.

Roads

To date, the length of the highways of the Republic of Kazakhstan is 128,300 km, in which 23,500 km are the republican roads. The republican road network includes six international corridors with a total length of approximately 8,250 km. These serve mainly as international transit routes between China, Kyrgyzstan, Uzbekistan, Turkmenistan and Russia, and onwards to Europe. They form part of international agreements under Asian Highways, Transport Corridor Europe-Caucasus-Asia (TRACECA), and Central Asia Regional Economic Cooperation (CAREC), amongst others.

Figure 10 shows the main republican roads in Kazakhstan, which includes the international corridors and the Nurly Zhol focus roads. According to the ADB (2016), 92% of the republican roads are paved.

Figure 10: The main republican roads in Kazakhstan

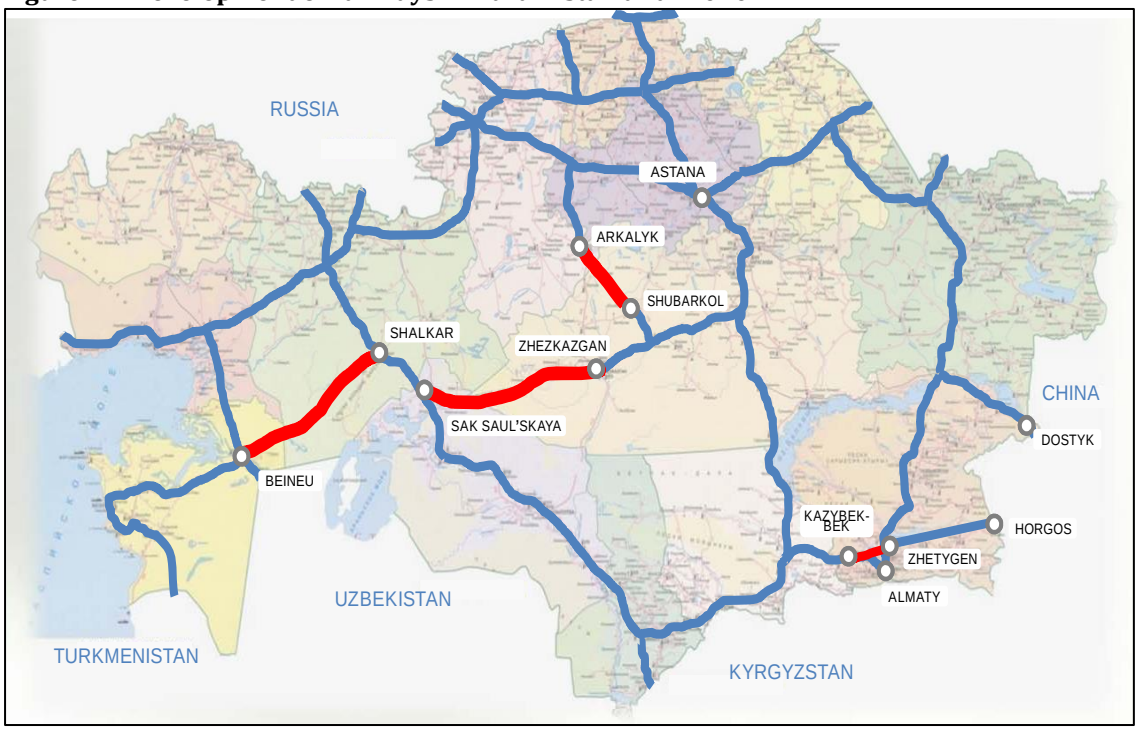
Source: ADB (2016)

Railways

The Kazakhstan rail network is shown in the following figure. The operational length of railways of Kazakhstan is 14,900 km, including 4,900 km double track lines and 4,216 kilometres electrified lines. About 70% of the railways do not have electrified lines. Currently there are five railway corridors in Kazakhstan that are part of international railway corridors.

Nurly Zhol suggests Astana to act as a centre that links all macro regions. Through the main road and rail links, as well as through airlines, Astana should link all the macro regions into a single transport hub. The development of the railway sector is focused on developing a modern network of transport and logistic centres, both inside the country and abroad, as well as continue to work on the elimination of bottlenecks and increase the power of the railway infrastructure.

Figure 11: Development of railways in Kazakhstan until 2020



Source: TRACECA

Water Transport

For water transport, Nurly Zhol focuses on developing a multifunctional ferry transportation system to increase the turnover of the neighbouring Caspian Littoral States (Iran, Azerbaijan) to ensure the goods transport necessary for the western region of the country.

Civil Aviation

Nurly Zhol sets a target of serving 16.2 million passengers at the Kazakh airports in 2019, which is an increase of 34% compared to 2010. In terms of freight transport, Nurly Zhol proposes the standard of paperless document circulation for air freight (e-freight), which allows simplifying procedures and speeding up the processing of air cargo.

Public Transport

Public transport in Kazakhstan is dominated by buses. As such, the public transport development focus in Nurly Zhol is to increase the capacity of bus terminals and stations in the city hubs such as Astana, Almaty and Aktobe. Nurly Zhol sets a target that 90% of the bus terminals and stations in 2019 correspond to the established standards.

It is clear that the international corridors that are passing the Kazakhstan's territory play an important role in forming the Nurly Zhol. Projects and investments suggested in this planning document are meant to increase the transit and export capacity of Kazakhstan by strengthening its position in the international transport corridors.

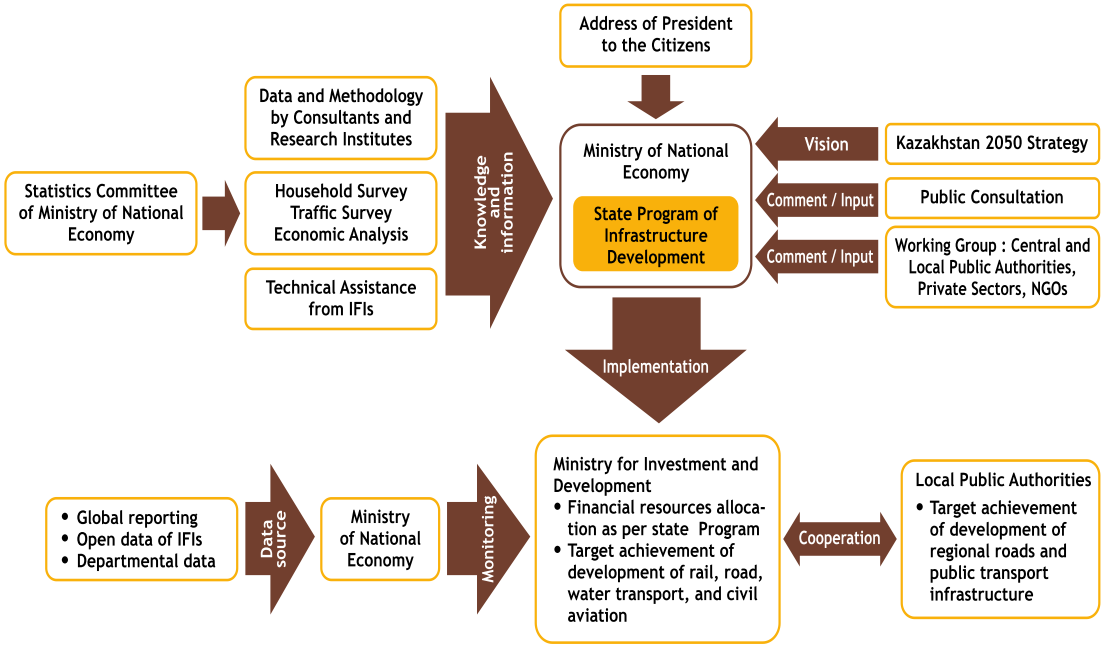
The Environmental Impact Assessment (EIA) for every transport project is mandatory to apply. According to the Ministry for Investment and Development (2018), no project can be implemented before the EIA is approved by the Environmental Protection Agency.

3.1.4. Procedural Factors and Financing

As mentioned earlier, Nurly Zhol as the State Program of Infrastructure Development is developed to implement the Address of the President to the citizens, showing a top-down approach of the infrastructure planning process in Kazakhstan. The Program is developed by the Ministry of National Economy in close cooperation with the Ministry for Investment and Development and knowledge support from consultants, research institutes, surveys, and technical assistance from IFIs.

The development process of Nurly Zhol is summarized in the following diagram.

Figure 12: Development process of the State Program (Nurly Zhol)



Stakeholders' participation

Public consultations are an inevitable part of the planning process in Kazakhstan and are accessible via the respective ministry's website. However they are not sufficiently user-centered nor pro-active (OECD, 2014). For instance, online consultation with the public lacks an explicit call for comments, clear timelines, consultation period and guidance, as well as a single online consultation platform listing all draft regulations (OECD, 2014).

The involvement of private sectors in NTI planning in Kazakhstan is high, not only in the implementation phase (see section Development Funding here below) but already in the planning phase. This is especially the case for national or state-owned companies related to infrastructure development like Kazakhstan Temir Zholy (the national railway company). This institution stipulated that they have significant contribution in forming NTI planning policies in Kazakhstan16. While the involvement of private sectors is high, that of academia is another story. The involvement of academia in NTI planning process in Kazakhstan is very low if not zero[17].

Development funding

The activities and investment projects of the Program are financed by the National Fund of the Republic of Kazakhstan, republican and local budgets, international financial institutions and organizations and own funds of the national companies and development institutions as well as private investment through PPP with the overall indicative amount of USD 23.2 billion. The following is the proportion of each of these funding sources:

Table 6: Division of funding sources of the investment projects of the Program

Source of funding	Percentage
The republican budget	5.6%
National Fund	30.7%
The local budget	3.9%
The international financial institutions and organizations	51.5%
Own funds national companies and the development institutions	7.8%
Private investments and PPP	0.5%
Total	**100%**

Source: Nurly Zhol (2014)

The largest share of the funding is from the IFIs. Those who are active in the transport sector in Kazakhstan include the World Bank, the Asian Development Bank (ADB) and the European Bank for Reconstruction and Development (EBRD). These IFIs are mostly financing the development of the CAREC corridors passing the territory of Kazakhstan.

The second largest funding is from the National Fund, while private investments and PPP still have a very small contribution despite the political will to enhance private sector involvement (see section 3.1.2 about the concession model in Kazakhstan).

Currently the only road user charges that can be considered to contribute to the financing of the republican road network include transit fees for trucks, roadside advertising on republican roads and toll revenue[1]. Fines for overloading on republican roads are also being introduced, and should be included as republican road user charges. These road user charges currently

[16] Based on a questionnaire survey conducted by Fimotions in 2018.
[17] Based on an interview with University of Nazarbayev in 2018.

cover 16% of all repair and maintenance expenditure for republican roads (including toll roads). With the planned increase in toll revenue, it is expected that this percentage will increase to nearly 60% by 2020[18].

3.1.5. Content of NTI Plan

As discussed in section 3.1.1, the Program targets seven areas of infrastructure investment, one of which is Transport and Logistics. The table here below indicates the main chapters of the Program and the key features of each chapter.

Table 7: Content of the Program (only transport infrastructure related chapters are presented)

Chapter	Key features
Analysis of the Current Situation	• population growth and urbanization level requires the accelerated development of urban infrastructure • the growth of the economy and economic ties, high transport and administrative costs of the business, as well as new emerging regional markets predetermine increase infrastructure capacity of the country and the provision of a new level of transport services • the growing turnover of goods in the direction of the Asia-Europe and transit potential of the country determine the further integration of Kazakhstan in international transport and communication flows
Goals, objectives, target indicators and performance	• The goal of the Program is the formation of a single economic market by integration of the regions of the country on the basis of building effective infrastructure in the hub principle, the integration of the transport infrastructure into the international transport system, the implementation of the transit potential for long-term economic growth in Kazakhstan. • Target indicators/KPIs including yearly target (see Table 8).
The basic directions, ways of achievement of objectives and appropriate measures	• The development of transport and logistics infrastructure - Development of roads - Development of the railway sector and logistics - Development of road transport - Development of water transport - Development of civil aviation - Reduction of administrative barriers to transport • Institutional development
The necessary resources	• Sources of funding and the necessary amounts

[18] Kazakhstan: Managing for Development Results in the Transport Sector of Kazakhstan, Final Report, Technical Assistance Consultant's Report, ABD, April 2016.

As discussed in section 3.1.1, the Nurly Zhol pays particular attention to the transit potential of Kazakhstan. As such the multimodal transport strategies and integration of the national transport infrastructure with the neighbour countries and transnational transport networks such as CAREC and TRACECA, are incorporated in the Program. The Program also came up with a list of projects, some of them are listed below. It is obvious that non-motorised transport is not covered in the transport infrastructure planning in Kazakhstan.

Road projects

1) Construction and reconstruction of Central-South (Astana – Karaganda – Balkhash – Kurty – Kapshagai - Almaty)
2) Construction and reconstruction of Central-East (Astana – Pavlodar – Kalbatau – Ust-Kamenogorsk)
3) Construction and reconstruction of Central-West
4) West Europe – West China
5) Astana - Almaty.
6) Astana – Ust-Kamenogorsk
7) Astana – Aktobe – Atyrau - Aktau

Railway projects

1) Construction of the second lines on sites Almaty – Shu

Waterway projects

1) Establishment of the security and navigation control systems at seaports, up to the level of modern requirements of the International maritime Organization (IMO) for the movement of ships

Aviation projects

Implementing infrastructure projects to increase the capacity of airports and to make the airports in line with international standards of International Civil Aviation Organization (ICAO).

The Program incorporated clear quantitative target indicators for every year of the program period as indicated here below.

Table 8: Yearly target indicators of the program

Target Indicators	Source of information	Measurement unit	Responsible body	2014 (Baseline)	2015	2016	2017	2018	2019
Projected growth of GDP	Ministry of National Economy (MNE)	% with respect to the previous year	MNE, MLSP[19], MID[20], MOA[21], MOE[22], MES[23], JSC[24] "NWF[25] Samruk-Kazyna", JSC "NUH Baiterek"	104.1	101.5	100.5	101.7	124.9	102.5
Increased the WEF rating on the quality of basic infrastructure	Global Competitiveness Report of WEF	Rank in the world		62	61	60	59	58	57
Increase in the volume of transit goods through the country territory including rail and road transport modes	Departmental Data	Million Tons				16.3	16.9	17.5	18.1
Rail Transport	Departmental Data	Million Tons				15	15.5	16	16.5
Road transport	Departmental Data	Million Tons				1.3	1.4	1.5	1.6
Water transport	Departmental Data	Million Tons				0.001	0.002	0.003	0.004

The plan also provides a breakdown of these targets into detailed yearly measurable results including the responsible executive bodies as shown by the example here below:

[19] Ministry of Labor and Social Protection
[20] Ministry for Investment and Development
[21] Ministry of Agriculture
[22] Ministry of Energy
[23] Ministry of Education and Science
[24] Joint Stock Company
[25] National Welfare Fund

Table 9: Breakdown of target indicators into measurement unit and responsible bodies (some examples)

Target indicators	Source of information	Measurement unit	Responsible body	2014 (Baseline)	2015	2016	2017	2018	2019
The average travel time between cities-hubs in the same direction as a result of road projects	Departmental Data	Hours	MNP, JSC Kazavtozhol[26]	115	115	115	110	105	90
The proportion of paid self-sufficient national roads	Departmental Data	%	MNP, JSC Kazavtozhol			1	4	25	27
Increase the speed of transit trains from China to Europe through the territory of the Republic of Kazakhstan	JSC "Kazavtozhol"	Km/day	MNP		930	950	980	1010	1050

Most of these indicators are output indicators that define the direct results to be achieved. The responsible bodies have the autonomy to organize operations to achieve the agreed targets.

3.1.6. Data Collection Method

National statistics and data collection in Kazakhstan is the responsibility of the Agency of the Republic of Kazakhstan on Statistics (ARKS), which is part of the Ministry of National Economy. The agency is responsible to provide the Kazakh government, business and individuals with reliable and accurate statistics, even though it is unclear whether this is the case for the transport sector related data. There is no information available on how the data is collected, most likely by conducting household surveys. It is very likely that the transport data used in NTI planning in Kazakhstan is not adequate nor being collected efficiently and analysed effectively (Kazakhstan Temir Zholy, 2018).

There is also no information on which transport model is applied to estimate ridership forecasts based on which the transport plans of Kazakhstan are formulated. The Ministry for Investment and Development (2018) did confirm that a comprehensive land use and transport data collection takes place periodically.

3.1.7. Monitoring System

The implementation of the Program is monitored annually by the Ministry of National Economy on the basis of the reports of other relevant governmental agencies, in which the following points are of importance:

[26] JSC Kazavthozhol is the national road authority primarily focused on developing, improving and operating the republican road traffic network.

- Stage of accomplishment of the quantitative indicators
- In case some of the indicators are not achieved, what are the causes and which measures can be taken to catch up?
- Analysis of spent funding

Furthermore, an assessment of the state program is carried out at the end of every three years of its implementation (intermediate assessment) and at the end of the planning period (final assessment). All agencies involved in the implementation of the program prepare their own monitoring report, and the complete report is prepared by the central government body having prime responsibility for the program, which in this case is the Ministry of National Economy.

Figure 13: Monitoring process of infrastructure projects implementation

Based on the results of monitoring and evaluation, the State audits the effectivess of the implementation of the state program. This is carried out by the Administration of the President of the Republic of Kazakhstan.

With support from the World Bank, the Ministry of National Economy has introduced results-based formats for strategic plans and for annual budget request, the so-called Managing for Development Results (MfDR). This tool sets out clear expected results for program activities, establishes performance indicators to monitor and assess progress towards achieving the expected results and enhances accountability of the organization as a whole. MfDR seeks to overcome what is commonly called the “activity trap”, i.e. getting so involved in the details of day-to-day activities that the ultimate objectives are being forgotten (ADB, 2016).

3.1.8. Conclusions

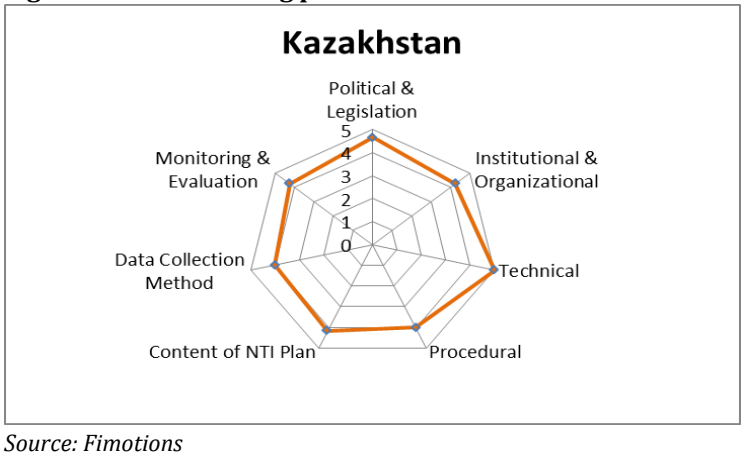
The NTI planning in Kazakhstan is very much driven by its landlocked position, as such its goal to increase the transit traffic passing its territory. Based on the analysis above, the status quo of the NTI planning in Kazakhstan can be concluded as follows:

- **Political and legislation**: A long-term national transport master plan does not exist in Kazakhstan. Transport infrastructure development is included in the State Program that covers all types of infrastructure, and based on this a 5-year transport infrastructure sectoral program is developed.
- **Institutional and organizational**: There is an institutional gap between the national and regional governments that needs to be addressed. Concession is the basic model for PPP in Kazakhstan with good legislative and regulatory frameworks although these are not successful yet in increasing the level of involvement of the private sectors in terms of project funding.

- **Technical**: The international corridors passing the Kazakhstan's territory play an important role in forming the State Program. Suggested projects and investments are meant to increase the transit and export capacity of Kazakhstan by strengthening its position in the international transport corridors. As such the State Program focuses more on road and rail infrastructure with no attention to non-motorised transport.
- **Procedural and financing**: The approach of the infrastructure planning process is top-down with the Presidential Decree sets the strategic direction of the infrastructure development of the country. The largest share of the transport infrastructure funding is from the IFIs and National Fund. Road user charges are in place in Kazakhstan, covering 16% of all repair and maintenance expenditure for republican roads.
- **Content of NTI Plan**: The State Program targets seven areas of infrastructure investment, one of which is Transport and Logistics. It incorporated clear quantitative target indicators for every year of the program period and provides a breakdown of these targets into detailed yearly measurable results including the responsible executive bodies. The indicators are however output-based, not outcome-based.
- **Data collection**: Transport related data is not exclusively collected in Kazakhstan, but a part of a national statistics and data collection, which is most likely being collected by conducting household surveys. There is also no information on which transport model is applied to estimate ridership forecasts based on which the transport plans of Kazakhstan are formulated.
- **Monitoring and evaluation**: The monitoring and evaluation system is mature with a standard process that needs to be followed by all government agencies and coordinated by the Ministry of National Economy.

Based on the questionnaire result, the NTI planning practice in Kazakhstan is quite mature although Kazakhstan does not have a national transport master plan, see Figure 14. It should be noted that this radar chart and the radar charts in the other case studies are developed based on the questionnaires filled out by OIC Member States. As such, they are representing the views of the Member States on NTI planning practice in their particular countries. The methodology used to develop the radar charts is described in Appendix 3.

Figure 14: NTI Planning practice in Kazakhstan



Source: Fimotions

3.1.9. Policy Recommendations

Based on these findings, the following policy recommendations are proposed:

- Policy driven planning that devolves, deregulates and promotes subsidiarity would be good for this large territory.
- Climate change resilience will need to be factored into the selection and design of projects
- Sustainability is an issue that needs to be solved as most of the transport services are subsidised.
- Improving international connectivity and the reduction of non-tariff barriers with neighbouring countries would stimulate trade and economic development.
- Improving the transparency of the public consultation process by providing more information such as guidance, a clear timeline, and all draft regulations to all stakeholders.
- Increasing the involvement of private sector by enhancing the market environment for private sector participation.
- Setting up an independent (external) objective monitoring in order to evaluate whether the implementation of the plan is effective on achieving the expected results. Furthermore, the focus of the monitoring should also include the outcomes instead of only on the achieved target and financial resources allocation.

3.2. Malaysia

Malaysia is a federation of 13 states and 1 federal territory. Its population in 2016 was 31.2 million. Malaysia has been on the fast track of development and progress since the independence 61 years ago and is shifting from an emerging to a developed market. Its GDP is increased from USD 202 billion in 2009 to USD 296 billion in 2016 (source: The World Bank) and this has placed Malaysia as the world's 24th largest trading nation.

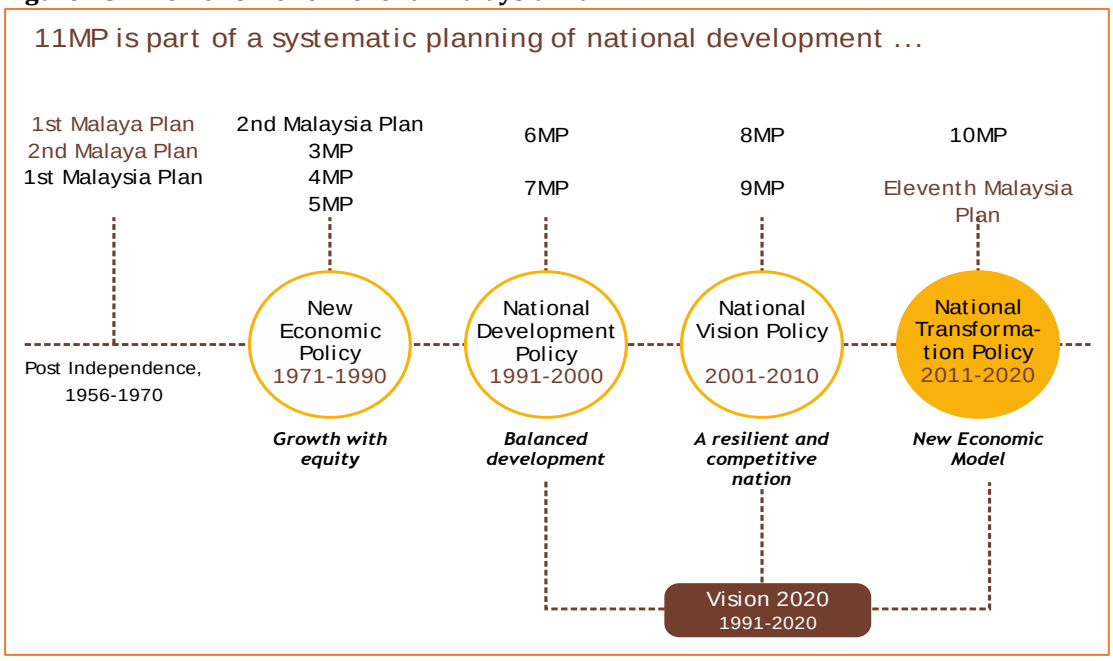
Malaysia holds the fifth place globally in the Global Infrastructure Investment Index 2016. A well developed and maintained infrastructure system is one of the driving forces behind this evolution. Malaysia has one of the highest quality of infrastructure amongst the ASEAN countries.

3.2.1. Political and Legislation Factors

Similar to Kazakhstan, Malaysia also does not have a National Transport Policy nor Master Plan. Transport infrastructure related programs are formulated in the 2016-2020 Eleventh Malaysia Plan ("11MP"), called "Anchoring growth on people". It is Malaysia's five-year economic development plan towards realizing the goal of Vision 2020 that envisions Malaysia as a fully developed country along all dimensions - economically, politically, socially, spiritually, psychologically, and culturally - by the year 2020. This plan contains several key physical infrastructure initiatives and is followed by master plans or implementation plans which are prepared by respective ministries and agencies to guide implementation on the ground.

The 11MP is the closing chapter of the lengthy 2020 Vision Plan launched in the year 1991, as shown in the following figure. The Eleventh Plan is of importance as it will be the last five-year plan before Vision 2020 is achieved.

Figure 15: The 2016-2020 Eleventh Malaysia Plan



Source: Economic Planning Unit, Prime Minister's Department of Malaysia

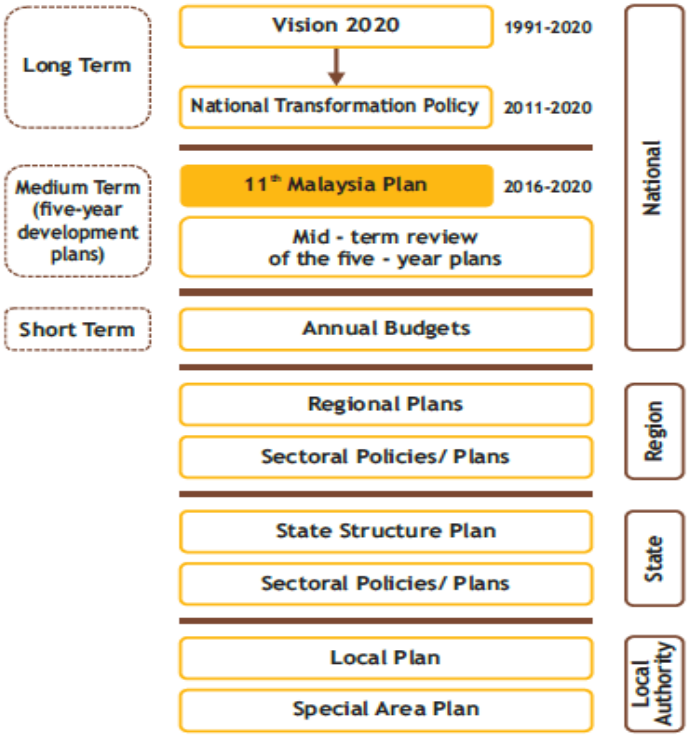
In the **Eleventh Malaysia Plan**, the infrastructure development falls under its fifth (out of six) strategic thrust, which is "strengthening infrastructure to support economic expansion". This thrust aims at ensuring the access of the people to essential amenities and services such as transport and communications. It believes that better integration of different transport modes will create seamless movement for people and goods. An efficient infrastructure will lower the cost of doing business, which in turn improves national competitiveness and productivity. The focus area of the transport sector is:

- building an integrated need-based transport system
- unleashing growth of logistics and enhancing trade facilitation

In 2010, the **National Transformation Policy** (NTP) was launched to implement the New Economic Model (NEM). NTP is a set of high-level strategic priorities of the government broken down into concrete interventions.

The diagram below shows the position of the 11MP in relation to the regional, state, and local policies and plans.

Figure 16: 11th Malaysia Plan in relation to other plans and programs



Source: adapted from various sources

The absence of a national transport policy

As is shown by Figure 16, as of now there is no national transport policy in Malaysia that can link the various plans and programs from the national down to the local government, and develop them as an integrated system. The absence of an overarching policy direction has resulted in that the sectoral transport plans do not contribute towards a common goal. Furthermore, each transport mode that comes under different ministries and departments developing and expanding on its own without any regard to the different roles of the others (Ministry of Works Malaysia, 2009).

The lack of a national transport policy might explain the inexistence of a national transport master plan, even though Malaysia does have the following transport related master plans:

1. National Land Public Transport Master Plan (NLPTMP) 2012-2022
   The NLPTMP was published in 2012 and was developed based on the key strategies for land transport outlined in the 10MP (2011 – 2015). NLPTMP is a master plan, which only focuses on land public transport, hence it contains greater details compared to the Malaysia Plans. The NLPTMP is a principal policy tool that provides strategic direction and guidance in achieving the desired outcome for land public transport. It is a 20-year plan that acknowledges the importance of raising the modal share of public transportation, improving reliability and journey times, enhancing comfort and convenience, as well as enhance the first and last mile accessibility, at both the national and regional levels.

2. Logistics And Trade Facilitation Master Plan of Malaysia 2015-2020
   This master plan provides the strategic framework to improve the efficiency of transport and trade facilitation and elevate Malaysia to become "The Preferred Logistics Gateway to Asia"27. The Master Plan came up with five strategic shifts (among others, enhancing trade facilitation mechanisms and developing infrastructure and freight demand) and 21 action plans to improve overall productivity and to better connect industries with their markets, both locally and internationally. Similar to the 11MP, this master plan is also developed based on an outcome-based approach.

At the time of writing this report, a public engagement on the Draft National Transport Policy (NTP) 2018-2030 is being undertaken by the Ministry of Transport. The NTP will provide the strategic direction for a sustainable transport sector by:

- providing strategic direction to ministries/agencies to plan and develop the transport sector
- streamlining initiatives and programs towards common objective and goals
- ensuring efficient and effective use of resources
- ensuring that sectoral plans complement each other.

3.2.2. Institutional and Organizational Factors

The development of the 11MP was coordinated by the Malaysian Economic Planning Unit (EPU) under the Prime Minister's Department. EPU is the principal government agency responsible for the preparation of development plans for the nation. The National Development Planning Committee is responsible for the formulation, implementation, progress evaluation and revision of development plans. Other federal ministries and agencies which are involved in the Malaysia national development planning, among others, are Malaysian Administrative Modernisation and Management Planning Unit (MAMPU), Ministry of Finance, Public Works Department, and Ministry of Transport.

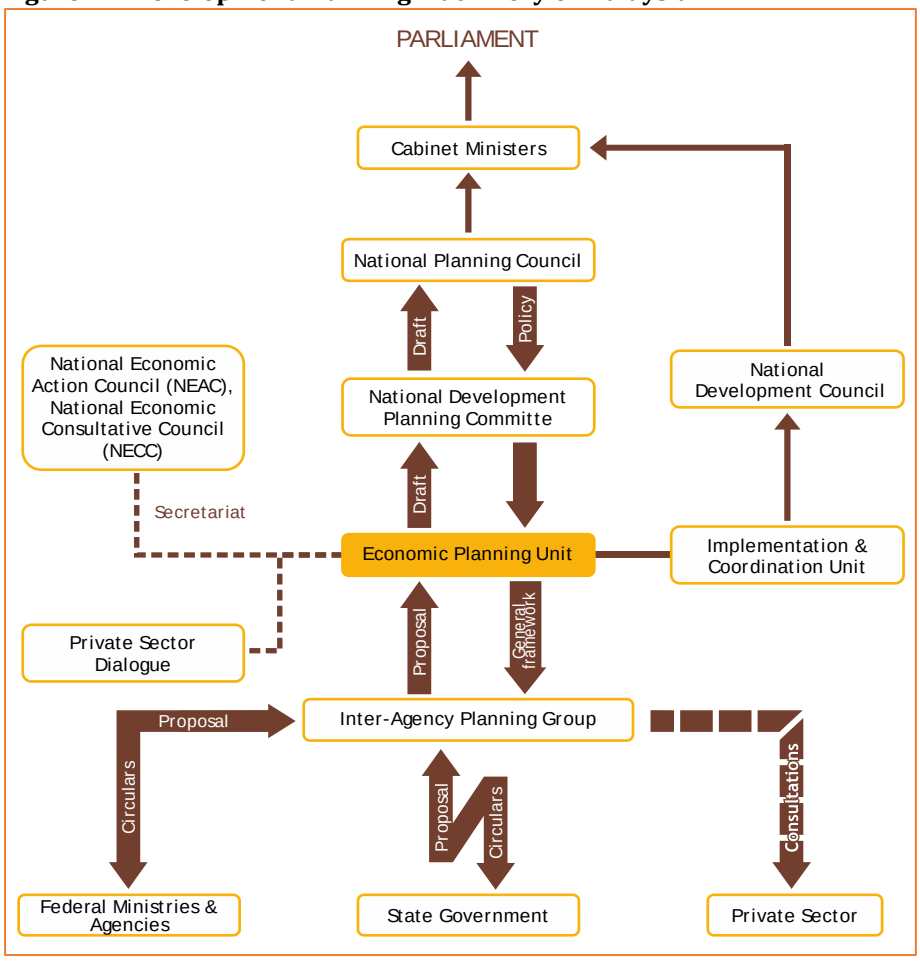
According to the EPU (2018), during the preparation of 11MP, a guideline was published and this document is communicated and shared with the respective ministries and agencies. The guideline contains three main components:

1. Macro economic prospects
2. Details the preparation and implementation of 11MP
3. Details the steps to be undertaken by ministries and agencies for developing programs and projects to achieve the outcomes of 11MP

The following figure shows the development planning machinery of Malaysia including the relationship between various stakeholders.

[27] Available from http://www.mot.gov.my/en/logistic/the-logistics-and-trade-facilitation-masterplan

Figure 17: Development Planning Machinery of Malaysia



Source: Economic Planning Unit, Prime Minister's Department of Malaysia

Recently the coordination of transport master plans of all 13 states in Malaysia has been commissioned to the Land Public Transport Commission (SPAD) to ensure comprehensive and holistic land transport development across Malaysia. The purpose was to reduce redundancy and wastage of resources. SPAD is one of the federal agencies and has been given wide powers in three key areas: planning, regulatory, and enforcement. At the time of writing this report, the SPAD is still developing a national land transport master plan (which is initially planned to be published in the first quarter of 2018).

A state transport master plan (in Figure 16 is shown as a sectoral plan at the state level) is a list of transport infrastructure projects with the aim of improving the state's transport system. Penang Transport Master Plan 2013-2030 for instance, proposes the following projects:

Sector	Project
Public transport	1. Bayan Lepas LRT 2. Ayer Itam Monorail 3. Tanjung Tokong Monorail 4. Raja Uda – Sg Nyiur – Buit Mertajam – Permatang Tinggi Monorail 5. Tram
Highways	1. Pan Island Link 1 2. Pan Island Link 2 & 2A
Roads	1. North Coast Pair Road
Interchange (IC)	1. Butterworth – Kulim Expresswa 2. Juru IC
Missing Links and Road Upgrading	1. Pematang Pasir – Perda 2. Bukit Minyak
BRT	1. Permatang Tinggi – Batu Kawan line
Penang Undersea Tunnel	1. Phase 1 2. Phase 2 3. Phase 3

The state transport master plans in Malaysia seem to be driven by the respective regional transport master plan (see Figure 16) rather than the national plan, which in this case is the 11MP. This is resulted by the fact that the regional transport master plan is the highest transport sector plan, while the 11MP is a national development plan, not a national transport master plan.

3.2.3. Technical Factors

Like Nurly Zhol of Kazakhstan, 11 MP also has a 5-year planning horizon. As such, it is primarily a list of approved infrastructure projects, not a visionary document that sets a framework for the sector to develop. The (long term) vision of the NTI planning of Malaysia is a part of Vision 2020.

The transport infrastructure related initiatives are more prominent in the 10MP than in the 11MP. Among the initiatives are the developments of multimodal transport work, rail, maritime and airport infrastructure.

Outcome-based approach

Malaysia is probably one of a few countries that implement an outcome-based approach for its NTI plans. In the 11MP, the transport related outcome is “Improving road safety to reduce accidents”, which is broken down into road fatalities index per 10,000 registered vehicles, as an output. Furthermore, the NTI plans of Malaysia are developed based on a building block approach in which the plan will serve as the foundation. This will be followed by the development of analytical tools and guidelines for detailed implementation plans at the ground level.

National Land Transport Multi-modal Model

A macro-level national land transport multi-modal model is developed with an integrated and coordinated approach to guide the assessment of future demand based on trends in economic and demographic indicators. This model will facilitate the demand assessment process. This will provide important data to federal agencies, project developers and local authorities at the planning stage (SPAD, 2013). A multi-modal transport system is clearly acknowledged by the Malaysian government in its NTI planning as a key to liveable city development28.

Sustainability and resilience

Sustainability is certainly being an important part of the NTI plan in Malaysia. The government has been putting efforts in ensuring that the energy consumption of the transport sector be at sustainable and efficient level. The importance of sustainable transport is also very prominent in the upcoming National Transport Policy 2018-2030 (see section 3.2.1). This is not surprising considering that Malaysia is a signatory to the UN-led Sustainable Development Goals.

As discussed in section 2.4, the integration of land use and transport planning is crucial for more resilient and sustainable planning outcomes. In Malaysia, this integration is deemed very high29. Land Use Plan is one of the six subsidiary plans of the NLPTMP. It identifies mechanism to influence land use policies and planning process to favour land public transport provision and performance. It also outlines available policy levers that allow land public transport to drive land development. Rather than reacting to preestablished constraints, land public transport can thus play a direct role in land use.

3.2.4. Procedural Factors and Financing

According to EPU[30], prior to the preparation of 11MP, multiple studies are undertaken to develop the strategic programs and projects. This is taken in the form of feasibility studies, blueprints, master plans, surveys and data profiling etc. These studies provide strong evidenced based foundation that helps the development of programs and projects incorporated in the 11MP. In addition, the strategic programs outlined in the 11MP have also been thoroughly discussed with the respective ministries and agencies though established platforms such as Inter-agency Planning Groups and Technical Working Groups. Stakeholders' consultation and buy-in is a critical process and given a lot of attention to ensure that strategic programs in the 11MP can be translated into actual implementation on the ground.

Public Consultation

Public consultation in NTI decision-making process in Malaysia is enforced by a Guideline on Public Consultation Procedures, which establishes guiding principles and requirements for carrying out an adequate public consultation exercise. The consultation involves various stakeholders such as experts, regulators, business community, NGOs, interest groups and

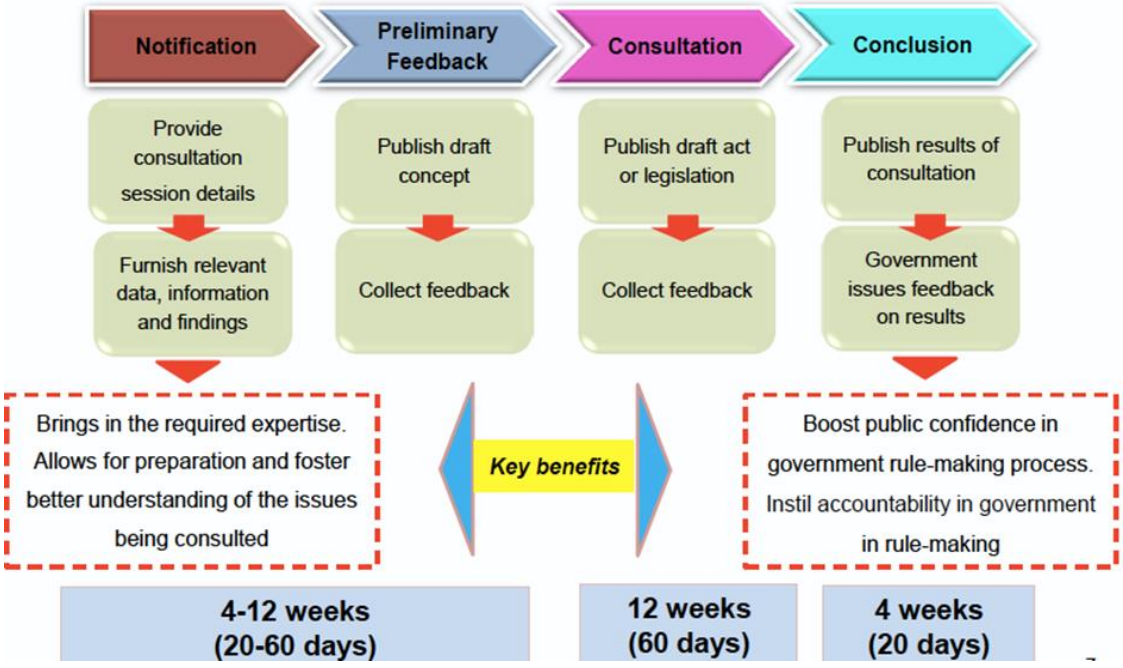
[28] *Multi-modal transport system key to livable city development*, ITS International.
[29] Based on information from the Ministry of Transport Malaysia in 2018.
[30] Interviewed by Fimotions in 2018.

citizens, using 24/7 online platforms, websites, government portals and social media. The consultation takes place at the following stages:

- prior to a more formal consultation to obtain initial feedback and gain an understanding of the issues
- early stage of impact assessment to gather inputs
- various stages of the policy making process

The public consultation process including the duration of each phase is shown in Figure 18.

Figure 18: Public consultation process in Malaysia



Source: Othman (2017)[31]

Public Private Partnership

A key factor for the successful implementation of the country's infrastructure projects is the adoption of public-private partnership (PPP) in the framework of the Malaysia Privatisation Master Plan (MPM) in 1983. Before this, most infrastructure development was financed through the Government Development Budget.

PPP allowed the government to launch more infrastructure projects by shifting the funding these projects to the private sector. This, in turn, has made the private sector an important engine of national growth[32]. In 2009, a dedicated agency, Public Private Partnership Unit (Malay:

[31] *Malaysia's Experiences in Establishing a Mechanism for Public Consultation in Rule-making Process,* Roziana Othman, WTO SPS Transparency Workshop, Geneva, 30-31 October 2017
[32] *Infrastructure Financing in Malaysia,* Hee Kong Yong, Nomura Journal of Asian Capital Markets, Spring 2017 Vol.1/No.2

Unit Kerjasama Awam Swasta, or UKAS), was established to monitor and implement PPP projects and acts as secretariat for the government's projects in the five dedicated economic corridors. Due to PPP, many of the multi-lane highways in Malaysia are tolled and most of the major ports are privately owned.

In the 10MP (the predecessor of 11MP), the Government outlined clearly What is in store for the private sector including the role division between the government and the private sector. In order to support the private sector, the government delivers, among others:

- A supportive regulatory environment which increases the ease and reduces the cost of doing business;
- An environment that promotes fair competition and level playing field;
- Better access to financing for all stages of business growth.

3.2.5. Content of NTI Plan

As previously indicated, there is no such national transport master plan in Malaysia. The highest level of NTI plan is the 11MP, which is a five-year economic development plan that contains key physical infrastructure initiatives, including but not only transport infrastructure. With regard to transport infrastructure, the 11MP covers the following:

1. Strategic thrust: *Strengthening infrastructure to support economic expansion*
2. Game changer: *Investing in competitive cities* by realizing a transition **from** uncontrolled and automobile-focused urban sprawl **to** transit oriented development to increase use of public transportation and reduce reliance on personal vehicles.
3. Focus areas:
   - *Building an integrated need-based transport system*, by:
     - enhancing connectivity across transport modes and regions;
     - improving safety, efficiency and service levels of transport operations;
     - expanding port capacity, access and operations;
     - strengthening regulatory and institutional framework for the transport industry.

   - *Unleashing growth of logistics and enhancing trade facilitation*
     - strengthening institutional and regulatory framework
     - enhancing trade facilitation mechanism
     - building freight infrastructure efficiency and capacity
     - deploying technology in the logistics chain
     - strengthening capabilities of logistics service providers
4. Expected outputs:
   - 40% public transport modal share in Greater Kuala Lumpur/Klang Valley;
   - 3,000 km paved rural roads constructed;
   - Malaysian Aviation Commission as newly established regulator;
   - 8.5% annual growth of transport and storage subsector
   - Top 10 in the World Bank Logistics Performance Index.

National Land Public Transport Master Plan (NLPTMP) 2012-2022

Unlike 11MP, the NLPTMP is a more visionary document that contains macro-level policies and plans, and includes objectives and policies that shape plans and proposals of regional and sectoral land public transport plans, as outlined here below. The plan also presents a comprehensive implementation timeline of each action plan.

Vision: Public transport as Rakyat's choice of mobility		
Objective	**Key policies**	**Action plans**
1. Physically well-connected	1.1 Enhance urban physical connectivity	• Stage bus network planning • Urban rail scheme
	1.2 Enhance rural and inter-city physical connectivity	• Inter-urban bus network planning • Rail extension to the eastern region • …
2. Affordable and accessible to all	2.1 Improve route-planning and explore alternative models to ensure accessibility to the under-served	• Guidelines on stage bus network planning • Guidelines on stage bus service improvement
	2.2 Build sustainable land public transport models which provide affordable services to public and financially viable for operator	• Fares policy and review process • Delivery model for stage bus • …
	2.3 Increase accessibility for the mobility impaired	• Guidelines on accessible infrastructure measures
3. Convenient and offer high service levels and quality	3.1 Raise service reliability of public transport	• Operator license • Enforcement strengthening • …
	3.2 Improve service standard for operators, drivers and vehicles	• Customer satisfaction surveys • Passenger charter • …
	3.3 Develop seamless experience for the user	• Station enhancement • Bus stop enhancement measures • …
4. Safe and secure	4.1 Ensure high standards of safety and security for operators	• Safety and Security Regulatory Enhancement
	4.2 Encourage and support safety initiatives	• Support national safety and security initiatives
5. Better quality of life	5.1 Promote healthy living	• Bicycle parking facilities • Pedestrian facilities
	5.2 Manage travel demand	• Travel demand management guidelines
	5.3 Encourage environmental sustainability	• Adopt green technologies and practices
	5.4 Optimise public transport infrastructure	• Develop transit-oriented development guidelines (TOD) • Development control process • …

3.2.6. Data Collection Method

The whole transport infrastructure planning is based on data collected monthly and annually in each transport mode sector i.e.: land transport & logistics, maritime and aviation. In general, the data is comprehensively collected by the Ministry of Transport, known as transport statistics and can be viewed in the Ministry of Transport's website (http://www.mot.gov.my/en/resources/yearly-statistic). All of these data collected will be used as reference points for ministries and agencies for planning towards developing an efficient, integrated and sustainable transport system. These data have also been used in analysing the current status of transport infrastructure, mobility trends and implications, and reviewing of existing policies and plans.

Each agency in the ministries will then propose for new transport infrastructure projects to suit with the future trends and future demands in transport sector based on the data collected and analysis done as above. The Department of Statistics Malaysia (DOSM) has been involved as a member of steering and technical committees for the implementation of projects or studies in other ministries and agencies. Amongst DOSM's roles is to give advice on statistical methodology, providing social and economic statistics, and endorsing other agencies' studies (World Bank Group, 2017) .

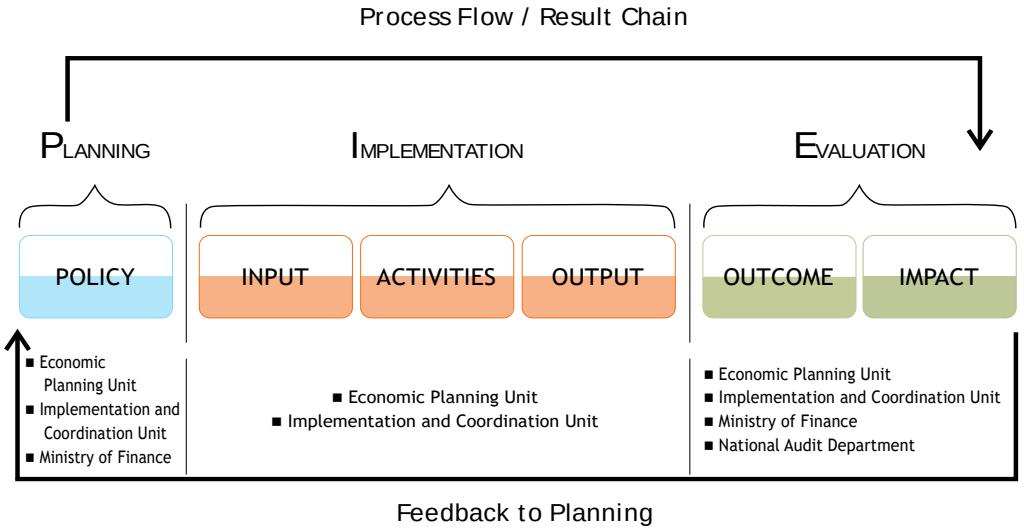
Accessible and reliable data is at the core of the 11MP, where a one-stop centre will be established to provide access and linkage to all data in the nation, including data that are housed in relevant agencies. DOSM will have the lead to establish an appropriate mechanism and coordinate with relevant ministries and agencies.

There is little information on which transport model applied to estimate ridership forecasts in the NTI plans of Malaysia. World Bank Group (2017) suggested that urban transport planning in Malaysia is based on unique, non-comparable data series, data definitions, units of measure, and temporal horizons, which resulted in different conclusions of what current travel demand levels are, and what their future behaviour is likely to be in response to a defined set of interventions (or lack thereof). The new data collection mechanism suggested by the 11MP, as previously described, is expected to address this challenge.

3.2.7. Monitoring System

Malaysia is a good example when it comes to a monitoring system that is driven by a project cycle management, as shown in Figure 19, where evaluation of the programmes and projects will feed back into the planning process.

Figure 19: Management cycle in national development



Source: Implementation and Coordination Unit of the Prime Minister's Department of Malaysia

The implementation of programs in the 11MP is monitored on a yearly basis during budget review process, which takes place from April to July. On top of that, the mid term review of the 11MP is currently on going. The mid term review exercise reports the progress that have been achieved during the first two years of the 11MP (2016 and 2017), details the actual performance versus targets and also outlines the programs that will be revised or continued in the remaining plan period. Where necessary, new programs will be introduced in order to achieve the targets that have been set for 2020. The mid term review document is expected to be tabled in the Parliament in September 2018 and will be made available to the public soon after that[33].

For the National Land Public Transport Master Plan (NLPTMP), which also includes Land Freight, the monitoring is carried out by the Land Public Transport Commission (Malay: Suruhanjaya Pengangkutan Awam Darat, or SPAD) who develops the plan. SPAD conducts reviews at 10-year intervals to ensure that the strategic directions set by the plan remain current and relevant to actual situations, challenges and demands of the time. Specific KPIs are defined, aligned to each strategic objective, along with methods of verification. These KPIs will be tracked to measure the progress of the transformation. In some instances, targets for these KPIs are set. A publicly Annual Report is published, containing an annual comprehensive stocktake to identify progress on specific KPIs.

3.2.8. Conclusions

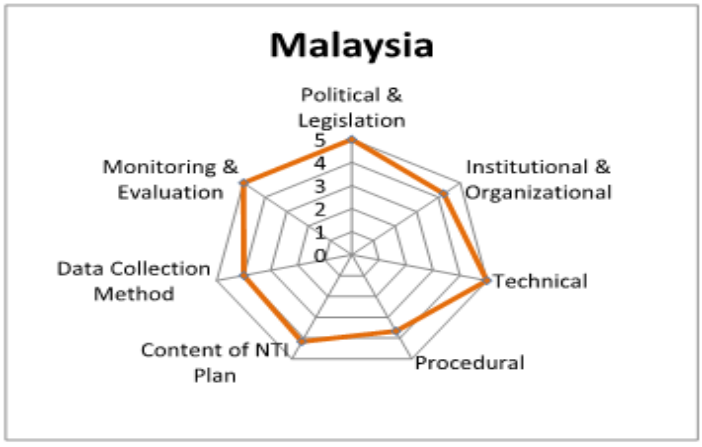
The NTI planning and process in Malaysia is obviously very mature if not the most mature among the OIC Member States. Based on the above analyses, the following conclusions can be drawn:

[33] Based on interview with EPU Malaysia (2018).

- **Political and legislation**: A national transport policy and a national transport master plan do not exist in Malaysia. As Malaysia desires to move up level to a more policy driven and spatial approach to transport planning in order to realize the government's vision, a national transport policy is currently being drafted to address the current challenge in which the sectoral transport plans do not contribute towards a common goal due to absence of an overarching policy direction.
  The fact that the 11MP 2016-2020 "acts" as a national transport master plan, while this is a 5-year development plan, a specific attention to national transport infrastructure is rather limited. This issue is however being addressed as a national land transport master plan is currently being developed.
- **Institutional and organizational**: A close collaboration among central Ministries' agencies and implementing agencies and a strong partnership between public and private sectors.
- **Technical**: The strongest aspect of the NTI plans of Malaysia is that they are developed based on an outcome-oriented approach that drives concerted performance measurement efforts at national and local levels. They also reflect a strong integration between land use planning and multi-modal transport. The NTI plans also pay attention to the development of non-motorised transport modes.
- **Procedural and financing**: Malaysia's NTI plan is currently not policy driven, but it will be, following the upcoming national transport policy, which can serve as a best practice example for other OIC countries. Public consultation is enforced by a legal basis, which also serves a guiding principle for an adequate public consultation process. PPP has been adopted successfully in Malaysia and became a key success factor of the country's transport infrastructure projects.
- **Content of NTI Plan**: The NTI plan of Malaysia is outcome based, such as enhancing connectivity across transport modes and regions, and improving safety, efficiency and service levels of transport operations. The plan also gives a high attention to sustainability and resilience.
- **Data Collection**: Ministries and agencies collect their own data and have their own databases and these are not fully integrated at the national level. This issue is however addressed by the 11MP that suggested that a one-stop centre will be established to provide access and linkage to all data in the nation.
- **Monitoring and Evaluation**: Malaysia is a good example when it comes to a monitoring system that is driven by a project cycle management. The 11MP is monitored on a yearly basis by the EPU, who also conducts a mid-term after two years of implementation. The implementation of the NLPTMP is monitored by SPAD who also conducts reviews at 10-year intervals.

These findings are similar to the questionnaire result shown by the following radar chart, which shows that Malaysia scores (very) high in all of the following NTI planning aspects.

Figure 20: NTI Planning practice in Malaysia



Source: Fimotions

3.2.9. Policy Recommendations

Malaysia is one of the best practices of NTI planning among the OIC Member States. The following improvements are recommended:

- As Malaysia is currently preparing a national transport policy, the policy should have a long term view of the transport sector in the context of the future economic and social needs and also to factor in the new dimension of the SDGs and technology.
- It will be necessary for Malaysia to prepare a national transport master plan that includes measures, projects and a comprehensive set of directions that will enable the transport policy to be implemented.
- Including non-motorised transport modes in the national transport master plan.
- One of the main objectives should be the reduction of greenhouse gasses and supporting this profound will be a challenge that will stimulate smarter planning, the use of NMT and demand substitution.
- Improving the institutional capacity by training or education of government officials and professionals to increase the effectiveness of the current planning procedures and techniques.
- The agenda of the TMP to establish a one-stop national data centre should be a top agenda as it will improve the efficiency of transport planning in Malaysia.
- The plan performance should be monitored and results published in dashboard format for public consumption and to promote transparency.

3.3. Uganda

This is a case study of a country with successful transport planning that is part of OIC Geography. The evidence used in the case study has been obtained from published information, online information, meetings with numerous officials and academics, and responses to the questionnaires prepared by the Fimotions consulting team. A considerable amount of information has been drawn from COWI consultants of Denmark who has been present in Uganda for 30 years and from the Ministry of Works and Transport, which are gratefully acknowledged. The consultant preparing this case study has also been in Uganda working on a Mid Term evaluation of the National Transport Master Plan funded by the European Union and has gained a good insight into the planning system.

Uganda has been selected because in 1986 following 24 years of power struggling, a new era of responsible government was ushered in. It marked the beginning of the journey to the restoration of the Kingdoms in Uganda. Solving this crucial political issue enabled the road to full-blooded democracy and constitutionalism, economic, educational and social advancement. This provided the political stability needed to develop the country in general and transport in particular. Already this is in an important historical observation.

By way of general background the 18% of the 200,500 km2 land area is water. The population was 41.5 million in 2016 and growing at 3.3% per year. GDP in 2016 was USD 25.53 billion growing at 1.3% at constant prices. The proportion of the Ugandan population living below the national poverty line declined from 31.1% in 2006 to 19.7% in 2013. Unemployment, rates are unclear, with the World Bank quoting 2.9% for all ages while youth unemployment has been stated as being as 69%.

Regarding transport performance, while road accessibility nationally is improving, rail has stagnated and urban transport has become increasingly problematic. Although, the role of the private sector in the solution mix is well understood, it is yet to be established to provide both infrastructure as well as services. The existence of problems does not imply lack of success, it is the firm intension to solve these problems in a contemporary way then indicates success. The need for the sector to be policy driven is understood and sector and subsector planning is well advanced.

Although cited as a good example of national transport infrastructure planning, Uganda does not provide the ideal case study for NTI planning because there remain many challenges, more that it shows that an African Country is heading in the right direction, that a transport planning process is being established and better decisions are being made.

3.3.1. Political and Legislation Factors

A 15 year National Transport Master Plan (NTMP) was produced for the period 2008-2023 (MoWT, 2008b). According to the MoWT (2018), the NTMP provides the framework in which decision making on transport investments is made, including those of the IFIs like the European Union and AfDB. The NTMP also has projects that comply with international agreements that Government of Uganda (GoU) has made, such as in the development of the Northern Corridor.

The range of policy instruments, programmes, plans and institutions that are involved in contemporary transport planning is very large. Fimotions has attempted to chart most of those

that have related in various ways to the preparation of the NTMP and also the Northern Transport Corridor. Clearly transport planning has moved on from simply being an engineering tool to plot a road network on a map as was the case in the 1970s in developed countries and in the 1990s in less developed countries. Whilst it is relatively easy to prepare the enabling policies and legislation that set up the multi-sectoral planning framework, the challenge is the coordination and implementation required by the leading Ministry – in this case the MoWT in Uganda. The level of implementation of the Master Plan has been limited mostly because of a weak institutional response to it.

The Master Planning was followed by Strategic Implementation Plan (MoWT, 2015) and sub-sectoral programming that were produced by the pertinent agencies. Implementation is by no means complete and the process of a formal mid-term review commenced in 2018. A new transport policy is being formulated and a new transport plan is envisaged covering 2020 to 2040 (World Bank, 2017). This short history reflects a good approach to transport planning that can be summarised as follows:

- Recognizing the need for being policy driven
- Producing a Master Plan
- Providing enabling legislation
- Implementation planning
- Sub-sectoral programming
- Monitoring and evaluation

In addition to the planning instrument, contemporary legislation was adopted that established an autonomous Uganda Roads Fund (URF) and Uganda National Roads Authority (UNRA) and enabling legislation for railway and airports privatisation. Sector management is undergoing reform as discussed in the next section. Some sectors have reformed well, such as roads, rail badly and aviation not at all. But that is the nature of reform.

Table 10: Institutional Framework for the Preparation of the National and Northern Corridor Transport Master Plans

Instruments	Plans	Programmes	Legislation	Institutions
o National Environment Management Policy, 1994 o National Energy Policy, 2002 o National Water Policy, 1999 o Uganda Wildlife Policy, 2014 o Uganda National Land Policy, 2013 o National Industrial Policy, 2008 o National Wetlands Conservation and Management Policy, 1995 o National Climate Change Policy, 2015 o National Policy for Disaster Preparedness and Management, 2010 o National Gender Policy, 1997 o Draft Transport Policy and Strategy Paper o Non-Motorised Transport (NMT) Policy o Draft Agricultural Policy, 2011 o HIV/AIDS Policy, 2007 o Mineral Policy, 2000 o Tourism Policy, 2015 o National Oil and Gas Policy, 2014 o Fisheries Policy, 2004 o National Land Use Policy, 2007 Other important instruments o Uganda's Vision 2040 o Africa Agenda 2063 o Sustainable Development Goals (SDGs)	o Uganda's Second National Development Plan (NDP II), 2015-2019 o Sector Development Plans (SDPs) o National Transport Master Plan (NTMP) including the Transport Master Plan for the Greater Kampala Metropolitan Area (GKMA) o National Irrigation Master Plan (2010 – 2035) o Northern Corridor Infrastructure Master Plan o Local Government Development Plans o Protected area management plans	o National Response Strategy for Elimination of Non-Tariff Barriers (NRSE-NTB) Programme o National Agricultural Advisory Services (NAADS) Programme o Joint Water and Environment Sector Support Programme o Fuel Efficiency Initiative (FEI) in Uganda o Youth Livelihood Programme (YLP) o Northern Corridor Spatial Development Programme (NCSDP) o District Livelihoods Support Programme o CAIIP-II - Community Agriculture Infrastructure Improvement Programme	o The Constitution of the Republic of Uganda, 1995 o National Environment Act, Cap 153 o Traffic and Road Safety Act, 1998 o Uganda Railways Corporation Act, 1992 o Inland Water Transport (Control) Act, 1964 o Lake Victoria Transport Act, 2007 o Investment Code, Cap 92 o Water Act, Cap 152 o Uganda Wildlife Act, Cap 200 o Local Government Act, Cap 243 o Public Health Act, Cap 281 o Historical and Monuments Act, 1967 o The Land Act, Cap 22 o The Land Acquisition Act, Cap 226 o Occupational Safety and Health Act, 2006 o Traditional Rulers (Restitution of Assets and Properties) Act, Cap 247 o National Forestry and Tree Planting Act, 2003 o Physical Planning Act, 2010	o Ministry of Works and Transport (MoWT) o Uganda National Roads Authority (UNRA) o Ministry of Finance Planning and Economic Development (MFPED) o Uganda Road Fund o Ministry of Local Government (MoLG) o Urban & District Local Government Authorities o Ministry of Lands Housing and Urban Development (MoLHUD) o Town and Country Planning boards o National Environment Management Authority (NEMA) o Transport Licensing Board o Uganda Freight Forwarders Association (UFFA) o National Planning Authority (NPA) o Uganda Railways Corporation (URC) o Uganda Revenue Authority o Uganda National Meteorology Authority o Lake Victoria Basin Commission o Uganda Chamber of Mines and Petroleum (UCMP)

Source: ERM (2016)

3.3.2. Institutional and Organizational Factors

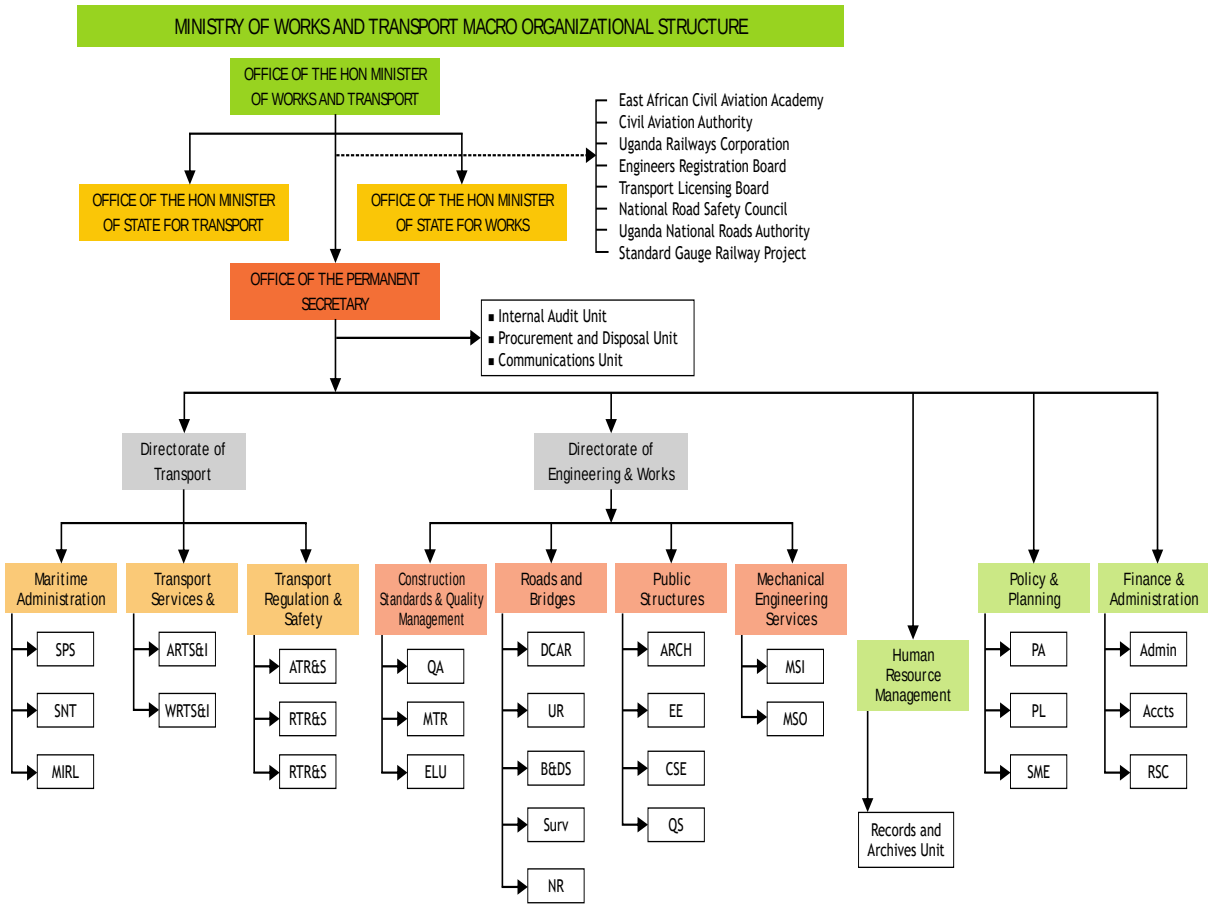
Since the 1990s, Uganda has sought to improve its transport sector infrastructure in keeping with its economic development and growing population and urbanisation, and this has been reflected in significant governance investment and resultant initiatives in the transport sector. The chronology of the changes should be of interest as it tells a story of pro-active reform that explains why Uganda is a good case to study.

- 1991 Civil Aviation Authority was set up
- 1992 Uganda Railways was incorporated
- 1995 Uganda Constitution
- 1996 Road Sector Development Programme No 1
- 1998 Road Agency Formation Unit Set Up
- 2001 Liquidation of Ugandan Airlines Corporation
- 2002 Road Sector Development Programme No 2
- 2002 Draft National Transport Policy and Strategy
- 2006 Rift Valley Railway takes over the URC
- 2008 Uganda National Transport Master Plan 2008 2023 (NTMP)
- 2010 Uganda Road Fund
- 2010 Uganda National Development Plan No 1
- 2011 Kampala Capital City Authority set up
- 2013 Vision 2040
- 2014 Draft National Transport Policy and Strategy
- 2014 Draft Plan for Kampala Metropolitan Area
- 2015 National Development Plan No. 2
- 2015 Standard Gauge Railway Unit Set Up
- 2015 Strategic Implementation Plan for the NTMP
- 2015 Intended Nationally Determined Contribution INDC submitted (Climate Change)
- 2016 Rift Valley Railway wound up
- 2017 Road Sector Development Plan 3 under preparation
- 2017 Mid Term Review of the NTMP
- 2018 National Transport Master Plan 2020/2040
- 2020 National Development Plan No. 3

The main conclusions that can be drawn from this chronology is that the process was proactive in reforming transport sector management from a centrally driven to a more modern and devolved one. Each mode of transport was reformed and restructured to work more efficiently and effectively with URC being leased out to Rift Valley Railways Ltd. The timeline also indicates a flexibility and willingness to correct, revisions and reversals if objectives are not achieved. It also shows that the transport plans, strategies and programmes were prepared hierarchically (top down). An important comment is that only towards the end of the road map was the usefulness of a new transport policy realised in 2014 – not at the beginning of the reform process. However, national transport master-planning has become a proxy for policy making in many countries including Uganda.

The transport sector is managed by the Ministry of Works and Transport. The Works component means that construction is a part of the transport ministry, which is normal for many developing countries, that sees the development of infrastructure, especially roads, as being of a high priority.

Figure 21: Current Organization of the Sector



Source: MoWT Uganda

Maritime Administration	Transport Services& Infrastructure	Transport Regulation	Roads and Bridges	Public Structures	Policy & Planning
SPS–Ship, Ports and Security Division **SNT**–Safety of Navigation and Training Division **MIRL**–Marine Inspection Registration and Licensing Division	**ARTS&I** – Air & Road Transport Services& Infrastructure **WRTS&I** – Water & Rail Transport Services& Infrastructure	**ATR&S** – Air Transport Regulation and Safety **RTR&S** – Roads Transport Regulation and Safety **RTR&S** –Rail Transport Regulation and Safety	**D CAR** - District and Community Access Roads Division **UR** – Urban Roads Division **B&DS** – Bridges and Drainage Structures **Surv**– Surveying Section **NR** – National Roads	**ARCH** – Architecture **EE** – Electrical Engineering **CSE** – Civil & Structural Engineering **QS** – Quantity Surveying	**PA** – Policy Analysis **P** – Planning Division **SME** – Statistics, Monitoring and Evaluation Division
		Construction Standards and Quality Management	**Mechanical Engineering Services**		**Finance & Administration**
		QA – Quality Assurance **MTR** – Material Testing& Research **EU** – Environment Liaison Unit	**MSI** – Mechanical Services Inspection **MSO** – Mechanical Services Operation		**Admin** – Administration **Accts** –Accounts **RSC** – Resource Centre Unit

The Ministry structure is expected to evolve with time to focus more on policy, legislation, regulation and strategic planning and devolve or spin out implementation to autonomous agencies, parastatals and local government.

Setting goals for the public sector

It is common in Africa to develop mandates, vision and mission statements that are intended to provide direction for sector management. The Uganda Transport Sector's mandate that is set out in the NTMP 2008-2023 was "to plan, develop and maintain economic, efficient and effective transport infrastructure and services; to manage public works including government buildings; and to promote standards in the construction industry". Its vision was: "to have a reliable and safe infrastructure in works and transport that will deliver timely, quality, cost-effective and sustainable services to the people of Uganda". While its mission was: "to promote an adequate, safe and well-maintained works and transport infrastructure and services, so as to effectively contribute to the socio-economic development of the country. These kind of vision statements abound. The vision for transport sector in Botswana is comparable to Uganda and that is to provide efficient, effective, sustainable and safe services.

The problem is being efficient or effective or sustainable are not visions at all but conditions, which all processes are evaluated. Such statements offer no direction that can be clearly identified and results that can be simply measured. Such statements are ambiguous. Efficiency, Efficacy Sustainability have become clichés, they are not goals, but the conditions needed to achieve them. This partly explains why policies and plans, while providing a shopping list of investment projects and measures that investors can pick off, fall short on delivering the results expected. A goal for the transport sector might be "Access will be provided to free public transport for 90% of the urban population within 15 minutes walking distance" Such a vision may seem ambitious and even improbable, but is it? In education nobody doubts that education should be free at the point of delivery and be accessible to 100% of the population. Also in health, that a vision would be a similar one to education of 100% access to free health services. So why not public transport? The socio-economic arguments are identical, that it is not only good for society to be well educated and healthy, but also mobile. The point about this discourse is that transport sector goals must be concrete.

Meetings held with the leading transport institutions in Uganda, with the MoWT, the Uganda Road Authority, the Ugandan Road Fund, the Uganda Railways Corporation, the Civil Aviation Authority, and the Kampala City Council Authority, provided insight to the management of the transport sector in Uganda. The extent to which a decision making on transport infrastructure investment is influenced by transport policy was considered to be significant. The curious aspect to this response is the current absence of a formal transport policy. The reason for this situation is the belief that a transport policy exists and a recollection of having actually read it. There was a draft transport policy of 2014, but it was never finalized and a new attempt is being made in 2018 (World Bank, 2017). Another reason is that the NTMP is considered to be both a policy and planning document and to some extent it has fulfilled the role of policy and planning document. The reform in the management of the transport sector between 2008 and the current time can be largely traced to the objectives of the NTMP, which are shown in Table 11. Certainly the list reads more like policy statements than transport planning objectives.

Table 11: 2008 Transport Sector Objectives from the National Transport Master Plan

1	Policy Objective
1.1	Contribute, through transport services, to an increase in trade, employment and economic output, and a reduction in poverty;
1.2	Improve access to public services, markets, and employment, through improvement and maintenance of rural and urban transport infrastructure;
1.3	Ensure good customer choice by promoting provision of efficient intermodal interchange facilities;
1.4	Promote private sector operation of transport services, and encourage private sector investment in infrastructure;
1.5	Promote equitable treatment of different transport modes, allowing efficiency and modal suitability to determine modal split;
1.6	Promote modal integration, including container transhipment facilities at interchange points between all modes, including those with the proposed Eldoret-Kampala Pipeline and 'road bridges' across waterways;
1.7	Ensure safety of transport networks and operations;

1	Policy Objective
1.8	Establish a long-term master plan to guide rational and complementary development of all modes;
1.9	Keep Government of Uganda policy on sector regulation under review so as to support the new commercial environment;
1.10	Promote greater integration of transport and land use planning in Kampala and other urban areas. In particular, seek to reduce the need for motorised transport in Kampala City centre, and provide a safe environment for pedestrian and non-motorised transport;
1.11	Use internal revenues to finance Government current expenditures and infrastructure maintenance, while negotiating with international donors to help finance upgrading and rehabilitation of infrastructure;
1.12	Promote improved capacity of the local consulting and contracting sector, including the performance of labour-based maintenance;
1.13	Maintain high-quality trading links through the Northern and Central Corridors to the ports of Mombasa and Dar is Salaam;
1.14	Help reform and simplify customs procedures and costs;
1.15	Promote development of a new Kampala Inland Port;
1.16	Contribute actively to regional co-operation in transport within the East African Community and the COMESA;
1.17	Promote equal opportunities for women in employment and provision of services;
1.18	Ensure that all transport development projects are subject to environmental impact assessments (EIA's) approved by the National Environmental Management Authority.

Source: MoWT (2008a)

The level of involvement of private sector in transport planning decision making is considered to be good by those in Government, yet the policy objective seeks to improve it. Indeed, there are not many examples of successful PPP projects in the transport sector in Uganda and the few ones include the outsourcing the operation of Ugandan Railways to the Rift Valley Railways company which became a failure and operations reverted back to Government in 2018[34], management of driving permits by Face Technologies Ltd and is still on-going, and provision of ferry transport services to Kalangala islands by Kalangala Infrastructure Services.

Figure 22: Rift Valley Railways Uganda

Source: 'The Ugandan' 8th April 2018

[34] Available from https://theugandan.com.ug/rift-valley-railways-finally-pushed-out-of-uganda/

Capacity considerations in the institutions are very important. The MoWT and its subsidiaries have some highly knowledgeable and skilled personnel, but generally they lack `hands on' experience to make a national transport plan, and most of the work is outsourced to consultants. The EU and others consider that Technical Assistance is needed in the leading Uganda agencies such as the UNRA and MoWT (European Commission, 2016) as shown in the text box. One of the shortcomings is the lack of any integrated planning agency and given the tenets of the NTMP to integrate land use with transport planning and to make sure that the subsectors are integrated has not registered any progress, consequently each transport mode does its own thing and coordination with other ministries is insufficient.

EU Technical Assistance

The technical assistance (TA) is expected to improve the human resource and institutional capacity of government institutions in the transport sector, namely the Ministry of Works and Transport (MoWT), the Uganda National Roads Authority and the Uganda Road Fund. Specifically, the TA will (a) strengthen the capacity of the MoWT in gender-responsive strategic planning and oversight in a multimodal transport environment, contributing to an appropriate investment-maintenance mix, climate change mitigation and building climate resilience of the sector; (b) improve the delivery of road development projects; and (c) improve the operational efficiency of road maintenance.

3.3.3. Technical Factors

When formulating the NTMP there appears to be no consideration given to the alternatives between transport modes not to the prioritization among certain transport modes, transport corridors, and major transport projects. Simply put each subsector is considered on its own merits completely separately from each other. Having said that there are numerous projects that aim to provide interchange between different modes of transport. The technical description considers the quantum of transport demand and the response in terms of network provision and influence of planning on investment decisions made. Uganda has a transport system that was based initially on railway and waterway services, followed later by roads and air services. Today, Uganda's transport system relies on almost totally on roads that account for 96.5% of freight cargo and 95% of passenger traffic.

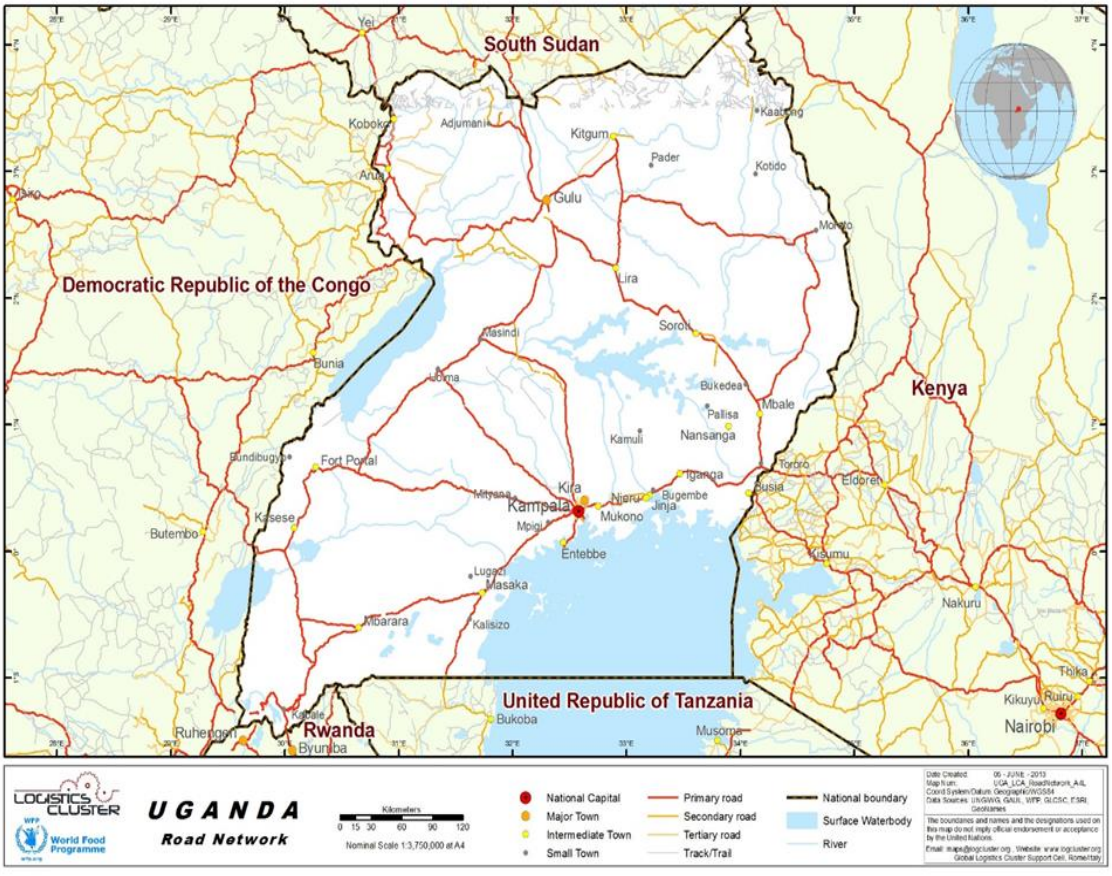
The road network in Uganda is classified into National Roads, District Roads, Urban Roads, and Community access Roads. According to UNRA, the total national road network is made up of 21,000 km of national roads; 32,000 km of district roads; 13,000 km of urban roads; and 85,000 km of community access roads. According to the 12th Joint Transport Sector Review, as of June 2016, the total paved network accounts for 4,157 km of roads, and the unpaved network 16,388 km. This means that a large proportion (more than 80%) of the national road network remains unpaved.

Paved road density is a critical indicator in determining the sufficiency of the road network so important for planning. The status in Uganda showed there is 1 km of paved road for each 10,000 population, alternatively there is 17km per 1,000 km2 indicates, both indicate very low accessibility.

In addition to providing accessibility, policy dictates that it must positively contribute to the economy. Yet despite the obviousness of the statement, few Roads Agencies follow it up, because their remit is to build and maintain roads only and so it is with UNRA.

Fimotions has used a method to test the adequacy of the Ugandan paved road network in relation to the economy, the method is elaborated in the text box. For Uganda in 2016 the value added to GDP of 1 km of new road per 1 million population was USD 6.1 in 2016. In 1992 the global mean was 1.39, which at 2016 prices would be 2.38[35]. This means that the road network is 250% smaller than it should be in relation to the size of its economy. This means that an optimum length of the paved road network would be about 10,000 km.

Figure 23: Uganda Road Network



Source:
http://dlca.logcluster.org/display/public/DLCA/2.3+Uganda+Road+Network;jsessionid=43AD6C5F9AB6692493CA39A51E50A39C

[35] Available from http://www.in2013dollars.com/1992-dollars-in-2016

Testing the adequacy of the paved road network

The methodology used herein is based on the work done by (Queiroz and Gautam, 1992) who showed there to be a significant relationship between per capita GDP and road network density as given as:

PGNP = 1.39 x LPR

Where PGNP is the Per Capita GNP and LPR is the length of paved roads per 1 million population.

The relationship had a correlation coefficient of 0.76 for a sample of 98 countries, of varied development status, an additional 1 km of paved road network per 1 million population added USD1.39 to per capita GDP. For countries with undeveloped road networks the value will be higher than 1.39 and for developed networks it will be lower – such that there appeared to be diminishing returns for road network enhancement in more economically developed countries.

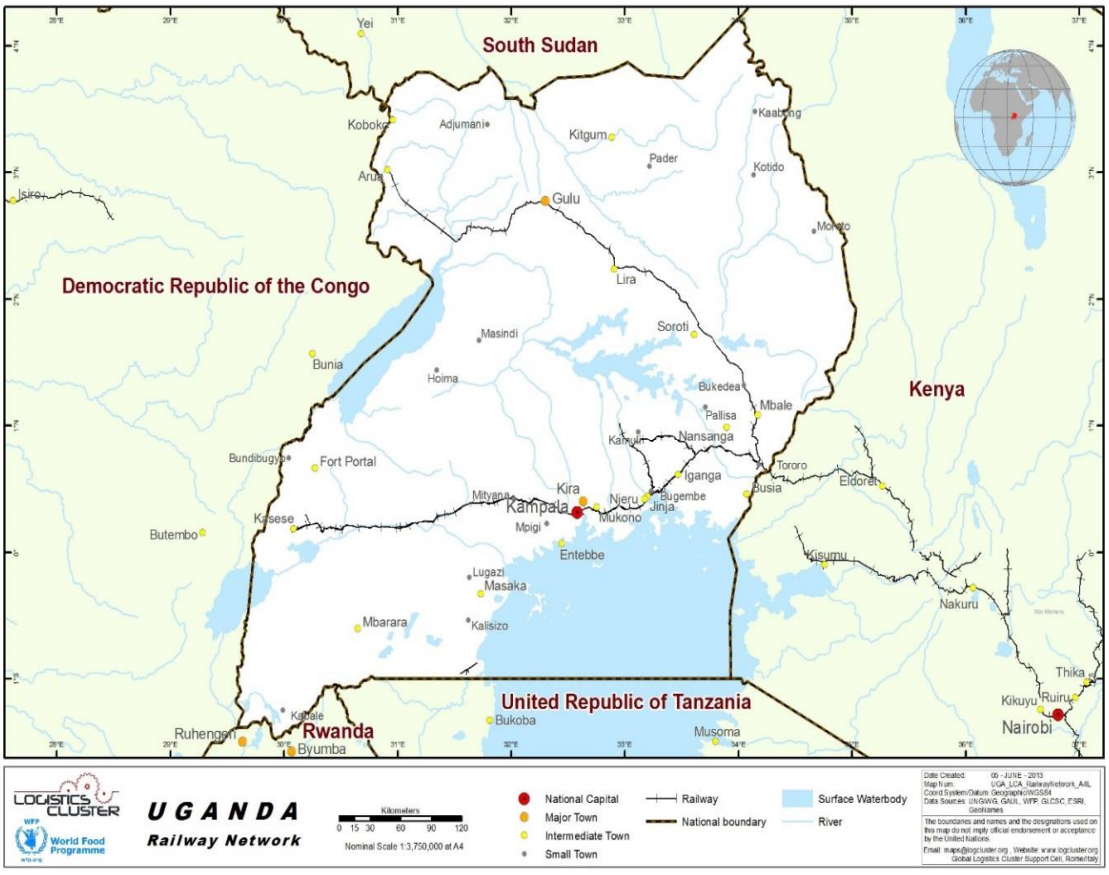
Railways

The Uganda rail network is shown in Figure 24. According to the URC, the track work is single line metre gauge and formed part of the East African Railways that linked the Port of Mombasa to its hinterland. Construction started in 1896 and the last sections completed in 1929. The length of passing loops on a single line railway determine the maximum train length and together with the ruling gradient, determine its capacity. In the case of the Ugandan Kenyan Railway the maximum train length was 30 wagons, so the maximum train load would be 1,200 tons. The maximum operation network was 1,260 km but by 2009 it had diminished to just 320 km. Attempting to reverse the declining role of railways, the entire Kenyan / Ugandan system was placed under a concession agreement with the Rift Valley Railway Company[i], but after 10 years of struggling the experiment failed and the railways reverted to public ownership. The lack of demand for East African railways is structural because there has been investment in roads but hardly any in rail, but recently this is changing.

As part of a joint agreement between the East African Community, the Government of Uganda is in the process of developing a standard gauge railway (1,485 mm) on the routes between the port of Mombasa to Kampala, Kasese, Kigali (Rwanda), and Kisangani (DRC). It will also link Tororo to Gulu, Nimule, Juba, and Djibouti. The new line is designed to take double stacked container and a 40 x 100 ton wagon train length.

This means that capacity increases from 1,200 tons to 4,000 tons per train. Although SGR has the potential to generate demand because of lower unit costs, the traffic forecasts are likely to prove optimistic partly because the limited traffic is also claimed by parallel tolled expressway projects in their feasibility studies. Furthermore, SGR costing is not intended to recover CAPEX at all but only the avoidable costs. This makes the entire project highly subsidized.

Figure 24: Uganda Railway Network



Source:
http://dlca.logcluster.org/display/public/DLCA/2.4+Uganda+Railway+Assessment;jsessionid=BD3D1CFF50B7F7B14A98497C5DBAC383

None the less, Chinese initiative and resources drive it forward with the same energy as projects in China. The interesting aspect is that SDG is not a part of the NTMP and in 2008 there was no intention of investing $2.5 Billion in a new railway. However, this was later captured in the Strategic Implementation Plan for the NTMP in 2015.

Civil Aviation

According to the Uganda Civil Aviation Master Plan (CAMP), it is projected that total passenger numbers at Entebbe (the main national international airport) will grow from almost 1.4 million in 2012 to more than 7.5 million in 2033. The details of the aviation sub-sector plan are set out below:

1	Establish an air transport regulatory framework that will enable the industry to respond to demand, and at the same time ensure safe, secure, regular and efficient air transport services to, from and within Uganda;
2	Develop cost-effective infrastructure and services;
3	Create a healthy competitive environment for provision of aviation facilities and services;
4	Develop and sustain an efficient network of scheduled services;
5	Also encourage non-scheduled operations, especially where traffic volumes do not permit economic operation of scheduled services;
6	Ensure a high level of aviation security through the Civil Aviation Security Programme;
7	Harmonise air transport policies with those of other countries, especially those within the East African Community and COMESA, including exchange of freedom rights with other COMESA the States;
8	Give favourable consideration to 'open skies' policies with other states, if such agreements are judged likely to benefit the Ugandan air transport sector;
9	Promote and develop Entebbe International Airport (EIA) as an international hub;
10	Ensure provision of efficient ground handling services at EIA;
11	Entrust the Civil Aviation Authority (CAA) with the roles of (i) advising Government on air transport policy, international civil aviation regulations and conventions, and bi-lateral and multi-lateral air service agreements, (ii) operating and managing air navigation services, and (iii) operating and managing gazetted aerodromes, either directly or through concession agreements;
12	Retain air navigation services as a CAA responsibility for the foreseeable future;
13	Privatise airport operation functions of the CAA when justified by traffic levels – specifically consider the privatisation of Entebbe International Airport through a long-term concession agreement;
14	Encourage the private sector to play a role in developing and managing private aerodromes, and in maintaining and managing Government upcountry aerodromes;
15	Subsidise essential loss-making CAA activities that cannot be charged out to customers;
16	Support and seek technical and financial assistance for the East African Civil Aviation Academy at Soroti;
17	Ensure that adequate regard is paid to environmental issues, including aircraft noise, the problem of bird strike, and the need to restrain smoking on scheduled passenger flights.

Projections see total aircraft movements and cargo follow a similar trend, from 43,000 to 124,000 movements and from 56,000 to 172,000 tonnes, respectively. The forecast for up-country airports projects a significant increase in traffic, from 14,000 passengers in 2012 to 660,000 passengers in 2033, which would see these airports account for 10% of commercial traffic. The NTMP proposes that Entebbe be privatized and the upcountry aerodromes put out to concession. These actions will surely test the confidence in the demand forecasts.

Public Transport

Public transport is fragmented system, which is dominated by private mini busses (matatus) and motorcycles (boda-bodas). In the city region Bus Rapid Transit and Light Rapid Transit are being considered to alleviate congestion and bring some order to chaotic public transport services. The NTMP objective is to supply well organised safe and affordable public transport services and this opens the door for public transport subsidy that will be vital for social objectives to be achieved. However, to date there are not PT services receiving subsidy according to the Kampala City Council (KCC).

The national population with access to public transport services is 38%. However the percentage of the rural population living within 2 km of an all-weather road is only 15%, demonstrating the lack of access to public transport services outside cities. Clearly the NTMP objectives are far from met. According to the Statistical Abstract of 2016, boda-bodas became the most common means of transport in rural areas but also contributed to the bulk of accidents recorded - forming 28% by type of vehicle in 2015 resulting in 24% of all victims of road accidents. The high road accident rate is a major concern. Ugandan transport planning has aimed high to rectify the evident lack of good quality transport infrastructure that is needed to develop the economy and improve people's lives. Further refinement of plans and processes is obvious but to date it deserves credit for not wasting time during the last 20 years, taking bold steps and moving forward with energy and confidence.

From discussions and questionnaire responses in Uganda, the level of holistic planning in transport sectors, in terms of the integration among various aspects such as land use, multi-modal transport logistics and communication plans is considered to be fair. But in reality, the response is a relative one, for without hard benchmarking and measures it is difficult to appreciate exactly what is good in terms of holistic and integrated planning. For example, the extent of complementarity of road, rail, air and water-based transport modes should be interpreted in the way that these transport modes interact rather than compete with each other. There being no road /rail / air /water interchanges or any description in Uganda, one concludes that there is much to do. In terms of the application of socio-economic evaluation / cost benefit analysis in infrastructure planning to prioritize projects it is a statutory requirement according to MoWT. However, very early signs from a mid-term evaluation of the NTMP (unpublished) show Economic Internal Rate of Return (EIRR) to be over estimated in some projects. The value of such analyses is only as good as the numbers going into the model. It is tempting to also to add that consulting engineers, that invariably have the job of assessing the feasibility of a project, have a vested interest in the outcome. It is also very definitely and mandatory to apply Environmental and Social Impact Assessments for transport investment projects. Whether recommendations regarding mitigation measures are implemented is a totally different matter, generally the anecdotal evidence is that they are partially implemented, because it adds to the cost of the project investment.

3.3.4. Procedural Factors and Financing

In Uganda, transport sector development depends on there being a national transport plan in place and that investment projects must appear in the plans before any budgetary allocation is made. This certainly applies to international investors and funding agencies that precondition project funding with a requirement that it is part of the national plan. This sometime makes project lead time very protracted, as is the case in Uganda whose NTMP 2008-2023 had its genesis in 2002. This means that projects now being built will have been identified more than 15 years ago. The consultative process may also be lengthy where in Uganda, even though projects appear in an approved national plan, it still does not exempt it from the due processes of consultation. Consultation is carried out at various levels, inter-ministerial, local government, and civil society. In addition, in Uganda the role of traditional African Laws is respected, and new projects will require the approval of local traditional leaders as well. The evolution and maturation of transport investment projects in Uganda broadly follows the project cycle management as shown in Figure 7.

The Uganda NTMP provided the necessary framework and programming. Projects were identified, pre-feasibility studies helped prioritized them using socio-economic and other criteria and then following selection detailed project appraisals made. There appears to be minimal political interference in the process of project selection in Uganda, possibly because there is so much infrastructure investment.

Transport Infrastructure receive the largest share of the available capital expenditure in the national budget. Of the UDX 23 trillion budget works and transport will receive 20.1%[36] or UGX 4.6 trillion or about $1.2 Billion. This represents a huge commitment by the Government to infrastructure and faith in its ability to stimulate the economy and improve the lives of its citizens. It must be pointed out that there is no direct reference to the NTMP 2008-2023 in the formulation of the 2018/19 budget although its intellectual influence is apparent. It is important to note that 55% of the funding for transport infrastructure is from international funding agencies. Their heavy commitment also means that they have a positive influence to the processes of planning, implementation and evaluation.

From discussions with local officials and responses to the questionnaire it is considered that level of consultation and stakeholder participation in NTI planning that includes other sectors other than transport planning institutions is good. From meetings with district councils in the south west of Uganda that involved the expert, there appeared to have been some consultations. The Uganda National Roads Authority Act stipulates that the 'Authority shall, in achieving its purposes under section 2 take into account and give effect to the following to consult and cooperate with departments, branches and agencies of the government and with utility agencies in the interests of improving accessibility to, or within, any area in Uganda'. The inclusion of assessment of transport user needs (market survey/research) to shape the transport agenda is carried out as far as the road user is concerned as shown in the survey data that it mentioned in this case study. However, the extent to which transport investment decision making includes the assessment of users' affordability need much further development in Uganda. All public transport is operated privately and there is no control of fares. Unfortunately, the extent of private funding of transport services and infrastructure has not been estimated, but it is important to do so. The examination of alternative solutions included in planning procedure in order to come up with optimized investments decisions is carried out by the consultants that are engaged to make the studies.

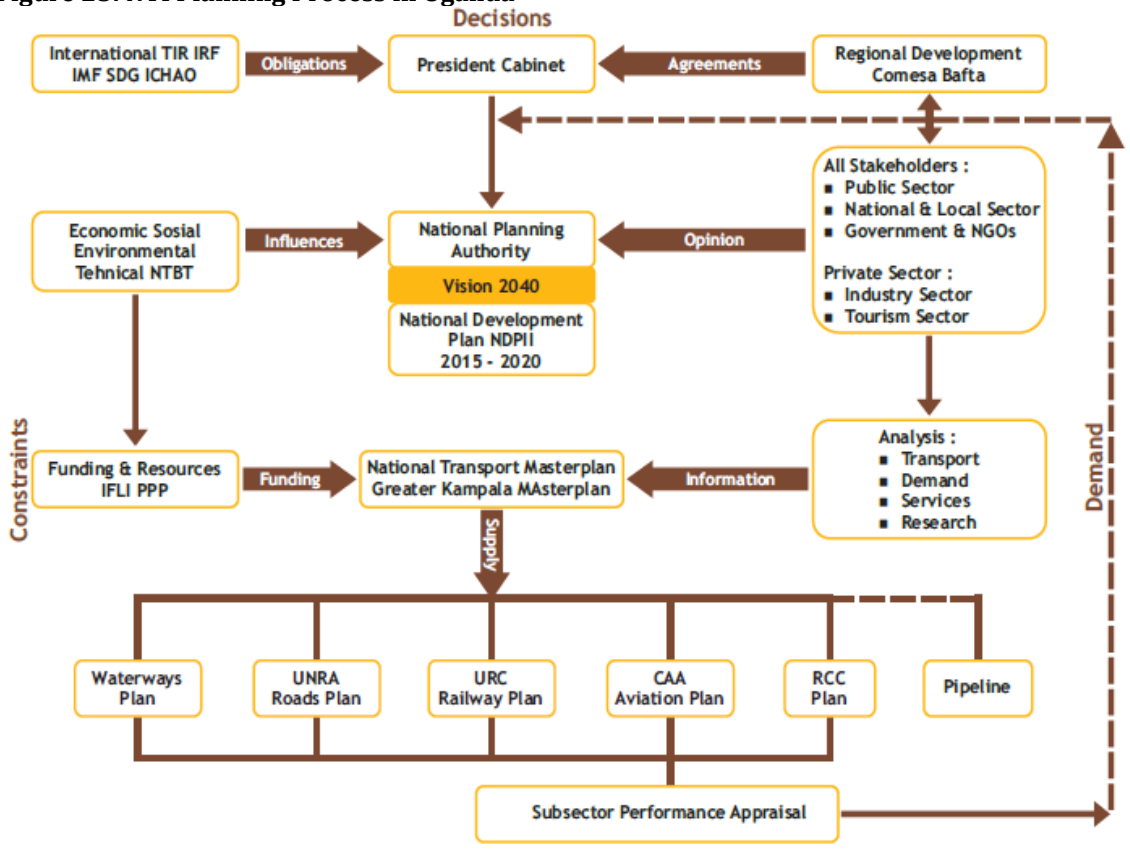
For example, KCCA policy is to have a pro transit orientated and has considered various types of mass public transport in their part of the NTMP and these include Light Rail and Bus Rapid Transit. The Plan objectives depend on the role of the private sector though specifity of subsidisation is vague and funding is vague. Moreover, the need for a Greater Kampala Metropolitan Area to promote and sponsor the Transit Systems has yet to gain a political foothold. The coordination between local authorities in promoting integrated land use and transport solutions cannot be overstated.

[36] Available from http://allafrica.com/stories/201705220476.html

The overriding failure of the Uganda NTMP is to consider its whole life cost. In other words, the budget needed to operate and maintain the planned system in order to keep the expected results flowing. It is a common failure even in developed countries.

The NTI planning process in Uganda is shown in the following figure.

Figure 25: NTI Planning Process in Uganda



To summarize the procedural appraisal, the NTMP considers multi-modal transport strategies but has failed to implement them. However, the plan has been highly successful in integrating its network with that of neighboring countries through transport corridors. The institutional procedures for preparing NTI plans is well established being the responsibility of the MoWT and the division of duties and responsibilities among relevant governmental agencies during the preparation of NTI plans is clear.

3.3.5. Content of NTI Plan

The Uganda NTMP also included a Transport Plan for the Greater Kampala Metropolitan Area (GKMA), which was prepared in 2008 by Consultants for the Government of Uganda, represented by the then Ministry of Works, Housing and Communications (MoWHC) (now MoWT).

The NTMP/GKMA was prepared to set out a framework for the development of the transport sector over a period of 15 years, from 2008 to 2023. NTMP/GKMA is a comprehensive long-term plan for the transport sector, covering not only investments needs, but also the whole transport

framework, including policy and strategy, institutions, legal and financial issues, land and environment, stakeholder interests, and capacity building requirements.

The key objectives of NTMP are:

- To provide a long-term multi-modal reference document giving a comprehensive framework within which consistent plans for individual modes can be developed;
- To serve as a key input to the overall national planning process spearheaded by the National Planning Authority (NPA);
- To serve also as a key input to regional transport planning at East African Community, COMESA, and African Union levels;
- To create a framework within which well-informed investment decisions can be made by both public and private sectors;
- To achieve establishment of a permanent high-quality long-term transport planning capability within MoWT, equipped to monitor and evaluate Plan performance, to undertake periodic updating of the Plan, and eventually to prepare subsequent National and GKMA Transport Master Plans.

What is apparent from the key objectives from the Uganda NTMP is that they refer to it being a part of a process of improving the capacity of transport planning in the country and this is both progressive and important. The key features of the NTMP are presented in Table 12. The plan is classically vertical in its form and is output rather than outcome based as if building x km of road is an end in itself. This is normal across Africa and the developing world, and it is logical because lack of transport network is seen as the most pressing problem. None the less, the strengthening of institutions, policies and laws is seen as being critical. The inclusion of both hard projects (infrastructure) with soft projects (measures) is very necessary for those countries that depend on IFI support.

Table 12: Key features of the NTMP 2008-2023

NTMP: Key Features – Infrastructure Development	
Roads	A total of 38 strategic road links was identified with total length of 1,148.4 km and total implementation cost would amount to US$ 369.8 million, which translates into an average implementation cost of US$ 24.7 million per year over the 15-year evaluation period.
Rail	The Government of Uganda should expedite joint concessioning between URC and KRC. URC should take advantage of funds made available by the EU (€ 10 million) for track rehabilitation and by the KfW for freight car maintenance (DM 7.9 million) to continue with track improvements and acquire higher-powered locomotives that are consistent with the anticipated operations of the new concessionaire.
Air	The plan includes EIA and a municipal airfield for Kampala as two distinct categories. The plan also considers the 60 licensed upcountry airfields, 19 of which are designated as belonging to the national airfield network.
Public Transport	GoU through MoWHC and the TMPO should undertake a study to determine the type of services to be provided and route plan and prepare a tender for providing the needed public transport services.

NTMP: Key Features – Institutional Development	
Organizational Framework	Creation of Transport Master Plan Office (TMPO) within MoWT, whose role will be to serve as a central transport planning unit responsible for monitoring implementation of both the master plans. It will also be responsible for developing and applying methodologies and techniques for conducting transport planning in accordance with the principles of transport economics, as well as liaising and coordinating with the land use planning of the region and the country. The TMPO will in addition monitor development of the master plans and keep abreast of the socioeconomic parameters of the country to readily incorporate changes in the investment plan and/or transport policy.
Capacity Building	Training of personnel and technical assistance for the professional bodies responsible for transport planning and operations within MoWT and within GKMA. As the role of the TMPO and MATE is highly professional, there is a need for training and technical assistance. It is also recommended that as a preliminary stage consultant be employed for a short duration to advise in detail on the functions of each new organisation, the skills needed for each position, and the selection of candidates. They will also advise on the detailed responsibilities for each professional body, the way decisions are taken and the persons responsible for these decisions.
NTMP: Key Features – Legislative Development	
Laws	The following laws are attributed to the recommendations of the NTMP: The Uganda National Roads Authority Act (2006) provides for establishment and operation of the Uganda National Roads Authority (UNRA) and managing the provision and maintenance of the national roads network; The Uganda Road Fund Act (2008) provides for establishment the Uganda Road Fund to fund routine and periodic maintenance of public roads;
Policies	The following policies are attributed to the recommendations of the NTMP: The Uganda railway freight services were concessioned to the Rift Valley Railways consortium (RVR) for a term of 25 years with effect from November 1, 2006; The National Construction Industry (NCI) Policy (2010) to improve coordination, regulation and development of the construction industry and establish a Uganda Construction Industry Commission (UCICO);
Bilateral Agreements	The following bilateral agreements are attributed to the recommendations of the NTMP: Uganda and Kenya signed a bilateral agreement for the joint development and operation of the Mombasa-Kampala standard gauge railway (2009); Uganda and Kenya signed a bilateral agreement for the joint development and operation of a One Stop Boarder Post at Malaba and Busia border crossing.

While the NTMP of Uganda provided the general direction and framework for the transport sector 2008-2023, the Strategic Implementation Plan (SIP) provides more detail on way the transport master plan is to be implemented (MoWT, 2015).

3.3.6. Data Collection Method

Manual Classified Count (MCC): This is the most common form of traffic data collection in Uganda and is designed to include all vehicle types (e.g., Motorcycles, Cars, Light Duty Vehicles (LDV) & Buses, Luxury Buses, Light trucks; and heavy trucks). These data are collected every two years by teams of traffic enumerators.

Automatic Traffic Counts (ATC): These are not so common in Uganda at the current time, but they involve counting vehicles automatically at permanent sites to enable a full daily profile of traffic to be established. Modern systems are georeferenced and transmit data in real time. From both manual and automatic counts, the Annual Average Daily Traffic (AADT) is established.

Roadside Interview (RSI) Survey: for specific projects questionnaire surveys are carried out that contain questions about the current trip that the interviewee is making and importantly its origin, destination and journey purpose.

Public Transport OD surveys (PTI): While RSIs apply to drivers of vehicles, travel demand data is also gathered from passengers at key railway stations, bus stops, stations and interchanges. The data collection survey instrument is normally a questionnaire that includes questions about fares, type of public transport, and number of interchanges and their locations between the respondent's origin location and destination location.

Public Transport Counts (PTC): With public transport being of increasing importance in transport planning, supply side data is also needed. This is problematic in many countries because PT is all privately owned so obtaining data is difficult. But the bus stations are normally owned by the state – Uganda in this case study, so this is where the data is normally collected covering route number, numbers of boarded passengers before departing – number of seats, load factor.

Household Interview (HI) surveys: Census data is available in Uganda for transport planning but generally the data is nowhere near sufficient. So data is also collected at the household level that will enable travel characteristics to be determined by socio-economic grouping. Data on number of trips made by household members, by mode and by purpose and also expenditure on transport.

3.3.7. Monitoring System

Annual sectoral performance reviews are the main means of monitoring the implementation of the infrastructure plan. They do follow an integrated approach regarding the transport modes but treat each transport mode individually. Implementation agencies in Uganda responsible to manage project preparation, procuring construction and overseeing construction and operation are UNRA, URC and the CAA for roads rail and aviation projects. It is required of agencies to establish appropriate execution governance arrangements. It nominates a project sponsor (i.e. a responsible officer), likely to be the head of the agency or head of the relevant department who fill this role ex officio. The sponsor consolidates monitoring reports periodically for each project. A complex, novel or particularly large project requires a steering committee to be set up that includes non-agency role players, e.g. representatives of other ministries, local government and even development partners. A project manager is designated for each project who prepares more detailed project preparation and implementation plan and prepares inputs to the monthly monitoring reports. The main criteria for monitoring projects are cost, time and scope of work.

Evaluation of projects after completion is quite rare in Uganda - and in most countries. Such evaluations, which are described in the literature review, should be carried out to determine the extent to which the project has what was expected of it, the process intended to improve the quality of projects, being the last part of the project cycle. Recognising this, the Government of Uganda is carrying out a full mid-term evaluation of its NTMP 2008–2023 in 2018. The

evaluation is both top down from sector and sub-sector and bottom up from the project level. The output from the evaluation will help government to decide on the preparation of the next transport plan.

3.3.8. Conclusions

Based on the above analyses, it can be concluded that Uganda has made very progress in NTI planning. For each planning aspect, the following conclusions are drawn:

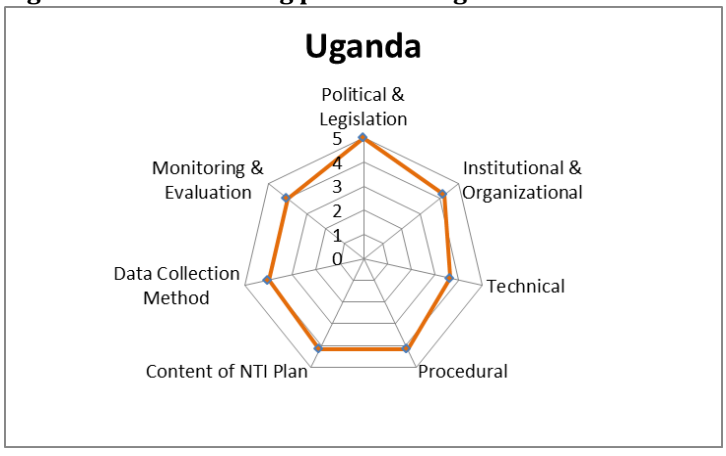
- **Political and legislation**: A draft policy made in 2014 is being updated in 2018. Legislation reforming the sector especially roads has been made.
  The National Transport Master Plan did not have any legal force other than cabinet approval so that compliance with it was weak. The NTMP is a product of IFI intervention and may not have been produced endogenously. The NTMP enabled IFIs to contextualise their investments.
- **Institutional and organizational**: The MoWT is responsible for producing national transport plans. The weakness in the NTMP is the lack of capacity to implement it, consequently less than 50% of the its 70 specific objectives have been addressed, according to the on-going mid term evaluation.
  Autonomous organisations produce sub-sectoral plans for road, rail and air. Councils produce plans for local roads and public transport. Transport planning agencies are not multidisciplinary and cross sectoral, and this causes problems in preparing plans that meet their multivarious objectives. Generally, transport planning agencies are autonomous authorities such as UNRA, URC and the Kampala City Council. Importantly no transport planning agencies have adequate authority to raise funds for investments, which is done through the Ministry of Finance. There is very little private funding of transport investments. Plans have not been aligned to fiscal space.
- **Technical**: There appears to be no systematic basis for prioritizing projects. There is no national traffic model. Traffic forecasts are made for each project and are normally too high.
- **Procedural and financing**: Transport planning is highly centralised, but transport planning agencies do not really have adequate capacity to prepare plans relying totally on outsourcing to consultants. Academia was not involved in the transport planning process, which is a waste of intellectual resources. All plan making is outsourced to consultants. Companies that do feasibility studies also do the design and this is conflict of interest. 55% of the funding comes from IFIs who have a positive influence on planning processes. The transport sector has the largest allocation of public expenditure.
- **Content of NTI Plan**: The NTMP was output based, that is to say reporting on the number of km of roads, number bridges and interchanges that should be built, the plan was not interested in outcomes in terms of meeting demand, level of service, reduction in accidents and improvement in human development and this is a weakness.
  The questionnaire response indicates a large measure of positiveness, the current study does not entirely concur with the levels attributed and this substantiated with the findings of this study and also the mid-term evaluation of its NTMP being carried out in 2018.
  In summary the current transport plan if Uganda is contemporary and so is mostly relevant and meets to needs of the nation.

The current NTMP is not complaint with the sustainable development goals as it predated them. Transport legislation is not as comprehensive and contemporary as it should be nor is transport legislation adequately enforced. The plan did not include non-motorised transport nor was the plan kept current through a revision process.

- **Data collection**: Has identified 18 Golden Key Performance Indicators about which data is collected. Data for plans and projects are collected as needed by consultants and traffic forecasting varies with each project as there is not national transport model.
- **Monitoring and evaluation**: Annual sector performance reporting carried out. Monitoring is exercised by UNRA for roads. No agency carries out evaluation.

The response to the planning questionnaire also shows a similar trend where the political and legislative factors being the strongest aspect, while technical factors the weakest.

Figure 26: NTI Planning practice in Uganda



Source: Fimotions

3.3.9. Policy Recommendations

The policy recommendations emanating from the Uganda Case Study are as follows:

- A transport policy is needed
- Both policy and plans should be produced organically,
- Transport plans should be annually revised to keep it up to date and maintain relevance
- Plans should be mandatory and have legal force which should emanate from transport legislation
- Non-motorized transport should be included
- Institutions must have capacity to implement plans
- Plans should have concrete achievable goals
- Plans should be outcome not output based.
- Plans must be aligned to fiscal space
- SDGs should be mainstreamed into transport plans
- Monitoring and evaluation processes should be strengthened

3.4. Senegal

The purpose of the case study of Senegal is to present the NTI planning of one of the countries that joined OIC since its year of foundation, 1969, and to introduce analogies and differences in the context of the other case studies taken as sample.

All the information that can be found in this case study will be accurately reported in the references and have as main common source published and online data, due to the lack of field visit. The latter has, however, a valuable substitute in the questionnaires prepared by the Fimotions consulting team and finalized on March 15th 2018.

To properly contextualize the framework in which Senegal is inserted, its estimated position in the Ibrahim Index of African Governance is remarkable. In fact, this index elaborated in 2007 reflects the quality of governance in African countries, defined as the provision of the political, social and economic public goods (Mo Ibrahim Foundation, 2017). NTI planning is considered to be a key-factor in the assessment and might play an important role in the evaluation of Senegal whose position has always been fluctuating among the first ten countries.

Besides this, Senegal is well-known to be one of the West Africa's key economic and political countries, thanks to its geographical position and the role played by its capital, Dakar. In fact, the most important city in the country reaps more than one fifth of the whole population of Senegal, that was around 15 million in 2016 (World Bank, 2016).

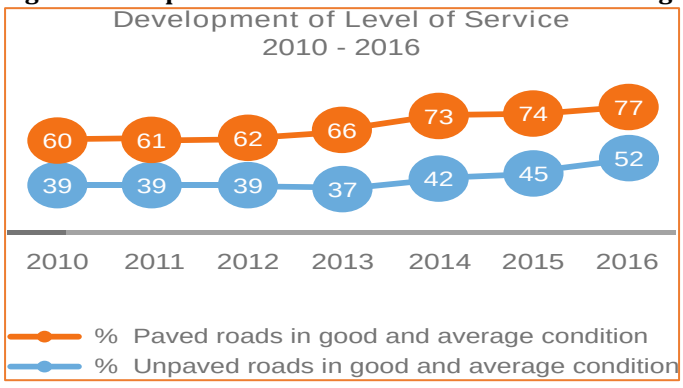
The political stability of the Republic of Senegal, that recently has also adopted a cut in the length of presidential mandate from 7 to 5 years strengthening the fairness and accountability of its system, in conjunction with economic factors, which will be object of further analysis in the next paragraphs, create an ideal field which developing transport plans can be based on.

In the context of this general introductory overview, a key-year for Senegal's economy is 2014 in which, after several years of low growth, the Government approved the Senegal Emergent Plan (SEP) with the goal to change direction to the modest-growth environment of the country and reduce poverty levels. In fact, it followed a positive period for Senegal whose economy grew by 6.5% in the last two years and made it one of the best performing countries in Sub-Saharan Africa (World Bank, 2017).

Regarding transport and infrastructures, World Bank (2013a) disclosed that Senegal was relatively behind the development of road infrastructure compared to the rest of sub-Saharan Africa, and it was not well connected to its neighbours or to its interior regions, adding that the density of road infrastructure was relatively low. In 2013, Senegal was connected with its neighbouring countries including Mali via the Dakar - Bamako corridor, the Gambia via the Dakar - Banjul corridor, Mauritania and Guinee via the Dakar - Nouakchott and Dakar - Conakry corridors. According to the Senegalese Ministry of Infrastructure, Land Transport and Disenclavement, in 2013, 66% of the paved roads was in good and average condition. Since 2013

the corridors have all been rehabilitated and the percentage of paved roads in good and average condition is 77% in 2016 and 80% in late 2017.[37]

Figure 27: Improvement of road service levels in Senegal in 2010-2016



Source : Ageroute, Annual activity report 2016

3.4.1. Political and Legislation Factors

The NTI planning in Senegal hinges on three different essential documents, National road safety Plan (Senegal, 2017), Transport Sector Policy Letter (LPST) and National Road and Motorway Master Plan (SDRAN). They can respectively be seen as a visionary long-term document and a list of concrete investment projects.

As part of the fight against road safety, the Road Transport Department has set up a strategy and road safety plan in Senegal. 38 The proposed actions are also part of the context of the Road Safety Decade (2011-2020), in which Senegal is engaged. These actions are being implemented in particular in the areas related to the establishment of an autonomous entity in charge of security, the modernization of the system of management of transport tickets through a computer system more successful and reliable, the revision of the laws and regulations materialized by the re-reading and recasting of the Highway Code, among others. An evaluation of the national road safety plan is included in the activities submitted to the Autonomous Road Maintenance Fund (FERA) to estimate the level of implementation and possibly reframe the objectives. The action plan also included an activity on the organization of trainings in road safety auditing in order to be part of the dynamics of Directive N°13/2009/CM/WAEMU (West African Economic and Monetary Union) establishing the Road Safety Audit. In WAEMU member states determining the future of road infrastructure in terms of security.

Furthermore, to draft a chronological storyline of the former LPSTs and assess the political and legislation factors for NTI plans in Senegal, the most recent LPST, with a timeframe 2016 to 2020 (LPST 2016-2020, 2016) is referred. The first LPST was elaborated in 1990 with the purpose to relaunch the transport system in Senegal after a long period of adjustment. In particular, the situation was mainly characterized by

- Bad condition of every kind of infrastructure in all sectors, especially in roads

[37] This information is provided by the Senegalese Ministry of Infrastructure, Land Transport and Disenclavement in 2018.
[38] This information was provided by the Senegalese Ministry of Infrastructure, Land Transport and Disenclavement in 2018.

- Inadequate investment plans
- Inefficiency of public institutions and inadequate regulatory framework in many subsectors
- Exclusion of the private sector from the management and financing of investments, intervening only in the execution of studies and works

The second LPST, adopted in 1998, denoted continuity with the goals of the first one and consolidated its processes of improvement of infrastructures. The most relevant themes were

- The creation of autonomous public agencies, some of them already active: Autonomous Agency of Road Works (AATR) and National Agency of Civil Aviation (ANACS) and others yet in development, being FERA National Agency of Maritime Affairs (ANAM) and National Agency of Meteorology of Senegal (ANAMS)
- Involvement of the private sector in management and financing through PPP and public service concessions (Dakar-Bamako Rail Line, Dakar-Ziguinchor maritime link, Dakar container terminal, toll motorway)
- The introduction of new financing methods such as the bond issuance for the extension of the Dakar Container Terminal
- Modernization of the legislative and regulatory framework in all subsectors (Civil Aviation, Merchant Marine, Land Transport)
- More attention to safety and security issues, as well as environmental management

At the end of the second LPST, most of the bullets above mentioned had not been achieved yet and those of the first LPST were far from that, too. The efficiency of the public institutions had large room for development, as well as the improvement of the services, the state of the infrastructures and the PPP. Up to now, however, this latter topic has been further developed and at the Ministry of Infrastructure, Land Transport and Disenclavement the level of involvement of private sector in transport planning decision making is accounted to be high.

The third LPST had been planned for the five-year program between 2010 and 2015 and had the same commitments as a project funded by Partenaires Techniques et Financiers/PTF (in English: Technical and Financial Partners) and the PATMUR (Support Project for Transport and Urban Mobility).

The above mentioned ANAM was created to take charge of the operational activities of maritime affairs and secondary ports. Also, the FERA (Autonomous Road Maintenance Fund) was finally instituted and, in conjunction with it, an Autonomous Road Fund was set up. It has introduced a "road user fee" that ensured the financing of the road maintenance.

In the period between 2005 and 2013 additional institutional and political reforms were enacted. It is in 2005 that the second-generation road fund FERA was established. Contemporaneously, they proceeded in restructuring the road agency AATR in 2000 and renamed it Ageroute (Road Works and Management Agency) in 2010. From that time on, Ageroute has the task to supervise modernization and maintenance of the road network. The management of the rural road network, though, was delegated to local authorities (European Commission, 2016).

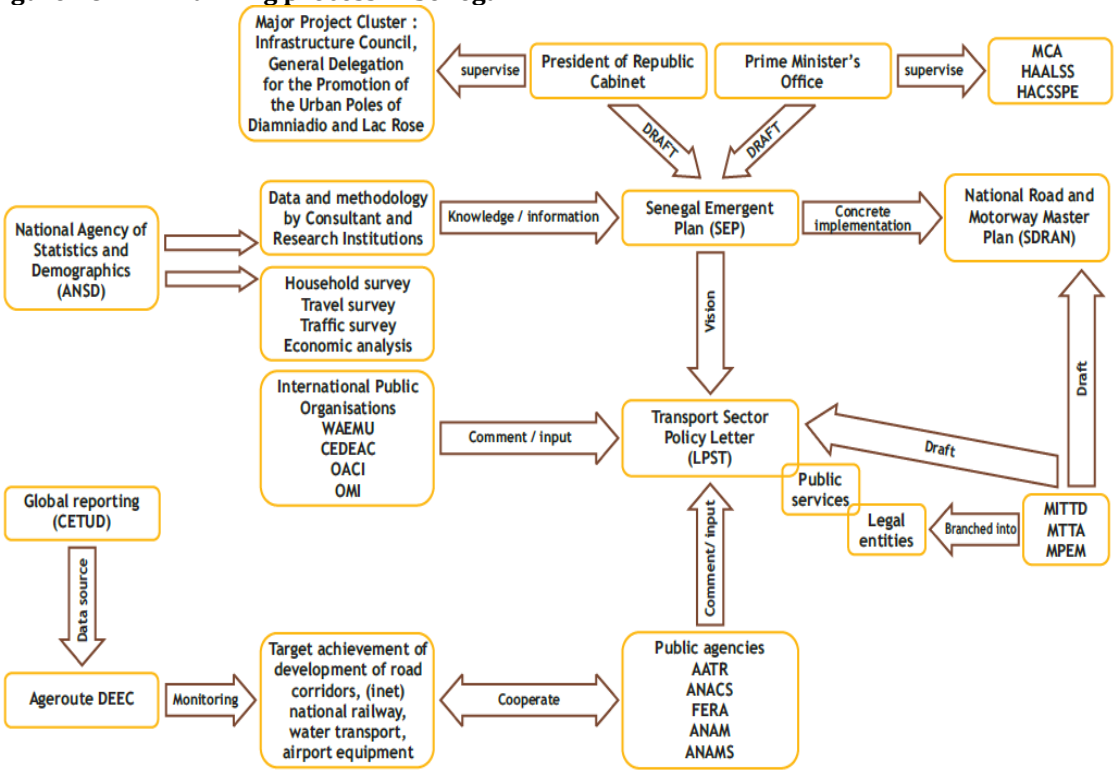
The development of the fourth LPST 2016-2020 presents some singularities compared to the previous ones. It was developed by the Ministry of Infrastructure, Land Transport and Disenclavement (MITTD), however, not as an implementation of a financing convention formerly stipulated or of a project financed by the PTF. In fact, it complies with the guidelines provided by the WAEMU in the framework of public financing project in the subject of infrastructures, which use multi-year programming instruments to formulate national and international strategies and translate them into objectives and programs. At the same time, it is part of the process of operationalizing the strategic axes of the SEP, which comprises the national strategy.

3.4.2. Institutional and Organizational Factors

As seen in the descriptive section, the distinction mentioned above among the institution of different ministries has a major role both in developed and developing countries. So it does in Senegal, where the government agencies are structured according to thematic classifications (Christensen and Lægreid, 2006).

The transport infrastructure planning process in Senegal is summarized in the following diagram.

Figure 28: NTI Planning process in Senegal



Since September 2013, the public administration of the transport sector is mainly divided into three ministries: Ministry of Infrastructure, Land Transport and Disenclavement (MITTD), the Ministry of Tourism and Air Transport (MTTA) and the Ministry of Fisheries and Maritime Economy (MPEM). There follows a table that summarizes the repartition of powers among the three ministers.

Table 13: Organization of the public administration of the transport sector in Senegal

MITTD	MTTA	MPEM
• **Deal with road and rail infrastructures, ensures their quality and ensures easy access by road to all areas of the country.** • **Ensures the functionality of the crossing structures (bridges, bins ..) and tracks, particularly at the level of rural areas, as well as the coherence of infrastructure networks and public facilities for better support of needs populations.** • **Implements urban and inter-urban transport policy.** • **Responsible for the development of national and international railway traffic** • **Ensures the facilitation of transit along WAEMU priority interstate road corridors.** • **Develops the intermodality policy and oversees the development of multimodal rail and port platforms.**	• Ensures the control of air transports and ensures their development and security. • Responsible for the quality and proper functioning of all airport infrastructures. • Makes the networks of infrastructure and airport equipment consistent for a better quality of service.	• Ensures the enforcement of the merchant navy and all the structures, in charge of shipbuilding and naval maintenance. • Oversees developing port infrastructures and in particular secondary ports.

Source: LPST 2016-2020 (2016)

The ministry's structure is expected to evolve in time to focus more on policy, legislation, regulation and strategic planning and devolve or spin out implementation to autonomous agencies, parastatals and local government.

In the three ministries, the transport management system is branched into central public services (cabinets, directorates, cells) responsible for planning, regulation, monitoring and control missions; and legal entities with administrative and financial autonomy (Public Establishments (PE), National Societies (SN), Agencies, etc.) that carry out operational management activities.

For this reason, in the framework of the institutional response in transport planning, Senegalese plans are said to be vertically driven. Senegal lacks the presence of an integrated land use and transport planning authority, and planning is therefore vertically driven by the central government through the different ministries and departments and services. This procedure is not limited to the division in three ministries already provided, and it also involves other services that include transport-related tasks in their missions. Furthermore, Senegal authorities have sufficient capacity in terms of qualified and skilled transport professionals in NTI planning.

As an example, the Millennium Challenge Account Senegal (MCA – Senegal), the High Authority of the Léopold Sédar Senghor Airport (HAALSS), the High Authority for the Coordination of Maritime Safety and Protection of the Marine Environment (HACSSPE) report to the Prime Minister's Office. The case of the MCA – Senegal is emblematic because its final objective is to accelerate growth to reduce poverty. To do so, the fund has, among its intervention sectors, transport with the aim to rehabilitate strategic roads to open up socio-economic areas and contribute to the development of a network of cross roads. This will lead to open up areas with high production potential and allow more open access to markets.

On the other hand, Major Projects Cluster (Infrastructure Council, General Delegation for the Promotion of the Urban Poles of Diamniadio and Lac Rose) report to the Presidency of the Republic's Cabinet. Furthermore, other ministries (beyond the three charged with infrastructure and transportation, MITTD, MTTA and MPEM) have tasks, related to its primary mandate, concerning NTI planning for the management and planning of transport sectors. Related ministries are the Office of the Minister in charge of Monitoring the SEP; the Ministry of the Home Affairs and Public Security (National Police); the Ministry of the Army Forces (National Gendarmerie and Navy); the Ministry of Economy, Finance and Planning; the Ministry of African Integration, New Partnership for Africa's Development (NEPAD) and the Promotion of Good Governance; the Ministry of Investment Promotion of Public-Private Partnerships and the Development of Government Teleservices (APIX) (LPST 2016-2020, 2016).

Besides the national borders, there are also sub regional and international public organizations that Senegal is member of and that play an essential role in the administration of the infrastructure sector. In primes, the West African Economic Union (WAEMU) and the Economic Community of West African States (ECOWAS) prescribe that community regulation should be transposed to the national level. This is also confirmed by the Ministry of Land Transportation and Infrastructures (2018), who attributes a high importance to the extent of implementing the ratified international agreements into Senegal's transport planning. This occurs even though international transport related agreements have low influence on planning of national transport infrastructure.

The International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) ensure the monitoring and control of compliance with international safety and security standards, whose application in Senegal is an essential factor of economic competitiveness at international level.

As it can be seen by this brief overview of institutional and organizational factors, Senegal lacks the presence of an integrated land use and transport planning authority.

The development of mandates, vision and mission statements is the major part of the SEP that provides direction for the management of the transport sector and is seen as a strategy of rupture whose implementation shall put Senegal on a new trajectory of economic and social development in order to realize the vision of "An emerging Senegal in 2035 with social solidarity and the rule of law" (LPST 2016-2020, 2016).

The SEP is structured as follows

- A twenty-year vision

- A ten-year strategy 2014-2023 that determines the orientations and objectives to be achieved
- Sectoral policies that specifically implement the strategic axes with strategies, objectives, priority lines of action, means of implementation and performance indicators
- A five-year (2014-2018) priority action plan (PAP) that aligns the strategic orientations, sector objectives and action lines
- Projects and programs that are subject to programming in the rolling three-year Public Investment Program (PTIP).

The 2014-2023 10-year SEP Strategy is based on the following three pillars (LPST 2016-2020, 2016):

- Pillar 1: Structural transformation of the economy and growth
- Pillar 2: Human Capital, Social Protection and Sustainable Development
- Pillar 3: Governance, Institutions, Peace and Security

For pillar 1, an efficient transport sector is needed to support the transformation of the structure of the production apparatus and growth, to increase the market share of horticulture, building materials and tourism. Export growth that is associated with the structural transformation of the economy must necessarily be supported by quality transportation infrastructure and services. Conversely, the development of quality goods transport infrastructure and services in all modes and their profitability is highly dependent on a better balance of goods flows and hence on export development. The diagnosis of the current situation of the sector has revealed a significant imbalance between the physical flows both in terms of foreign trade and internal trade which results in high service costs (large empty returns, overloads, percentage of empty containers important to PAD).

In addition, the development of the mining resources sector, essential to make Senegal a regional industrial logistics hub, due to its position as West Africa's gateway for corridors, necessarily involves a better integrated and more competitive transport system. The same applies for the multi-service hub that aims to make Dakar the regional platform for the headquarters of companies and international institutions and the core for health care, education and leisure, besides being a tourist destination of reference.

About pillar 2, the extension of access to basic social services, especially to quality education and health care, requires investments to bring equipment closer to the population, but transport support is still always needed.

The transport sector is very much concerned by the third pillar and particularly by the establishment of strong institutions. Indeed, the diagnosis of the transport sector has shown the weak capacities of the public institutions and a lack of professionalization of the actors.

For SEP implementation to be successful, there had been addressed fourteen challenges, five of them are related to the transport sector:

- Control of factors of production;
- The gradual modernization of the informal economy;
- The correction of territorial disparities and social inequalities as well as the protection of vulnerable groups;

- The reduction of the infrastructure deficit to open up and strengthen regional interconnection;
- Improving Governance and Establishing a Successful Public Administration.

There is no doubt, therefore, that the transport sector must occupy an important place in the SEP so that the main objectives of the three pillars mentioned can be achieved.

3.4.3. Technical Factors

As part of the study, the analysis of technical factors has a major role in NTI planning. In particular, it is worth to observe if Senegal uses an integrated approach of policy and transport modes as described above. The integration of policy aspects such as land use and multi-modal transport logistics is crucial for more sustainable planning outcomes.

Regarding transport performance, the system of roads in Senegal is one of the most developed in West Africa and almost all the roads are paved and connect all major towns. The importance of the capital, Dakar, is also shown by the fact that it is the endpoint of three different routes in Trans-African Highway Network that links it respectively with Cairo, Ndjamena and Lagos.

The road network is ordered hierarchically considering the demographic and socioeconomic criteria. There are seven national roads prefixed with "N" and numbered from 1 to 7. They provide link between the regional capitals and localities of national/international interest. Secondly, there are regional roads (R) that connect department capitals or towns of regional interest. The departmental road (D) provides the link between the district capital or towns of interest for the department. Finally, the remaining roads are classified as urban road (VU).

From surveys and questionnaire responses the level of holistic planning in transport sectors in Senegal, in terms of the integration among various aspects such as land use, multi-modal transport logistics and communication plans is reputed high. Respondents included ministerial and academia/private institutions. However, the bias is the common one for this kind of data, and the response is a relative one. In addition, lacking a benchmark and measures it is tough to properly define the benefits from holistic and integrated planning. As an example, the relative insignificance of waterways transport have been already mentioned. Nonetheless, geo-political importance of the Port of Dakar, the only significant maritime transport way, will lead interviewees to consider the extent of complementarity of road, rail, air and water-based transport modes as high, interpreted in the sense of interacting rather than competing.

In terms of the application of socio-economic evaluation/cost benefit analysis in transport infrastructure planning to prioritize projects, it is a mandatory requirement. It is also mandatory that the technical and implementation studies of transport infrastructures include an Environmental and Social Impact Assessments. In the context of the analysis of the project on going, the results of these assessments have an important role and condition the decision-making process and the financing decision by institutions. In Senegal, the environmental impact study is regulated by the Environmental Code (Law No. 2001-01) and its implementing decree (No. 2001-282). The Environmental Code states in the article L48 that "any development project or activity likely to harm the environment, as well as the policies, the plans, programs, regional and sectoral studies will be subject to an environmental assessment."

The main issue concerning environmental aspects in infrastructure projects, shared by the Central and Territorial Administration as well as by local authorities, is the consideration - explicated in the Environmental Code – to protect biodiversity, culture and the quality of life of agents and populations close to road infrastructure.

The purpose of the environmental impact assessment is to determine the damages caused by the construction of the infrastructure in order to protect and preserve the natural basic resources for life (water, soil, air, forest and landscape), to optimize the land use, to preserve the heritage and the wellbeing of the man. It aims to minimize the negative impacts of human activity while maximizing the positive impacts of the projects implemented.

3.4.4. Procedural Factors and Financing

The complexity of NTI plans is shown in Senegal by the presence of two different documents being useful for the draft of this plan whose role, according to the responses to the questionnaire, is respectively being a visionary long-term document, Transport Sector Policy Letter (LPST), and a list of concrete investment projects, National Road and Motorway Master Plan (SDRAN).

This peculiarity in the NTI plan of Senegal does not allow us to include it with certainty in one of the three levels of NTI planning mentioned in the descriptive part. Despite the fact that Senegal is a developing country, it does not comply with the standard NTI plan that is usually limited to a chapter or a paragraph of the National Development Plan.

The purpose of the SDRAN is to implement the road and highway network throughout Senegal under its indications to carry out the Development Plan (SEP).

Financing

The financing of road infrastructure projects in Senegal is provided by several sources. The main one is the national budget, followed by resources from development partners and funds obtained from financing with the private sector in the framework of PPP. Finding adequate funding is a challenge.

The most important part of financing transport infrastructure in Senegal is provided by resources from multilateral or bilateral lenders.

Within the framework of the three-year Public Investment Program (PTIP), 2015-2017, 73.6% of planned investments in the tertiary or service sector are destined for road transport.39 In the same program, tertiary sector infrastructures are financed 43% by the national budget and about 57% by lenders. The importance of road transport sub-sector has been already pointed out along the case study and it confirms the Senegal's choice to pursue the policy of improving road infrastructure, but also rural roads, to ensure the opening of the country both inside the borders and externally.

[39] 73.6% is destined to road transports, 2% to commerce, 2.6% to tourism, 9.1% rail transport, 5.7% air transport, 3.1% maritime transport, 2.7% posts and telecommunications, 1.1% institutional support and assistance. (Source: DIRECTION DE LA COOPERATION ECONOMIQUE ET FINANCIERE (DCEF)/Ministry of Economy and Finance - MEF)

The annual repartition of investments under the SDRAN has been gradually based on the importance of the funds to be used during the period of completion of infrastructure projects. The annual rates adopted in the SDRAN financial scheme, in line with those used in the financing of PES infrastructure projects, are as follows:

- First year: 10%
- Second year: 14%
- Third Year: 20%
- Fourth Year: 24%
- Fifth year: 32%

From discussions and surveys, the level of consultation and stakeholder participation in NTI planning that includes other sectors other than transport planning institutions is reputed high. The inclusion of assessment of transport user needs (market survey/research) to shape the transport agenda is accomplished with respect to the actual involvement of the road user. This peculiarity will be deepened in the context of data collection and surveys. However, the extent to which transport investment decision making includes the assessment of users' affordability is reputed to be still low and needs further development in Senegal. On the other hand, the extent of private funding of transport services and infrastructure is estimated to be high and this was already highlighted in the recent development of the interaction between public and private sectors. The examination of alternative solutions included in planning procedure in order to come up with optimized investments decisions has a relevant importance in the matter of procedural factors in Senegal.

3.4.5. Content of NTI Plan

The NTI plan for Senegal can be concretely found in the investment projects explained in the National Road and Motorway Master Plan (SDRAN). It divided the twenty-year horizon from 2015 to 2035 in four five-year periods and it highlights the main objectives to be achieved in each of these periods.

Table 14: Investment projects explained in the National Road and Motorway Master Plan (SDRAN)

FIVE-YEAR PERIOD	MAIN PROJECTS	OVERALL PROJECTS INTERVENTIONS			INVESTMENT COSTS (CFA Franc billion)	FUNDING ALLOCATION	
		Paved Roads (km)	Unpaved Roads (km)	Bridges (m)		Government-funded (43%)	Investors (57%)
First Quinquennium (2015 - 2020)	48 Projects Planned by Ageroute	**2,363**	**302**	**4,993**	**1,948**	**838**	**1,110**
Second Quinquennium (2020 - 2025)	Completion of four motorway projects. Enlargement to 2x2 lanes or the rehabilitation/ asphalting of	**2,782**	**0**	**5,057**	**1,842**	**792**	**1,050**

	sections of national roads. Rehabilitation or construction and asphalting of regional or departmental roads.						
Third Quinquennium (2025 - 2030)	Highway project (Kaolack-Tambacounda). Rehabilitation or asphalting of link-roads for national roads, regional and departmental roads.	**4,589**	**0**	**0**	**2,351**	**1,011**	**1,341**
Fourth Quinquennium (2030 - 2035)	Two highway projects Tambacounda - Ziguinchor and Kaolack – Ziguinchor. Expansion of national roads with an additional lane. Rehabilitation and asphalting of regional and departmental roads.	**2,065**	**0**	**0**	**2,137**	**919**	**1,218**
TOTAL					**8,278**	**3,560**	**4,718**

Source: Fimotions based on SDRAN, 2016

According to respondents to the questionnaire that was part of this study, the NTI plan (SDRAN) does not sufficiently cover all modes, and could be improved on this aspect.

3.4.6. Data Collection Method

From discussion and questionnaire responses, the adequacy of information to formulate plan is reputed to be average, not too high nor too low. Furthermore, the comprehensive land use and transport data collection takes place periodically.

Generally, there are limited data available on transport services and they refer to infrastructure management more than transport regulation. Transport regulation mainly mirrors only opinions from transporters' unions. For this reason and for the phases of data collection, analysis and management of specific transport sectors, the Department for Transport in the

MITTD is reputed to be weak (European Commission, 2016). Commercial entities do not release data for use in transport planning, according to respondents to the questionnaire that was part of this study.

For a complete analysis of data collection method, it is very useful to refer to the final report drafted by the Japan International Cooperation Agency (JICA) in 2012. Despite the distance in time which could be playing a relevant role in a time of fast changes as the present one, methods and procedures as the ones currently used will be assumed.

The collection and analysis of basic data involves socio-economic and transport sectors that include also trading, industry, business investment and physical distribution industry trends. Additionally, they are also widely used surveys to determine the actual status of traffic and physical distribution. The main source of this procedure is the National Agency of Statistics and Demographics (ANSD) that collects and elaborates data belonging to sectors.

The Road Works and Management Agency (Ageroute) is responsible for the implementation of road data management. Among its ambitions there is also the automation of traffic counts (European Commission, 2016).

It is however essential to keep in mind the general fallacies of survey methods such as that the sequence of questions can influence answers, and the very common problems of sample size bias and sample credibility bias.

Once more, data from a survey were used for another study. In particular, data from two household travel survey helped to analyse the changes in daily mobility patterns in Dakar. The data were funded by the Executive Board for Public Transport in Dakar (Executive Council of Urban Transport of Dakar, CETUD), which is a public agency created in 1997 in order to implement and monitor policy for the public transport sector in the region of Dakar.

It is the same institution that coordinates public services and had been complemented by the introduction of a private public consortium, the Dakar Dem Dikk (DDD), to help managing the increasing transport demand in the capital. To assess the demand for public transports, an innovative study (Wang, 2015) used mobile phone data. They were collected from a mobile phone operator, combined with official data from public transport services.

3.4.7. Monitoring System

The monitoring and evaluation programs are useful to build strategic program with a maximum impact. A rigorous program is essential for prioritizing policy and regulatory actions. The importance of monitoring and evaluation was experienced first-hand by Senegal. In fact, due to the weakness of monitoring and evaluation programs in transport projects undertaken under the Urban Mobility Improvement Project (UMIP) and others financed by the World Bank, it was not possible to report data on key performance indicators wholly and this led to the unavailability of a feedback that could have informed for mid-course corrections. Currently, however, the situation has been improved and the extent of coordinated, comprehensive and regular reporting on plan implementation is reputed to be high.

The SEP is subject to a Committee that is responsible of its implementation and monitoring, the Committee for Strategic Orientation that operates under the authority of the President of the

republic. There is also an Observation and Monitoring Office that measures and evaluates the results of SEP implementation.

According to the African Development Fund report of 2014, the Ageroute monitors the implementation of the various project components. To do so, it has also set up a road data management. It is assisted by the Directorate of the Environment and Classified Establishments (DEEC) and its regional division for monitoring the implementation of the Environmental and Social Management Plan (ESMP). There can also be an external consulting firm in charge for the monitoring and evaluation of the socio-economic impact of the project. The extent of independent objective reporting on a plan effectiveness, in order to evaluate whether the implementation of the plan is effective on achieving the expected results, is considered to be high.

To analyse an example of ex-ante evaluation, the project of Road Improvement and Transport Facilitation Program on the Southbound Bamako-Dakar Corridor under EPSA for Africa, implemented in Senegal in 2006 are considered. It is relevant to mention in the Project Description the wide space reserved to the environmental and social consideration. It has already been seen throughout the whole case study the importance that Senegal devotes to these factors and that is confirmed also in this case. From the questionnaire, it also emerges that the extent to which the plans have achieved the goals and objectives as set at the time of launching the plan is high, although there is still room for improvement when it comes to efficiency of implementation, monitoring of the implementation and evaluation of the NTI process.

The results of the questionnaire also point at the need to improve the education of monitoring and evaluation in tertiary education in Senegal.

3.4.8. Conclusions

- **Political and legislation**: There is a strong public-sector support. There is a high inclusion of ratified international agreements in NTI planning, mainly coming from organization such as the ADB, WAEMU, CEDEAC, OMI, OACI. The indications of the regional and sub-regional organizations – such as Program for Infrastructure Development in Africa (PIDA) and the Regional Infrastructure Development Master Plan of the Economic Community of West African States (ECOWAS) – and the integration with neighbouring countries via the corridors are taken into account as inputs in the planning of national transport infrastructure. As far as the Road Safety Management is concerned, it lacks consistency with respect to the training of agents auditing new road projects.
- **Institutional and organizational**: The public administration of the transport sector is branched into three ministries (MITTD, MTTA, MPEM). Each of them is responsible for sub-sectoral plans and targets. Concrete objectives deduced from the Senegal Emergent Plan can be found in the SDRAN. National Transport Plans refer also to a visionary long-term document, the LPST. The collaboration between public agencies and international public organizations is fundamental.
- **Technical**: The SDRAN focuses more on road and railway transport infrastructure and does not include non-motorized transports. The integration with land use planning and the complementarity of different transport modes are crucial for the tasks of the National Agency for Land Development (ANAT). ANAT performs the tasks of the Directorate of

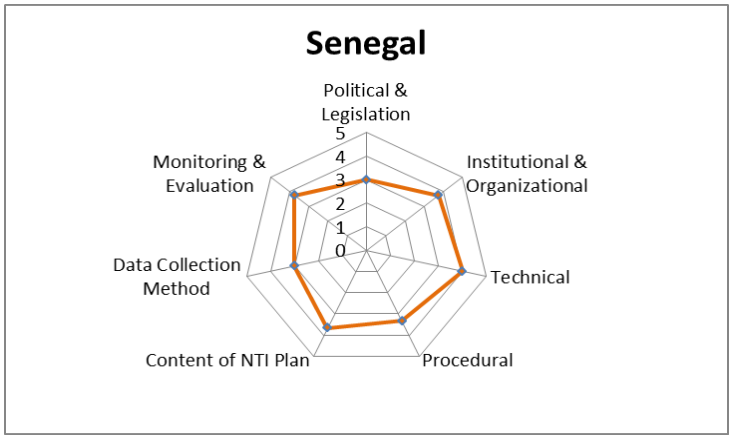
Spatial Planning (DAT). Its main tool for Land-Use Planning is the National Plan of Development and Land Development (PNADT).
The integration with land use planning and the complementarity of different transport modes are crucial. Infrastructure planning are also highly subject to socio-economic evaluation and cost-benefit analysis in order to provide prioritization.

- **Procedural and financing**: Transport planning is centralized mainly coming from President of Republic and Prime Minister's Office. However, there are three ministries involved first hand in the infrastructure sector (MITTD, MTTA, MPEM). There is a close collaboration among public agencies (AATR, ANACS, FERA, ANAM, ANAMS) and the private sector is highly involved in transport planning decision making.
- **Content of NTI Plan**: The concrete implementation of targets is embodied in the SDRAN. However, this does not include non-motorized transports and it can be considered output based. It reports all the objectives set for building and rehabilitation of paved and unpaved roads, specifying number of kilometres. Same for motorways and highways and (inter)regional corridors. Through the SDRAN (but also LPST) there are outlined targets in terms of meeting demand and the use of econometrics models to forecast demand is high. The application of scenario, financial and socio-economic analysis makes it a strong aspect.
- **Data collection:** Data for plans and projects are collected as needed by consultants and research institutes also through surveys of various kinds (household, traffic, travel). The main source is the National Agency of Statistics and Demographics (ANSD) and additionally global reports and data collection funded by CETUD.
- **Monitoring and evaluation**: The monitoring and evaluation system has been developed rapidly in the recent years. The establishment of the Committee for Strategic Orientation and of the Observation and Monitoring Office for monitoring and evaluating the implementation of the SEP – which is concretely implemented through the SDRAN and gives the vision to the LPST – is a significant proof of the recent further steps pursued. In addition to this, Ageroute and DEEC are responsible of other actions of M&E.

In summary, the good performance of the tertiary sector in Senegal in the last years was mainly determined by the beneficial dynamism in relevant sectors that include telecommunication, transport and financial. The five-year plans, despite covering infrastructure investments in all the kind of transport infrastructure (road, rail, air and sea), mainly focus on ground-based roads with focus on urban transport. Concerning urban transport, the optimal policy would be to incentivize a modal shift from cars to high quality public transport services, which is required to solve the congestion issue in a sustainable way. Special attention is also given to facilitate trade along key corridors to support the regional growth poles. The direction that plans and summits are working towards is to promote sustainable urban mobility in Western Africa. The main aspects considered are the social dimension of car ownership, the link between land use, urban density and transport development in African cities and the peculiarities of governance. The main challenge stands in finding the right balance between private and city-government services. In fact, the widespread liberalization in the past decades limited the ability of governments to offer attractive services and to shape urban development.

The response to the planning questionnaire (as shown in Figure 29) shows that Senegal is in a phase of progress in transport infrastructure planning. Despite being in around the average among the African case studies for what concerns political and legislation factors, these are relatively to the questionnaire response the weakest aspect, in conjunction with the collection of data. The strongest aspect, according to the respondents, is the technical factors.

Figure 29: NTI Planning practice in Senegal



Source: Fimotions

3.4.9. Policy Recommendations

Based on evidence and analysis provided, following policy recommendations are suggested:

- The NTI plans should aim to provide a long-term multi-modal reference document giving a comprehensive framework within which consistent plans for individual modes can be developed.
- The NTI for Senegal should serve as a key input to the overall national planning process.
- The NTI plans should also serve regional transport planning such as for the promulgation of transport corridors. Currently this part is taken into account in the documents with the programming of interventions on international corridors (PIDA and the Regional Infrastructure Development Master Plan of the ECOWAS).
- Overall the Transport Plans should set up a framework within which well-informed investment decisions can be made by both public and private sectors.
- A plan must have resources to implement, monitor and revise it so a permanent high-quality long-term transport planning capability is needed.
- The Road Safety Action Plan should be more formally consistent with an adequate training program for the agents of the Road Transport Office, whose tasks shall still comprise the regular inspections of existing road infrastructure, as it currently does, but also include the formal auditing of new projects. To do so, they shall be supplied with the necessary equipment to be well prepared for these tasks.
- The NTI plan should be subject to a strategic economic and environmental assessment.
- The Plan should have indicators based on the Sustainable Development Goals and be accordingly evaluated against them.

- Overall, the NTI plan should have mandatory force from legislation that embraces the foregoing recommendations emanating from transport policy.
- The concrete objectives are set in the SDRAN, which concerns only roads and motorways, first policy recommendation regards the inclusion of non-motorized transport in the planning.
- Plans should be outcome not output based.
- The focus of the plans should be broadened from a strong orientation to road, to the other modes.
- A stronger public-private partnership and a higher involvement of the private sector
- The subdivision of the plan in four periods of five years should be subject to an annual revision.
- Linked to the last recommendation, there should be higher flexibility in adapting when sudden deviations from initial plans occur.
- The transfer of responsibility's mandate for rural roads to local authorities has not been accompanied by a corresponding financial transfer. For this decentralization to be effective, the financial transfer is also recommended.
- Monitoring and evaluation processes should be strengthened. A parallel of the Committee for Strategic Orientation and the Observation and Monitoring Office to monitor the SDRAN and evaluate if the plan is effective for the achievement of the objectives should be implemented.

3.5. Qatar

Qatar has been chosen as case study as it has been heavily investing in transport infrastructure during the last decades. Qatar is successful in its ambitions and integrates planning of transport infrastructure with the planning of land development.

The evidence used in the case study has been obtained from published information, online information, meetings with numerous officials and academics and the responses to the questionnaires prepared by the Fimotions consulting team.

The State of Qatar, is a small peninsular country, located on north-eastern coast of the Arabian Peninsula. It borders with Saudi Arabia and the Arabian Gulf.

Qatar is amidst a staggering development that emerged about two decades ago during which it has faced a steep rise both in population and in income. Population grew from less than 600.000 in 2000 to more than 2,6 million in 2017, of which about 12% Qatari (based on Qatar Ministry of Development Planning and Statistics and IMF Statistics). The GDP grew from US$ 18 billion in 2000 to US$ 210 billion in 2014 and dropping back to US$ 155 billion in 2016, due to lower oil prices. In 2018, Qatar has the highest per capita income in the world, about 130,000 US$, based on purchasing power parity per capita. Its prosperous state is fuelled by natural-gas and oil reserves.

Parallel with the demographic and economic growth, the country has invested in its wealth, both outside the country (foreign direct investment) and within its own geography. A US$ 200 billion infrastructure program, being about 120% of 2017 GDP, is underway to diversify the economy and prepare for the FIFA 2022 World Cup, and to sustain its growth past the 2022 World Cup event. (Qatar National Bank, 2014).

The centrality of Qatar in the *international community* stands in different sectors. Being member of several organizations, among which are IBRD, IMF, International Maritime Organization, Interpol, OIC, OPEC, UN, UNCTAD, UNESCO, WHO, WMO, WTO recognizes it a central role in economic, political and cultural terms specifically in the Arab League, Gulf Cooperation Council and Organization of Islamic Conference (Qatar, 2015). This role is also confirmed in the steps beyond pursued by Qatar in international transportation matters, as on February 1st, 2018, the Turkey-Qatar Business Forum was held in Doha with the aim to promote bilateral trade and make transportation through Iraq and Iran easier (Al Jazeera, 2018).

The overall analysis of Qatar, and specifically its transports and infrastructures, hinges strongly on **Doha**, the capital. It is the most populous city in the country and within its suburbs it reaps more than half of the population of Qatar. This makes it undoubtedly the most important city, the economic centre and the most developed in the whole country. To reach this stage it had to implement an extraordinary transportation network within the last decades. Most of the expansion's projects in infrastructure subject involve Doha first-hand, such as the construction of a new airport, the development of new highways and the Doha metro that is currently under-construction.

Qatar has a *car-oriented culture*, principally due to the economic developments and the abundance of petrol products and fuels. The economic boom and the population growth have led to congestion and increasing travel times. In view of the importance of mobility and

accessibility, and the need to reduce its environmental footprint, Qatar has made the development of a solid public transportation system a high priority ambition (Qatar, 2011). This reflects a more responsible and informed approach to develop to factor in more sustainability. As mentioned in the contextual comments in the introduction. In the near term a mass transit metro system is planned with an addition of 300-kilometre rail infrastructure network that will provide an attractive alternative to private cars. Current infrastructure policies, in addition to the focus on public transport, envisage promoting *walking and cycling* by integrating appropriate facilities in new to build infrastructures and by redesigning existing roads.

3.5.1. Political and Legislation Factors

The NTI planning mainly hinges on the plans that are declared in transport documents produced at local, regional and national level. These are aligned with the goals of the Qatar National Vision 2030 (Qatar, 2008). This is the roadmap that provides the guidelines in economic, social, human and environmental development for the coming decades. The Qatar Ministry of Transport and Communication (MOTC) obviously plays a leading role in compiling the vision and strategy and the preparation of the national transport master plan. The MOTC sets out objectives aligned to the Vision to guide stakeholders of the decisions that they should make.

The Qatar National Vision 2030 (Qatar, 2008) is based on the principles of the Constitution and consultations with government institutions and experts at local and international level. It refers to the exceptional economic growth of the past period and its political progress (ratification of Qatar's Permanent Constitution in 2004). It aims at "transforming Qatar into an advanced country by 2030, capable of sustaining its own development and providing a high standard of living for all of its people for generations to come."

Qatar's National Vision 2030 rests on four pillars:

- Human Development - development of all its people to enable them to sustain a prosperous society: free and high-quality education and health care for all and increased and diversified participation of Qataris in the workforce;
- Social Development - development of a just and caring society based on high moral standards, and capable of playing a significant role in the global partnership for development (social care, sound social structure and international cooperation;
- Economic Development - development of a competitive and diversified economy capable of meeting the needs of, and securing a high standard of living for, all its people both for the present and for the future (sound economic management, responsible exploitation of oil and gas, suitable economic diversification, including a diversified economy, a knowledge-based economy and a world-class infrastructural backbone);
- Environmental Development - management of the environment such that there is harmony between economic growth, social development and environmental protection.

Qatar National Vision 2030 identifies five challenges:

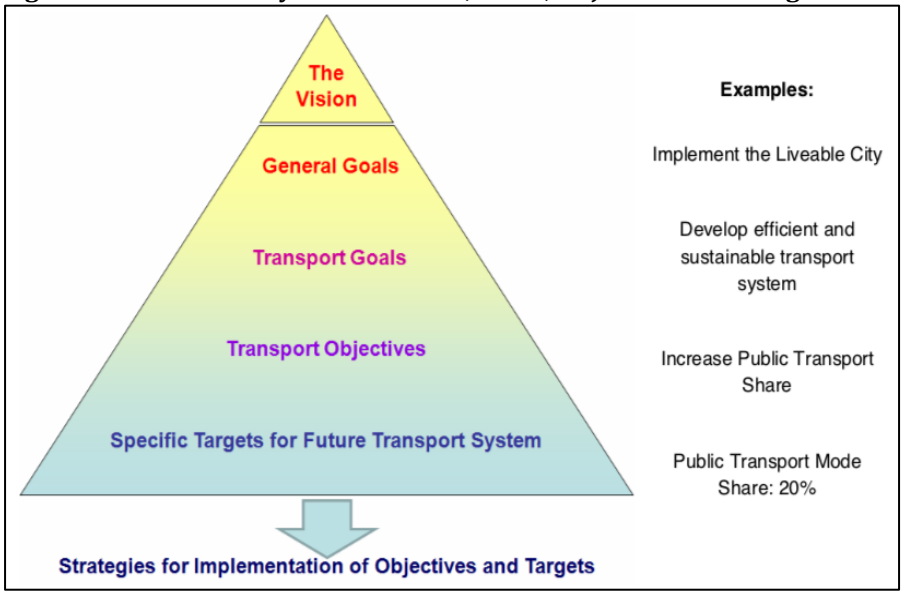
1. Modernization and preservation of traditions
2. The needs of this generation and the needs of future generations (intergenerational justice: investing wisely and prevent "tipping the environmental scales irreversibly")
3. Managed growth and uncontrolled expansion

4. The size and the quality of the expatriate labour force and the selected path of development
5. Economic growth, social development and environmental management

In 2008 Qatar started its *integrated planning process* with the drafting of the first Qatar National Vision 2030. It had set a planning horizon of 20 years. Since then every five years the plan is being revised to check on the real and concrete implementation of the objectives set. In particular, it is checked for the harmonization among national and regional plans with the same time pattern or when major changes occur. The goal for Qatar is to launch a new plan every 20 years.

In Qatar the logic of "policy first" prevails in the transport planning framework. Embedded in the overall policy plan of Qatar National Vision 2030, as seen above, there are requirements which transport plans have to rely on. Figure 30 clearly reflects this.

Figure 30: Consistent system of Vision, Goals, Objectives and Targets



Source: Qatar 2008 Transport Objectives for Qatar

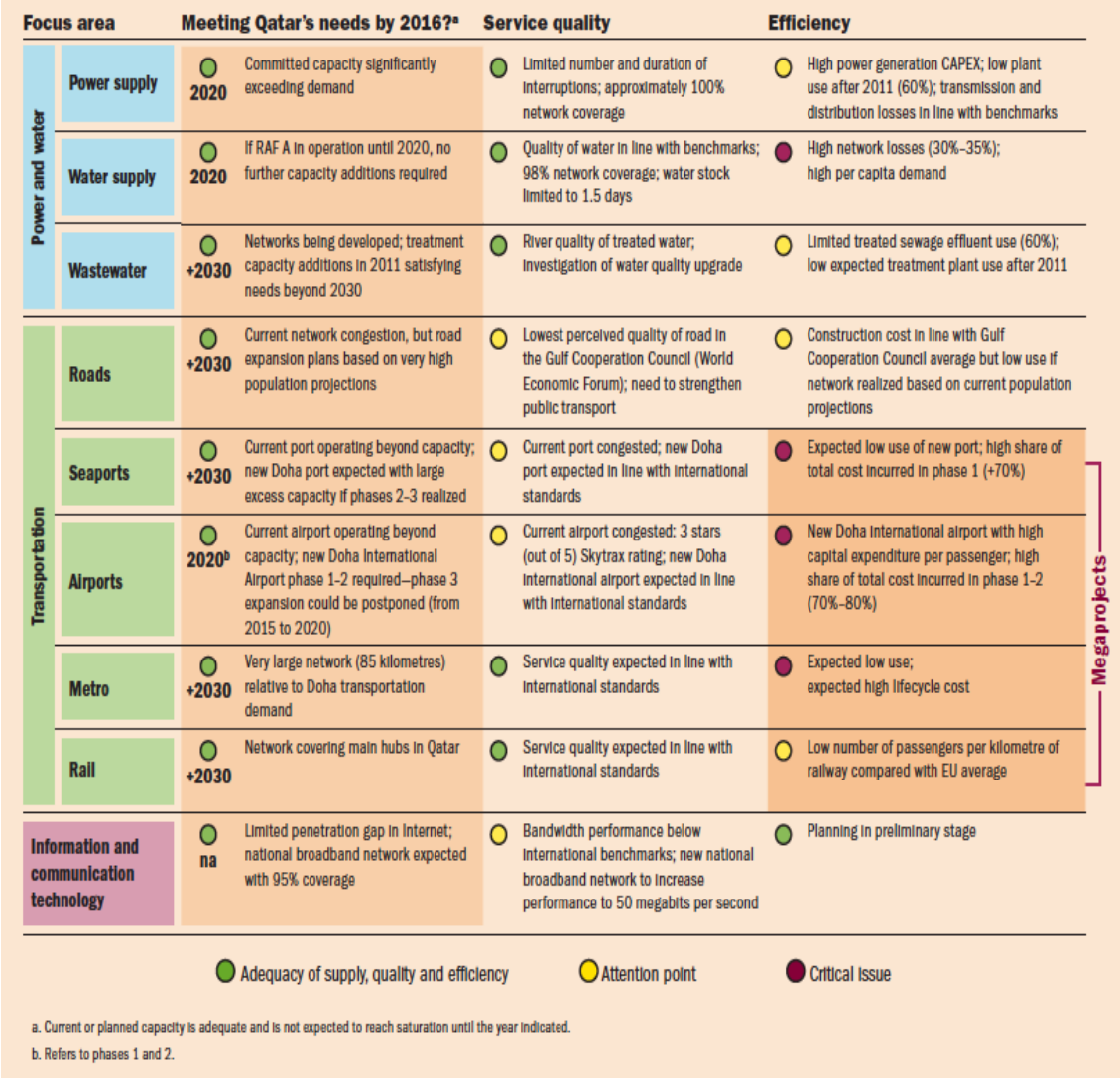
Furthermore, the government puts strong emphasis on *the needs and the future of the users* of the transport infrastructure. This information is mainly obtained through surveys (see section 3.5.6).

The development of each project involves its stakeholders, mainly consisting of Ministerial and Municipal Departments, and service providers of drainage, sewerage, water supply, cooling and electricity that are generally categorized according to their role, sector and influence in relevance to the NTI plans. Their input and requirements are considered in respect to their position and role regarding the plan. The involvement of stakeholders generally occurs through regular meetings and workshops throughout the whole preparation period of NTI plans. In Qatar, land planning (via the Ministry of Municipality and Environment) and transport infrastructure planning (via the Ministry of Transport and Communications) are well integrated.

Challenge for Qatar is keeping its growth in control and reducing its environmental footprint. WHO concludes that Qatar has the second highest levels of atmospheric particulate matter, 2.5 micrometres (PM2.5) in the world, behind Saudi Arabia (WHO, 2016). Although Doha views congestion as a high priority challenge, Doha is not in the international top 100 lists of congested cities.

Figure 31 reflects the ambitions Qatar had in its Strategy 2011, towards Qatar National Vision 2030.

Figure 31: Qatar's infrastructure in needs, quality and efficiency per 2011 (Qatar National Development Strategy 2011-2016)[40]



Source: Qatar General Secretariat for Development Planning (2011)

[40] Since 2011 much has changed in line with the growth spur Qatar made. F.e. the current state of the Roadnetwork adheres to international standards.

Planning processes are highly centralized and follow a simple structure as all funding is coming from government and is state-based. The Ministry of Finance can either approve or reject a project, once this has been assessed according to its impact. Recently Qatar added traffic impact as a new and additional criterion in its projects assessment.

The centralized and strong position of the state limits the role of private companies, whose impact is of minor importance. However this is about to change as the Qatar government is transiting to a PPP model where finance and risk borne by the state are reduced to 70%, from the original 100%, opening doors to private parties. Aim of this transition is to accelerate developments and to reach the national objectives.

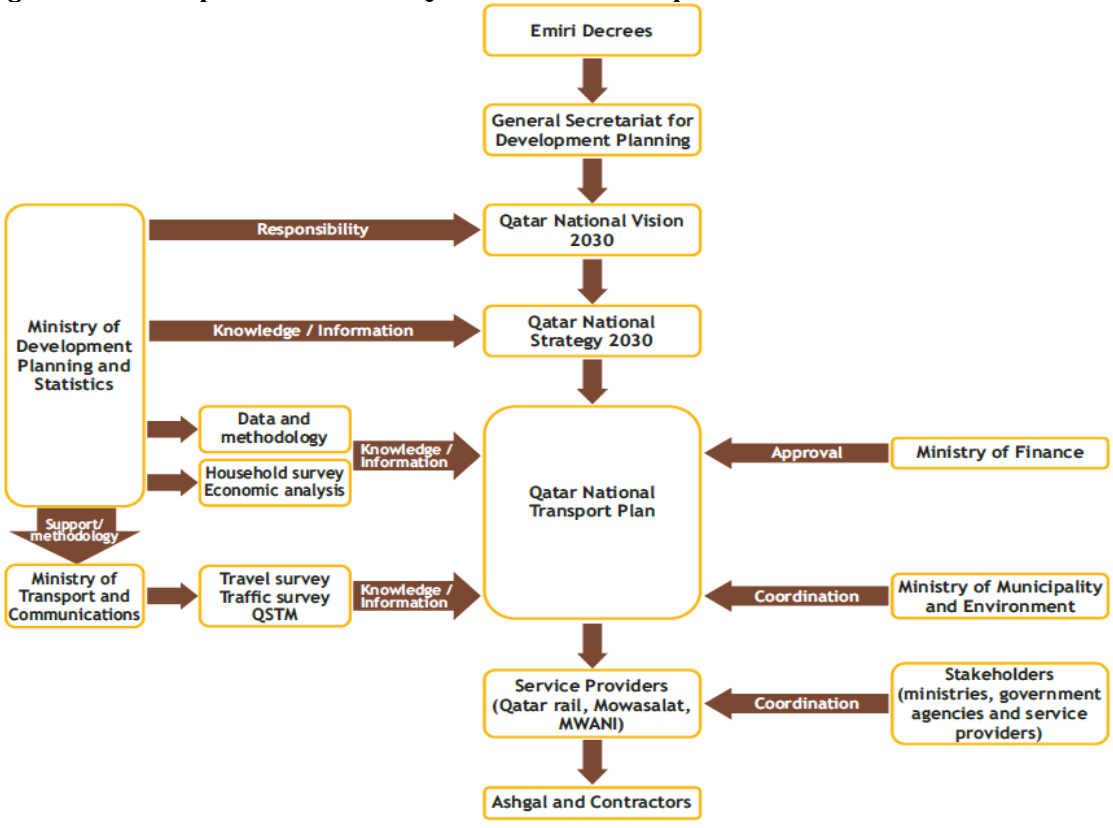
International transport infrastructure related agreements do have a large influence on Qatar's NTI plans. These agreements have an impact on the supplies, the logistics and the regional transportation market and define the border transportation facilities.

3.5.2. Institutional and Organizational Factors

Assessing the institutional response to transport planning in Qatar, it is necessary to consider the fundamental role of the state both in planning and in funding. Despite the progressive opening to PPP, investments and initiatives in the transport sector are still mainly coming from the state.

The transport infrastructure planning process in Qatar is summarized in the following diagram.

Figure 32: Development Process of Qatar National Transport Plan



According to the principles of the descriptive analysis, Qatar's institution are classified as *vertically driven* where hierarchy is mainly following a top-down process. This idea comes out from the Emiri decree, which outlines the duties that each ministry has in carrying out the transport Vision of Qatar, embedded in the Qatar Vision 2030 (Qatar, 2008). For this reason, instead of a real integration among ministries, there is a detailed process that is being followed for the approval of each infrastructure project. The four ministries involved are

- Ministry of Development Planning and Statistics;
- Ministry of Municipality & Environment;
- Ministry of Transport & Communications;
- Ministry of Finance.

Each of them is assigned a specific role: the first ministry is in charge of making an overall planning for a specific project; the plan will be filled in the second one and financially assessed by the Ministry of Finance that – in the case of a positive assessment – will eventually approve it.

Equally like the institutional, also the organizational factor analysis cannot ignore the role of the National Vision 2030**.** It is the guiding principle which any project has to comply with.

The institutional procedure of the preparation of project appraisal and NTI planning starts therefore with the preparation of tender documents. Once the study has been approved, it follows the phase of request for proposals and the evaluation of bids, based on which a specific consultant or contractor will be awarded with a contract. Only after this process, NTI plans will be prepared and published and it will set the implementation mechanism in coordination with the parties involved.

3.5.3. Technical Factors

In Qatar transport plans follow land use plans. Developments start with land use planning, prepared by the Ministry of Municipality and Environment, following the Qatar National Development Framework and the Municipal Spatial Development Plan (63 zones). The *integration of policy* related to land use and multi-modal transport logistics is crucial in order to attain more sustainable planning outcomes. The Qatar NTI plans follow an integrated approach regarding the transportation modes. Transport plans are tested and assessed using the Qatar Strategic Traffic Model (QSTM), that emphasizes demand modelling platform characterized mainly by flexibility and inclusiveness in network data management, comprising all means of transport in an integrated transport model (Ministry of Municipality and Environment, 2013 and Zaina, 2017).

The traffic model is used to evaluate new network options of roads and public transport and policies for future development of the transport system of Qatar, for conducting Traffic Impact Studies (TIS) for the major projects of Qatar, and to evaluate how specific projects affect the integral network and how successful traffic solutions can be designed.

Multi modal transport strategies (multi modal transportation facilities for Doha) are developed in line with the NTI plan goals and are based on *revealed and stated preference surveys* and

relevant stakeholders' opinion. In addition, the multi model transport strategies undergo detailed assessment using QSTM,.

The technical and implementation studies of transport infrastructures also include an *Environmental and Social Impact Assessment*. In the context of the analysis of the on going project, the results of these assessments have an important role and put conditions to the decision-making process and the financing. They are embedded in the transportation assessment framework.

Figure 33: Doha Metro, Red, Green and Gold line

Source: Qatar Rail

As described earlier in this chapter, Qatar is investing US$ 200 billion in infrastructure. This effort involves multiple mega projects, such as:

- Sharq Crossing Bridge Project (US$ 12 billion): 10 km bridge tunnel connection between Hamad International Airport and the centre of Doha
- Hamad International Airport (US$ 17 billion) with a capacity of 29 million passengers at the opening in 2014, and 50 million passengers per annum upon completion.

- Doha Metro (US$ 36 billion) covering a total distance of 241 km with 106 stations (see Figure 33). Three out of four lines will open by 2020, with expected 640,000 passengers per day per 2021. The fourth line (Blue) is expected to open per 2026.
- Hamad New Port (US$ 7.5 billion) with a capacity of 7.5 million TEU per annum, opened in 2015, and completed per 2020 (see Figure 34).
- Highway project (US$ 11 billion), 30 main roads, starching 1000 kilometres of road, 360 brides, 240 intersections, and including the New Orbital Expressway (US$ 148 million) from Al Khor in the North to Mesaieed in the South
- Long Distance Rail, with a freight focus, connecting the Port and Mesaieed with the Gulf Cooperation Council countries
- Lusail Tram, 19-kilometre tram, with 25 stations, connecting Lusail with Doha

Figure 34: Hamad New Port

Source: Hamad Port Project

The metro fits in the approach that Qatar follows, namely Transit Oriented Development (TOD). Zaina (2016) defines TOD to be "a mixed use commercial and residential area designed to maximise access to public transport and to encourage transit ridership". TOD reflects the integrated approach between land development and planning of transport infrastructure. They are a key element in stimulating public transport. Many of the developments around the stations of the metro line project are TOD. The heterogeneity in population provides Qatar with a traffic related communication challenge: traffic signs are in Arabic and in English. But for large part of the population it is still a problem to understand the meaning of the traffic signs. The traffic police is making lot of efforts to make residents of Qatar understand and follow the Traffic signs and go by it since the people come from lot of different countries

3.5.4. Procedural Factors and Financing

The planning procedures in Qatar are laid out in the Qatar Vision 2030 where the National Strategy is drafted by the General Secretariat for Development Planning (GSDP) under the direction of Qatar's Higher Authorities (Qatar, 2008). This provides a medium-term framework for coordinated and aligned sectorial and enterprise strategies, containing plans and projects designed to achieve the National Vision. To do so, there are certain requirements that should be respected, such as organizational capacity building, an efficient delivery of public services, an effective public-private cooperation and the creation of a vibrant climate for business (Qatar, 2008). The process considers also the *stakeholders* concerned among which are ministries, government agencies and service providers.

Financing

The state budget is the main source of finance of Qatar's transport infrastructures. According to the Qatar Investment Authority (QIA) (Independent, March 27th 2017), large investments will also be made in this sector in the coming years. Since recently private funding is also being considered. In 2015 Qatar signed its first PPP agreement and at the moment a PPP law is being introduced (Qatar Tribune May 2nd, 2017). According to Gulf Times (May 20th, 2017), in the National Development Strategy 2017-22 (NDS-2) PPP is seen as a diversification enabler.

New Hamad Port is an example where private finance and management to transport infrastructure projects in which PPP, build-operate-transfer (BOT) and design-build-operate-transfer (DBOT) have been applied. Qatar considers these structures at an early stage of NTI planning in order to attract private finance, improve the system performance and reduce capacity obstacles. The cost of major projects and the annual allocations and sources of finance are estimated with a 3-5 year horizon by the implementing entities and are submitted to the Finance Department for approval. Examples are the future road programme budget planning that is prepared by Ashghal, the Public Works Authority of Qatar; the Metro Cost estimates are prepared by Qatar Rail and Bus system costs by Mowasalat, the National Bus Company.

3.5.5. Content of NTI Plan

The objectives and performance measures which the NTI plans are based on, take into consideration that Qatar is still a developing country, the need to implementation of connection among cities and an improved design of a road network that can reduce travel time and congestions and improve accessibility. Qatar aims to connect to the world and to its close neighbours. During the phase of preparation of the NTI plans, Qatar takes into consideration economic and demographic aspects, and issues of space, climate, environment, maintenance and behavioural changes.

The purpose of the NTI plan of Qatar is outlined in the Transportation Master Plan Qatar (TMPQ) drafted by the Ministry of Municipality & Environment to respond to the increasing demand for transport due to the rapidly growing economy and fast development of population and therefore employment. It is intended to redesign the system to meet demand needs, enhance and foster development and reduce negative impacts and drafted with a 20-year time horizon (Qatar, 2008). This is generally the typical planning horizon that can, however, be extended to 35 years.

The NTI plans also incorporates *scenario analyses* that are implemented using the Qatar Strategic Transportation Model (QSTM). External shocks like are not included in scenario

analysis. The output is therefore embedded in a comprehensive transportation assessment framework considering performance, environmental, and financial aspects of scenarios. The employment of this process – that is still at an early stage of implementation – will allow Qatar to make relevant progresses in a short time, catching up with countries like United Arab Emirates.

Mega projects play the main role in the National Vision 2030's goals. They are of different natures, including road, rail, air and water base transport modes and their target is to provide a sufficient transportation equipment and logistics solutions adequate for a prompt delivery. Among these are the Hamad International Airport (HIA), the New Doha port, and several mega cities such as Lusail and Musheireb. In addition, the Qatar Railways Company (Qatar Rail) oversees the implementation of the Qatar's integrated railway network that plans to extend shipping railways by 325 km and to connect Qatar's rail networks to the others' belonging to the Gulf Cooperation Council (GCC).

Qatar Rail Development Program (QRDP) works in line with the National Vision 2030 committed to foster sustainable growth and development providing an alternative and modern mean of transportation to comply with the fast-growing economy and with the aim to make Qatar one of the most advanced countries in the transportation sector. The QRDP leads three main developments:

- Doha Metro
- Long Distance Passenger and Freight Rail
- Lusail Light Rail Transit

The Doha Metro will link the focal areas inside and outside the capital such as Lusail city, HIA, the Education City, and the West Bay area through four lines 354 km long. There are four lines:

- Red Line (Coastal Line) that crosses Wakrah City, the Doha International Airport, Musheireb, Katara, The Pearl, and Qatar University routes
- Gold Line (History Line) that links the airport's northern part with Souk Waqef, Musheireb, Bin Mahmoud, Al Sadd, and Al Waab
- Green Line (Education Line) that crosses the Al Rayyan Road and connects Education City with Musheireb and Hamad Hospital
- Blue Line (City Line) that is a semi-circular line linking residential and commercial areas in the West Bay and the northern part of Airport City with the main C-Ring Road.

The project is implemented in two stages: the first, that should be completed in 2019, includes the setup of 37 stations – among which the Musheireb Station will be the metro network's headquarters and the intersection point for three of its four lines (Red, Green and Gold) – 84 km long. The second stage should be achieved in 2026 and extends the network to an overall length of 152 km in (47 km underground, 76 km above ground level, and 29 km on ground level) among 56 stations. The Long-Distance Passenger and Freight Rail transportation system will be 350 km long and its speed will be ranged between 220 and 350 km/h for passenger trains and nearing 120 km/hrs for freight trains. The project – that is expected to be finalized in 2030 - can be divided into three different categories: a shuttle service for GCC transit passengers and travellers, transportation services for locals, and freight transport services for international and domestic routes (Marhaba, 2013).

The Lusail Light Rail Transit will work to connect Qatar's key areas with each other and with their extensions, it consists of 28 tramway vehicles and 37 stations, 24 of them are on ground level, 10 undergrounds, one located on the bridge level and two connecting two high-rises. The structural works for the tunnels, ancillary structures and underground stations are almost completed and the LRT yellow line is expected to start being operative in January 2019. The Lusail Light Rail Transit is composed of four lines for an overall length of 33.1 km, 10.4 km underground and 22.7 at ground level and elevated.

The Hamad Port is creating a new world-class commercial port in Qatar, making it the world's largest "greenfield" port-development project. Comprising a port, a base for the Qatari Emiri Naval Forces and a canal for the planned Qatar Economic Zone 3, the project will span a 26.5-square-kilometer area. The port will act as a catalyst for the country's trading industry, better positioning Qatar to benefit from the expected regional growth in container and vehicle carrier traffic as well as general cargo traffic.

The Qatari NTI plans also embed *regulatory measures*: pricing of parking in congested areas, discouraging car ownership and use of cars and infrastructure are being considered. In the central business districts parking management has been introduced. MoTC is studying pricing and accessibility regulations in view of constraining the use of private cars in central business district, constraining trucks usage for certain routes during certain hours, and promoting advanced public transport fare ticketing system and contracts. The *legislative amendments* include enforcement proposals and the organizational changes include introducing new authorities for managing specific transportation aspects and facilities, e.g. parking authority and road tolling unit. In fact, NTI plans cover projections and measures on the pricing of transport infrastructure in the NTI plans scenarios through the mentioned road tolling, but also congestion area charging, parking pricing and indirectly thorough fuel costs and vehicle ownership costs. The content of the NTI plan is typical of that of most oil wealthy countries to build transport infrastructure for the future generations. It is premised on the classical wisdom that more transport is needed as the economy grows, but as mentioned at the outset, such thinking is being questioned. Decoupling of transport and energy from economic growth would provide more sustainable solutions.

3.5.6. Data Collection Method

In Qatar developments have a strong rational and quantified character. Surveys play a key role. The Ministry of Development Planning and Statistics Surveys is responsible for data collection. Some specific data are delegated to specific ministries, i.e. the Ministry of Transport and Communications prepares the National Transportation Surveys, supported and approved by the Ministry of Development Planning and Statistics Surveys. With respect to the preparation of NTI plans, the MOTC uses the latest technology in conducting all kinds of surveys to collect data such as the Manual Classified Count (MCC), the Household Interview surveys (HI), the Roadside Interview (RSI), the Automatic Traffic Counts (ATC), the Public Transport OD surveys (PTI) and the Public Transport Counts (PTC) to update the transport master plan for Qatar.

The analysis and elaboration of these data collected has led to the development of an *integrated database* and a traffic model (TMPQ), using VISEM (VISEVA-W for freight) and VISUM, from which projects can be assessed and traffic impact studies can be done (Ministry of Transport and Communications, 2018). The transport modelling comprises the development of an

integrated transport demand model and *microscopic simulation models* for short term solutions of traffic problems. Data analysis is the phase before the decision is being taken for the implementation plan of the proposed measures and policies in a five-year horizon. The model is used for the required transport planning tasks, like the development of the road and the public transport network and services.

Commercial entities do not release data for use in transport planning. Respondents also indicate that availability of data for public, commercial or for academic use is limited and could be improved.

3.5.7. Monitoring System

A stable system of monitoring and evaluation programs can ensure the sound implementation of public policies and strategic program with maximum impact. A rigorous program is essential for prioritizing policy and regulatory actions. Qatar Vision, being the responsibility of the Ministry of Development Planning and Statistics Surveys, has 14-16 strategy teams that decide and monitor the implementation of the strategy. In Qatar implementation agencies do the follow-up of the implementation of the NTI actions. In the evaluation phase, intended as the periodic assessment of overall achievements, the highlighted major bottlenecks of the NTI planning are usually related to data collection difficulties and the successful promotion and implementation of the NTI plan. In particular, the former challenge is generally object of further analysis in a final assessment of the case study and usually its main difficulty is that it takes longer than the allowed time, therefore delaying and extending stakeholder consultations, meeting and presentations to decision makers for directions.

The overall assessment of the effectiveness and success of the previous NTI planning practices has been positive up to now when comparing objectives with outcomes mainly from the Transportation Master Plan of Qatar (TMPQ), Qatar Strategic Transportation Model and concept design for roads in Qatar phases 1, 2 and 3. However, the issue is whether the objectives in the plan are the right ones. The questioning of planning decisions is appropriate because they have led to increased use of private vehicles, congestion, pollution, high levels of land use, traffic accidents and enormous consumption of energy. The question remains whether the economy has really benefited from such, as may be called, extravagance. It is right to ask these questions.

The results of the questionnaire point at the need to stimulate the education of monitoring and evaluation in tertiary education in Qatar.

3.5.8. Conclusions

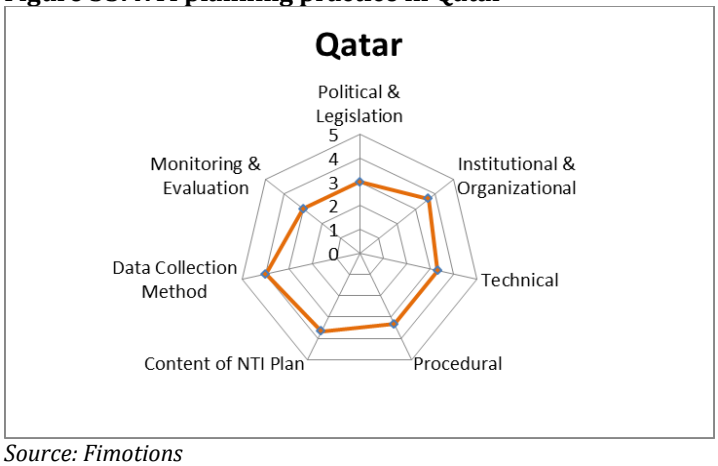
In summary, the transport sector has been involved in the high-speed development, which has characterised Qatar in the last decades. It is interesting to see if Qatar will comply with the objectives set by the Qatar Vision 2030 and will also be able, 8 years before this conclusive time period, to face the global event of the World Cup 2022. Transport infrastructure and especially public transports will have to face a consistent wave of tourist and football-lovers coming from all over the world and needing to move from a stadium to another in a short time. Therefore, a high effort is needed by entities to guarantee a sound and fast commuting not only in every-day life but also in occasions of these big events. Based on the analyses in the previous sections, the conclusion for each NTI planning aspect can be drawn as follows:

- **Political and legislation**: The NTI planning of Qatar has a strong emphasis on national policy and less on international policies and agreements. This is the direct consequence of the current diplomatic developments Qatar faces.
- **Institutional and organizational**: Skills and capacity are sufficiently available and NTI is well organized and integrated with land use policies.
- **Technical**: Qatar has a strong methodological focus.
- **Procedural and financing**: A close collaboration among central Ministries, Municipalities, and Service providers. The position of public parties is dominant. As a consequence, the position of private parties is minor.
- **Content**: Qatar has a strong methodological focus and puts emphasis road, (light)rail and port infrastructure.
- **Data collection**: Qatar puts a strong emphasis on data and data collection: intense collection and applying a large variety of collection methods.
- **Monitoring and evaluation**: Monitoring and evaluation is in the development phase. The majority of the Qatari infrastructure is still in the construction and early in the implementation phase. A focus on monitoring and evaluation is expected to follow soon.

The path undertaken by the country with opening to PPP and BOT to include private entities in infrastructure investment is indeed beneficial for a fast growth. In addition to this, the main driver of development will still be the main source for Qatar, which is petrol revenues. The investment of them in sustainable national assets will guarantee Qatar a prosperous and sustainable economic future.

The response to the questionnaire also reflects that Qatar has a methodological focus and puts emphasis on planning, procedures and techniques. Monitoring and evaluation is in the phase of development. This can be easily explained by the spurt of infrastructure development and construction the country is currently in. A focus on monitoring and evaluation is expected to follow soon. The medium score on political and legislative aspects is due to a strong emphasis on national policy and less on international policies and agreements. This is the direct consequence of the current diplomatic developments Qatar faces.

Figure 35: NTI planning practice in Qatar



Source: Fimotions

3.5.9. Policy Recommendations

The policy recommendations emanating from the Qatar Case Study are as follows:

Overall Policy Recommendation

An integrated transport, energy and environment policy would be worthwhile and very progressive. Its objectives would be to decouple transport and energy from the economy through smart planning and be aligned to the SDGs. Qatar can easily set the stage for other oil producing states to show that it is perfectly possible for economies to grow – even rapidly - by consuming less resources.

Communications led transport demand substitution using the internet where ever possible to minimise mobility while maximising accessibility through online services and also e-commuting.

Although there maybe an abundance of oil, the use of fossil fuels to provide energy has reached its zenith. The policy needs to set out how new technology and Artificial Intelligence may be exploited.

More specific recommendations;

- Opening up for PPP constructions will require level playing field between public and private parties. This might require providing more information and adding parties to the present set of stakeholders;
- PPP will lead to new risks in planning and implementation. These risks have to be mitigated;
- Providing a more prominent role for the pricing mechanism, in view of policies related to parking, congestion and PPP, will require research and modelling on price elasticities of demand;
- The predictive models and scenarios need to be robust for external effects and shocks (global market, competitive position) and systemic risks. When required, expanding the set of scenario's and parameters in the models might be useful;
- The models need to be calibrated and the scenarios need to be updated regularly, due to the fast and massive developments that take place. Models can easily handle marginal changes, but have difficulties in coping with substantial changes.
- The efforts required to perform proper data collection should not be underestimated. Academic and commercial entities might play a larger role in data collection and data analysis. Data availability in the public, commercial or academic sphere could be improved.;
- Monitoring and evaluation processes should further be tested and strengthened, as yet the focus is on implementation of a large series of mega projects.

3.6. Oman

The Sultanate of Oman has experienced an economic and social upturn since 1970's that has driven the development of a modern country. In recent years, the Sultanate has made substantial investments in transport infrastructure as part of the overall strategy of diversifying its economy, which revolves around the production and export of natural gas and oil. Oman has a population of over 4 million people, of which 30% –around 1.2 million people– live in the capital Muscat of which around 40% are Omani national and 60% are expatriates from Bangladesh, India, Pakistan, Indonesia, Philippines, Ethiopia or Egypt. The population of Muscat is essentially private vehicle dependent, the number of registered vehicles has increased at about 9.3% every year41. As a result, accident rates and traffic congestion, have become pressing issues. Due to the lack of public transport, mobility has been a problem for workers – most of whom are expatriates. Although the Ministry of Transport and Communications of Oman has not drafted a national transport plan because transport infrastructure is one part of the National Development Plan they have prepared a Public Transport Master Plan (PTMP) for Muscat in 2017, which fits the more conventional understanding of a transport plan. The Vision of the PTMP is the development of a high quality and sustainable public transport system in Muscat as a real alternative to private cars, in order to reduce automobile dependency and to improve accessibility, safety, urban environment and quality of life in Muscat by achieving a 25% public transport modal split by the year 2040. This case study focuses on the Muscat Transport Plan as source of information regarding procedure and data whilst also using information from the development of road, rail, air, maritime and pipeline transport.

3.6.1. Political and Legislation Factors

In 2016 a Royal Decree was issued that initiated the 9th Five Year Plan of the Sultanate of Oman and the first plan that sets out to achieve Oman's Vision 2040. The process amply shows that planning is centrally controlled by the Sultan who rules by decree and ruling by decree obviates the necessity for policy, consequently there is no transport policy in Oman. By policy it is meant a set of principles that provides the direction needed for governments to make long term changes. Such principles then provide the rationale to resolve issues in a certain way. Bear in mind that the definition of an issue is a topic of debate and not a problem. Issues never go away. Take the issue of how to resolve traffic congestion or conversely how to improve traffic flow; should it be by building more infrastructure to maintain a high level of independent mobility using private transport, or should it be the opposite, to restrain traffic and promote public transport. Such issues have socio-economic and moral ramifications such as freedom and the right to personal mobility and this is why policy making is recommended.

The 9th Plan was driven by the need to promote economic diversity due to various challenges but mostly due to the fluctuation in international oil prices, the geopolitical and regional circumstances and the youth employment. The plan focussed on building transformational industries, logistics services, fisheries and mining. Given the highly centralised planning processes, the plan was the most participative so far with representatives from the government sector, the private sector, the civil society and youth institutions. This may partly be explained

[41] According to the Royal Oman Police.

by the new need to diversify from the mono-oil economy. The plan aimed at attracting private as well as the normal state investment, unlike previous plans that were founded 100% from State revenues (SCP, 2016). SCP being the Supreme Council for Planning.

According to questionnaire response, the extent to which a decision making on transport infrastructure investment is influenced by transport policy is very high in Oman and this evidenced by the significant role of the SCP in driving the entire development of the Nation – not only transport. Furthermore, the connectivity of Oman to neighbouring states has necessitated the importance of internationally compatible networks, though harmonization of legal matters appears to remain less relevant.

3.6.2. Institutional and Organizational Factors

Although the extent to which decision making on transport infrastructure investment should be influenced by transport policy is considered to be very high, the response to the question on the content of the infrastructure plan is low. This anomaly has been noted elsewhere where master plans are considered to be policies. There is no problem with this of course, in states that are centrally planned and autocratic, policy is simply unnecessary. Although Fimotions has not obtained information on the organisation, resourcing of the SCP establishment, indirect evidence of its outputs provides a strong indication that capacity is highly adequate, significantly because Oman is able to attract internationally qualified and skilled professional personnel. Indeed, this is confirmed in the response to the questionnaire on the issue. As such contemporary land use and spatial planning techniques are used in planning and the national development plan prepared by the SCP is integrated. In Oman the private sector is not involved very much in the transport sector either in the provision of infrastructure or operations, therefore the planning process does not involve the private sector very much. On the other hand, the level of coordination between various government agencies and departments is considered to be very high.

Oman is signatory to the Council of Arab Economic Unity (CAEU) that promotes economic, social and technical cooperation and where possible harmonisation or technical standards to promote interoperability between contiguous states. The first three items of Article 2 of the CAEU Statute are pertinent:

Merging into a unified customs area

1. Merging into a unified customs area
2. Unifying their import and export policies
3. Unifying their regulations with regard to transit

The CAEU is also merging with the Agidir agreement of North African States and others as well as the Greater Arab Free Trade Area (GAFTA). Both of which recognise the importance of harmonising technical standards as a means of improving international transport efficiency and these fit into the Oman National Development Plan.

3.6.3. Technical Factors

The Transport component of the Oman Development Plan is primarily a list of approved infrastructure projects (Omani Ministry of Land Transport and Communications, 2018). The key projects and measures include:

- Air cargo business development: Invest in leasing 3 air freighters
- Oman as E-Commerce Logistic Hub
- Improve efficiency in air cargo clearance process
- Sohar Port Improve the quality of services by Oman's Ports Sea:
- Feeder connectivity into the regional market Sea:
- Increase competitiveness and service deliverables of local logistics Port Community System
- Level playing field for Free Zones
- Rail connectivity 3 One Stop Shop with full integration of Bayan
- Land Connectivity to Saudi Arabia
- Bonded warehouses for goods in transit
- Enhancing cold logistics network
- Making the most of new opportunities
- Salalah Port Development Project Cargo Village
- Improving rail connectivity
- One Stop Shop with full integration of Bayan
- Land Connectivity to Saudi Arabia
- Bonded warehouses for goods in transit
- Enhancing cold logistics network
- Air cargo business development

It cannot be described as a visionary document that sets a framework for the sector to develop. There is a good reason for this. It is self-evident that planning transport in Oman has benefitted from the availability of open space, the mandatory nature of the planning process and the availability of financial and other resources. For example the paved road network has grown rapidly over the last 50 years and now comprises 62,240 km of which 29,685 km is paved, including 1,943 km of expressways, and 30,545 km is unpaved (2012). Integration between alternative transport means is certainly factored in, but the choices are limited to road with rail currently playing a minor role. But it is expected that it will change.

Because Oman was sparsely developed country in the 1970's, it was possible to basically plan and design a road network from scratch with setting technical standards, such as expressway interchanges which are spaced approximately 7 km apart, without worrying about existing development. The road network is shown in Figure 36. The network classification and standards built the level of service needed for each category of link. Intercity links and expressways being 4-6 lanes and collector and local roads on single lanes. Given its population of 4 million, and length of paved km of 30,000 km the density of 750 km per 100,000 inhabitants is one of the highest in the world. In the absence of any strategic alternative like rail, road transport has provided the main source of mobility in Oman and this has been the stated ambition of successive 5-year plans produced by the SCP. Despite reliance on one mode of transport only, the level of holistic planning in transport sectors, in terms of the integration among various aspects such as land use, multi-modal transport logistics and communication plans is considered to be high.

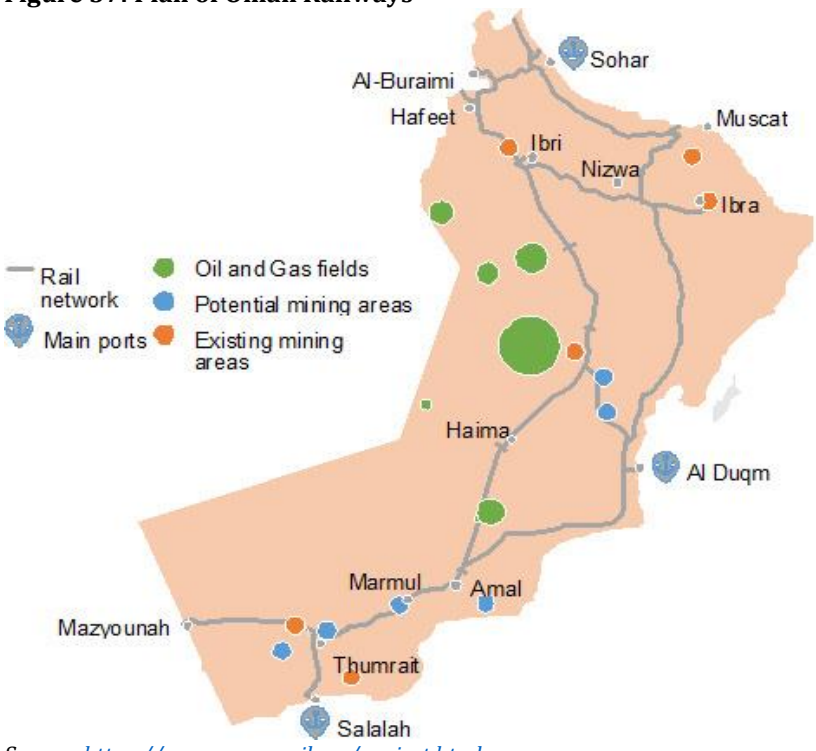
Figure 36: Oman State Road Network

Source: https://www.omanroads.om/project.html

However, the SCP recognises that the Oman rail network is rather limited to the narrow gauge for mining industrial lines and investment in an interregional Gulf railway has long been envisaged but is now more firmly planned. Therefore, Oman Rail has the mandate to develop the rail network as a major step in Oman's journey to become a key logistics hub for the region. The rail network is being built in conjunction with other Gulf Cooperation Council (GCC) member countries to connect rail services within the Gulf countries. The 2,135 km rail network - the country's first - is connecting major Oman Ports of Sohar, Duqm and Salalah, to the GCC and consequently wide region. And yet despite the absence of rail in the transport mix, the extent of complementarity of road, rail, air and water based transport modes was considered to be high.

Accordingly, the vision is to develop the rail network that facilitates the growth of a new logistics industry so that it becomes a significant contributor to GDP. Oman has a vision of becoming the region's gateway, but this is also the vision of other neighbouring countries. The interplay between both cooperating and competing with neighbouring countries is worth noting, as it supports the need for more economic prudence in the face of declining oil revenues.

Figure 37: Plan of Oman Railways



Source: https://www.omanrail.om/project.html

In addition to the GCC Rail Project, the Public Authority for Mines has proposed building a railway line for transporting minerals to Duqm Port for onward export to overseas markets. Clearly railways are being considered by the SCP as an important component of the national transport mix, having previously excluded it. This is welcome news as it shows that even oil rich countries understand the need for more energy efficient transport.

A public transport (PT) strategy for 2017 to 2025 was recently approved by the Council of Ministers as is mentioned in opening section of this case study. The plan is set to include public services, such as bus routes, taxi services, the regulation and monitoring of the transport sector, the goals of the transport strategy and its timetable, as well as illustrating the socio-economic benefits and the basic environment for enabling public transport. An improved transport framework is seen as meeting the needs of the working population most of whom are Asian. That Oman needs a public transport system that is cost-effective and convenient is remarkable in a society that has provided mostly for the Omani's. A new public transport system would benefit transportation of working class people is a major and welcome change in policy. For example, in Muscat the capital of Oman, the PT system is planned to expand its bus network with an addition of more than 60 bus stops and 40 new buses that will make commuting easier along a new main route connecting Ruwi and Seeb. The new PT system, which will have a zonal based ticketing, is expected to reduce traffic congestion as well as improve mobility. Other measures planned include dedicated lanes for buses and taxis.

Figure 38: New Busses for Muscat

Source: Elham Pourmohammadi, Oman Times 07.11.2015

Oman historically is a sea going country situated in the horn of the Arabian Peninsula with open water access the Indian Ocean. Prior to the discovery of oil, trade was the major commercial activity. The SCP includes ports into its portfolio but not shipping that is handled directly by the Ministry of Transport and Communications. The SCP in the 11th plan have implemented the vision of Oman becoming a regional cargo hub centred on its main ports.

Port of Salalah is the biggest port with six berths that have been managed by APM Terminals, the Dutch terminal operating company, since 1998. The operating company, Salalah Port Services Company (S.A.O.G.), is listed on the Omani stock exchange. Other smaller ports are at Duqm, Raysut, Mutrah, Mina al Fahal, Al Wajajah and Sohar, as shown in Figure 39. The merchant fleet is expanding around the Oil and Chemical Industries with 16 VLCCs, 17 product tankers and 4 chemical carriers, OSC's fleet of product carriers accounts for more than half of the company's national fleet that is wholly owned by the Oman Shipping Company (OSC). OSC is expanding into dry bulk and containers, which is driving investment in container handling in the major ports. Whether Oman has the scale to be able to compete with Dubai in the Gulf for deep-sea ships and Ultra Large Container Vessels (ULCV) is unlikely.

Figure 39: The Ports of Oman

Source: World Port Source

In 2015 Oman produced 360 million barrels of oil and condensate – about a million barrels per day. It is worth remarking that pipelines are as important to oil producing countries as railways have been for coal producing countries. Oman has over 8,000 km of pipeline for moving condensate/gas 4,330 km, refined products 3,940 km and also 264 km of water pipelines. The pipeline network is the responsibility of the Ministry of Oil and Gas. The allocation of pipelines to ministry's responsible for energy as opposed to transport is often questioned.

3.6.4. Procedural Factors and Financing

The planning procedures in Oman are laid out by the Supreme Council for Planning (SCP). SCP set all the government authorities defined time periods for elaboration and execution of projects. For the projects that did not start (whether forwarded from previous development plans, those not contracted for, or the new proposed projects for the 9th Plan) a new mechanism shall be applied for defining the allocations of the development budget as follows:

1. Exclusion of the on going projects.
2. Priority for Royal Orders projects,
3. Priority for those with previous approvals
4. And finally, for the projects that maintain existing government assets and the natural growth of the economy.

In defining the level of priority for the remaining projects, the SCP mandates that these shall be on the basis of economic, social and environmental returns and must conform with the Plan's objectives. The economic return shall be defined as the share of the sector in the GDP, the provision of employment opportunities, the contribution to economic diversification related to the pre-defined economic sectors. The social return shall be defined as being based on the contribution projects make to human development, building of national capabilities of youth, provision of social needs for all citizens, and development of services and expansion of scope of e-government services. The environmental aspects are defined according to the ability of projects to preserve the environment and limit the impacts of natural disasters and the floods according to SCP rules (SCP, 2016).

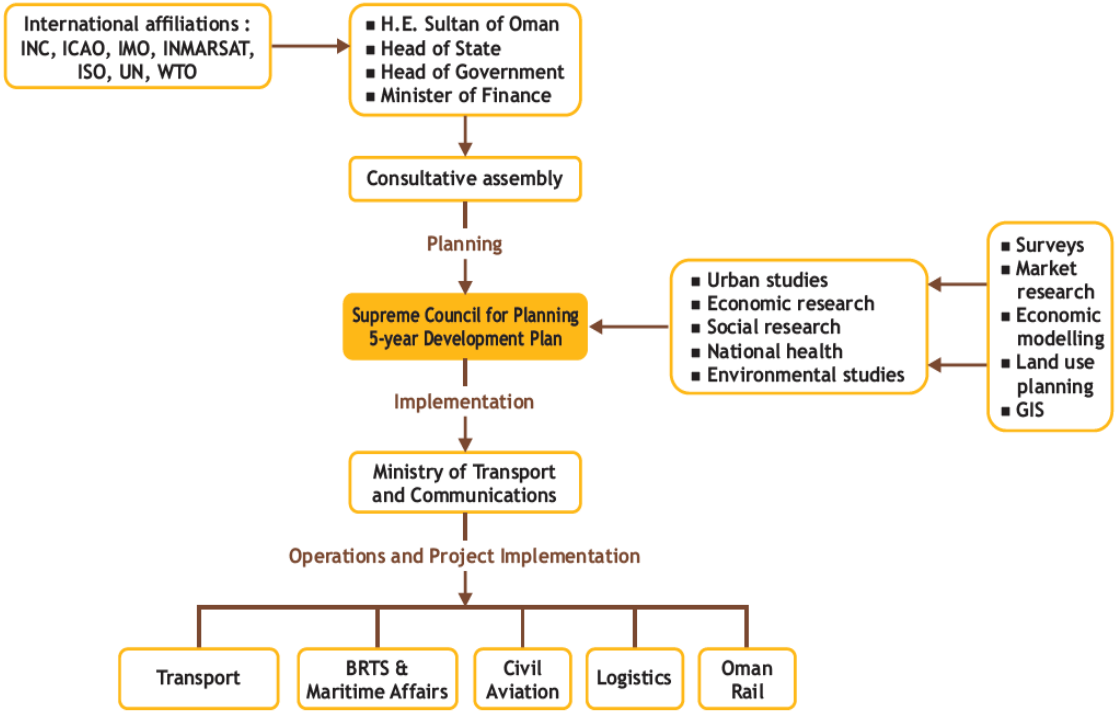
The method for project approval is also mandated by the SCP, which requires that projects will be approved after completion of feasibility studies and legal and technical procedures. Prioritisation takes into consideration the ceiling for expenditure and the capacity of authorities for implementation. The SCP requires projects that were started during the previous Five-Year Plan be brought forward and awarded the highest priority during the first three years of the 9th Plan. The SCP particularly requires that 'mega' strategic projects are also at the top of the list for fiscal provision, this means that after deducting for committed and mega projects, a new budget is created and available for the project to be considered for the 9th Plan (SCP, 2016).

The level of consultation and stakeholder participation in NTI planning that includes other sectors other than transport planning institutions is high within the public sector but not with the private sector and there is no legal basis enforcing public consultation in NTI decision making. However, local opinion is that the inclusion of assessment of transport user needs (market survey/research) to shape the transport agenda is carried out and that this process includes matters of users' affordability. Very likely the willingness to pay for services is a part of

the data collected. Because all services are owned by the state the extent of private funding of transport services and infrastructure is minimal. Possibly because of the way the state machinery works there is little attempt to evaluate alternative solutions included in planning procedure to come up with optimized investments. Similarly, the extent to which the financial investment plan considers the adequate funding of maintenance and operation expenses along the lifetime of the project is minimal.

The NTI planning process of Oman is shown in the following figure.

Figure 40: NTI Planning process of Oman



In Oman NTI plans do not appear to cover measures/projections on the pricing of transport infrastructure but environmental impacts of transport infrastructure are an important part of the assessment of the planning processes. Naturally the financial planning of projects is a very important perspective although feasibility appears not always a priority as all funding is from the state budget. There is no utilization of private finance. PPP is not used at the present time.

3.6.5. Content of NTI Plan

The purpose of Oman National Spatial Strategy (ONSS) is to provide a comprehensive spatial framework for directing, organizing and implementing sustainable high quality urban and rural development in the Oman. It is intended to provide incentives for enhancing socio-economic prosperity in combination with improving the environment for the future. The ONSS provides framework for development in the Sultanate for 2040. The main drivers for the ONSS is as follows:

- Population growth in size and typology
- Economic growth and diversification

- Well-guided spatial development with high spatial quality
- Contemporary land use system with smart integrated mobility
- Well preserved natural environment and cultural heritage
- Food security and resilient water systems
- Climate change and energy transition
- Health and well-being

The ONSS process is on going and will be completed in 2019. The ONSS will be developed in a simultaneous manner as Regional Spatial Strategy (RSS) on a regional level and ONSS on a national level to be aligned with the Vision 2040. The idea is to achieve compatible planning between the country and its governorates. This is to ensure a final consolidated vision and obtain with relevant planning standards and tools in a place ready to be utilized in an implementation framework. The implementation framework is expected to guide planning activities at all levels:

The first step involved an extensive primary data collection exercise related to social, economic and land use aspects, the stakeholders were intensively involved, highlighting current issues and future solutions. The second step involved the development of a number of plausible national scenarios, based both on the regional key topics and international trends. After stakeholder consultation, which is mostly government agencies, the SCP will formulate the preferred spatial direction for the Sultanate. This will be the base for further elaboration of the specific strategies on regional and national levels. This in turn will be debated with both national and regional stakeholders and the final strategies will be approved by the SCP council, before being endorsed by Al-Shura and the Council of State.

As mentioned before, the national transport plan is considered to be a list of infrastructure projects and as such one would not expect there to be mention of public transport systems, this is because public transport planning is considered to be a local government matter. Reference is made to the public transport plan proposed for Muscat that includes the following features:

- Trunk services: bus routes which provide public transport services along the main mobility corridors of Muscat to provide future development corridors
- Feeder services that operate on medium-density areas, serving the end-of-route terminals and intermediate stations of the trunk services.
- Direct services where end to end demand is high
- Reorganization of the taxi and microbuses as complementing public transport,
- Restructuring of the taxis to achieve higher quality services using online services such as Uber
- New licensing regulations
- Densification of urban areas and land use integration with public transport.
- Improvement in pedestrian spaces to promote walking and facilitate the access and egress to public transport.
- Private vehicle restraint including parking charges in the short term and possibly area road user charging in the longer term.
- Traffic management measures

3.6.6. Data Collection Method

Although there is no NTP in Oman, there is a national transport model. The Oman National Transport Model (ONTM) was prepared as part of the Oman National Spatial Strategy, to support the establishment of an effective transport system to enable sustainable development in the country. With the aim of ensuring accuracy in planning and decision making, the Oman National Transport Survey (ONTS) aimed to generate accurate data for application in the transport sector. It is very good that spatial planning informs transport planning. The ONTS as undertaken in collaboration with the Ministry of Transport and Communications and Royal Oman Police. The ONTS included a range of field surveys carried out in all governorates of the Sultanate including interviewing commuters at various transport terminals (bus, airport, seaports, borders crossings), people at their homes, businesses, in their cars, in taxis or on buses. The ONTS included:

Field Traffic Surveys: Automatic Traffic Counts (ATC), Turning Movement Counts (TMC), Journey Time Surveys (JTS),) and Manual Classified Counts (MCCs).

Behavioural Surveys: Household Interview Surveys (HIS), Roadside Interview Surveys (RSI), Stated Preference Surveys (SP), Behavioural Surveys (Agencies, Enterprises, Hotels), Passenger Terminal Surveys (Ports, Airports and Borders).

Public Transport Surveys: Bus Terminal Surveys, In Vehicle (Bus) Surveys, Passenger Demand Surveys and Spot Measurements, Public Transport User Opinion Surveys, Taxi Surveys of Operators, Taxi Surveys of Users.

The information generated by the ONTS was used to build a mathematical model of the transport network and transport use in order to identify and predict transport requirements for the future. The ONTM enabled good planning measures to be identified and different travel options to be developed.

3.6.7. Monitoring System

International expertise indicates that the sound execution of public policies depends to a large extent on the presence of stable systems of monitoring and evaluation. Also, it depends on quantitative key performance indicators (KPIs) for measuring performance. In addition, follow-up and evaluation is a necessary condition for drawing out the lessons learned from the implementation of the policies, plans and programs to improve their path in the future. In this context, a mechanism was created in the SCP (the "Tanfeedh" program) to undertake the process of follow-up of implementation of the 9th Plan. That evaluation is considered an essential component of planning is very progressive.

The SCP also requires that the impact of transport projects on the diversification program be systematically evaluated. The SCP requires ministries to produce the KPIs to measure the impact of the 9th Plan in all its dimensions. The principle of the rolling plan was also adopted by the SCP, which means that the plan is flexible and dynamic. It also indicated that Oman believes that the future has become much harder to predict - this is profound. Consequently, the SCP requires a mid-term evaluation for the 9th Plan with the aim of revising the assumptions on which the Plan was based in light of local, regional and international developments.

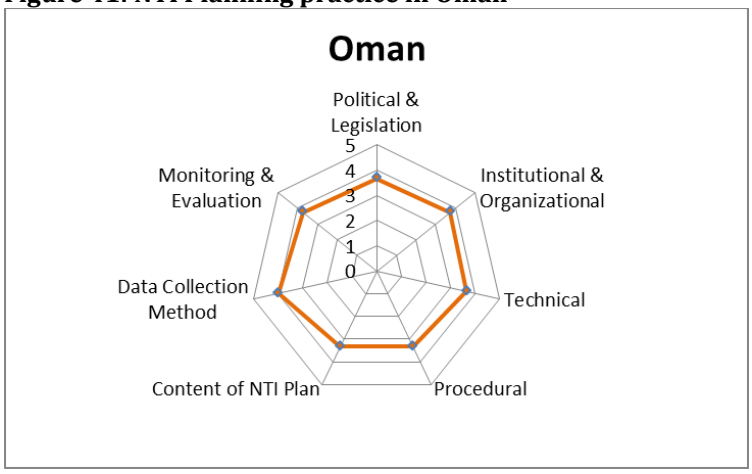
3.6.8. Conclusions

Based on the above analyses of NTI planning of Oman, the following conclusions can be drawn for each planning aspect.

- **Political and legislation:** The Omani transport sector has grown rapidly over the last 50 years, as has its population. The national transport plan is a list of infrastructure projects that has been selected by the Supreme Council for Planning and approved by Decree.
  Despite the growing complexity of the transport sector, there is no transport policy, given the general understanding of the term.
  Laws empowering the Supreme Council for Planning are robust and effective.
- **Institutional and organizational:** The SCP prepare plans, obtains funding regulates compliance and provides oversight. Highly effective central planning.
- **Technical:** Public transport planning is a local government matter, which has assumed higher importance nationally owing to the high numbers of non-Omani and non-car owning public whose mobility had been limited. Oman is looking outwards once again and aims to become a major logistics hub. As such, the role of port and railways is increasing and the need for more holistic and integrated planning is increasingly appreciated.
- **Procedural and financing:** Some procedures need strengthening such as public participation and consultation
- **Content of NTI Plan:** The plan is output and not outcome based. Km of road and railway network built, which are the outputs, and not the proportion of traffic at level of service, level of mobility and accessibility, which are the outcomes. It is very a good transport infrastructure plan.
- **Data collection:** Collection of transport demand data and the application of transport modelling is used to help further develop the transport system and in a more integrated way with land use.
- **Monitoring and evaluation:** The need for monitoring and evaluation is supported, though the former is a stringent requirement the latter has to evolve further. Evidence suggests that Oman seeks to improve the quality of its transport planning.

The response to the planning questionnaire from Oman reveals that although data collection and analysis is excellent, the content of the infrastructure plan is poor. This might be because the plan is almost totally roads orientated.

Figure 41: NTI Planning practice in Oman



Source: Fimotions

3.6.9. Policy Recommendations

- It will be useful for Oman to prepare a transport policy, it provides an opportunity for structured stakeholder and transport user engagement to discuss a wide range of issues in this dynamic and rapidly changing sector.
- Plans should include measures as well as projects, the plan should provide a comprehensive set of directions that will enable policies to be implemented
- Plans should be outcome based, not only outputs. The specific objectives of the plan may relate to transport sector efficiency issues but also cross cutting issues as well.
- Plan implementation and performance could be public domain - using contemporary means such as dash boards

3.7. Comparisons of Case Studies

In order to give an overview of the performance of NTI planning practices among the six case studies, the following comparison table is developed. From the seven framework areas, 10 criteria are chosen. These criteria are considered as basic criteria that should be addressed by NTI plans of a country. Each case study country is assessed based on these criteria by determining whether each criterion “does not exist”, “needs to be improved”, or already “developed”.

The comparison table shows that Qatar performs best as it “ticks all the boxes”, followed by Malaysia even though Malaysia does not have both a national transport policy and a multimodal national transport model.

Table 15: Comparisons of case studies based on 10 basic criteria

No	Criteria	Kazakhstan	Malaysia	Uganda	Senegal	Qatar	Oman
1	National transport policy	□	□	/	+	+	□
2	NTI plans are comprehensive, thematic and horizontally driven	/	+	□	/	+	□
3	Multidisciplinary transport planning agency	□	+	□	/	+	+
4	NTI plans are outcome-based	□	+	□	/	+	□
5	Inclusions of NMT modes	□	/	□	□	+	□
6	Multimodal national transport model	□	□	□	/	+	+
7	NTI plans available in the public domain	□	+	/	+	/	□
8	Public consultation and stakeholder participation	/	+	/	+	/	/
9	Sustainable Development Goals mainstreamed into NTI plans	□	+	□	□	/	□
10	Monitoring and evaluation agency	□	+	/	/	+	+

Legend :

□ Does not exist
/ Needs to be improved
+ Developed

4. Conclusions and Recommendations

This chapter presents a summary of the key findings of the study. In addition, this chapter provides recommendations and identifies prioritized possible policy options to implement these recommendations using the framework developed in the literature review chapter. The recommendations build upon the analysis of the previous chapters and aim to provide a concrete basis for understanding the national transport infrastructure planning in the OIC region.

4.1. Conclusions

Conclusions are drawn based on the literature review and the six case studies, following the framework areas that have been used in the previous chapters. Furthermore, a survey was carried out to determine the general status of transport infrastructure planning in OIC countries. The sampling frame represents all three OIC regions. The survey instrument is contained in Appendix 2.

4.1.1. NTI Planning Aspects in OIC Countries

At the outset it is commented that NTI Planning is facing a paradigm shift in thinking from being a list of infrastructure projects that maximise mobility to a more thematic set of the objectives that emphasise outcomes that aim to decouple transport from the economy aligned to the sustainable development goals. Mostly, the case studies showed that planning has taken place in a policy vacuum, which has allowed a more ad hoc, and project orientated approach. Line Ministries are required to implement works rather than study, research and formulate policy. The risks of over-spending to create massive transport infrastructure that is out of sync with the demands of the economy are great. Why set up a 20th century transport system based on mass transit of goods and people for the 21st century of high tech where logistics will be increasingly robotic and workers travelling to huge offices in CBDs will be considered Jurassic! Needed in a future age is a more circumspect, judicious and smarter planning. Fundamental questions can be asked of policy that cannot be asked of projects once decisions have been made. The main message from the research is the long-term transport projects need long-term policies to guide them.

The general situation of NTI planning practices in the OIC countries for each of the seven NTI planning aspects is outlined as follows:

1. **Political and legislation factors**
   - Unlike in Africa and the Middle East, the countries in the Asian OIC region tend to not having a long-term national transport master plan. The Asian practice seems to be more successful as it performs better than those who have a national transport master plan (NTMP). The transport infrastructure development planning in Asia is included in a medium-term plan that covers all types of infrastructure, not only transport. This medium-term plan serves mostly as a strategic policy tool to realise the national government's vision, based on which a medium-term transport infrastructure sectoral program is developed. The advantage of a medium term plan is that the planning and implementation can be undertaken in a well structured and consequent way. Long term

planning horizons might constitute a problem for developing countries as their available capacities are limited.

- Because an NTMP is a visionary long-term document, it is mostly considered to be transport policies, which is an anomaly. This is not the case in countries that do not have an NTMP but a medium-term transport plan instead, which is driven by a higher-level vision or policy. A policy provides an opportunity for structured stakeholder and transport user engagement to discuss a wide range of issues in the dynamic and rapidly changing transport sector.
- NTMPs in the OIC region are mostly a product of IFI intervention and may not have been produced endogenously. They enable IFIs to contextualize their investments.

2. Institutional and organizational factors

- NTMPs are mostly developed by the Ministry of Transport, while in the countries that do not have an NTMP, the national infrastructure development plan is mostly developed by the Ministry of Economy.
- An institutional gap between the national and regional governments is very common; hence this needs to be addressed.
- Transport planning agencies are sometimes not multidisciplinary and cross sectoral, and this causes problems in preparing plans that meet their multifarious objectives. Furthermore, they do not have adequate authority to raise funds for investments, which is then mostly done through the Ministry of Finance. They also do not really have adequate capacity to prepare plans relying totally on outsourcing to consultants.

3. Technical factors

- Most of the NTI plans focus more on road and rail infrastructure with no attention to non-motorised transport. Furthermore, the integration of land use planning and transport planning is well-acknowledged by the OIC countries, yet this is scarcely present in practice.
- Very few NTI plans are developed based on an outcome-oriented approach that drives concerted performance measurement efforts at national and local levels.
- A systematic basis for prioritizing projects appears to be missing.
- A national traffic model does not always exist. Traffic forecasts are mostly made for each project and are normally too high.

4. Procedural factors and financing

- The transport planning approach in most of the OIC countries is top-down with the leader's vision sets the strategic direction of the infrastructure development of the country. The transport planning process is therefore highly centralized mainly coming from President of Republic and Prime Minister's Office.
- The involvement of the private sector in the transport planning process is very low if not zero. As such plans have not been aligned to fiscal space and this results in very little private funding of transport investments. The same applies to the involvement of academia, which is a waste of intellectual resources.

- Public consultation and stakeholder participation have been practiced by most of the OIC countries with different levels of involvement. The procedures however require strengthening.
- PPP is also being the most common practice of financing although the success rate in increasing project funding from the private sector is low. The largest share of transport infrastructure funding is mostly from IFIs. Road user charges are in place and cover a small portion of the operation and maintenance costs.

5. Content of NTI plan

- An NTMP is most of the time a visionary (abstract) long-term document, while a medium-term (transport) plan contains a list of concrete investment projects, be it at the ambition level or already formally approved.
- Many NTI plans are output based, that is to say the direct results of activities, for instance the number of km of roads, number of bridges and interchanges that should be built. While good NTI planning practices are outcome based, which refers to the short- or medium term development results that are caused by the outputs, for instance increase in level of service and accessibility, reduction in accidents and improvement in human development.
- Most of the NTI plans are not compliant with or not taking the Sustainable Development Goals into account.

6. Data collection method

- In some cases, data for plans and projects are collects as needed by consultants and research institutes through surveys of various kinds, such as household survey and traffic survey. In other cases, transportation data is collected annually by the Ministry of Transport or the National Bureau of Statistic.

7. Monitoring and evaluation

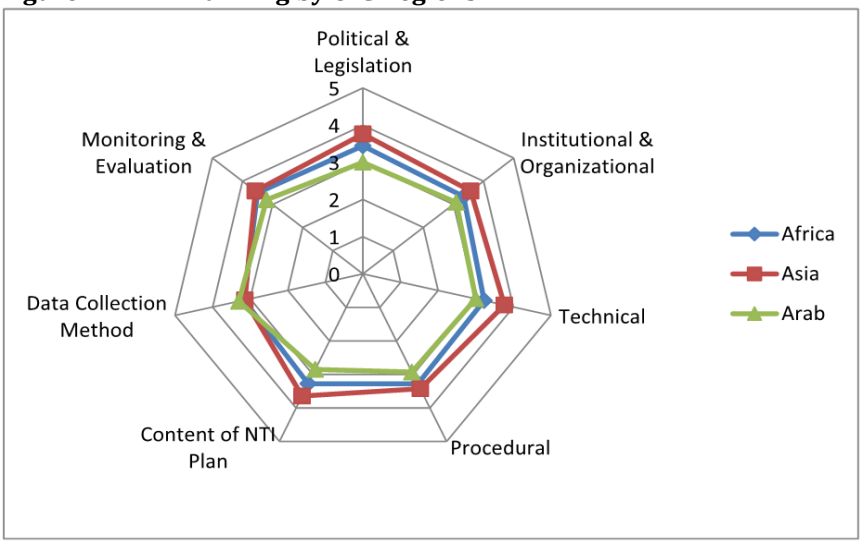
- The monitoring and evaluation system has been developing rapidly in the recent years in the OIC countries, even though the former is being more implemented than the latter. In some countries the monitoring process is coordinated by the ministry who developed the NTI plan, while in other countries it is done by a separate agency.
- In Malaysia, the infrastructure development program is implemented and monitored by a separate hybrid delivery unit which became one of the most prominent delivery units in the world

4.1.2. General Situation of NTI Planning in OIC Countries

This section concludes the views of the surveyed OIC Member States on the general situation of NTI planning in their countries.

Figure 42 shows that Asia appears to be performing marginally better than the other regions. This does not mean that infrastructure development is poorer as a consequence, not at all, only that planning procedures are different.

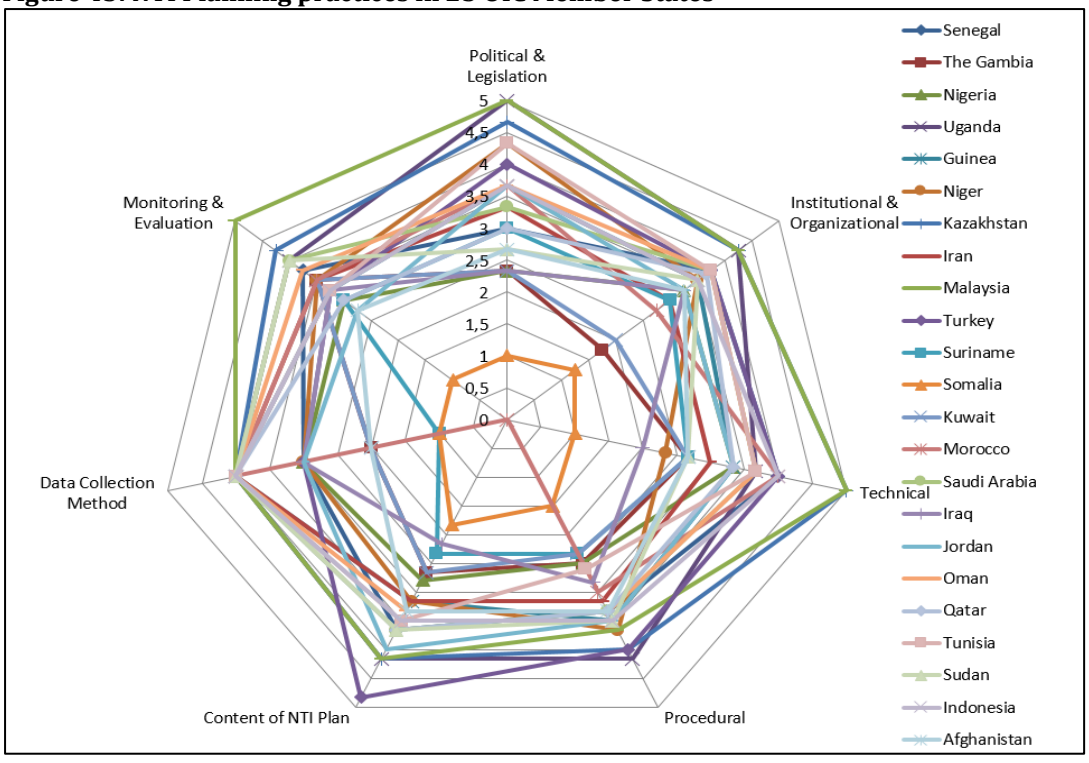
Figure 42: NTI Planning by OIC Regions



Source: analysis based on questionnaire results of 23 OIC Member States

However, the analysis of results by country reveals wide differences in the responses to the questions, with Malaysia appearing to consider its infrastructure planning to be highly satisfactory and Somalia the least satisfactory, as shown in Figure 43.

Figure 43: NTI Planning practices in 23 OIC Member States



Source: analysis based on questionnaire results of 23 OIC Member States

The range of values scored by each planning attribute is shown in Table 16. The widest range was the satisfaction with the content of the NTI plan for respective OIC members, while the least discrepancy was in the procedural aspects of the preparation of NTI plans.

Table 16: Planning attributes range of values

Per Country	Political and Legislation	Institutional & Organizational	Technical	Procedural	Content of NTI Plan	Data Collection Method	Monitoring & Evaluation
Max	5	4.25	5	4.2	4.8	4	5
Min	1	1.25	1	1.5	0	1	1
Range	4	3	4	2.7	4.8	3	4

Source: Fimotions

4.2. Policy Recommendations for OIC Member States

Although it is not suggested that NTI planning problems or solutions are the same for all OIC countries, this recommendations section is an effort to consolidate the results of the analysis and provide some specific suggestions towards improving NTI planning, based on our research, observations, and good practice examples.

1. Political and legislation factors

- A national transport policy needs to be developed before developing a national transport plan in order to provide a strategic direction towards common objective and goals to be followed by sectoral plans and programs. A medium-term planning process is therefore a better practice than developing an NTMP as the former is most likely driven by a transport policy.
- Both policy and plans should be developed in a way that is less incremental and more organic, that is to say from within and to avoid outsourcing the entire process to consultants. This ensures buy-in and ownership.
- Transport plans should also be mandatory and have legal force through legislation.

2. Institutional and organizational factors

- Institutions must have capacity to implement plans. Therefore it is important to build the institutional capacity by training or education of government officials and professionals to increase the effectiveness of the current planning procedures and techniques.
- The rule of subsidiarity should apply, transport master planning should be centralised and subsector and urban planning decentralised.

- Transport planning agencies must be multidisciplinary and cross-sectoral to apply a holistic approach, to ensure integration between modes of transport and adequately cover cross cutting issues.
- Transport planning agencies at the national level should be semi-autonomous authorities.

3. Technical factors

- NTI plans should integrate land use planning and multi-modal transport planning. Multimodal means not only road, rail, air, and water transport modes, but also non-motorised transport (pedestrian and bicycling).
- NTI plans should be outcome not output based.
- Methods to prioritise project should be in place, such as socio-economic evaluation and cost-benefit analysis.
- A national multi-modal transport model should be developed and be robust for external effects and shocks (global market, competitive position) and systemic risks. When required, expanding the set of scenario's and parameters in the models might be useful.

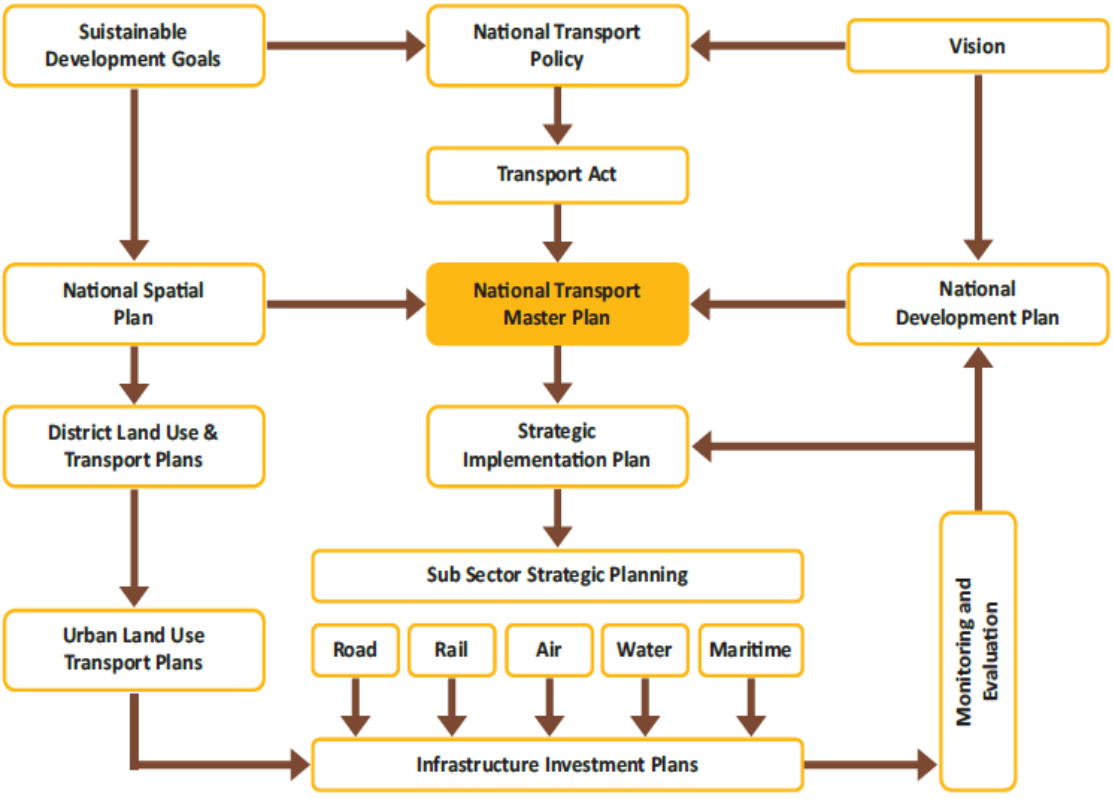
4. Procedural factors and financing

- Develop common guidelines for project appraisal and assessment for the OIC members.
- Make NTI plans publicly available, communicate them, this will stimulate the economy.
- Strengthening of procedures regarding public consultation and stakeholder participation.
- Improving the transparency of the public consultation process by providing more information such as guidance, a clear timeline, and all draft regulations to the stakeholders.
- Ensure that the planning horizon of NTI plans is 15 to 25 years, and that updates come on time.

Recommended Planning Process

An ideal process of developing an NTI plan is shown in Figure 44. The diagram puts at the head of the planning process a transport policy, which receives its intelligence from the development vision of the nation, if it has one, and the 17 Sustainable Development Goals that all nations have signed up to. The heart of the national transport planning process is the National Transport Master Plan that sets out the goals objectives and programming needed. The body of the plan is the strategic implementation plan that sets out the how, when and where of for implementation and the legs and feet of the planning processes, to complete the antotomic analogy, are the strategic plans at sub-sector level. National spatial planning and the National Development Planning feed the NTMP while Local and Urban Planning provide inputs at the subsectoral level. Importantly, the entire process must be subject to proactive monitoring and evaluation for which adequate institutional capacity is required.

Figure 44: Ideal process of developing NTI plans



- Increasing the involvement of private sector by enhancing the market environment for private sector participation. The involvement of private sectors in project finance, for example in the form of PPP, will lead to new risks in planning and implementation, and these risks need to be mitigated.
- Apply the use of the pricing instrument in view of optimization, allocation and funding. In order to ensure a sustainable financing, a greater share should be funded from road user charges (*user pay principle*).
- Increasing the involvement of academia to gain intellectual views in policy formation.
- Aligning NTI plans to fiscal space.

5. Content of NTI plan

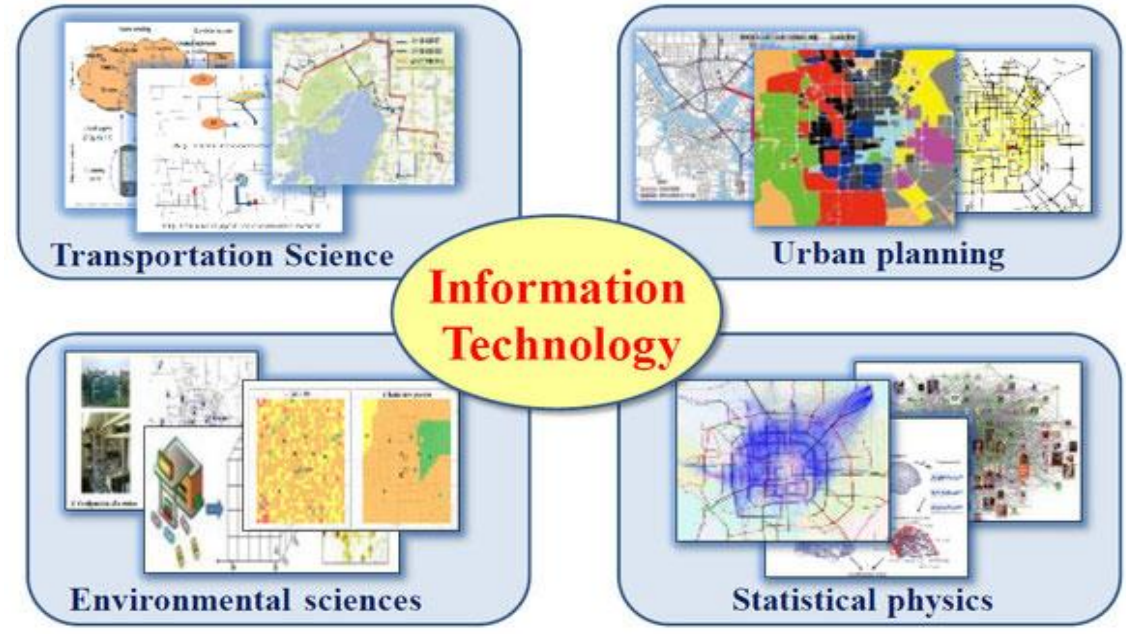
- NTI planning should start with problem identification and mapping of needs.
- NTI plans should have concrete achievable goals that fit in the policy context.
- NTI plans should include measures as well as projects and provide a comprehensive set of directions that will enable policies to be implemented.
- NTI plans should be outcome based, not only outputs. The specific objectives of the plan may relate to transport sector efficiency issues and cross cutting issues as well.
- Investments should be optimized by comparing them to the best alternative investment in view of the specific transport objective.

- Apply common guidelines for project appraisal and assessment for the OIC members.
- Sustainable Development Goals should be mainstreamed into NTI plans.
- The plans, the underlying models and scenarios should be made robust to external changes and shocks.
- NTI plans should mention project evaluation criteria and performance indicators.

6. Data collection

- Data collection is key to decision making and should be done in a systematic way.
- Develop common guidelines for data collection for the OIC members.
- Transportation data should be collected periodically (annually or more frequent)
- Data should be the basis of NTI planning and of the design of transport systems.
- Make use of new technologies and share data with the private domain (open access) as this will help the matching the infrastructure and the systems/assets making use of it.
- A most significant change will be the use of big data or mobile data in transport planning. Real time dynamic planning, the use of swarm intelligence and planning for autonomous vehicles.

Figure 45: Technology and Innovation in Transport Planning



Source: The Being City Lab

7. Monitoring and evaluation

- Transport plans should be annually revised to keep it up to date and maintain relevance.
- Setting up an independent (external) agency to monitor and evaluate whether the implementation of the plan is effective on achieving the expected results.

- The focus of the monitoring should include the outcomes instead of only on the achieved target and financial resources allocation. Monitoring of the output and outcome indicators should be carried out regularly. For the outputs, the indicators should be calculated at least once every quarter. For the outcomes, a yearly monitoring is sufficient as long as the output targets are achieved.
- Plan implementation and performance monitoring could be public domain using contemporary means such as dashboards.

4.3. Recommendations on further research

The world of transport planning is changing rapidly due to technology, communications and concerns for the environment and global warming. Also roads are becoming a cost burden for many governments in terms of maintenance operation and also the internalization of external costs. In light of these issues, the following are topics of research that should be of interest to OIC members:

- Reducing the need to travel - smart transportation planning
- Automation and transportation – removing the human element
- Paying for roads - the state of art and state of things to come
- Equity and subsidy in transportation – practices and recommendations

Appendix 1

Main drivers of contemporary transport policy

Sectors	Subsector
1. Transport Sector Policy	• creating equitable/fair conditions for all modes of transport that will create choice and lower costs; • applying the principle of the user payments to all modes of transport; • governing the transport sector-separation of roles between policy-planning and funding-implementing and supplies- customer/user quality • being socially responsible, guaranteeing citizen rights to compensation; • being sensitive to environment and energy efficiency; • taking advantage of advance technology and using communications to reduce the need to travel; • integrating and planning, management that will use scarce land and resource better;
2. Passenger Transport Policy	• being sensitive to the needs of users – improving urban and rural mobility, promoting non-motorised transport; • liberalising and opening the market to provide choice, expand the networks increase investment and improve commercial performance; • applying quality licensing to operators and vehicles that will ensure safety reliability and compliance to standards; • investing in public transport infrastructure to provide priorities for buses, encourage rail passenger transport; • support public transport services where there are not commercial but socially desirable; • apllying pro-active traffic restraint measures; • enforce higher standards to obtain quality;
3. Freight and Trade	• lowering the cost of freight; • providing new services for small business, consolidation, helping the economy to grow; • transport corridor development; • land-liking land locked countries; • promoting trade facilitation, removing non-tariff barriers; • internalisation of external costs of road freight transport, paying for infrastructure, accidents, pollution and congestion; • promoting industry self-regulation, being more responsible, operating safer and greener; • improving road side services; • respecting citizens' rights;
4. Road Networks	• making sure that road development is aligned to economic need, providing value and affordability; • refining the way roads are planned, developed, maintained to reduce costs and obtain better value; • transforming the way roads are managed, autonomies. Government responsible for policy, roads authority for planning, funding and public participation, they provide sector for maintenance to improve decisions making and performance; • improving technical standards in construction and maintenance; • reducing mistakes and being more attentive to design, reducing risk and benefiting economy; • being more sensitive to environment, managing traffic better and reducing congestion thus saving time; • ensuring citizen's right to compensation when incurring loss and injury due to negligence – like all other models of transport;

Sectors	Subsector
5. Rail	• restructuring to provide commercial autonomy, creating viability and accountability and separating the provision of infrastructure from operating freight and passenger trains; • opening up the railway market to new companies to provide freight and passenger services; • increase market size, develop merge to engage former large entities that will engage economies of scales to reduce costs and increase competitiveness; • diversify to provide new freight services to a demanding market requiring added value, logistics and on-line information; • redefining passenger services using special arrangements with government to finance the gap if services not commercial and private sector to develop station parking and provide added value services;
6. Aviation	• opening up markets permitting other carriers to operate; • enhancing the market with more tourism; • developing aerotropolis concepts around airports; • realignment of user charges, moving to profitability on the ground and in the air; • supporting volume tourism, enhancing markets working with charters and developing packages; • regionalisation of national operators; • regional integration of Air Traffic Controls, application of Global Navigation Satellite Systems;
7. River, lake and Inland Waterways	• need to develop the mode, where navigable as alternative transportation means; • strengthen and enforce safety, design, standards and operating regulations; • securing physical access to viable waterways; • ensuring environmental standards are safeguarded; • including in the portfolios of transport ministries; • subsidies to connect remote communities;
8. Maritime Transport	• complete separation of port infrastructure and navigation from operations; • expanding capacity, accommodation of larger vessels; • automation of loading and offloading; • advance customs clearance with electronic data; • minimizing dwell times, elimination of discriminatory performance; • establishing dry ports; • empowering shippers' councils;

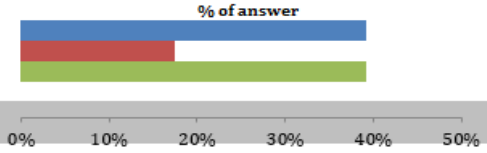
Appendix 2

Questionnaire Result (Member States)

Introduction

1 What is a National Transport Infrastructure Plan in your country? Please choose

Answer	Total	% of answer	Percent
A visionary (abstract) long term document	9		39%
A list of concrete investment projects (ambitions)	4		17%
A list of concrete investment projects (formally approved)	9		39%
Other	-		0%
Total number of countries	22		
Question skipped	1		



2 What is the name of this planning document in your country?

Open Answer	Total	Percent
Total number of countries	22	96%
Question skipped	1	

ARAB:

- Iraq: Transportation Plan Sheet
- Jordan: Long Term National Transport Strategy
- Kuwait: Vision 2035
- Morocco: Plan Routs 2035
- Oman: The Five Year Development Plan (2016-2020)
- Qatar: Qatar Transport Master Plan
- Saudi Arabia: MOT Master Plan
- Somalia: Somalia National Development Plan
- Sudan: Ministry of Transport Plan
- Tunisia: Plan 2016 - 2020

ASIAN:

- Afghanistan: -
- Indonesia: Strategy Plan
- Iran: CTSL
- Kazakhstan: Nurly Zhol
- Malaysia: Eleventh Malaysia Plan
- Suriname: *included in the Annual Budget of the country*
- Turkey: National Transport Master Plan for the Republic of Turkey

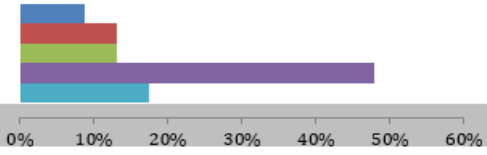
AFRICAN:

- The Gambia: National Transport Plan/Policy
- Guinea: Feasibility Study
- Niger: La Stratégie Nationale des Transports 2017-2025
- Nigeria: National Plan on Infrastructure Development
- Senegal: Lettre de Politique Sectorielle das Transports
- Uganda: National Transport Master Plan

Part I: Political and Legislation Factors

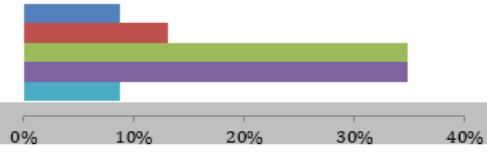
3 The extent to which a decision making on transport infrastructure investment is influenced by transport policy

Answer	Total	% of answer	Percent
1 - very low	2		9%
2	3		13%
3	3		13%
4	11		48%
5 - very high	4		17%
Total number of countries	23		
Question skipped	-		



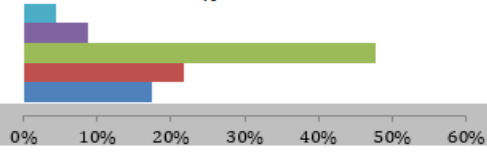
4 Degree to which international transport infrastructure related agreements have an influence on planning of national transport infrastructure

Answer	Total	% of answer	Percent
1 - very low	2		9%
2	3		13%
3	8		35%
4	8		35%
5 - very high	2		9%
Total number of countries	23		
Question skipped	-		



5 The extent of implementing tha ratified international agreements into your national transport planning

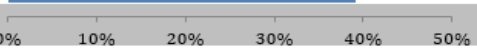
Answer	Total	% of answer	Percent
1 - very low	1		4%
2	2		9%
3	11		48%
4	5		22%
5 - very high	4		17%
Total number of countries	23		
Question skipped	-		



Part II: Institutional and Organizational Factors, including Institutional Capacity

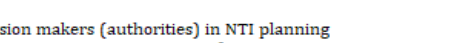
6 The extent to which a decision making on transport infrastructure investment is influenced by transport policy

Answer	Total	% of answer	Percent
1 - very low	-		0%
2	5		22%
3	2		9%
4	6		26%
5 - very high	9		39%
Total number of countries	22		
Question skipped	1		



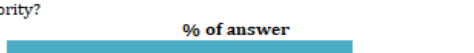
7 The level of involvement of private sector in transport planning decision making

Answer	Total	% of answer	Percent
1 - very low	2		9%
2	9		39%
3	6		26%
4	6		26%
5 - very high	-		0%
Total number of countries	23		
Question skipped	-		



8 Sufficiency of qualified and skilled transport professionals at decision makers (authorities) in NTI planning

Answer	Total	% of answer	Percent
1 - very low	2		9%
2	2		9%
3	8		35%
4	11		48%
5 - very high	-		0%
Total number of countries	23		
Question skipped	-		



9 Do you have an integrated land use and transport planning authority?

Answer	Total	% of answer	Percent
Yes	11		48%
No	11		48%
Total number of countries	22		
Question skipped	1		4%

10 Adequacy level of coordination between government agencies in related matters

Answer	Total	% of answer	Percent
1 - very low	2		9%
2	-		0%
3	11		48%
4	7		30%
5 - very high	3		13%
Total number of countries	23		
Question skipped	-		

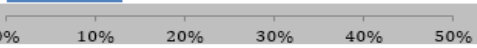
Part III: Technical Factors

11 Level of holistic planning in transport sectors, in terms of the integration among various aspects such as land use, multi-modal transport logistics and communication plans

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	4		17%
3	5		22%
4	11		48%
5 - very high	2		9%
Total number of countries	23		
Question skipped	-		

12 Extent of complementarity of road, rail, air and water based transport modes (complementarity should be interpreted in the way that these transport modes do not primarily compete with each others)

Answer	Total	% of answer	Percent
1 - very low	3		13%
2	5		22%
3	8		35%
4	5		22%
5 - very high	2		9%
Total number of countries	23		
Question skipped	-		

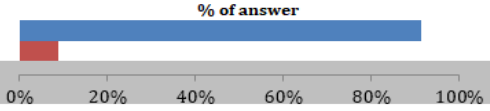


13 Application of socio-economic evaluation / cost benefit analysis in infrastructure planning to prioritize projects

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	1		4%
3	9		39%
4	8		35%
5 - very high	3		13%
Total number of countries	22		
Question skipped	1		

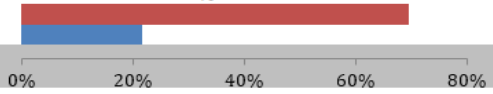
14 Is it mandatory to apply Environmental and Social Impact Assesments for transport investment projects?

Answer	Total	% of answer	Percent
Yes	21		91%
No	2		9%
Total number of countries	23		
Question skipped	-		



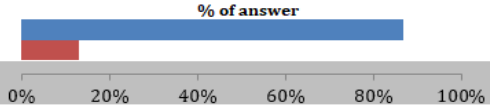
15 Are you signatory party to international transport corridors?

Answer	Total	% of answer	Percent
Yes	16		70%
No	5		22%
Total number of countries	21		
Question skipped	2		



16 Do multi-modal freight logistics elements play a role in your NTI planning?

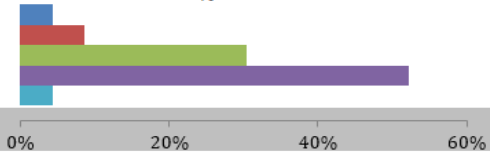
Answer	Total	% of answer	Percent
Yes	20		87%
No	3		13%
Total number of countries	23		
Question skipped	-		



Part IV: Procedural Factors, including Financing

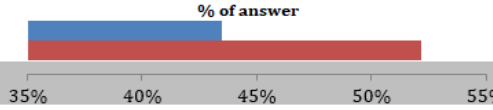
17 Level of consultation and stakeholder participation in NTI planning that includes other sectors other than transport planning institutions

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	2		9%
3	7		30%
4	12		52%
5 - very high	1		4%
Total number of countries	23		
Question skipped	-		



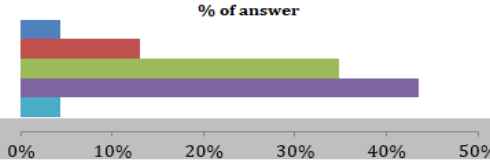
18 Does a legal basis enforcing public consultation in NTI decision making process exist?

Answer	Total	% of answer	Percent
Yes	10		43%
No	12		52%
Total number of countries	22		
Question skipped	1		



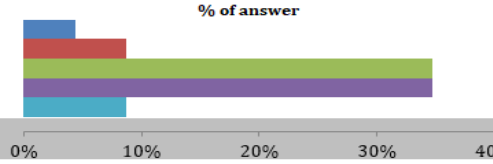
19 The inclusion of assesment of transport user needs (market survey/research) to shape the transport agenda

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	3		13%
3	8		35%
4	10		43%
5 - very high	1		4%
Total number of countries	23		
Question skipped	-		



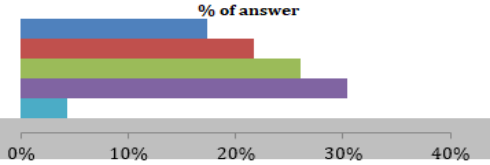
20 The extent to which transport investment decision making includes the assesment of users' affordability

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	2		9%
3	8		35%
4	8		35%
5 - very high	2		9%
Total number of countries	21		
Question skipped	2		



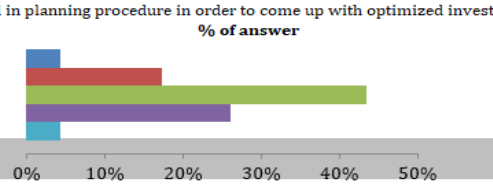
21 Level/extent of private funding of transport services and infrastructure

Answer	Total	% of answer	Percent
1 - very low	4		17%
2	5		22%
3	6		26%
4	7		30%
5 - very high	1		4%
Total number of countries	23		
Question skipped	-		



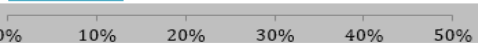
22 The extent to which the evaluation of alternative solutions included in planning procedure in order to come up with optimized investments

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	4		17%
3	10		43%
4	6		26%
5 - very high	1		4%
Total number of countries	22		
Question skipped	1		



27 The extent of application of socio economic analysis

Answer	Total	% of answer	Percent
1 - very low	-		0%
2	4		17%
3	6		26%
4	9		39%
5 - very high	3		13%
Total number of countries	22		
Question skipped	1		



28 What is the typical time horizon of NTI planning in your country?

Open Answer	Total	% of answer	Percent
Total number of countries	19		83%
Question skipped	4		

-4 years: 1 country
-5 years: 9 countries
-9 years: 1 country
-10 years: 2 countries
-15 years: 1 country
-20 years: 3 countries
-25 years: 1 country
-50 years: 1 country

29 Application of econometric models in demand forecasting

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	3		13%
3	6		26%
4	10		43%
5 - very high	1		4%
Total number of countries	21		
Question skipped	2		

30 Incorporation of clear targets in the plan against which the results of the planning are evaluated

Answer	Total	% of answer	Percent
1 - very low	-		0%
2	4		17%
3	6		26%
4	7		30%
5 - very high	4		17%
Total number of countries	21		
Question skipped	2		

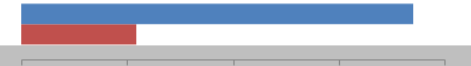
23 The extent to which the financial investment plan considers the adequate funding of Maintenance and Operation expenses along the lifetime of the

Answer	Total	% of answer	Percent
1 - very low	-		0%
2	4		17%
3	8		35%
4	10		43%
5 - very high	-		0%
Total number of countries	22		
Question skipped	1		

Part V: Content of NTI plan

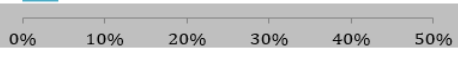
24 Do you have a national transport policy that drives the content of the NTI plan?

Answer	Total	% of answer	Percent
Yes	17		74%
No	5		22%
Total number of countries	22		
Question skipped	1		



25 Use of scenarios/sensitivity analysis in planning

Answer	Total	% of answer	Percent
1 - very low	2		9%
2	2		9%
3	10		43%
4	7		30%
5 - very high	1		4%
Total number of countries	22		
Question skipped	1		

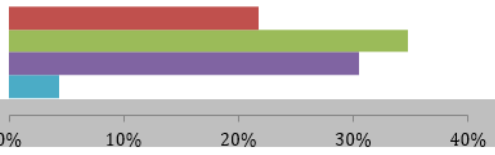


26 The extent of application of financial analysis

Answer	Total	% of answer	Percent
1 - very low	-		0%
2	2		9%
3	7		30%
4	11		48%
5 - very high	2		9%
Total number of countries	22		
Question skipped	1		

31 The extent to which the plans and investments are scalable (in a later phase) in order to adapt to future deviations from present expectations

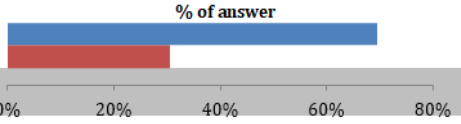
Answer	Total	% of answer	Percent
1 - very low	-		0%
2	5		22%
3	8		35%
4	7		30%
5 - very high	1		4%
Total number of countries	21		
Question skipped	2		



Part VI: Data collection method, including statistics and surveys

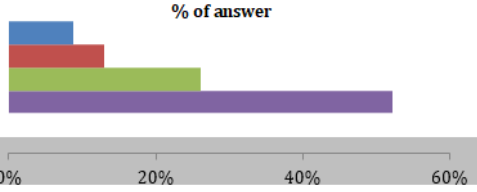
32 Does comprehensive land use and transport data collection take place periodically?

Answer	Total	% of answer	Percent
Yes	16		70%
No	7		30%
Total number of countries	23		
Question skipped	-		



33 Adequacy of information to formulate plan

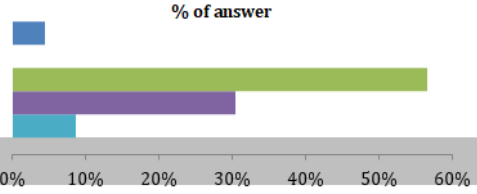
Answer	Total	% of answer	Percent
1 - very low	2		9%
2	3		13%
3	6		26%
4	12		52%
5 - very high	-		0%
Total number of countries	23		
Question skipped	-		



Part VII: Monitoring and Evaluation System

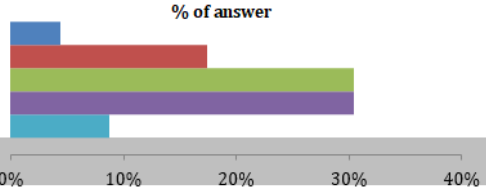
34 The extent of coordinated, comprehensive and regular reporting on plan implementation

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	-		0%
3	13		57%
4	7		30%
5 - very high	2		9%
Total number of countries	23		
Question skipped	-		



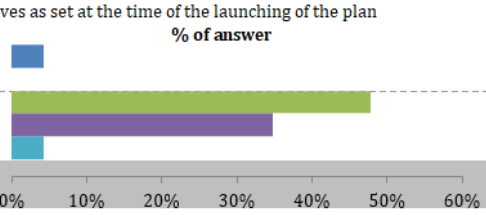
35 The extent of independent objective reporting on plan effectiveness, in order to evaluate whether the implementation of the plan is effective on achieving the expected results

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	4		17%
3	7		30%
4	7		30%
5 - very high	2		9%
Total number of countries	21		
Question skipped	2		



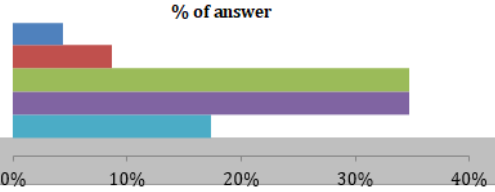
36 The extent to which the plans have achieved the goals and objectives as set at the time of the launching of the plan

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	-		0%
3	11		48%
4	8		35%
5 - very high	1		4%
Total number of countries	21		
Question skipped	2		



37 Level of improvement needed to strengthen planning processes

Answer	Total	% of answer	Percent
1 - very low	1		4%
2	2		9%
3	8		35%
4	8		35%
5 - very high	4		17%
Total number of countries	23		
Question skipped	-		

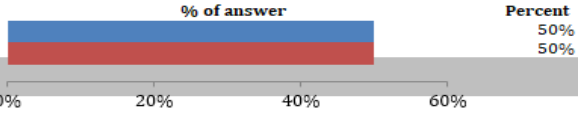


Questionnaire Result (Academia/Private Institutions)

Introduction

Please choose between these two categories that represents yourself:

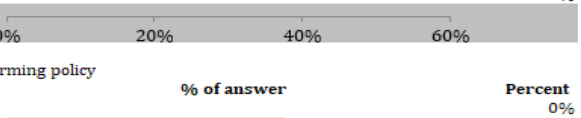
Answer	Total	Percent
Academia	4	50%
Private Institution	4	50%
Total number of respondents	8	
Question skipped	-	



Part I: Policy and Legislation

1 The current transport policy is relevant and meets the needs of the nation

Answer	Total	Percent
1 - not agree	-	0%
2	1	13%
3	3	38%
4	4	50%
5 - fully agree	-	0%
Total number of respondents	8	
Question skipped	-	

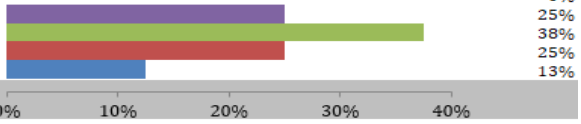


2 Academia and the private sector have significant contribution in forming policy

Answer	Total	Percent
1 - not agree	-	0%
2	3	38%
3	1	13%
4	4	50%
5 - fully agree	-	0%
Total number of respondents	8	
Question skipped	-	

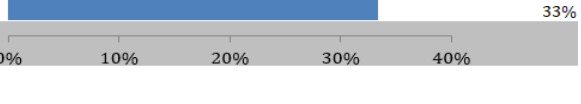
3 Transport legislation is comprehensive and contemporary

Answer	Total	Percent
1 - not agree	-	0%
2	1	13%
3	3	38%
4	3	38%
5 - fully agree	1	13%
Total number of respondents	8	
Question skipped	-	



4 Transport legislation is adequately enforced

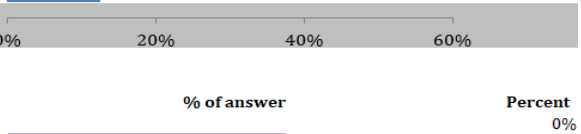
Answer	Total	Percent
1 - not agree	-	0%
2	2	25%
3	3	38%
4	2	25%
5 - fully agree	1	13%
Total number of respondents	8	
Question skipped	-	



Part II: Institutions and Organizations

5 Transport planning is highly centralized

Answer	Total	Percent
1 - not agree	1	11%
2	1	11%
3	1	11%
4	2	22%
5 - fully agree	3	33%
Total number of respondents	8	
Question skipped	1	



6 Transport Planning agencies have adequate capacity to prepare plans

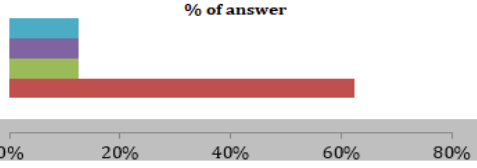
Answer	Total	Percent
1 - not agree	-	0%
2	2	25%
3	1	13%
4	4	50%
5 - fully agree	1	13%
Total number of respondents	8	
Question skipped	-	

7 Transport Planning agencies are multidisciplinary and cross sectoral

Answer	Total	Percent
1 - not agree	-	0%
2	2	25%
3	3	38%
4	2	25%
5 - fully agree	1	13%
Total number of respondents	8	
Question skipped	-	

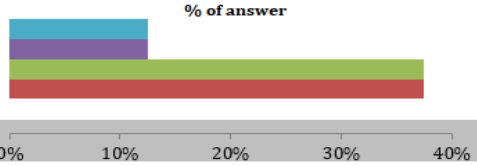
8 Transport Planning agencies are autonomous authorities

Answer	Total	% of answer	Percent
1 - not agree	1		13%
2	1		13%
3	1		13%
4	5		63%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



9 Transport Planning agencies have adequate authority to raise funds for investments

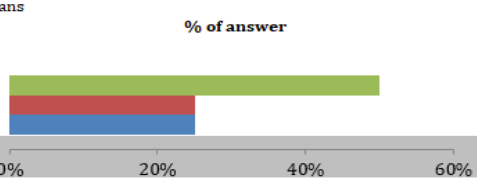
Answer	Total	% of answer	Percent
1 - not agree	1		13%
2	1		13%
3	3		38%
4	3		38%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



Part III: Planning Processes and Informations

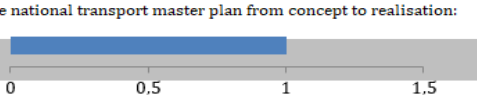
10 Transport sector development is dependant on national transport plans

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	-		0%
3	4		50%
4	2		25%
5 - fully agree	2		25%
Total number of respondents	8		
Question skipped	-		



11 What is the normal lead time of the implementation of projects in the national transport master plan from concept to realisation:

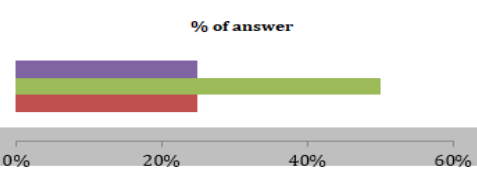
Open Answer	Total	Percent
Total number of respondents	6	75%
Question skipped	1	



*Kazakhstan 4-7 years
*Senegal 5-10 years
*Indonesia (1) 2-5 years; (2) 5-10 years
*Saudi Arabia 5 years
*Uganda 5 years
*Suriname 5-8 years

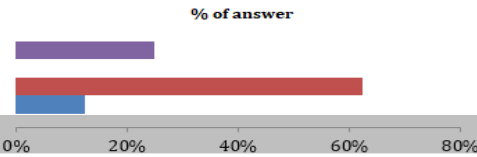
12 The public consultation process is highly effective

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	4		50%
4	2		25%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



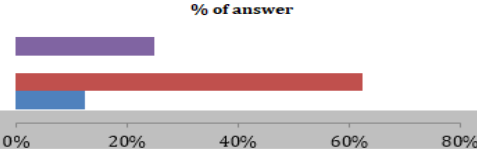
13 Transport infrastructure investments do reflect the needs in society

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	-		0%
4	5		63%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		



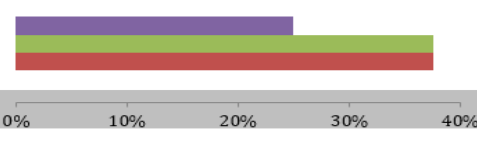
14 Transport infrastructure investments are normally part of a development plan

Answer	Total	% of answer	Percent
1 - not agree	1		13%
2	1		13%
3	1		13%
4	4		50%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		



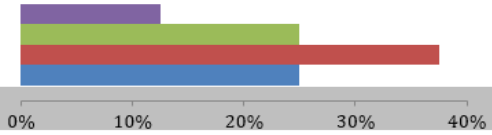
15 Transport infrastructure and services are well integrated

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	3		38%
4	3		38%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



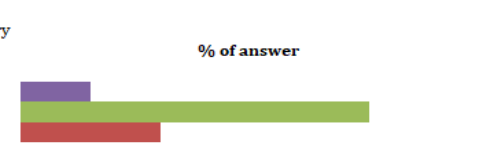
16 The results expected from national plans are aligned to the national vision

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	1		13%
3	2		25%
4	3		38%
5 - fully agree	2		25%
Total number of respondents	8		
Question skipped	-		



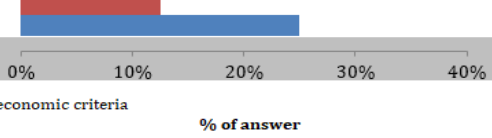
17 Information on transport projects is accessible in the public domain

Answer	Total	% of answer	Percent
1 - not agree	1		13%
2	-		0%
3	3		38%
4	2		25%
5 - fully agree	2		25%
Total number of respondents	8		
Question skipped	-		



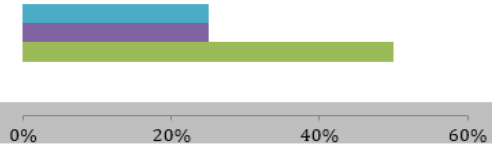
18 Transport planning is well taught in tertiary education in the country

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	5		63%
4	1		13%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



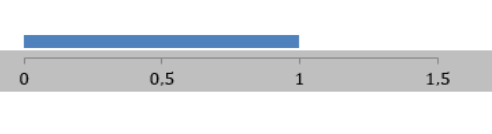
19 Transport planning uses project cycle management

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	3		38%
4	1		13%
5 - fully agree	2		25%
Total number of respondents	8		
Question skipped	-		



20 Projects in the National Transport Plan are prioritized using socio-economic criteria

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	1		13%
3	4		50%
4	2		25%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		



21 There is minimal political interference in the process of project selection

Answer	Total	% of answer	Percent
1 - not agree	2		25%
2	2		25%
3	4		50%
4	-		0%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		

22 The extent to which you (or your sector) participate in the planning process of national transport infrastructure in your country?

Answer	Total	% of answer	Percent
1 - very low	1		13%
2	-		0%
3	2		25%
4	2		25%
5 - very high	3		38%
Total number of respondents	8		
Question skipped	-		

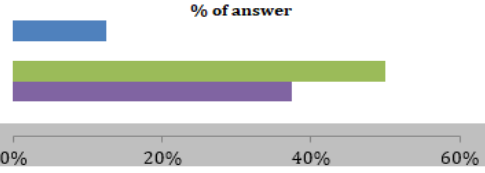
23 In which phase of the process are you involved?

Open Answer	Total	Percent
Total number of respondents	8	100%
Question skipped	-	

The answers vary among the following phases:
- Planning (and design)
- Implementation
- Envinmental assessment

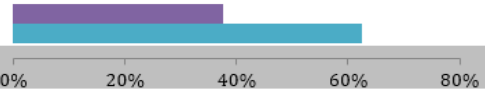
24 Your satisfaction of your involvement

Answer	Total	% of answer	Percent
1 - very low	1		13%
2	-		0%
3	4		50%
4	3		38%
5 - very high	-		0%
Total number of respondents	8		
Question skipped	-		



25 Your willingness to be (more) involved in the planning process of national transport infrastructure in your country?

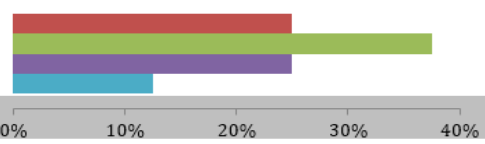
Answer	Total	% of answer	Percent
1 - very low	-		0%
2	-		0%
3	-		0%
4	3		38%
5 - very high	5		63%
Total number of respondents	8		
Question skipped	-		



Part IV: Technical Factors

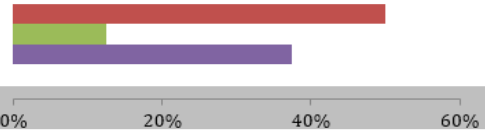
26 The Environmental Impact Assessment Process is efficiently carried out and effectively monitored

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	3		38%
4	2		25%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		



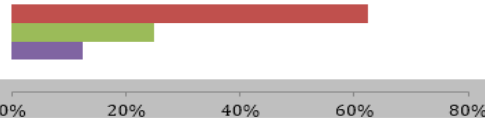
27 Transport data used in transport planning is adequate, being collected efficiently and analysed effectively

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	4		50%
3	1		13%
4	3		38%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



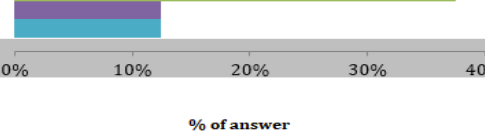
28 Commercial entities release data for use in transport planning

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	5		63%
3	2		25%
4	1		13%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



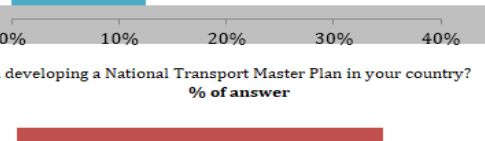
29 Transport data are accessible for (academic) research

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	3		38%
3	3		38%
4	1		13%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		



30 Transport data are accessible for (commercial) research

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	3		38%
4	2		25%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		

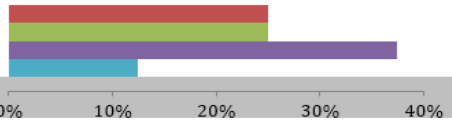


31 The extent to which Land Use and Transport Modelling being used in developing a National Transport Master Plan in your country?

Answer	Total	% of answer	Percent
1 - very low	-		0%
2	3		38%
3	2		25%
4	2		25%
5 - very high	1		13%
Total number of respondents	8		
Question skipped	-		

32 The extent to which the sustainable development goals (SDGs) are embedded in transport planning

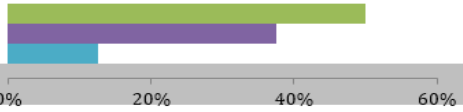
Answer	Total	% of answer	Percent
1 - very low	-		0%
2	2		25%
3	2		25%
4	3		38%
5 - very high	1		13%
Total number of respondents	8		
Question skipped	-		



Part V: Plans and Content

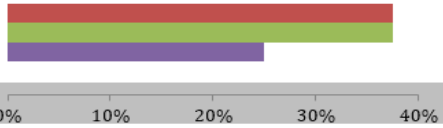
33 Transport planning horizons are appropriate

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	-		0%
3	4		50%
4	3		38%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		



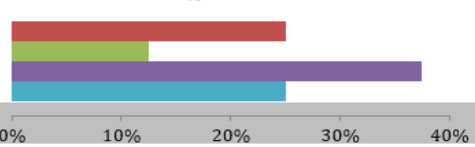
34 The structure of national transport plans are clear for each mode of transport

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	3		38%
3	3		38%
4	2		25%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



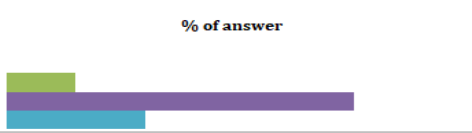
35 Transport plans are organised by theme such as reducing congestion, fair and affordable travel, improving trade, reducing poverty, etc

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	1		13%
4	3		38%
5 - fully agree	2		25%
Total number of respondents	8		
Question skipped	-		



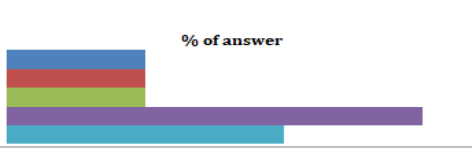
36 National transport plans are mostly strategic in nature

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	-		0%
3	1		13%
4	5		63%
5 - fully agree	2		25%
Total number of respondents	8		
Question skipped	-		



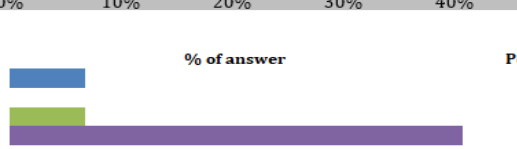
37 National transport plans cover all modes of transport

Answer	Total	% of answer	Percent
1 - not agree	1		13%
2	1		13%
3	1		13%
4	3		38%
5 - fully agree	2		25%
Total number of respondents	8		
Question skipped	-		



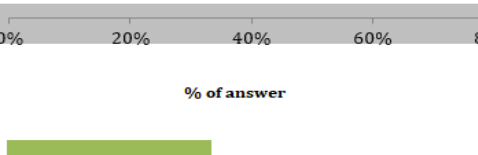
38 Planning outputs are clearly stated

Answer	Total	% of answer	Percent
1 - not agree	1		13%
2	-		0%
3	1		13%
4	6		75%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



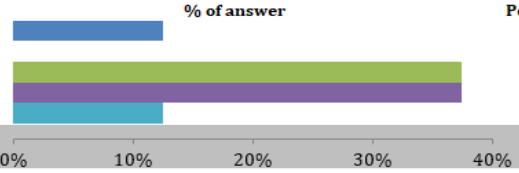
39 The outcomes from the plan are understandable

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	-		0%
3	3		38%
4	5		63%
5 - fully agree	-		0%
Total number of respondents	8		
Question skipped	-		



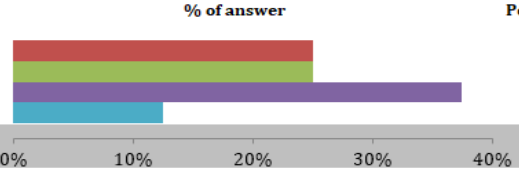
40 Targets and performance indicators are stated and measurable

Answer	Total	Percent
1 - not agree	1	13%
2	-	0%
3	3	38%
4	3	38%
5 - fully agree	1	13%
Total number of respondents	8	
Question skipped	-	



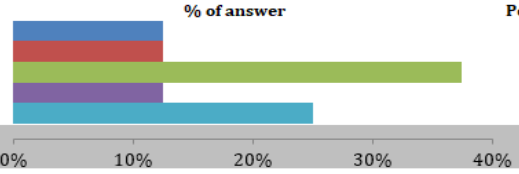
41 The cost of the investment in the transport plans clearly set out

Answer	Total	Percent
1 - not agree	-	0%
2	2	25%
3	2	25%
4	3	38%
5 - fully agree	1	13%
Total number of respondents	8	
Question skipped	-	



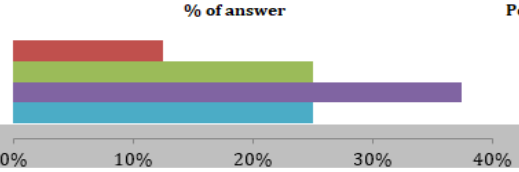
42 Investors use transport plans as a main source of information

Answer	Total	Percent
1 - not agree	1	13%
2	1	13%
3	3	38%
4	1	13%
5 - fully agree	2	25%
Total number of respondents	8	
Question skipped	-	



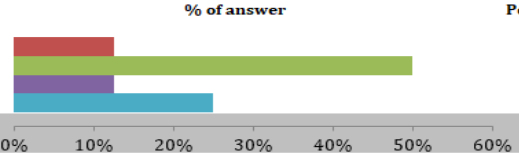
43 Projects investments in the plan are public and private

Answer	Total	Percent
1 - not agree	-	0%
2	1	13%
3	2	25%
4	3	38%
5 - fully agree	2	25%
Total number of respondents	8	
Question skipped	-	



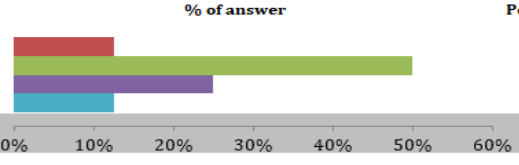
44 Most of the funding needed is committed when the plan is issued

Answer	Total	Percent
1 - not agree	-	0%
2	1	13%
3	4	50%
4	1	13%
5 - fully agree	2	25%
Total number of respondents	8	
Question skipped	-	



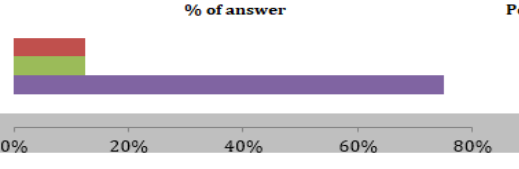
45 Monitoring plan implementation is well organized and effective

Answer	Total	Percent
1 - not agree	-	0%
2	1	13%
3	4	50%
4	2	25%
5 - fully agree	1	13%
Total number of respondents	8	
Question skipped	-	



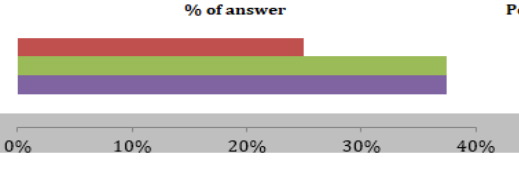
46 Key Performance Indicator is used to evaluate the performance of the projects

Answer	Total	Percent
1 - not agree	-	0%
2	1	13%
3	1	13%
4	6	75%
5 - fully agree	-	0%
Total number of respondents	8	
Question skipped	-	



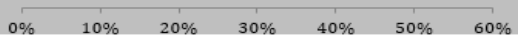
47 Plan implementation is generally efficient

Answer	Total	Percent
1 - not agree	-	0%
2	2	25%
3	3	38%
4	3	38%
5 - fully agree	-	0%
Total number of respondents	8	
Question skipped	-	



48 The evaluation process is in place and working well

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	4		50%
4	1		13%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		

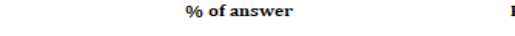


49 National Transport Plans have generally achieved their outcomes and results expected

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	2		25%
3	3		38%
4	2		25%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		

50 Reporting on the periodic performance of the plan is mandatory

Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	1		13%
3	1		13%
4	3		38%
5 - fully agree	3		38%
Total number of respondents	8		
Question skipped	-		



51 Plan performance reporting is in the public domain

Answer	Total	% of answer	Percent
1 - not agree	1		13%
2	2		25%
3	2		25%
4	2		25%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		

52 Monitoring and evaluation is well taught in tertiary education in the country

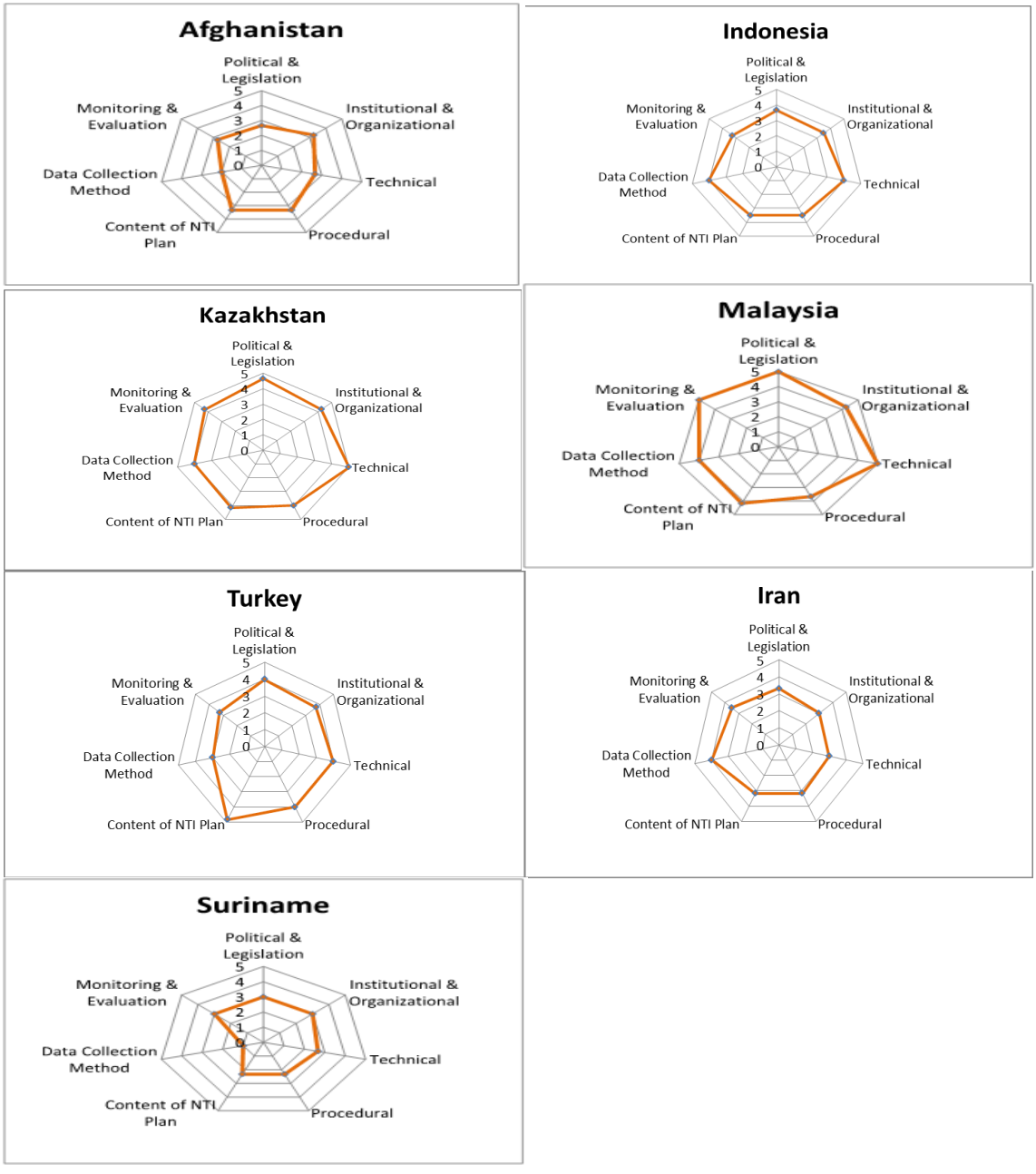
Answer	Total	% of answer	Percent
1 - not agree	-		0%
2	4		50%
3	3		38%
4	-		0%
5 - fully agree	1		13%
Total number of respondents	8		
Question skipped	-		

Appendix 3

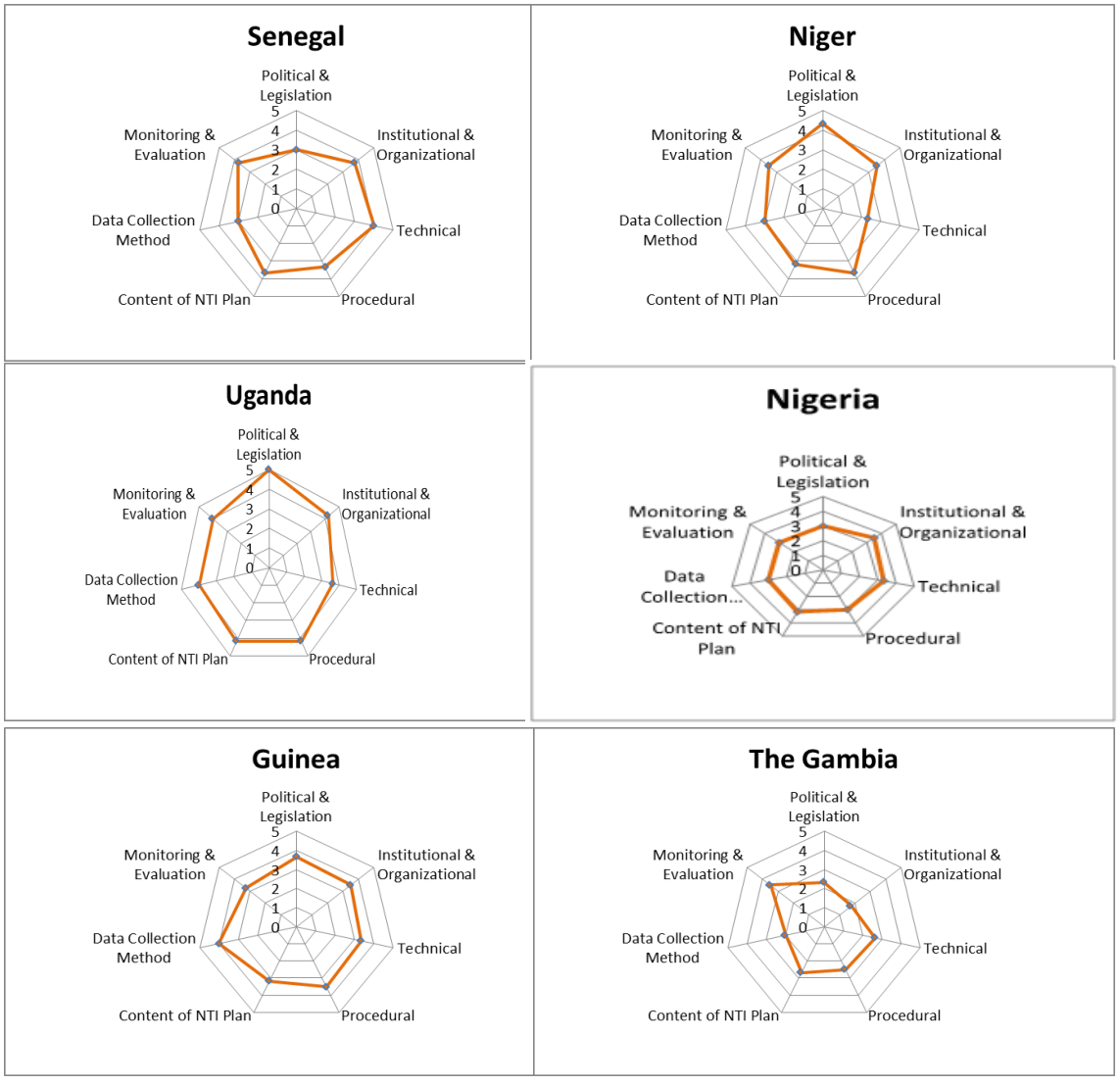
Radar Chart per country

The radar charts are created based on the responses of the Member States to the questionnaire. The answer of each question is in the form of a likert scale (1 to 5). Every part (for instance Political and Legislation) contains several questions. The value per part (which is presented in the radar chart) is the average value of the questions that belong to the particular part.

Asia



Africa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Political & Legislation
Institutional & Organizational
Technical
Procedural
Content of NTI Plan
Data Collection Method
Monitoring & Evaluation
Niger
Political & Legislation
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Technical
Procedural
Content of NTI Plan
Data Collection Method
Monitoring & Evaluation
Uganda
Political & Legislation
Institutional & Organizational
Technical
Procedural
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Data Collection Method
Monitoring & Evaluation
Nigeria
Political & Legislation
Institutional & Organizational
Technical
Procedural
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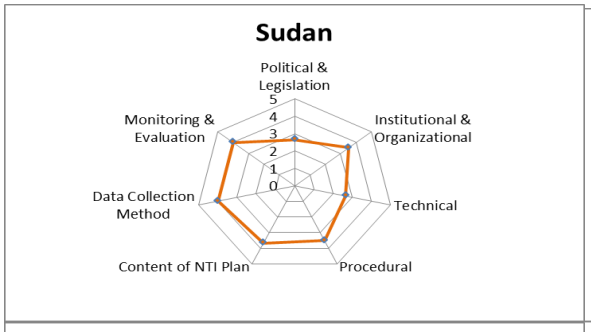
Data Collection...
Monitoring & Evaluation
Guinea
Political & Legislation
Institutional & Organizational
Technical
Procedural
Content of NTI Plan
Data Collection Method
Monitoring & Evaluation
The Gambia
Political & Legislation
Institutional & Organizational
Technical
Procedural
Content of NTI Plan
Data Collection Method
Monitoring & Evaluation

Middle East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Institutional & Organizational
Technical
Procedural
Content of NTI Plan
Data Collection Method
Monitoring & Evaluation
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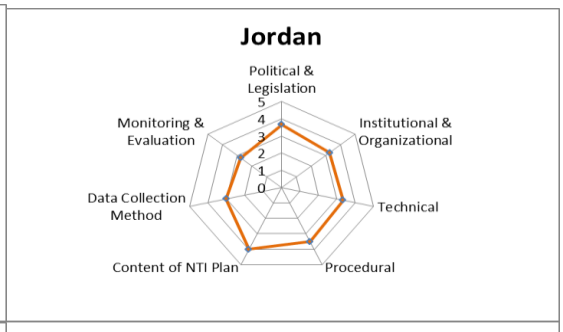
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Technical
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Monitoring & Evaluation
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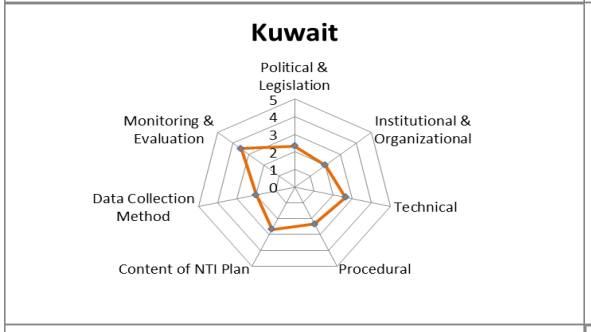
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Institutional & Organizational
Technical
Procedural
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Data Collection Method
Monitoring & Evaluation
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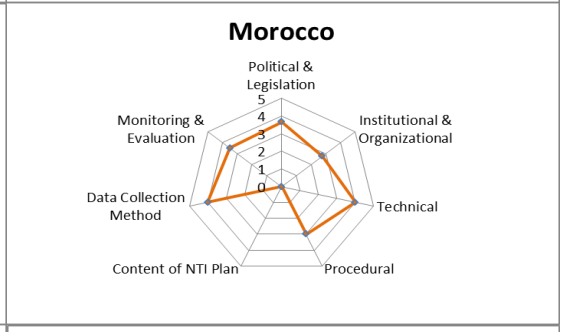
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Data Collection Method
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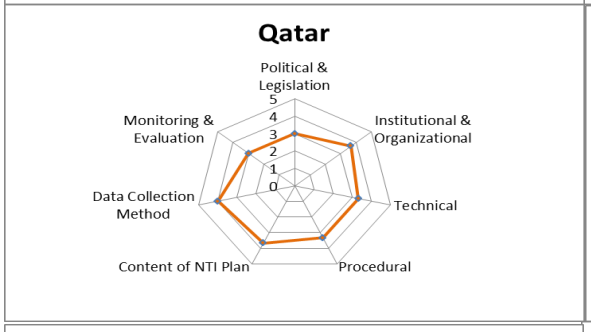
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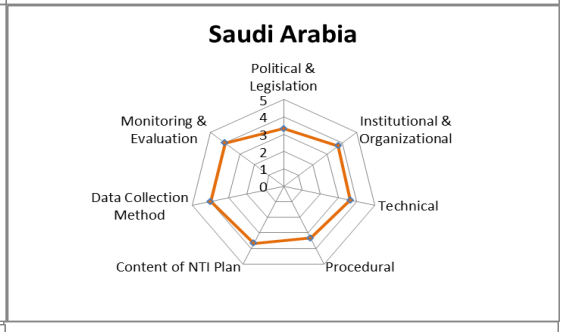
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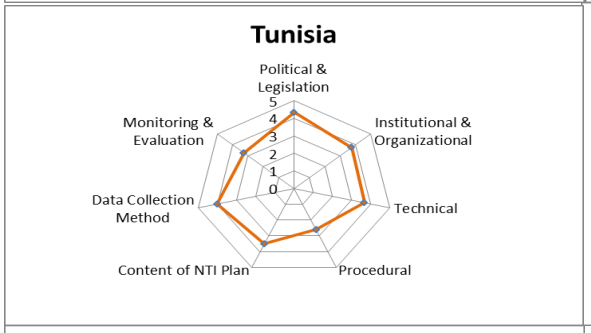
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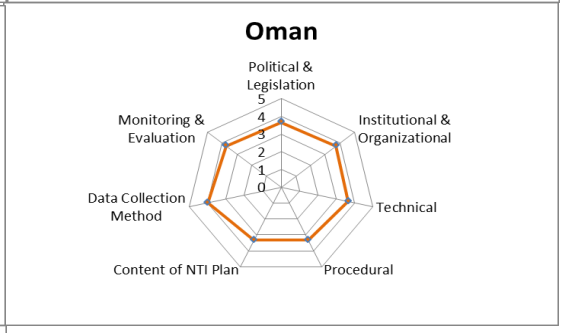
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Data Collection Method
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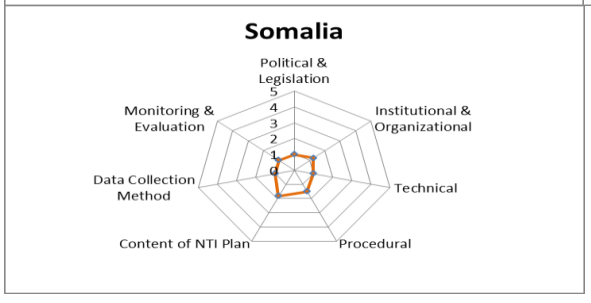
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Political & Legislation
Institutional & Organizational
Technical
Procedural
Content of NTI Plan
Data Collection Method
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