

Centre for Transport Studies

IMPERIAL COLLEGE

UNIVERSITY COLLEGE

MSc in Transport



**A THEMATIC ANALYSIS OF NATIONAL TRANSPORT MASTER PLANS IN
RELATION TO URBAN TRANSPORT POLICIES**

Ahmet Gunduz

September 2021

A Dissertation submitted as part of the requirements for
the degree of Master of Science of Imperial College
and University College London

Intercollegiate MSc Course in Transport

DISSERTATION SUBMISSION SHEET

NAME: Ahmet Gunduz

TITLE: A Thematic Analysis of National Transport
Master Plans in relation to Urban Transport
Policies

SUBMISSION DATE: 5th September 2021

SUPERVISOR: Helena Titheridge

WORD COUNT: 10,942

DECLARATION:

I confirm that this submission is my own work. In it, I give references and citations whenever I refer to or use the published or unpublished work of other people.

I confirm that the word count declared above is correct



Signature:.....

ABSTRACT

Urban transport is becoming a more crucial aspect for cities with the continuous growth of the urban population. It also exists in the policy agenda of national governments since it is a factor of economic development and sustainability goals. Moreover, some national governments provide national leadership and guidance for urban transport policies in their cities. Urban transport policies shape the built environment in cities and consequently affect sustainability and liveability. Recently, a conceptual model called “the 3-stage process” was introduced to analyse urban transport policy development in Western European cities. According to this, urban transport policies evolved in Western Europe in three stages: car-oriented, sustainable mobility and city of places. Furthermore, some researchers use a taxonomy for policy instruments regarding coerciveness of policies: regulatory, economic and information-based instruments. This dissertation aims to contribute to the conceptualisation of urban transport policies by answering that question: Do/How do national urban transport policies reflect perspectives of the 3-Stage process and this taxonomy? The study used a thematic analysis to investigate 15 National Transport Master Plans (NTMPs) from different economic development levels and regions. The main objective was to analyse NTMPs to examine policy perspectives of the 3-stage process and policy types. The secondary one is to examine relationships between economic development and those policy perspectives and types. Results showed that perspectives of the 3-Stage process and the policy types of that taxonomy exist in national transport plans. However, their appearances vary from country to country, and some differences and similarities were seen between different levels of economic development, and these all findings were presented. Overall, the study concluded that the 3-stage process could be used to assess national urban transport policies in terms of sustainable and liveable cities. Furthermore, national policymakers could use this taxonomy to see how different and coercive policy instruments are available to achieve their goals, objectives, and aims for urban transport.

ACKNOWLEDGEMENTS

I would like to thank the following people and institutions, without whom I would not have been able to complete this dissertation and without whom I would not have made it through my master's degree.

Firstly, I would like to express my thanks to my supervisor Professor Helena Titheridge for her helpful guidance and support during this dissertation. I am also thankful to Professor Peter Jones since he constructively answered my question about this research.

I would not have been able to study for my master's degree without the scholarship provided by the Ministry of National Education, Turkey. So, I am thankful to the Ministry and am indebted to Turkish taxpayers. I am also filled with gratitude to M. Kemal Ataturk, who initiated this scholarship programme.

I want to thank also my friends for encouraging me to study for this master's degree.

Finally, all of my inspirations for completing this master's degree took by my family, who always support me at all time during this year and in the past.

Contents

ABSTRACT.....	3
ACKNOWLEDGEMENTS	4
LIST OF FIGURES	7
LIST OF TABLES	7
ABBREVIATIONS	7
1 INTRODUCTION	8
1.1 Cities and Urban Transport	8
1.2 Urban Transport Policy	8
1.3 The Role of National Transport Master Planning in Urban Transport.....	9
2 AIM, RESEARCH QUESTIONS AND OBJECTIVES.....	11
3 CRITICAL LITERATURE REVIEW	12
3.1 Urban Transport Policy Perspectives	12
3.1.1 The 3-Stage Process	12
3.1.2 What policies shape perspectives of the 3-Stage process?.....	14
3.2 Urban Transport Policies and National Governments.....	17
3.2.1 Regulatory Instruments	18
3.2.2 Economic Instruments.....	19
3.2.3 Information-based Instruments	19
3.2.4 Governance Reforms.....	19
4 METHODOLOGY.....	20
4.1 Overview	20
4.2 Thematic Analysis: A Justification for the Method	20
4.3 Deductive Thematic Analysis: A Justification for the Approach.....	20
4.4 Conducting Deductive Thematic Analysis of NTMPs.....	21
4.4.1 Sampling	22
4.4.2 Theoretical Framework	25
4.4.3 Coding Procedure and Coding	27
4.4.4 The Codebook	29
5 RESULTS	30
5.1 Overview	30
5.2 Policy Perspectives Themes	31
5.2.1 Car-Oriented Perspective	31
5.2.2 Sustainable Mobility Perspective.....	37
5.2.3 City of Place Perspective	45
5.3 Policy Types Themes	49

5.3.1	Regulatory.....	50
5.3.2	Economic	53
5.3.3	Information.....	56
5.3.4	Governance Reforms.....	59
5.3.5	Strategic	63
6	LIMITATIONS AND FURTHER RECOMMENDATIONS	65
7	DISCUSSION AND CONCLUSION.....	65
7.1	Discussion	65
7.2	Conclusion.....	69
8	BIBLIOGRAPHY	70
9	APPENDIX A	77



LIST OF FIGURES

Figure 1 3-Stage process in urban transport policy development seen in Western Europe cities	13
Figure 2 The coding guideline for the first iteration of coding process.....	26
Figure 3 The coding guideline for the second iteration of coding	28
Figure 4 Themes deduced from NTMPs: Policy Perspectives and Policy Types.....	30

LIST OF TABLES

Table 1 Responsibilities of different level government in urban transport.....	17
Table 2 The Summary of the Process of the Analysis	21
Table 3 Economic Development Levels	23
Table 4 The Selected Sample: 15 NTMPs and Some Characteristics	24

ABBREVIATIONS

HICs	High-Income Countries
LICs	Low-Income Countries
MaaS	Mobility as a Service
MICs	Middle-Income Countries
NTMP	National Transport Master Plan
NTMPs	National Transport Master Plans
NVivo	QSR International's NVivo 12 software
ToD	Transport Oriented Development

1 INTRODUCTION

1.1 Cities and Urban Transport

Cities are home to more people than ever seen before. The urban population rate has increased from about %33 in 1960 to %56 in 2020 (The World Bank , 2020). Moreover, the world economy mainly relies on cities; more than %60 of the global economy is generated from urban areas (Rode *et al.*, 2017). In addition to economic activities, cities host most cultural, sportive, educational, and artistic activities. Therefore, cities' is crucial for socio-economic development in countries. While people need to access their activities, urban transport responds to this need for mobility and accessibility in urban areas (Dotson, 2011). Therefore, urban transport is essential to the functioning of urban areas. However, whereas urban transport provides people's mobility needs, it produces externalities that affect the environment, economy, well-being, health, quality of life and social justice. As almost one of four world CO₂ emissions emerged from the transport sector in 2014 (IEA, 2018), the proportion of the urban transport in all transport CO₂ emissions is predicted as %32 in 2015 (ITF, 2019). Goodwin estimated the value of time lost in traffic congestion as %1.2 of GDP in the UK (2004). The other externalities can be listed more, but it is obvious that while urban transport is a determining agent with both benefits and adverse outcomes in countries' goals and vision in sustainability, economy, and social development, it also directly affects citizens' quality of life. Consequently, while policymakers answer the transport demand in cities, they also need to intervene in urban transport to reduce those externalities.

1.2 Urban Transport Policy

The requirement for transport policy primarily arises from the failure of a free market to provide for society's needs effectively (Stopher & Stanley, 2014). Whether service providers are private or public sector, authorities intervene in urban transport, considering the growing concerns mentioned in the previous section. There are some ways to intervene in urban transport. Rode, Heeckt & da Cruz, 2019 have classified the urban transport policies according to their level of coercion in 3 main categories, which involve individual policy instruments for connected and compact urban development: regulatory, economic and information (2019). Rode et al. have stated that urban transport challenges can be managed by regulatory interventions (e.g., forceful measures, standards), economic interventions (e.g., infrastructure provision, incentives, disincentives), and information interventions (e.g., non-coercive measures; awareness campaigns, education, skill management) and have added that those should be

supported by governance reforms (2019). Those three types of interventions and governance reforms studied by (Rode, Heeckt & da Cruz, 2019) will be discussed more in the critical literature review chapter. While authorities use those types of policy interventions, some triggers could affect how they shape urban transport policies. With the rapid growth in private car ownership during the first three-quarters of the 20th century in North American and Western European cities, urban transport policies were shaped to accommodate increasing private car use. (Teoh, Ancaies & Jones, 2020). and urban transport policy perspectives have evolved. Banister (2008) has stated that two principles have driven that era: transport is a derived demand, and people want to decrease the generalised cost of travel. After growing concern about the negative side effect of private cars, urban transport policy perspectives evolved by considering broader aspects such as sustainability, social justice, accessibility, quality of life. In many large cities in Western Europe, urban transport policies have been evolved historically into three subsequent stages: car-oriented city, sustainable mobility city and city of places (Jones *et al.*, 2018). Jones *et al.* stated that five main European cities (London, Paris, Berlin, Copenhagen, Vienne), which followed this trajectory, decreased car trips in urban areas considerably in the last stage. (2018). Obviously, the decline in the use of cars, the increase in quality of the public realm, and the shift from movement base planning to people-oriented places support sustainability and social development goals. In developing countries, with easiness in affordability of private cars, there would be a tendency to meet the need of increasing private cars. Therefore, policymakers in developing countries need to avoid following the same trajectory experienced by western European cities, and they need to consider how to switch sooner into stage-3 perspective. More details of the 3-Stages paradigm and lessons could be taken from that will be discussed in the critical literature review.

1.3 The Role of National Transport Master Planning in Urban Transport

Considering current urban population share, national economic development, social development, well-being, and public health are strongly related to how cities perform and, consequently, to how cities manage urban transport. Therefore, urban transport is not only a concern for city governments but also national governments. Many countries have accepted the crucial impacts of transport on countries' high-level social, sustainability and economic goals. Thus transport has started to take account in the central in policy agendas. (Stopher & Stanley, 2014). After acknowledging the importance of urban transport, the national leadership and national vision on urban

transport have been expected to be presented by central governments. Tsay and Harrmann (2013) underly the importance of strong national-level governance and national policy on urban transport to meet sustainability goals. Like other policy areas, many governments have long-term plans under a high-level vision for national transport policies. Governments use master planning as a long-term tool to pursue their vision and strategies in different areas, specifically urban development. As Tyler (2015) has stated, having an overarching vision and a strategy is important in the transport policymaking process. Therefore, many countries practice transport master planning to meet long term goals about transport. By its definition and function, master planning plays an effective role in governments' transport visions and strategies. While National Transport Master Plans (NTMPs thereafter) comprise inter-regional, inter-city, and international transports, urban transport is also an important theme in most NTMPs. Those plans help countries shape their long-term national policies on urban transport and guide their cities through sustainability goals in urban transport. Therefore, NTMPs are one of the main resources to understand countries' perspectives that will shape their urban transport in the future.

2 AIM, RESEARCH QUESTIONS AND OBJECTIVES

The principal aim of this dissertation project is to contribute to the conceptualisation of urban transport policies that was studied in urban transport literature by attempting to answer research questions below.

RQ1) Do/How do urban transport policies that governments plan to use or to be used in their cities reflect perspectives of the 3-Stage process?

RQ2) Do/How do urban transport policies that governments plan to use/to be used in their cities reflect the taxonomy of Rode, Heeckt & da Cruz (2019)?

The main objective was to apply current theoretical frameworks in the literature to urban transport policies that countries plan to use or see in their cities. Therefore, this project used NTMPs to examine the perspectives of the 3-Stage process and the use of the policies in the taxonomy of Rode, Heeckt & da Cruz (2019).

Objectives:

1) Analysing NTMPs to deduce and examine urban transport policy perspectives of the 3-Stage process.

2) Analysing NTMPs to deduce and examine types of urban transport policy instruments and governance reforms for urban transport?

3) Examining relationships between economic development and those policy perspectives in NTMPs?

4) Examining relationships between economic development and the types of urban transport policies in NTMPs?

3 CRITICAL LITERATURE REVIEW

3.1 Urban Transport Policy Perspectives

Urban transport policies have evolved, and many scholars have studied changes and perspectives in urban transport policies (Hysing, 2009; Jones, 2016; Buehler, Pucher & Altshuler, 2017; Moncada A., Jones & A. Escobar, 2018; Jones *et al.*, 2018; Ghosh & Schot, 2019; Stopher & Stanley, 2014). Stopher and Stanley have stated four main policy directions that have been used to reduce congestion (2014):

- 1.) Constructing more roads, often with the following decentralisation and lower urban density
- 2.) Limiting private cars by using charges, tolls, taxes
- 3.) Aiming modal shift by investing in public transport and active travel
- 4.) Providing more compact cities to decrease travel demand

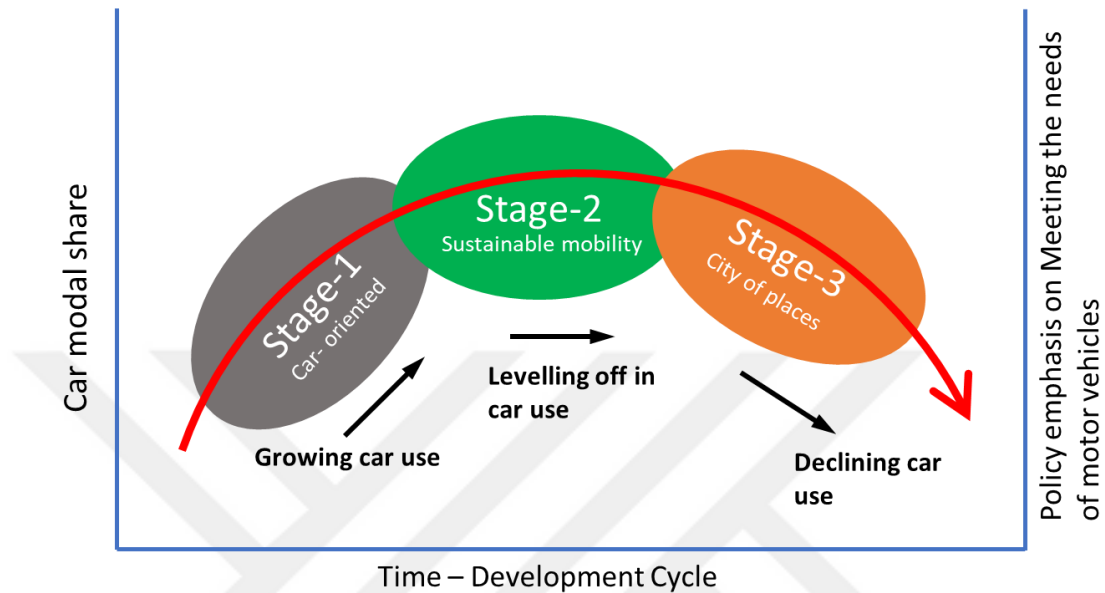
Since there is the fact that some major cities in West Europe have succeeded to reduce the car share of trips, many scholars have paid attention to study the change in urban transport policies in these cities. Buehler *et al.* examined policies that led Munich, Berlin, Hamburg, Vienna, and Zurich to decrease mode share of car use (2017). They concluded that these cities are in common to making private cars costly as time and price while improving the safety, practicality, and usefulness of active travel modes and public transport (Buehler *et al.*, 2017). While this study mainly focuses on the new era after the awareness of the necessity to decrease car use, Jones *et al.* have developed a conceptual model called the “3-Stage process”. They concluded that major cities in Western Europe had experienced three successive stages from the 1960s to nowadays (2018).

3.1.1 The 3-Stage Process

The 3-Stage process has three stages; car-oriented (based on vehicle movement), sustainable mobility (based on the movement of people efficiently), and city of places (based on the recognition of the importance of place in urban transport) (Jones *et al.*, 2018). Accommodating the continuing increase in private cars with the building of urban roads and required infrastructures represents the main characteristic of stage-1, also called the car-oriented city (Jones *et al.*, 2018). Stage-2 (sustainable mobility city) fundamentally relies on the shift to alternative modes to cars and improving public transport systems and services. Stage-3, also called the city of places or liveable cities, concentrates on the public realm, street activities, and society's well-being (Jones *et al.*, 2018). The 3-Stage process is associated with car modal share and the level of policy

emphasis on meeting the needs of motor vehicles (Jones, 2014; Jones *et al.*, 2018).

Figure 1 shows the development cycle of the 3-Stage process starting from the 1960s to now. Car trip share and policy focus on needs of private vehicles rise in the stage-1, then this curve slowed and made a plateau in the stage-2, finally, with stage-3, these two has started to decrease (Jones, 2014; Jones *et al.*, 2018).



(Source: Jones, 2014 and Jones *et al.*, 2018)

Figure 1 The 3-Stage process in urban transport policy development seen in Western Europe cities

3.1.1.1 What stimulates transition between stages?

To take lessons from this route in Western Europe, the forces that trigger the development within the 3-Stage process should be understood. While the main trigger behind the car-oriented policy perspectives is the rapid increase in car ownership with the easiness of affordability of cars; the consequences of stage-1 policy perspectives, which are congestion grow, and the impossibility of supplying enough capacity to all cars, are two of the forces that stimulate the transition from stage-1 to stage-2 (Jones *et al.*, 2018). Furthermore, the emergence of a movement dominated and non-appealing urban environment after stage-2 plays a key role in initiating the transition towards stage-3 (Jones *et al.*, 2018). Aside from these triggers, while the oil crisis in the 1970s and international competition to achieve high-quality urban environments are external triggers for stage-2 and stage-3 respectively, growing concerns about CO2 emission and public health affect both transitions towards stage-2 and stage-3 (Jones *et al.*, 2018).

These triggers show that the 3-stage process is strongly related to sustainable

development goals, especially environmental goals for the transition towards stage-2 and the “Good Health and Well-being” goal for the transition towards stage-3.

3.1.1.2 Does the 3-Stage process apply to all cities?

It is stated that Latin cities can be classified in one of the stages nowadays, and while some followed sequential order from stage-1 to stage-2, some are still in stage-1 (Moncada A., Jones & A. Escobar, 2018). Additionally, progressions between two successive stages are slower in Latin-American cities than in cities in Western Europe (Moncada A., Jones & A. Escobar, 2018). There are also high-income cities where urban transport policies mostly support the car-oriented perspective, especially in Gulf region countries and the United States (Buehler, 2009; Alotaibi & Potoglou, 2017). All in all, the 3-Stage process does not necessarily apply to all high-income cities as in Western Europe (Jones *et al.*, 2018). However, it can apply partly (at least stage-1 and stage-2) to some cities but with different transition periods from Western Europe. (Moncada A., Jones & A. Escobar, 2018).

3.1.1.3 Is it possible to skip straight to stage-3?

In developing countries, with a possible increase in wealth, an increase in car ownership is expected. This fact asks that: What should policymakers in those countries do to avoid the same path followed by cities in Western Europe and skip straight to stage-3? While Jones says that the cities, which already experienced this path, can still teach us more, he brings two significant recommendations forward for these countries (2016):

- 1.) Enabling public acceptability of policies that want to reduce car use amid the possible increase in car ownership.

- 2) Enabling comprehensive governance systems at the city level and providing a suitable financial scheme for stage-3 policies.

The first one arises from that people in those countries have not already faced adverse outcomes of increased car use (Jones, 2016).

3.1.2 What policies shape perspectives of the 3-Stage process?

Since the 3-Stage process is a historical development process is challenging to determine the particular policies of each perspective in the 3-Stage. Halpern has studied 5 European cities (Vienne, Berlin, London, Paris and Copenhagen) to explore the historical transformation of urban transport policies from car-oriented cities to stage-3 cities (2018). As this comparative study of five cities and theoretical framework of the 3-Stage process are two primary sources to help us distinguish policies for each

perspective, other studies about the 3-Stage process are exploited (Jones, 2016, 2014; Moncada A., Jones & A. Escobar, 2018; Teoh, Anciaes & Jones, 2020).

All in all, to describe a policy perspective, for example, as a core car-oriented one, while the presence of such policies should be searched, the absence of stage-2 and stage-3 policies should also be taken into consideration. However, these policy perspectives could exist at a time in a city as in Western European cities. (Halpern, 2018). This dissertation will also examine these policy perspectives worldwide from central governments perspectives. Therefore, this section aims to examine the literature to look at policies for each perspective.

3.1.2.1 Policies of the car-oriented perspective

Jones et al. and Jones state that the main centre of car-oriented policies is to meet the needs of the rising number of cars and answer the demand for private cars, not to hinder economic development (2018; 2016). Some typical policies were urban road building, expanding the capacity of urban roads, increasing parking provision and disperse land-use policies and unawareness of land-use planning on urban transport (Jones *et al.*, 2018; Jones, 2016; Barter, 1999; Kenworthy, 2011). Halpern's report states that traffic congestion was one of the objectives of policies in the car-oriented age of 5 European cities and adds that traffic management efforts without demand management can be seen as an aspect of this perspective (2018). While Halpern takes policies that aim to mitigate environmental problems, in stage-2, they apply both to private and public vehicles (2018). However, those policies on private cars lack the primary focus of encouraging a modal shift in the sustainable mobility perspective, and they are still based on vehicle movement, not people movement. Therefore, policies about reducing environmental problems on private cars are closer to the car-oriented perspective, and those on public transport vehicles fit more the stage-2 perspective.

Policies about safety are difficult to relate with one of the perspectives, but we can divide them into three. The first is to enable safety by traffic calming, improving the public realm and pedestrian centric, the second is via improving pedestrian infrastructure like building sideways. The third is through car drivers and cars like traffic rules, alcohol controls, and safety awareness. While the last one is mainly car-oriented, the first one is closer to the city of places. The second is closer to the sustainable mobility perspective since it aims to reallocate spaces on roads and improve infrastructure for active travel.

3.1.2.2 Policies of the sustainable mobility city

The pillars of sustainable mobility perspectives are public transport, encouraging the shift to sustainable modes and road space reallocation (Jones *et al.*, 2018; Halpern, 2018; Jones, 2014). Apart from the 3-Stage process, many scholars and experts have also studied, introduced and proposed urban transport policies and objectives to achieve more sustainable transport in cities (Banister, 2005, 2008; Pojani & Stead, 2015; Malasek, 2016; Stephenson *et al.*, 2018; Gallo & Marinelli, 2020), many of them have studied sustainable mobility policies used in practice (May & Crass, 2007; Reigner, 2016; Buehler, Pucher & Altshuler, 2017; European Commission, 2017; Diao, 2019). Policies provided by those articles include both the pillars of sustainable mobility perspectives of the 3-Stage process and implementations of the city of places. The practical purpose of this section is to collect policies of the main pillars of the stage-2 so those policies, which the literature has provided, can be summarised as below:

- Public transport improvements such as infrastructure provision, enhancement of services and operations
- Policies for mode shift include promoting active travel, provisions of active travel infrastructures, policies to discourage car use, implementations to reduce car ownership like shared mobility and MaaS.
- Road space reallocation includes building tramline on roads, bus priority lanes, cycle lanes on roads, providing more space for sidewalks.

3.1.2.3 Policies of the city of places perspective

In the context of the city of places concept, all people should feel safe, enjoy and be impressed on streets and in the urban transport environment in the state of both movement and using them as a public space. (Anciaes & Jones, 2020). Jones *et al.* have introduced the main characteristics of perspectives of the city of places in 4 major items: public realm, street activities, traffic restraints and ToD/mixed-use development (2018). In line with the traffic restraints of stage-3, congestion charge, low emission zone and urban road pricing are considered the stage-3 policies (Halpern, 2018). London and Vienne are two cities currently following this policy perspective (Halpern, 2018; Jones *et al.*, 2018; Anciaes & Jones, 2020). Therefore, policies from the two cities are reviewed to see implementations related to the four major items of stage-3. Some exemplary implementations about those items in these two cities: Vision of healthy streets, shared spaces, street activities on closed roads, ground play activities, places to stop and rest, high density and mixed-use developments, traffic restriction in city

centres, appealing and good quality of spaces, sharing streets fairly, temporary closing of streets to motor vehicle traffic, low emission zones and so on (Greater London Authority, 2018; Urban Development Vienna, 2015).

3.2 Urban Transport Policies and National Governments

Whatever perspective is followed in urban transport, appropriate policy involvements are needed. This chapter aims to compile how national governments intervene in urban transport and possible policy interventions and actions for urban transport. Some researchers have studied urban transport policies for specific countries (Hidalgo & Díaz, 2014; May *et al.*, 2017; Tønnesen *et al.*, 2019), whereas some studies examine available policies and policy instruments used by national governments in urban transport. The World Bank lists possible focuses and responsibilities at the national government level and the provincial level. (Table 1) (2014).

Table 1 Responsibilities of different level government in urban transport

National Government Level	Provincial Level
National policies and programs	Strategic planning
Integration with other sector policies	Investment planning
Regulations and standardizations	Public transport planning
Research and development	Public Transport operations
Capacity and knowledge building	Enforcement

Resource: (World Bank, 2014)

May et al. studied current practices of central governments' functions in supporting cities to develop Sustainable Urban Mobility Plans in 6 European countries; after that, they listed a set of recommendations on that (2017). These can be summarised like these: establishing a national policy, institutional coordination, decentralisation and centralisation where necessary, supporting local authorities, providing a legal and regulatory framework, rationalising financial system, improving data collection and research (May *et al.*, 2017). These emphasise how governments should modify governance structures and processes. At the same time, they also reveal a need for national guidance and leadership in urban transport interventions. Apart from their responsibilities, central governments can also provide possible policies and actions through NTMPs to achieve national goals about urban transport. At that point, it is crucial to choose suitable types of urban transport policies for different challenges. Before passing on urban transport policy types in the literature, it is helpful to look at the context of public policy instruments. While Vedung defines public policy

instruments as various tools that governmental power use to encourage, influence or limit the change of society, he presents a typology for policy instruments by using an analogy to show the extent to which they are coercive on society: regulatory (stick), economic (carrot) and information (sermon) (1998).

Rode, Heeckt & da Cruz have exploited this typology on urban transport policies while exploring choices available to national policymakers (2019). The study first prepared a catalogue of 189 policy instruments and governance reforms for national policy-makers to achieve sustainable urbanisation through urban transport with the help of expert interviews and a global literature review (Rode, Heeckt & da Cruz, 2019). Then, by using Vedung's typology (1998), according to the forcefulness of urban transport policy instruments, they split them into categories: regulatory (the most forceful and mandatory), economic (incentives and disincentives) and information-based (non-coercive) (Rode, Heeckt & da Cruz, 2019). Apart from policy instrument categories, they had governance reforms that comprise institutional arrangements and organisational structures. Policymakers could use any of these or a cluster from these policy instruments to resolve a specific problem. (Rode, Heeckt & da Cruz, 2019). For example, if the use of private cars is wanted to be reduced in urban centres, driving can be prohibited at the centre (regulatory); they can introduce road pricing (economic) or awareness campaign can be run (information) (Rode, Heeckt & da Cruz, 2019). After that, according to prominence in the literature and expert feedback, Rode, Heeckt & da Cruz shortlisted 21 flagship policy interventions suitable for national governments for a compact and connected urban development (2019). The taxonomy used in that study is introduced below.

3.2.1 Regulatory Instruments

Lemaire describes regulatory interventions as policies to establish acceptable practices or draw the legal borders of activities. (1998). While Rode, Heeckt & da Cruz state that implementing these policies is less costly for governments, regulatory instruments could be more effective when appropriately monitored (2019). The regulatory instruments could be used to define vehicle standards, to control urban transport operations (e.g., traffic regulations with vehicle access restrictions, regulating public transport operations and other operational activities), and to regulate urban transport planning and infrastructures (Rode, Heeckt & da Cruz, 2019).

3.2.2 Economic Instruments

According to Vedung's inventory, subsidies and grants are taken as incentives; charges, levies, and taxes are considered disincentives. (Vedung, 1998; Leeuw, 1998) Rode, Heeckt & da Cruz highlight the importance of administrative capacity, institutions' abilities, and communication between policymakers, the public, and firms to implement economic instruments appropriately (2019). Urban transport investments are taken as a financial instrument (Rode, Heeckt & da Cruz, 2019). We could receive financial policies as investments, projects, and funds for urban transport.

3.2.3 Information-based Instruments

In public policy, information-based policies try to influence the public and organisations via knowledge transfer, information transmission with proper communication, and convincing approaches to achieve a policy objective (Vedung & van der Doelen, 1998). This could be performed with awareness campaigns, educational ways, data collection and statistical supports, skill and knowledge improvements of urban transport institutions (Rode, Heeckt & da Cruz, 2019).

3.2.4 Governance Reforms

Apart from policy instruments, suitable governance systems are needed to implement those policies successfully. To implement policy instruments planned, administrative arrangements can be needed in structures of governance systems, tools (e.g., assessment methods) and enabling conditions (e.g., capacity building) (Rode, Heeckt & da Cruz, 2019). We could also basically express these arrangements as governance reforms in structures and processes.

4 METHODOLOGY

4.1 Overview

By considering the aim and research questions (Chapter 2), this dissertation used a thematic analysis to investigate urban transport policy perspectives and policy types from central government perspectives. Since a national transport master plan is a source of a government's perspective in urban transport policies, 15 NTMPs from different countries were investigated for the aim and objectives. This study implemented a deductive approach whilst generating codes from the raw information in line with a theoretical framework for policy types and policy perspectives. Furthermore, it attempted to examine the deduced themes, subthemes, and codes from previous studies within the national transport plans. In the coding process, NVivo, which is a qualitative data analysis software, was used.

4.2 Thematic Analysis: A Justification for the Method

Several different methods have been used to investigate policy documents and plans. The commonly used ones are content analysis and thematic analysis. The content analysis aims to investigate qualitative textual data by determining inclinations and patterns of words and phrases that existed, their frequency and their relations (Vaismoradi, Turunen & Bondas, 2013). On the other hand, the thematic analysis aims to identify, investigate and report repeated patterns of meaning in qualitative data by describing themes representing some level of patterned meaning (Braun & Clarke, 2006). Boyatzis mainly describes thematic analysis as a way of seeing (1998). Thematic analysis was chosen for this project because this project aims to explore repeated patterns reflected by national transport plans. Furthermore, since we will look at the policy perspectives and policy types, the thematic analysis is more suitable for describing directions and perspectives rather than examining specific words and phrases. To examine transport policy documents in a thematic investigation, qualitative thematic analysis has been used by many researchers (Gössling, 2013; Towns & Henstra, 2018; Alando & Scheiner, 2016; Roggenbuck & Roggenbuck, 2019).

4.3 Deductive Thematic Analysis: A Justification for the Approach

The thematic analysis can be performed through theory-driven, data-driven or both ways (Boyatzis, 1998; Braun & Clarke, 2006). In thematic analysis, the deductive approach is more useful where examining specific aspects of data that can be studied based on the ideas of existing studies and theories. (Braun & Clarke, 2006).

Consequently, since part of this dissertation explores whether a particular theory (the 3-

stage process) is a useful way of assessing national transport plans, this dissertation will use a deductive approach for thematic analysis.

4.4 Conducting Deductive Thematic Analysis of NTMPs

Considering steps of deductive thematic analysis given by Boyatzis (1998) and recommendations about the deductive approach for thematic analysis by Cassell & Symon (2004), and Braun & Clark (2006), the process of the analysis followed is summarized in Table 2. The table shows the three main steps of the analysis, which involve selection criteria in the sampling process, the preparation for the coding process with the determination of priori themes and initial codes, and lastly, how the coding process was performed. After that, each step is shown in detail in successive chapters.

Table 2 The Summary of the Process of the Analysis

Step-1 Sampling	<ul style="list-style-type: none"> I.) Defining the population: defining the scope of NTMP II.) The sampling was performed by convenience sampling approach due to the limited availability of NTMPs. However, although the priority is the availability of national transport plans with defined scope, variety in economic development and geographical regions was considered as where applicable.
Step-2 Preparation for coding	<ul style="list-style-type: none"> I.) Generating the theoretical framework including priori themes, subthemes, and initial codes (including both three perspectives of the 3-Stage process and the taxonomy of urban transport policies) II.) Reviewing and revising codes in the context of combability with master plans before starting coding. III.) Preparing a coding procedure with descriptions of codes for reliability within 15 NTMPs
Step-3 Performing coding	<ul style="list-style-type: none"> I.) Applying codes to master plans by using NVivo in line with coding procedure and descriptions. Generating codes from initial codes considering sub-themes of the themes for the policy taxonomy. (e.g., from an initial code “regulations for appealing public spaces” to two codes “road closure for community activities” and “providing shared spaces”) II.) After completing the first iteration of coding; reviewing and revising the codebook. In this step, some codes were renamed, some of them were combined or broken into two/three codes. III.) Performing the second iteration of coding on NVivo with revised codes and their descriptions. IV.) Generating the codebook by validating codes according to absence or presence.

4.4.1 Sampling

While the raw data quality is one of the main determinants of a proper thematic analysis, sampling both impacts and determines the level of reliability and validity (Boyatzis, 1998). Before starting sampling, we should determine the unit of analysis which “*is the entity on which the interpretation of the research will focus*” (Boyatzis, 1998). As we aim to investigate governments’ perspectives on urban transport policy, NTMPs are selected as the unit of analysis, which does not cover implemented policies but planned and desired policies.

The World Bank (2015) defines a master plan as a dynamic plan that enables governments to have vision, principles and ideas to pursue long-term development. In this study, NTMPs is described as transport-specific documents generated by central governments to create a plan as World Bank defines. After defining the population with the scope of the NTMP, the sampling approach are chosen as the convenience approach because of limited NTMP.

In the sampling process, the “scope criterion” was the first selection criterion. Even though we looked for “National Transport Master Plans”, many countries have plans in a different name such as "National Transport Plan", "National Transport Strategy", "National Transport Policy", so firstly the content table and summary part of the plan were checked. Those aspects, listed below, were looked for to select documents as NTMPs according to World Bank definition and relationship with transport:

- Being a unified transport plan: particular for transport and not specific for only one mode of transport. Some countries could not have an integrated national strategy or plan for transport like the UK (Baldwin & Shuttleworth, 2021).
- Presence of a horizon period (for long term development in line with master plan definition)
- Presence of overarching vision
- Presence of action plans
- Being written to interest whole the country
- Being published by a body of central government such as a ministry of transport

The second criterion of the sampling was pragmatic; it is the availability of plans in English since it is accessible to the analyst and avoids the risk of misinterpretation. In addition, government types could vary worldwide, affecting a government's extent of authority on transport, especially in federal states. Therefore, considering federated states, the third criterion was for the presence of a government authority that can make a

strategy on transport. Finally, this study was not intended to examine the historical development of policies but to examine current urban transport policies from central government perspectives. Hence the fourth criterion was to have current plans of which horizon years are away from 2021.

Even though those criteria were restricted to the available national plans, the variety in economic development and geographical regions is considered in the sampling process. The 3-Stage process was originated from wealthy cities in Western Europe. To apply and examine perspectives of the 3-Stage process at the national level, diversity in economic development and geography were considered where available. Eventually, the above criteria and considerations produced the following selection of 15 NTMPs. Regarding economic development level, countries, which of NTMPs were selected, were grouped based on the World Bank’s classification (Table 3) (2021).

Table 3 Economic Development Levels

Low-Income Countries (LICs): \$1045 or less GNI	Middle-Income Countries (MICs): \$1046 to \$12695 GNI	High-Income Countries (HICs): \$12695 or more GNI
Malawi, Uganda	India, Belize, Jamaica, South Africa, Malaysia	Greece, Malta, New Zealand, Singapore, Norway California, New South Wales (NSW)

Further characteristics of NTMPs are given in Table 4. After the Table 4, master plans will be shown with short versions where mentioned (e.g., India-NTMP and NSW-NTMP)

Table 4 The Selected Sample: 15 NTMPs and Some Characteristics

Name of NTMPs	Country/ State	Publisher Body	Region	Horizon period	Pag es
LOW INCOME COUNTRIES (LICs)					
Malawi National Transport Master Plan: Final Report	Republic of Malawi	(Ministry of Transport and Public Works, 2018)	Sub- Saharan Africa	2017 2037	354
The National Transport Master Plan Including a Transport Master Plan for Greater Kampala Metropolitan Area	Republic of Uganda	(Ministry of Works and Transport, 2008)	Sub- Saharan Africa	2009 2023	197
MIDDLE INCOME COUNTRIES (MICs)					
India Transport Report: Moving India to 2032	Republic of India	(The National Transport Development Policy Committee, 2014)	South Asia	2014 2032	132 0
Comprehensive National Transportation Master Plan	Belize	(Office of the Prime Minister, 2018)	Latin America & Caribbean	2018 2035	550
Vision 2030 Jamaica Transport Sector Plan 2009-2030	Jamaica	(Planning Institute of Jamaica, 2009)	Latin America & Caribbean	2009 2030	89
National Transport Master Plan 2050	Republic of South Africa	(The Department of Transport, 2016)	Sub- Saharan Africa	2016 2050	245
National Transport Policy: 2019-2030	Malaysia	(Ministry of Transport, 2019)	East Asia and Pacific	2019 2030	74
HIGH INCOME COUNTRIES (HICs)					
National Transport Plan for Greece: Final Transport Plan Report	The Hellenic Republic (Greece)	(Ministry of Infrastructure, Transport and Networks, 2019)	Europe & Central Asia	2019 2037	152
National Transport Master Plan: 2025 Malta	Republic of Malta	(Transport Malta, 2016)	Europe & Central Asia	2016 2025	444
Government Policy Statement on Land Transport	New Zealand	(Ministry of Transport, 2020)	East Asia & Pacific	2020 2031	59
Utah's Unified Transportation Plan 2019-2050	Utah	(Department of Transportation, 2019)	North America	2019 2050	130

Land Transport Master Plan 2040	Republic of Singapore	(Land Transport Authority, 2019)	East Asia & Pacific	2019 2040	68
National Transport Plan 2018–2029: English summary	Norway	(Ministry of Transport and Communications, 2017)	Europe & Central Asia	2018 2029	45
California Transportation Plan 2050	California	(Department of Transportation, 2021)	North America	2021 2050	154
NSW Long Term Transport Master Plan	State of New South Wales	(Transport for NSW, 2012)	East Asia & Pacific	2012 2032	424

4.4.2 *Theoretical Framework*

By considering discussion and reviews in Chapter 3.2.2, a coding guideline was prepared to apply in the first iteration of coding (Figure 2). While this framework contains ten themes (9 themes for policy perspectives and one for governance reforms), it also reflects policy taxonomy. Under the nine themes of policy perspective, each initial code was labelled one of policy intervention types (regulatory, economic or information) or strategic aim. For example, “Public Transport” is a sub-theme but considering policy intervention types and strategic aim, it is possible to generate those codes under the sub-theme: “Aiming to improve public transport” as strategic aim, “Investing in public transport operations” as the financial type of economic intervention, “Providing real-time information for public transport” as under the information-data sub-theme of information intervention, “Regulations for public transport operations” as an operational type of regulatory intervention, and so on. For each theme, those initial codes were created in line with the policy taxonomy and the literature about the 3-Stage process. Since governance reforms do not directly reflect a policy perspective of the 3-Stage process, it was taken as a separate theme with subcategories of "structure" and "process". Thus, three themes and nine sub-themes for policy perspectives, five themes and 13 sub-themes for policy types, and 71 initial codes were defined. Based on the literature about the 3-Stage process and the descriptions of the taxonomy Rode, Heeckt & da Cruz, coding descriptions were prepared. For example, “Regulations for Public Transport operations” is one of the initial codes in “Public Transport”, the description was prepared for this code: “updating/improving/re-publishing regulations/standards to improve quality of service/ performance of public transport systems”.

3-Stage Perspectives

Themes	Sub-themes
Car-oriented	Meeting motor vehicle needs Traffic Management Road for Development
Sustainable Mobility	Mitigating Environmental Problem Improving Public Transport Modal Shift and Demand Management
City of Place	Appealing Public Spaces Healthy Street Community Cohesion, public realm, compactness

Policy Types

Themes	Sub-themes
Regulatory	<ul style="list-style-type: none"> Planning & infrastructure design Vehicle standards Operational
Economic	<ul style="list-style-type: none"> Financial Incentive-Subsidies Taxes Pricing-charging
Information	<ul style="list-style-type: none"> Guidelines Information-data Awareness campaigns Skill-knowledge
Strategic aim	
Governance Reforms	<ul style="list-style-type: none"> Structure Process



Figure 2 The coding guideline for the first iteration of coding process

4.4.3 Coding Procedure and Coding

Aside from descriptions of initial codes, general coding principles were prepared to help the consistency of codes among master plans. These principles are given below:

- Coding policies planned for the future, not past implementations, since some plans may not cover past implementations
- Coding for only urban transport-related aspects, not general transport sector (e.g., inter-regional, inter-cities and rural roads should not be coded as “road-building”, general aims like “improving road network” should not be coded if it is not given in the context of urban transport)
- Coding for all urban transport policies and governance reforms in the plans regardless of which level of government is in charge to implement them.

After all preparation, themes and initial codes were created on NVivo, and they were applied to master plans for the first iteration of coding. While initial codes were applied to master plans, where necessary, new codes were generated in line with the taxonomy and the context of themes. For example, under the theme “Appealing Public Spaces”, a code “guideline for public space design” was created in line with a subcategory “Guidelines” of a policy intervention type “Information” and the context of the theme. After the first iteration, the codes were reviewed and revised with renaming, merging, splitting. The number of codes, 71 before the first iteration, increased to 91 after this revision. Relating themes, some minor revisions about the structure of themes were implemented, and the coding guideline was modified, as shown in Figure 3. Firstly, “Mitigating Environmental Problems” was noticed that it covers both private and public transport vehicles. Therefore, policy and aims about public transport modes were engaged in the “Public Transport” themes with related codes, and private vehicle aspects were taken as the "Limiting Environmental Problems of Private Cars" theme in the car-oriented policy perspective. Secondly, a considerable number of codes about active travel were noticed in the “Modal Shift and Demand Management”; therefore, the “Active travel” theme was created from this theme, and its name changed to the “Modal Shift and Road Space Reallocation”. Thirdly, the “Healthy Street” was renamed the “Healthy Street and Reducing Traffic Level”, considering codes to reduce traffic speed and level. Finally, while codes about public realm and community cohesion of the "Community Cohesion, public realm, compactness" theme was put in the "Appealing Public Spaces", its name changed to "ToD and mixed-use development."

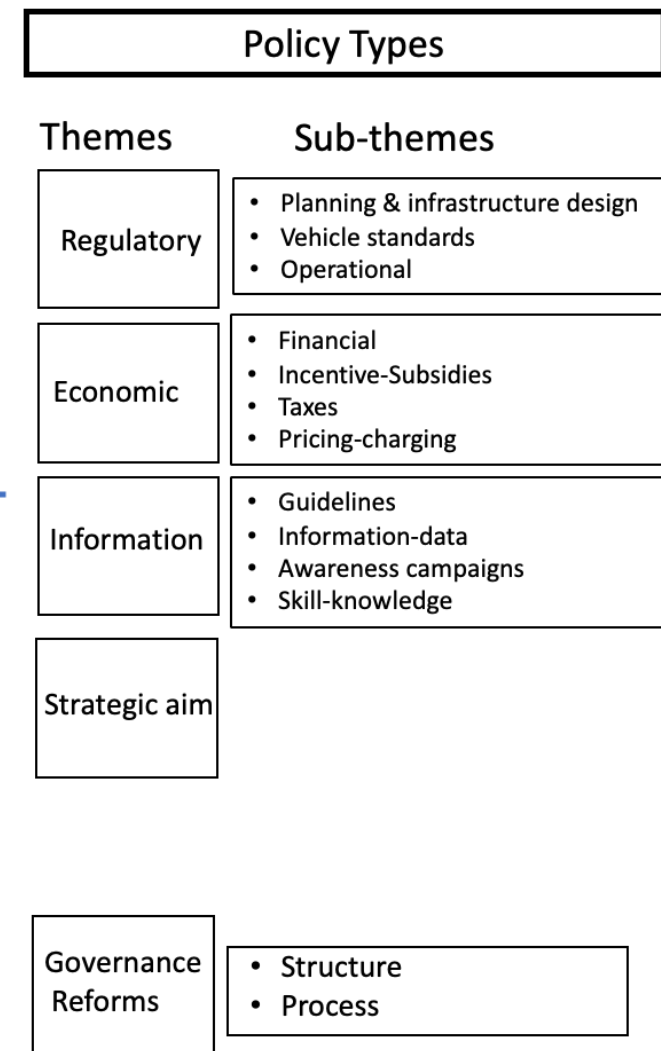
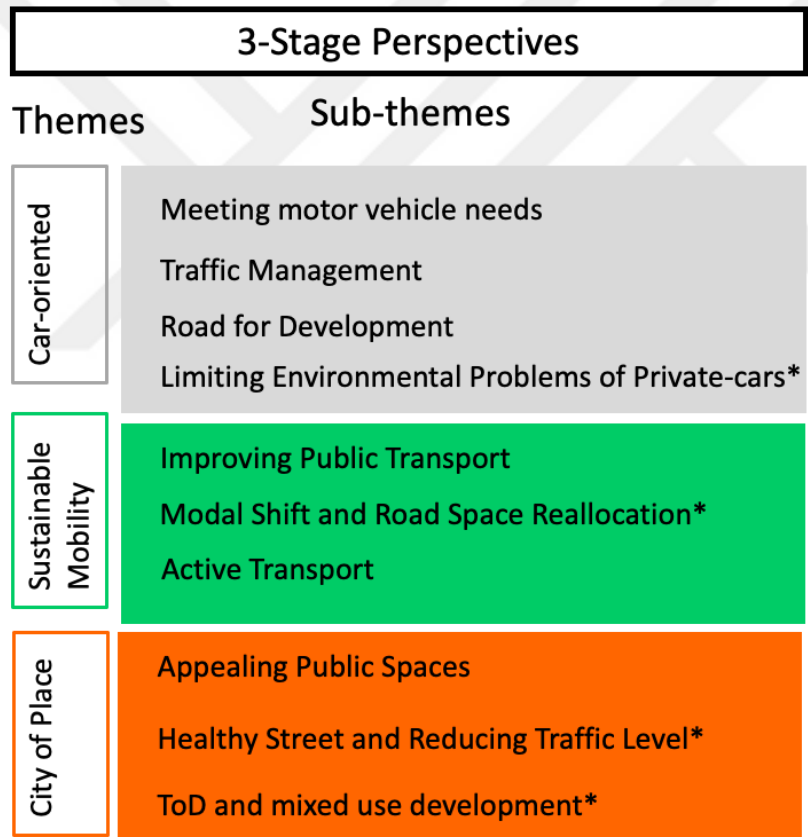


Figure 3 The coding guideline for the second iteration of coding

*themes are different in the first coding guideline

After the minor revisions in codes and the coding guideline, the second iteration of coding was performed with revised codes.

4.4.4 The Codebook

Finally, after completing coding, the ultimate codebook was turned out as in APPENDIX A.



5 RESULTS

5.1 Overview

This chapter presents the results of the deductive thematic analysis of 15 NTMPs. In chapters 5.2 and 5.3, the results will be presented by main themes of policy perspectives and policy types, respectively. Chapters 5.2 and 5.3 will consider research question-1 and 2 with sub-chapters for each theme. Each sub-chapter will also consider how countries at the different economic development levels use these policy perspectives and policy types.

The codebook (in APPENDIX A) enables us to look at themes of policy perspective and policy types separately. The themes are illustrated in Figure 4

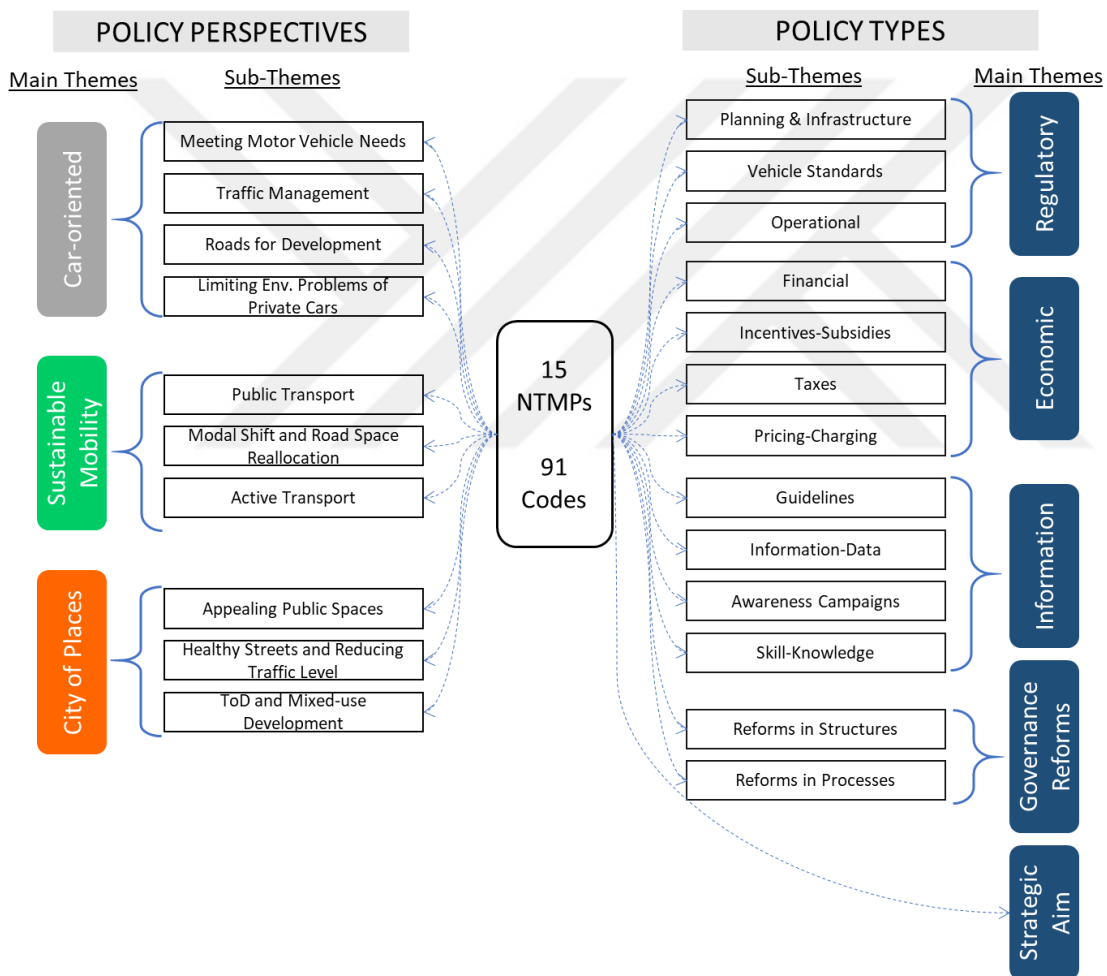


Figure 4 Themes deduced from NTMPs: Policy Perspectives and Policy Types

5.2 Policy Perspectives Themes

In this chapter, while presenting results for each sub-theme in sub-chapters below, each sub-theme also covers how they are represented at different economic development levels. Thus, according to the appearance of a sub-theme in NTMPs, appropriate quotes are presented from each level of countries.

5.2.1 Car-Oriented Perspective

5.2.1.1 Meeting Motor Vehicle Needs

Urban road building and parking provision are the two major aspects seen in plans to accommodate the demand for private cars. While the urban road building appears with statements of general network improvement in some plans, it also emerges with particular road projects.

“Road network in all 100,000 plus population cities to be completed with missing links and with good surface and drainage”

(India-NTMP)

“Measure Title: Attica metropolitan road network - Extension of Kymis Avenue to A1”

(Greece-NTMP)

Apart from new roads, some NTMPs also plan to improve the capacity of existing networks with widening roads.

“Widening the M7 – Widen various parts of the M7 Motorway between Seven Hills and Prestons”

(NSW-NTMP)

“Capacity improvements on various roads (M7, R302, R310, R300).”

(South Africa-NTMP)

The road building is also seen as a provision for the infrastructure for busses in some plans. When some master plans (e.g., NSW and Uganda) project the road building, it is followed by intending to improve bus network and bus priority lanes.

“Upgrade the Greater Sydney bus and road network, ..., Expand and upgrade roads in growth centres, including bus priority measures.”

(NSW-NTMP)

In LICs, although we could see such aims to overcome traffic congestion by building roads, both two plan urban roads with acknowledging the negative reputation of road building. They state the low quality and insufficient road network as a reason for the new road building and they also plan to upgrade the condition of existing roads.

overcoming traffic congestion by new roads:

“Improvement to the existing road network to improve traffic flow and safety...”

(Uganda-NTMP)

negative reputation of road building and reasons for road building:

“The approach of ‘predict and provide’ for increasing private transport use has largely been discredited in European cities, with the accent on public and non-motorised forms of transport. However, it is necessary to ensure that there is sufficient highway capacity to ensure that public transport vehicles can move easily. Therefore, there is merit in an additional highway provision to meet this end, as well as providing a reasonable level of service for private vehicles.”

(Malawi-NTMP)

upgrading existing roads:

“Urban Roads:

- Raise percentage in good or fair condition from 25 % to 70 %,*
- Rehabilitate and apply low-cost seals to 2,550 km, ...”*

(Uganda-NTMP)

All in all, we could see at least one of the policies about the urban roads mentioned above, in LICs and MICs except Jamaica and Malaysia. In HICs, these do not appear in plans of Singapore, Norway and California.

On the other hand, parking provision does not appear in HICs, whereas LICs and some MICs have proposals for parking. For example, Uganda NTMP takes parking provision as a need of future city planning; furthermore, Uganda, Jamaica and Malawi NTMPs want the private sector to involve in parking provision with off-street parking.

“In future city planners must ensure that all new premises are constructed with adequate parking space; in the meantime it may in any case be necessary to induce the private sector to construct new public car parks, either multi-storey or underground, at suitable central and peripheral sites.”

(Uganda-NTMP)

“Improve flow of traffic in urban centres, ..., Encourage the construction and operation of off-street parking facilities where appropriate.”

(Jamaica-NTMP)

Malta NTMP offers an effective way of using existing parks to meet the parking needs of both residents and offices.

“The concept of double use of parking where the same parking spaces would be used by offices or retail establishments during the day and by residents at night could also be explored to retain accessibility by car for city functionality, but at the same time mitigate the negative effects of traffic congestion and parking clutter.”

(Malta-NTMP)

To sum up, meeting motor vehicle needs appeared in various ways and with various purposes. Furthermore, we could see this sub-theme in LICs and MICs (except for Malaysia), but in HICs, NTMPs of Norway, California, and Singapore do not comprise any plan or action to meet motor vehicle needs in urban areas.

5.2.1.2 Traffic Management

In the traffic management subtheme, traffic rules and drivers' awareness for safety are also considered with traffic management policies. Traffic management could be seen in each level of economic development as an objective.

“Traffic management is designed to ease congestion and improve road safety.”

(Malawi-NTMP)

“Develop and implement traffic management plans for major urban centres.”

(Jamaica-NTMP)

“Develop traffic congestion management plans in all metros.”

(South Africa-NTMP)

Some plans aim to improve their traffic management systems to ease traffic flow with various implementations and improvements like real-time information, intelligent systems, traffic police provision.

“Implement real time broadcast of traffic data and routing congestion alleviation.”

(Jamaica-NTMP)

“Increase use of intelligent transport systems in traffic management, ... increase presence and effectiveness of traffic police.”

(Malta-NTMP)

“Real-time information can be provided to traffic control centres such as the Transport Management Centre and to customers.”

(NSW-NTMP)

As discussed in chapter 3.1.2.1, traffic management itself is seen as an aspect of a car-oriented city; however, governments could use it with together demand management policies.

In NTMPs, generally these are seen under separate chapters and topics of some NTMPs. Nevertheless, some plans explicitly highlight that traffic management and demand management policies (e.g., modal shift, reducing travel demand, managing temporal travel demand, etc.) together to improve traffic flow and decrease traffic levels on roads.

“... consider a wide range of 10 measures to improve traffic flows in its road transport system, including use of more efficient traffic management techniques, junction improvements, promotion of higher vehicle occupancy, parking restrictions, intelligent transportation systems and flexible work and school hours to reduce peak traffic flows.”

(Jamaica-NTMP)

“Much can be done to alleviate urban congestion problems, including, for instance, provision of adequate road space; construction of ring-roads and fly-overs; provision of an effective low-cost public transport system; implementation of traffic management measures backed by strong police control; an effective parking policy; provision of good facilities for pedestrians and cyclists, possibly including designation of zones closed to motorised traffic...”

(Uganda-NTMP)

While safety policies in line with car-oriented perspectives are seen in some master plans as rules and standards to regulate car drivers' actions, some also propose awareness programs to promote safe driving for car drivers. These policies can be seen at each level of economic development.

“Take measures to reduce road accidents, including incorporation of safety features in road design and enforcement of traffic rules and regulations.”

(Uganda-NTMP)

“Implement rider improvement programme – aimed at offenders to improve awareness of positive driving behaviour and a positive responsible approach to prevent unnecessary deaths and injuries to fellow road users.”

(South Africa-NTMP)

“We will also continue to roll out and encourage participation in programmes such as the Safe Riding Programme (SRP).”

(Singapore-NTMP)

In LICs, drivers' education and driving licencing procedures are emerged as two main aspects to enable safety in urban roads. Therefore, they plan to tighten driving licence procedures with sufficient driving education and proper tests.

“Introduce a theory test for all drivers.”

(Malawi-NTMP)

“Measures must be taken to ensure that no driving licences are issued without proper driving tests being held and correctly passed.”

(Uganda-NTMP)

In summary, we could see these policies listed above in LICs and MICs except for Malaysia. In HICs, these also appear in master plans of Greece, Malta, Utah and NSW.

5.2.1.3 Roads for Development

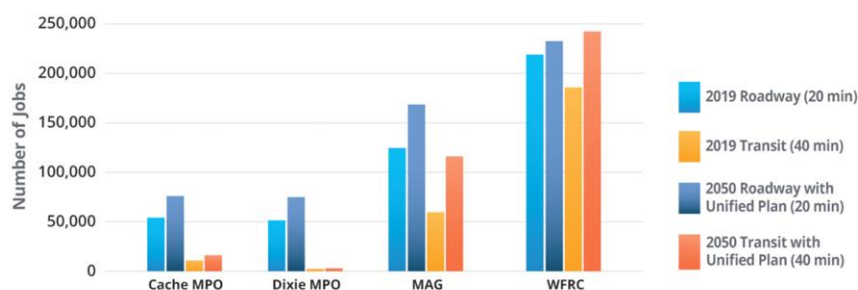
Master plans of NTMPs, Utah, NSW and Uganda take urban as an economic development tool. For example, in NTMPs of NSW and Utah, it is stated that new urban road projects will connect businesses and jobs and eventually support economic development.

“The WestConnex project will:

Support Sydney’s long term economic growth through improved motorway access and connections linking Sydney’s international gateways and Western Sydney and places of business across the city.”

(NSW-NTMP)

Job Access by Planning Jurisdiction



(Utah-NTMP)

On the other hand, Uganda-NTMP considers the existing urban road network as vital for economic activities.

“ROADS AND ROAD TRANSPORT..., It is also the most prominent mode of transport in grater Kampala and other urban areas. It is, thus, the ‘life-blood’ of economic and social activities in the country.”

(Uganda-NTMP)

5.2.1.4 Limiting Environmental Problems of Private Cars

Regarding noise pollution of road transport, while master plans of Malta and Norway express their aims to decrease noise level from roads,

“The Government will contribute to compliance with the Pollution Regulation and ensure that the municipalities have sufficient measures to comply with national targets for local air quality and noise.”

(Norway-NTMP)

Singapore-NTMP and NWS-NTMP provide specific actions for that problem.

“Build another 20km of noise barriers on existing flyovers of expressways”

(Singapore-NTMP)

“We will administer the Road Noise Abatement Program to provide noise mitigation to locations where road traffic noise is high and no road upgrades or developments are planned.”

(NSW-NTMP)

Mitigating CO₂ and other greenhouse gases emissions through private cars appears in all plans except New Zealand-NTMP. Standards for emission and energy efficiency of private cars are outstanding policies for that subtheme. While GHG emission is wanted to limit via these regulations, master plans also provide policies to encourage using more efficient cars by economic incentives for clean cars or disincentives for inefficient cars.

Standards:

“Regulation of polluting emissions: Comply with the maximum permissible emission limits of pollutants for motor vehicles based on international regulations.”

(Belize-NTMP)

“Strengthen facilities for the testing of motor vehicle emissions to meet stipulated standards...”

(Jamaica-NTMP)

Incentives-Disincentives

“Incentivize ZEV adoption by expanding rebate and vehicle buy-back programs...”

(California-NTMP)

“Differential taxes and charges based on fuel efficiency or greenhouse gas emissions (or proxies such as engine size or vehicle weight).”

(India-NTMP)

Apart from these measures, India-NTMP outlines an awareness campaign to promote clean and efficient cars.

“Public Outreach and Awareness Programs The mechanisms of public awareness campaigns, through billboards, television, print media, radio, and in-vehicle systems, have included the following: Provision of information to car purchasers on vehicle performance, e.g. fuel consumption.”

(India-NTMP)

Furthermore, apart from policies on public, government bodies are wanted or obligated to purchase clean vehicles where they need to buy in some NTMPs at each level of economic development.

“The Government procurement of hybrid vehicles for its fleet;...”

(Malawi-NTMP)

“Mandate government agencies to purchase hybrid, alternative fuel, or efficient vehicles for agency fleets.”

(India-NTMP)

“Accelerate the conversion of Government-owned vehicle fleets to ZEVs.”

(California-NTMP)

To supply sufficient charging stations for cars using clean energy, there are goals and plans set in the master plans of Malta, California, Greece and Malaysia.

“California EO B-48-18 sets a target of 200 hydrogen fueling stations and 250,000 EV chargers to support 1.5 million ZEVs by 2025.”

(California-NTMP)

In summary, there are various actions planned to mitigate environmental problems arising from private vehicles in NTMPs. Furthermore, these policies could be seen in all master plans except New Zealand. However, it is important that what kind of policies accompany these actions. As discussed in chapter 3.1.2.1, these policies can be taken as car-oriented where they are not accompanied by policies that aim to shift alternative modes and reduce private car use.

5.2.2 Sustainable Mobility Perspective

5.2.2.1 Active travel

Active travel appeared in all master plans except Belize-NTMP. Active travel is considered an environmental-friendly mode of transport in NTMPs. Through active travel, they aim to increase public health, decrease car use, and decrease environmental pollution of urban transport in master plans.

“Increased walking and cycling, particularly for short, local trips, will also contribute to improved environmental outcomes.”

(NSW-NTMP)

“Chronic illnesses related to lack of physical activity can be mitigated or lessened through increased physical activity, which can be accomplished through transportation modifications that promote active travelation.”

(California-NTMP)

In NTMPs of LICs, active travel is stated as the primary mode of urban transport.

Therefore, they aim to sustain this and have sufficient and safe infrastructure for active travel, whereas some of the MICs and HICs countries plan to increase the mode share of active travel with several policies in their master plans.

“Walking and cycling are healthy, sustainable, economical and non-polluting means of transport. The modal share of walking is already very high and this needs to be sustained. The citizens of Malawi have the right to walk and cycle in safety, while conforming to appropriate regulations, in their pursuit of work and family tasks and in accessing social and economic activities and services.”

(Malawi-NTMP)

Hence, in master plans of LICs, active travel policies focus on improving infrastructure rather than modal shift policies to active travel like promoting active travel and incentives, which appear in some NTMPs of MICs and HICs.

“There is a need to maintain footways and cycleways as well as the roads. This will not only include physical repair and maintenance, but also regular operational maintenance, involving clearing away obstructions, debris and any encroachment.”

(Malawi-NTMP)

“Install street lighting and construct side pavements over 486 km.”

(Uganda-NTMP)

In other countries, in addition to infrastructure provision and improvement, their plans also include modal shift policies to active travel like awareness campaigns, incentives, bike-sharing provision etc. Some examples are given below.

Infrastructure provisions

“Develop necessary infrastructure to increase usage of active and non-motorised transport and allow them to be carried in trains.”

(Malaysia-NTMP)

Encouraging the shift to active travel

“Expand statewide campaigns to encourage active travelation and educate both active travelation users and drivers about safety.”

(California-NTMP)

“Encourage employers to create incentives for employees to walk and cycle to work.”

India-NTMP

“Introduction of e-bike sharing system and management platform between central and outer Valletta...Financial incentives to shift from private cars to alternative transport modes such as car-pooling or bicycle use.”

(Malta-NTMP)

5.2.2.2 Public Transport

Public transport has appeared in NTMPs, with from infrastructure provisions, service quality, and operational improvements to encouraging public transport use. While all NTMPs project or aim to develop their public transport network and infrastructure, Utah-NTMP is the only master plan that lacks service quality and operational improvement policies. Master plans aim to improve and develop public transport networks by highlighting their various benefits, from providing alternatives to car use to urban mobility.

“Improved public transport with a wider geographical network will help suppress the dependency on single-occupancy vehicle trips over time.”

(South Africa-NTMP)

“In order to ensure mobility throughout the country we must make a number of efforts, from providing adequate capacity in urban transport systems, ...”

(Norway-NTMP)

“Improved public transport networks will increase productivity and global competitiveness.”

(NSW-NTMP)

Infrastructure and network developments includes busses, light rails, underground metro rails and ferry stations. While developing underground metro rail networks, which require high investment and geographical suitability, appears with other public transport systems in India-NTMP and master plans of most HICs, other master plans rely on bus networks and light rail systems for public transport systems.

“Metro rail projects to be planned based on the findings of a comprehensive mobility plan for the city. Initially, to be restricted to cities with 5 million plus population if required. Principle should be the ability of the city to cover all costs through user charges or fiscal costs.”

(India-NTMP)

“Travelling to the airport will eventually be easier with the Thomson-East Coast Line Extension (TELe) from the new Sungei Bedok Station to Changi Airport. Passing through the future Terminal 5, this new link will also connect ...”

(Singapore-NTMP)

“Better public transport facilities should become available as a result of implementing recommendations of the upcoming Bus Rapid Transport (BRT) Study (to be completed during 2009).”

(Uganda-NTMP)

Aside from infrastructure and network, NTMPs want to improve the quality of existing public transport services at each economic development level. These improvements vary from universal accessibility, frequency, reliability to service quality.

“The provision of public transport infrastructure, especially in urban areas, will focus on the need to have a more integrated, efficient and comfortable transport network.”

(Uganda-NTMP)

“To increase the quality of service of the public transport system in all its dimensions (efficiency, quantity, safety, sustainability and financial viability) so that all Belizeans, regardless of their level of income, can meet their mobility needs.”

(Belize-NTMP)

“Improve accessibility at passenger terminals and on public transport with the aim of universal access for persons with disabilities (PWDs)”

(Malaysia-NTMP)

“Expanding transit capacity, frequency, reliability, and connectivity.”

(California-NTMP)

To support and achieve this level of public transport services, various policies are arising in master plans, from the financial provisions for public transport operations, improving skills of public transport workers and local authorities, to guidelines and regulations for public transport operations.

“Investment in a modern public transport fleet, including new trains and ferries, and new buses in growth areas and on strategic corridors.”

(NSW-NTMP)

“Establish incentive and penalty framework for public transport services operator to ensure reliability and good quality of service.”

(Malaysia-NTMP)

“Reviewing existing regulations and creating new ones for qualification of public transport service provider.”

(Uganda-NTMP)

“We will also work with transport providers to train our transport workers to make every journey a pleasant and enjoyable one.”

(Singapore-NTMP)

“Training sessions on designing for universal access could also be provided to improve awareness and knowledge within the industry.”

(Malta-NTMP)

“We will apply consistent design principles and guidelines for the urban design of interchanges to help create active, vibrant, multipurpose interchange environments that integrate with surrounding areas.”

(NSW-NTMP)

In most master plans of MICs and HICs, integrated public transport systems are desired, and some policies are arising to support that.

“Prioritising the delivery of modern integrated ticketing systems in New Zealand’s main centres.”

(New Zealand – NTMP)

“Besides the Passenger information display system, integrated ticketing for all modes (Common mobility card) and interchange facilities.”

(India-NTMP)

Regarding environmental performance of public transport vehicles and systems, while NTMPs of HICs provide investment for environmentally friendly fleets; environmental standards for public transport vehicles appear in master plans of Belize and some HICs. On the other hand, in LICs, NTMPs aim to change their small public transport vehicles with higher capacity ones considering their environmental performance and efficiency.

“We are committed to having a 100% cleaner energy public bus fleet by 2040, like electric or hybrid vehicles. We have been conducting trials with 50 diesel hybrid buses since December 2018.”

(Singapore-NTMP)

“Implementation of regulation on bus fleet emissions. Follow the EPA regulation and technology up to date.”

(Belize-NTMP)

“Mass transit vehicles have more efficient engines than smaller vehicles leading to reduced fuel consumption. A bus with a carrying capacity of 108 passengers could replace around seven minibuses. The minibuses would use around 23 to 25 litres of diesel for a 20 km journey, whereas the bus would consume eight to ten litres. In terms of both fuel consumption and CO₂ emissions a bus could replace the equivalent of 14 private vehicles.”

(Malawi-NTMP)

5.2.2.3 Modal Shift and Road Space Reallocation

Almost all master plans explicitly state their intention for a modal shift from car use, stating many concerns such as health and environment.

“This objective seeks to reduce dependence on the single-occupant vehicle and ensure that people have access to safe and healthy travel options such as biking, walking, and transit.”

(California-NTMP)

“People will have better options for low emissions travel modes, including active modes and public transport.”

(New Zealand)

“Promote use of public transport over private car travel.”

(Jamaica-NTMP)

While Malaysia-NTMP states its purpose of moving to sustainable modes, the plan also underlines the intention to limit new urban roads.

“Move towards a more systematic, holistic and sustainable practice of prioritising active mobility and public transport modes.... Limit the development of new highways in urban centres.”

(Malaysia-NTMP)

Improvement of public transport and active travel can be considered modal shift policies, but these were already presented under the separate sub-themes. Apart from

these, NTMPs provide various policies to boost the modal shift from cars, which we can present in two categories: encouraging the shift to other modes and discouraging car use. In each level of economic development, awareness programs could be seen. However, in these awareness campaigns, it has been noticed that while some plans aim to shift towards a specific transport mode, some aim to move toward all modes.

“Develop and implement public education programmes on the economic, social and environmental benefits of public transport.”

(Jamaica-NTMP)

“National media plans can help increase awareness of the impacts of excessive car use in cities... introduce the health and environmental benefits resulting from cycling, walking and public transport in the primary and secondary school curricula.”

(Malta-NTMP)

Furthermore, in Malta-NTMP, financial incentives are proposed to encourage the shift.

“Financial incentives to shift from private cars to alternative transport modes such as car-pooling or bicycle use.”

(Malta-NTMP)

To discourage private car use, master plans of India and Jamaica offer taxes; India-NTMP provides taxes on both fuel and car ownership, the tax in the Jamaica plan is on fuel.

“tax/ charge on vehicle purchase/ ownership/ scrappage, ...fuel tax pay-at-the-pump (sur)charges”

(India-NTMP)

“Establish tax on petrol at levels to encourage conservation.”

(Jamaica-NTMP)

Another discouraging car use policy is that parking restrictions could be seen at each economic level.

“Restrict parking supply, and/or increase charges for long-term parking;...”

(Malawi-NTMP)

“Provide disincentives for private vehicle use (e.g., parking fees, congestion pricing entrance fees)”

(Jamaica-NTMP)

“A comprehensive new Metropolitan Parking Policy to promote mode shift to public transport, improve local amenity and encourage more active travel options”

(NSW-NTMP)

Multimodality and shared mobility were observed in master plans. Regarding multimodality, in NTMPs, especially MaaS and "park and ride" projects are planned to support multimodality and help modal shift. Those types of policies could be seen in each economic development level.

"A multi-modal approach is needed to solve the urban transport problems of Greater Kampala..."

(Uganda-NTMP)

"Additional park and ride facilities at the periphery of the city..."

(India-NTMP)

"Mobility as a Service (MaaS) aims to consolidate all modes of transport – bike sharing, car sharing, taxis, public transit – into one unified mobile service within a single app."

(Utah-NTMP)

Regarding shared mobility, it appears for both bicycle and car-sharing in NTMPs. Furthermore, master plans desire shared mobility considering its help to reduce car dependency. Similar to multimodality, it is seen at each level.

"Promote car-pooling and car-sharing."

(Malawi-NTMP)

"Provide intelligent and shared mobility for goods and passengers"

(Malaysia-NTMP)

"SHARED MOBILITY services such as bike-share and car sharing programs can help reduce reliance on single-occupant vehicles, improve first-last mile connectivity to public transit, reduce the need for urban parking, and support more affordable travel options in California communities."

(California-NTMP)

Another focus of this subtheme, road space reallocation, appears in NTMPs of two LICs, India and Jamaica. In HICs, Norway is the only country in which NTMPs do not comprise this.

"Where feasible, we will convert existing road lanes into spaces for public transport and active mobility, such as bus lanes, dedicated cycling paths and wider footpaths"

(Singapore-NTMP)

"A road transport system which accommodates non-motorized transport"

(Jamaica-NTMP)

While NTMPs take road space reallocation as an objective as given the above, specific actions planned were also noticed, such as bus lane projects and cycle lanes on roads.

“Cycleways All new and upgraded urban and main roads will include consideration of the needs of cyclists and include dedicated cycle lanes when the existing and predicted demand justify this.”

(Malawi-NTMP)

“Provision of a bus-only link from Meurants Lane to the North West T-way to bypass the congested Norwest Boulevard and Windsor Road”

(NSW-NTMP)

Master plans of Malta, Malawi and NSW plan to provide design guidelines for road space reallocation on the urban environment.

“Develop a policy framework and design guidelines to create a balanced approach to different modes in urban streets and public space”

(Malta-NTMP)

“We will develop and require the use of guidelines on providing and managing separated space for the use of cyclists where feasible.”

(NSW-NTMP)

5.2.3 City of Place Perspective

5.2.3.1 Appealing Public Spaces

Appealing public spaces in urban transport were seen in those HICs: Malta, Singapore, New Zealand and California. Malawi and South Africa are only two LIC and MIC whose master plans aim to improve the public realm in the urban transport environment. Those NTMPs highlight the importance of social inclusion, attractive places and leisure activities.

“Pedestrian priority Pedestrianisation of existing streets can be done to enhance the urban ambience, and promote activities such as retailing, culture and leisure in city centres.”

(Malawi-NTMP)

“Support enjoyable trip experiences and vibrant public spaces Transportation is not just used to get from point A to point B. It can be used for recreation, art, public events, and more—all of which contribute to the activated public spaces that make California communities so unique and inviting. This objective aims support public spaces that are vibrant, living, and inclusive.”

(California-NTMP)

Malta and NSW, in their NTMPs, plan to spare funds to make streets more attractive.

“Support transport investments that enable, support and shape growth, make streets more inviting places for people, and enable increased housing supply in line with the Urban Growth Agenda.”

(NSW-NTMP)

“Develop a funding programme for the redesign/refurbishment of local streets according to the design guidelines for urban streets and home zones.”

(Malta-NTMP)

Singapore and California are only two countries where master plans consider road closure implementations to provide community spaces.

“Learning from these successes, we will convert parts of other roads permanently into walking streets and community spaces, starting with Armenian Street and Market Street/Malacca Street in 2019 and 2021 respectively.”

(Singapore-NTMP)

Another implementation seen in master plans to improve space quality in urban transport is the shared spaces. Malta, NSW, and Malawi consider these in their NTMPs.

“However, while measure 2.2.5.1 addresses the provision of design guidance for urban streets in general, this measure focuses on design guidance for shared spaces within residential areas i.e. the provision of home zones.”

(Malta-NTMP)

“We will also implement public domain improvements such as revitalised public spaces together with partial pedestrianisation along George Street between Town Hall and Wynyard Stations. Light rail will provide a step change in travel experience and will be simple, comfortable, and easy to use.”

(NSW-NTMP)

5.2.3.2 Healthy Streets and Reducing Traffic Level

Healthy streets were seen in master plans with reducing traffic speeds, pedestrian priorities, road closures implementations. Furthermore, policies that aim to reduce general traffic levels in city centres and on streets appear in master plans.

In LICs, non-motorised streets are desired in NTMPs. Nevertheless, other policies as mentioned above about healthy streets do not appear.

“Pedestrian priority: Pedestrianisation of existing streets can be done to enhance the urban ambience, and promote activities such as retailing, culture and leisure in city centres. Removing motorised vehicles not only adds to safety but it can act as a deterrent to car use, particularly where alternative high quality public transport is in place.”

(Malawi-NTMP)

On the other hand, India, Jamaica and South Africa in MICs consider low emission zones, speed restrictions, and congestion charge policies to reduce general traffic levels.

“Create pilot low emission zones in certain highly densified urban areas (e.g. Gauteng, Durban and Cape Town) that prevents certain type of vehicles entering such zones during certain times of the day.”

(South Africa-NTMP)

“The time has come in India, especially in cities with the higher motorised vehicle populations to consider the implementation of restricted registration programmes and linking ownership to proof of ownership / availability of parking place, and limiting accesses to zones / areas through measures like congestion charges, high parking fees, restriction on availability of parking in areas served by public transport.”

(India-NTMP)

In HICs, at least one of these policies above appear in master plans.

“Furthermore, the Government has established a legal basis for introducing low-emission zones, and has asked the Norwegian Public Roads Administration to arrange for the road toll to be differentiated according to environmental performance of the vehicles.”

(Norway-NTMP)

“We launched a Silver Zone initiative at Whampoa Drive. Apart from introducing enhanced safety features such as speed-calming measures.”

(Singapore-NTMP)

“Congestion Pricing: What if by paying a little bit, you could save a lot? Nobody likes traffic congestion. The challenge with reducing congestion by adding lanes is that it usually entices people to travel more, which in turn hastens the return of congestion. Congestion pricing is the idea of charging a modest toll on certain lanes only at congested times of day.”

(Utah-NTMP)

Apart from specific actions, stating general concepts for healthy streets seen in NTMPs of New Zealand, Singapore, California and NSW, common aims are to improve safety and limit cars for active travel.

“We will improve pedestrian access, safety and amenity around the city and work with local government and communities to make city neighbourhoods and local centres more walkable.”

(NSW-NTMP)

“Shape land use, urban form and street design in a way that reduces car dependency, and makes walking, wheeling, cycling and micro-mobility safe and attractive travel choices...”

(New Zealand-NTMP)

“Expand funding for implementation of safety plans at the state, local, and regional level, including Complete Streets, Safe Routes to School, and Vision Zero plans.”

(California-NTMP)

“We have heard you and will make it easier for Singaporeans to be active by designing more pleasant, welcoming streets that make walking and cycling a breeze.”

(Singapore-NTMP)

Belize and Malaysia are two countries of NTMPs do not have a policy about this theme.

5.2.3.3 ToD and Mixed-Use Development

Compact and mixed-used land development concepts are noticed in NTMPs but not in Malawi, Greece and Belize. Land development concept generally is accompanied by the aim of reducing travel distances and travel needs.

“The central idea behind the TOD scenario is to cluster areas of more intensive land use in the inner metropolitan area, in major mixed-use corridors and (to a more limited extent) in the periphery along some circumferential corridors, all in a development pattern that is movement-efficient.”

(Uganda-NTMP)

“The need to minimize traveling requirements also should be incorporated into urban and regional planning, for example by developing mixed-use communities where workplaces are in closer proximity to residences....”

(Jamaica-NTMP)

“In the next 20 years, Sydney will become a more compact, multi-centred, connected city, with a transport network that provides quick and convenient public transport connections across the city and frequent links to other cities.”(NSW-NTMP)

As the box above, while Uganda-NTMP states in one sentence its goal for both mixed-use land development and ToD, all master plans, which desire compact and mixed land use, also pursue ToD.

“2. Continuously ensure that development guidelines integrates land use and public transportation

3. Impose requirement for TOD in urban areas and around public transportation nodes”

(Malaysia-NTMP)

“Transit-oriented development (TOD), particularly in urban and suburban areas, can make transit trips more attractive and competitive with auto travel for more Californians.”

(California-NTMP)

Aside from general goals, specific actions support these land developments, such as funding in Norway-NTMP, knowledge support local authorities in NSW-NTMP, incentives and regulations in South Africa’s plan.

“The Government will prioritise funding in order to achieve efficient land use and transport solutions, which will reduce emissions and improve mobility.”

(Norway-NTMP)

“Action: Encourage transit-oriented development Transport for NSW will support transit-oriented urban renewal across the Greater Metropolitan Area by working with relevant agencies to: Identify the interventions required to support urban renewal in different localities (potentially ranging from providing technical advice to local councils through to large scale urban regeneration projects undertaken in partnership with the private sector)”

(NSW-NTMP)

“Strengthen the link between public transportation and land use management with the introduction of incentives and regulations to support compact mixed use development within walking distance of transit stops, and high-density developments along transit routes.”

(South Africa-NTMP)

5.3 Policy Types Themes

In the previous chapter, the matter was that policies are used for which perspective of urban transport. Therefore, policies in a specific urban transport perspective were illustrated with related quotes from each level of the economic level if used. However,

in this chapter, the matter is which type of policies are used in urban transport.

Therefore, in this chapter, quotes are given from each economic level based on the policy types. Furthermore, sub-themes are instantiated with quotes not presented in the previous chapter where possible.

5.3.1 Regulatory

5.3.1.1 Planning & Infrastructure

In all NTMPs except Belize and Utah, regulations for urban planning and infrastructures were noticed. Those policies could aim to regulate the entrance of motor vehicles on urban roads via road closures and low emission zones.

“The designation closes several streets to through vehicular traffic, lending more space to bikes, pedestrians, wheelchair users, and local vehicles only”

(California-NTMP)

“Low Emission Zones (LEZs) are normally introduced in areas where air pollution from vehicles is at a dangerous level for public health. They therefore regulate access to such areas by high polluting vehicles.”

(Malta-NTMP)

These types of interventions also exist in master plans to regulate urban road designs and urban spaces with road space reallocations, shared spaces or providing public spaces.

“Establish priority measures (bus lanes and priority traffic signals) on high ridership corridors...”

(Malawi-NTMP)

“George Street – how it will work The CBD and South East Light Rail will change the face of George Street. A one kilometre pedestrianised zone shared with light rail along George Street will be created between Bathurst and Hunter Streets”

(NSW-NTMP)

“Providing access to vibrant public open spaces that encourage a culture of walking, cycling, social interaction and active lifestyles.”

(South Africa -NTMP)

Apart from urban roads and spaces, regulating urban land development was seen in the NTMP of South Africa.

“Strengthen the link between public transportation and land use management with the introduction of incentives and regulations to support compact mixed use development within walking distance of transit stops, and high-density developments along transit routes.”

(South Africa-NTMP)

5.3.1.2 Vehicle Standards

NTMPs of South Africa, New Zealand, and Utah are only three plans where vehicle standards were not detected. While vehicle standards on private ones could be seen, they also apply for public transport vehicles. These standards were noticed that they aim to control the environmental performance of vehicles by regulating emissions level, vehicle age, vehicle capacity or energy efficiency level.

“As the motor industry continues to produce cleaner and quieter vehicles, we will facilitate their adoption by private individuals by reviewing our regulatory regimes, vehicle registration schemes and vehicular emissions schemes.”

(Singapore-NTMP)

“The establishment of an age limit for the fleet can set the path for making Belize’s vehicle fleet more efficient and can promote the enactment of an air quality standard in the future”

(Belize-NTMP)

5.3.1.3 Operational Regulations

These policies have been seen in master plans for three primary purposes: regulating public transport operations, vehicle traffic and parking in urban transport. These for public transport operations are not detected in the master plans of New Zealand and Utah. NTMPs state their general intention to regulate public transport operations to improve services as below.

“Reviewing existing regulations and creating new ones for qualification of public transport service provider”

(Uganda-NTMP)

However, they also provide more explicit actions from licencing, capacity control, regulating fares in the market, health standards, safety standards; to regulating fares to manage peak-hour congestions. Apart from mass public transport, there are also policies for taxi services to be regulated. Some examples are listed below.

Licencing public transport operators and controlling capacity of vehicles:

“New Regulations:

a) Regarding Transport Operators licences: Requirements to be licensed, Grant of licenses, License Categories and Periods (improve periods for 2 to 8 years),...”

(Belize-NTMP)

“Licence only vehicles with more than 38 seats...”

(Malawi-NTMP)

Regulating fares to control the market and manage peak hours:

“Monitoring the fares charged and the degree of monopolization of the market; Applying sanctions whenever the established regulations have been infringed after a number of warnings;...”

(Uganda-NTMP)

“For example, we have changed our fare structure to encourage more pre-peak travel. Commuters now pay lower fares if they tap in at any MRT or LRT station before 7.45am.”

(Singapore-NTMP)

Health standards are seen in California-NTMP, which is the only plan published after the outbreak of the Covid-19 pandemic:

“Develop statewide public health standards to reduce the spread of COVID-19 on transit vehicles, such as capacity limitations, thermal screening, no-touch payment, and others. “

(California-NTMP)

Regulations on taxis services and paratransit:

“Move from a ‘closed permit systems’ to an ‘open permit system’, for para-transit/intermediate public transport modes to make public transport more convenient”

(India-NTMP)

“Institute and enforce licensing regime to ensure vehicle fitness, driver capability and adherence to regulations”

(Jamaica-NTMP)

On the other hand, regulations for traffic could be seen in NTMPs at different economic levels. For example, traffic management implementations and regulating traffic speed are two actions detected in plans. However, while traffic management can be seen in all economic levels, speed restrictions and traffic calming are seen in only master plans of MICs and HICs.

“Reducing congestion and better managing traffic Transport for NSW will continue to manage the urban road network in real-time through the Transport Management Centre: detecting and responding to incidents, traffic signal timing, planning for major events and providing real-time traveller information to motorists.”

(NSW-NTMP)

“Implement traffic-calming zones and designate 30 km/h zones in all residential areas, school and hospital areas and shopping districts, areas with high pedestrian activity and local streets.”

(India-NTMP)

Regulating parking is another operational intervention seen in master plans. Similar to regulating traffic, it is also seen at each economic level.

“Restrict parking supply, and/or increase charges for long-term parking;”

(Malawi-NTMP)

“Parking management is to be used as a demand management tool – to decrease use of private vehicles and thus reduce overall demand of parking, and shift travel to public transport, para-transport and non-motorised modes.”

(India-NTMP)

“The concept of double use of parking where the same parking spaces would be used by offices or retail establishments during the day and by residents at night could also be explored to retain accessibility by car for city functionality, but at the same time mitigate the negative effects of traffic congestion and parking clutter.”

(Malta-NTMP)

5.3.2 Economic

5.3.2.1 Financial

Financial tools are the most commonly seen policy instrument in this theme and among all policy interventions (regulatory, economic, information). In all 15 master plans, financial policies are detected. However, we could see these in different ways, such as infrastructure investments for urban transport, procurements and operational investments to funding land use developments. In the master plans, these financial policies could be direct central government funds or plans for local governments.

Infrastructure investments:

“...around US\$167 million is recommended for the reconstruction of 334 km of roads. If the cost of reconstruction is removed from the long run maintenance need, the total average annual requirement becomes US\$59.7 million.”

(Uganda-NTMP)

“24 billion NOK have been allocated to local public transport projects in the four major urban areas (50 per cent government funding).”

(Norway-NTMP)

“Support transport investments that enable, support and shape growth, make streets more inviting places for people, and enable increased housing supply in line with the Urban Growth Agenda.”

(NSW-NTMP)

Procurements and operational investments:

“Installing ITS applications to notify passengers of bus and ferry schedules.”

(Malta-NTMP)

“Implement new routes in the Montego Bay Metropolitan and environs”

(Jamaica-NTMP)

“Investment in a modern public transport fleet, including new trains and ferries, and new buses in growth areas and on strategic corridors.”

(NSW-NTMP)

Funding land use development:

“The Government will prioritise funding in order to achieve efficient land use and transport solutions, which will reduce emissions and improve mobility.”

(Norway-NTMP)

5.3.2.2 Incentives and Subsidies

Incentives and subsidies are seen in all master plans except the New Zealand-NTMP. We can divide them into two: the first targets urban transport users to affect their behaviour, and the second is through urban transport operators. While Incentives for users could be seen at each economic level, incentives for operators are seen in LICs and MICs. The only exception is California-NTMP which wants to support public transport operators because of the Covid-19 pandemic.

Incentives and subsidies for users:

“Fiscal incentives such as duty free importation of hybrid vehicles...”

(Uganda-NTMP)

“Subsidies for purchasing alternative fuel vehicles or for converting traditional fuel vehicles to alternative fuel vehicles.”

(India-NTMP)

“The development of an overarching public transport subsidy policy that incorporates all modes of public transport to subsidise users and not the operators.”

(South Africa-NTMP)

“Explore partnerships and incentive programs to support expanded use of e-bikes, both for short- and longer-distance travel.”

(California-NTMP)

Incentives for operators:

“Providing incentives for the creation of new service...”

(Uganda-NTMP)

“MoT may negotiate tax reduction on the importation of new / recent buses to help the modernization of the buses. Grants may be obtained for the modernization of the fleet such as the clean technology fund (CTF).”

(Belize-NTMP)

“Support transit agencies facing shortfalls due to COVID-19.”

(California-NTMP)

5.3.2.3 Taxes

Even though taxes are not seen in all master plans, they could be noticed at each economic level. For example, while taxes on vehicles like car ownership, fuel and emission taxes are seen in some MICs, Malawi-NTMP and Greece-NTMP, land value taxes can be seen at MICs and HICs.

Taxes on vehicles:

“In the meantime, in order for the funding mechanism to provide a sustainable source of funds, our preliminary conclusion is that the fuel levy will need to be increased.”

(Malawi-NTMP)

“Tax/ charge on vehicle purchase/ ownership/scrappage”

(India-NTMP)

Land value capturing:

“Capturing value from publicly funded investments Action Capture land value uplift from major transport investments”

(NSW-NTMP)

“Anything that empowers metropolitan-scale governance in user pricing (which within urban areas will include congestion pricing and marginal cost pricing of other externalities), land value-capture tax financing, and integrating land use plans and transport infrastructure should be encouraged”

(India-NTMP)

5.3.2.4 Pricing-Charges

In LICs, there are no pricing-charging policies seen, but we can see congestion charging in some MICs and Utah-NTMP. On the other hand, other road pricing implementations were detected in some HICs (California, NSW, Norway).

“Develop guidelines on congestion charging and its application in the wider context of a national transportation demand management strategy”

(South Africa-NTMP)

“Congestion pricing is the idea of charging a modest toll on certain lanes only at congested times of day. The toll is meant to be just enough to encourage just enough people to commute at another time of day, carpool or take transit so that the road stays free from congestion.”

(Utah-NTMP)

“Provide guidance and facilitate coordination on roadway pricing (research, best practices, considerations) to support regional and local partners, such as SCAG, MTC, Los Angeles County, and San Francisco who already are investigating pricing program”

(California-NTMP)

5.3.3 Information

5.3.3.1 Guidelines

Guidelines, seen in master plans, are provided to guide local bodies or authorities to enable sufficient standards about various topics such as road designs, public space design, land development, public transport. While they are provided in NTMPs of all MICs except Belize, the other countries of which master plans include guidelines are Malawi, Malta, and NSW.

“In order to assist road authorities, the Government will develop and issue guidelines on the standards for pedestrian crossings and incorporate thee in Universal Design principles.”

(Malawi-NTMP)

“Maintain and enforce minimum standards and guidelines for sidewalks”

(Jamaica-NTMP)

“Continuously ensure that development guidelines integrates land use and public transportation.”

(Malaysia-NTMP)

“We will develop and require the use of guidelines on providing and managing separated space for the use of cyclists where feasible.”

(NSW-NTMP)

5.3.3.2 Information-Data

This subtheme covers two main policies; the first is real-time information for traffic management, public transport, multimodality, the second is developing databases and statistics for public transport improvements. These interventions are not seen in NTMPs of MICs, but they exist in others except Utah and Norway. General database developments for urban transport planning are examined under the governance reform theme. Real-time information:

“RA-Soft 3: Fostering Multimodality o Development of a platform of information on land transport services in Greece.”

(Greece-NTMP)

“Continue to modernize transit systems through ITS elements like signal priority, automatic passenger counters, and real-time traveler information systems.”

(California-NTMP)

Databases and statistics:

“To improve intermodal integration: Public transport user survey...”

(Malawi-NTMP)

“Producing monthly and annual statistics on public transport operations...”

(Uganda-NTMP)

“Producing monthly and annual statistics on public transport operations in Uganda. Facilitate coordination and information sharing between transit agencies, as well as between transit agencies and private shared-mobility providers.”

(California-NTMP)

5.3.3.3 Awareness Campaigns

These campaigns also include pupil education in schools and public education.

Awareness and education programs appear in all master plans except Belize, Norway and Utah. These programs, seen in master plans, are planned to promote behavioural change in urban transport such as safety, modal shift, gracious commuting, responsible driving etc.

“Comprehensive education and awareness campaign that targets all categories of road users; ...”

(Malawi-NTMP)

“Increase safety mobility awareness and behaviour change through effective and comprehensive user behaviour improvement programmes and innovative ideas and techniques.”

(Malaysia-NTMP)

“Develop and implement public education programmes on the economic, social and environmental benefits of public transport “

(Jamaica-NTMP)

“Safety education, law enforcement and encouragement programmes...”

(India-NTMP)

“Promoting civic-mindedness and social responsibility through education, recognising exemplary behaviour when using Walk-Cycle-Ride options, and encouraging active citizenry will all contribute towards a gracious and caring commuting culture.”

(Singapore-NTMP)

“Travel behaviour change – Programs falling under this banner seek to encourage more sustainable travel choices by the community.”

(NSW-NTMP)

5.3.3.4 Skill-Knowledge

This subtheme covers attempts to increase the skills and knowledge of urban transport workers and bodies rather than capacity improvement, which will be presented in the governance reforms. These policies exist in some NTMPs of HICs (Malta, Singapore, California and NSW) and master plans of MICs except Jamaica. These skills and knowledge could be about safety, active travel design, land use development and public transport operations.

“Public transport: A DoT recognized CPC providing skills to master the technical public transport sector planning and operations, including understanding and estimating operating costs over full asset life cycle.”

(Belize-NTMP)

“Educate all transportation professionals in non-motorised transport planning principles.”

(India-NTMP)

“Upskill and train personnel at Provinces, Metros and other local authorities involved in road safety management to maintain a minimum level of skilled personnel.”

(South Africa-NTMP)

“Provide data and technical tools to help State, regional, and local governments evaluate the transportation impacts of land use decisions.”

(California-NTMP)

“Training sessions on designing for universal access could also be provided to improve awareness and knowledge within the industry.”

(Malta-NTMP)

5.3.4 Governance Reforms

5.3.4.1 Reforms in Structures

Decentralisation in urban transport, with devolving power to local bodies, is seen in all LICs and some MICs (India, Malaysia and South Africa) but not in HICs.

“Clearly decentralising policy and planning authority, including urban transport, to the constitutionally recognised urban and metropolitan governments...”

(India-NTMP)

“Ensure active involvement of state/local government, industry players and public as an integral part of public transport planning and development...”

“Strengthen LPKP (Lembaga Perlesenan Kenderaan Perdagangan) as a dedicated land transport authority for Sabah and Sarawak.”

(Malaysia-NTMP)

“Pass to district and urban authorities the responsibility for roads in their areas, and to the local councils responsibility for community access roads...”

(Uganda-NTMP)

In LICs, Malawi-NTMP plans to introduce a national urban transport authority and, after that, launch local bodies in major cities. On the other hand, Uganda intent to introduce urban transport bodies at local levels and the capital city. India is the only country in MICs of which NTMPs aim to introduce new bodies for urban transport. In HICs, Malta is only country planning to introduce new body about urban transport in the master plan.

“Create semi-autonomous agencies to perform specific functions such as management of road infrastructure in a commercial manner...”

“Reorganisation of transport planning in the GKMA under a single metropolitan authority...”

(Uganda-NTMP)

“Urban Transport Authority to provide initial national focus for complex urban challenges – transitioning to local bodies in larger urban areas.”

(Malawi-NTMP)

“Decentralisation should be engendered by legislation and a dedicated Metropolitan Urban Transport Authority (MUTA) should be set up in each city with population in excess of 1 million and dedicated cells in smaller cities for integrated planning and coordination and delivery of urban transport services.”

(India-NTMP)

“Set up a sustainable mobility unit within transport Malta to work with local councils in the redesign of local streets.”

(Malta-NTMP)

NTMPs define some roles and responsibilities for bodies relating to urban transport or align these. Aligning roles and responsibilities of bodies are seen in all LICs and MICs except Jamaica. Greece-NTMP is only master plan providing these arrangements in HICs.

“MATA will also act within a mandate of delegated authority from MTRA to enforce regulatory provisions for licensing, economic regulation and environmental issues, and legal services pertaining to all transport services and operations within the jurisdiction of GKMA.”

(Uganda-NTMP)

“The new metropolitan urban transport authorities should be financially independent and have some authority over allocation of funding for urban transport projects, to ensure that they can exercise their statutory role in integrated planning across geographies and modes.”

(India-NTMP)

“Ensuring the role of MIT in coordination between Urban/Regional Planning and National Strategy Making.”

(Greece-NTMP)

Master plans aim to create teams or increase their capacity in the related bodies to achieve their aims set in the plans. We could see capacity building intentions in all LICs and MICs except Malaysia. Furthermore, in HICS, Malta also comprises these.

“City councils need to play a key role in local development, in which transport will be major part. A programme of capacity building for the four cities is proposed with the four components introduced below.”

(Malawi-NTMP)

“Capacity building to BPA on water taxi management”

(Belize-NTMP)

“Set up a multi-organisational team to develop a pedestrian infrastructure plan focussing on the “HUB””

(Malta-NTMP)

5.3.4.2 Reforms in Processes

We could see at least one proposal for governance processes in all master plans. These are policymaking, project assessment, performance assessment, and financial systems and data provisions for urban transport management. Policymaking proposals generally focus on stakeholder collaborations and public consultations.

“Proposals for involvement and collaboration with relevant public agencies, private sector and users, including neighbouring districts...”

(Malawi-NTMP)

“Conduct research to understand travel behaviour and travel pattern for right intervention to promote behavioural change.”

(Malaysia-NTMP)

“At the same time, we will continue to keep open multiple channels for members of the public to reach out to LTA, to provide feedback or share ideas on how the transport system can be improved. These are valuable to us in our day-to-day operations as well as in our plans for our long-term transport landscape.”

(Singapore-NTMP)

In some NTMPs of MICs and HICs, projects and performance assessment proposals were notices.

“Second, it will be important to establish the basis for more deliberate and informed comparisons of costs and benefits of rail and bus-based systems.”

(India-NTMP)

“Define sets of standard data analyses and KPIs. This must include the identification and monitoring of fixed assets of public use (bus stops, stations, parking areas, etc.), their owners and operators.”

(Greece-NTMP)

Changes and proposals to modify financial systems for urban transport could be seen at each level of economic development.

“Local government finance The objective is to increase the resource base of city authorities, and to improve transparency. Structural improvements to the framework of the local government finance are needed, along with reform of the fiscal architecture. “

(Malawi-NTMP)

“Second, it will be important to establish the basis for more deliberate and informed comparisons of costs and benefits of rail and bus-based systems.”

(India-NTMP)

“Define sets of standard data analyses and KPIs. This must include the identification and monitoring of fixed assets of public use (bus stops, stations, parking areas, etc.), their owners and operators.”

(Greece-NTMP)

On the other hand, in MICs and HICs, there are proposals and plans to improve or introduce data management, such as creating databases and conducting surveys for urban transport management.

“Provide a common database that can be used as a reference point by respective agencies for evidence-based planning.”

(Malaysia-NTMP)

“Action Continually improve the data used for decision making The data underpinning transport decisions will be improved by: Incorporating insight on customers’ priorities and travel experiences in the transport system into decision making processes as more of this information becomes available...”

(NSW-NTMP)

Finally, legislative changes are proposed to support a governance reform or a policy in the master plans; These could be seen in NTMPs of some HICs (Greece, Norway and California) and all master plans in LICs and MICs except Jamaica.

“New legislation will be required to establish MATA so as to furnish it with the necessary legal powers and authority to enable MATA to perform its functions effectively.”

(Uganda-NTMP)

“Setting up emission and safety standards under the Motor Vehicles Act.”

(India-NTMP)

“Enact State legislation to allow for roadway pricing programs, grounded in research on equity and other implications.”

(California-NTMP)

5.3.5 Strategic

This theme covers overarching policy aims and goals where specific policy instruments are not provided in master plans. NTMPs use this theme to state their general intention and perspectives about urban transport, such as aims for modal shift, goals for active travel, aiming less travel etc. In all plans, we could see strategic declarations from explicit objectives and goals statements to latent expressions.

“Increase the competitiveness of transit, shared mobility, and active travelation options.”

(California-NTMP)

“Integrate non-motorised transport (NMT) philosophy in spatial development strategies”

(South Africa-NTMP)

“A shift from personal vehicles to other mass transit and non-motorised modes is also necessary to reduce energy demand from cities.”

(India-NTMP)

“This will call for better quality and more reliable public transport.”

(Malta-NTMP)

“Highly liveable cities and towns are people-friendly places with healthy environments that improve wellbeing and economic prosperity.”

(New Zealand-NTMP)

“Improvement to the existing road network to improve traffic flow and safety.”

(Uganda-NTMP)

6 LIMITATIONS AND FURTHER RECOMMENDATIONS

In this study, the major limitation was that NTMPs in different languages from English could not be examined. Moreover, even though some countries have national plans, they do not publish them publicly. Therefore, these limitations restricted both sample size and sampling variety in terms of economic development levels. This study focussed on current national plans. In further studies, national plans from different historical periods could be studied to examine the applicability of 3-stage process. This would help to see the historical development process in urban transport worldwide from central government perspectives regarding the 3-stage process.

7 DISCUSSION AND CONCLUSION

7.1 Discussion

Regarding policy perspectives, previously, scholars studied the 3-stage process on implemented policies in cities. These studies were interested in the historical development of these stages. However, considering three perspectives in the 3-stage process, this dissertation attempted to examine the national urban transport policies that central governments want to see in their cities. As presented in the results, each policy perspective could be seen in plans, but their appearance can vary from country to country. After presenting results based on sub-themes, we could now attempt to answer the question: Which countries follow which policy perspectives? In LICs, we could see each sub-theme of car-oriented perspective. Especially the “meeting motor vehicle needs”, which is the major pillar of car-oriented policies, is well represented in these plans. On the other hand, these policies are accompanied by sustainable mobility policies. In both plans, road building is accompanied by road space reallocation regulations, and they want to sustain their high active travel mode share with related policies and improvements. Moreover, even if we see traffic management objectives in two plans, they also have aims and policies about mode shift and public transport. Regarding the city of places, while we could not see all sub-themes together, just some intentions without policy instruments were seen. Consequently, we can say that these two LICs mostly follow car-oriented and sustainable mobility perspectives in their plans. In MICs, while Belize-NTMP is the only plan with no policy or aims about the city of places, it only focuses on public transport enhancement policies in sustainable mobility perspectives. On the other hand, car-oriented subthemes appear in the plan. Therefore, Belize-NTMP can be stated as mostly car-oriented. Malaysia-NTMP provides policies to manage traffic and limit private cars' environmental problems;

however, no policy or statement about meeting motor vehicle needs. Furthermore, the plan reflects three subthemes of sustainable mobility at a certain level. Regarding the city of places, it has policies and intentions about ToD and mixed-use development but not about others. Hence, it could be categorised as a plan that follows a relatively sustainable mobility perspective. While master plans of India and South Africa reflect mostly sustainable mobility perspectives, they also have policies to meet motor needs. Their traffic management policies and policies for limiting environmental problems of private cars are accompanied by mode shift, public transport and demand management policies. Furthermore, while each subtheme of the liveable city could be seen in NTMP-South Africa, India lacks only appealing public spaces policies and aims. Consequently, even though these two NTMPs plan stage-1 and stage-2 policies, they also attempt to follow the city of places perspective.

Jamaica-NTMP does not plan road building, but it has some aims and policies to improve traffic flow in urban centres, such as off-street parking provision, traffic management systems. About city of places, this plan mentions only congestion-charge and ToD and mixed-used planning. On the other hand, sustainable mobility policies are well presented in Jamaica-NTMP. In summary, in the plan, sustainable mobility policies seem more dominant.

Lastly, in HICs, master plans of Singapore and California seem closest plans to stage-3 perspective since they lack policies to meet private car needs, and they follow policies in each sub-theme of the city of places. At the same time, these both pursue sustainable mobility policies. While we could see each subtheme of stage-3 in master plans of Malta, New Zealand and NSW, they also intend to implement policies that help meeting motor vehicle needs. Policies, which are to limit environmental problems of private vehicles and manage traffic, are accompanied by all subthemes of the sustainable mobility perspective. Therefore, it is difficult to say which perspective is closer to these plans. However, we could state that each perspective appears in those plans at certain levels. In Greece-NTMP, we could see only one statement relating to the liveable city perspective: low emission zone. However, principal policies for car-oriented and sustainable mobility subthemes could be seen in the plan. So, the plan seems to follow both stage-1 and stage-2 perspectives. Similar to Greece-NTMP, the master plan of Utah could be categorised as both stage-1 and stage-2 because it lacks most of the policies and aims of the city of place, and it has car-oriented and sustainable mobility policies at a certain level. On the other hand, Norway-NTMP does not have any aim and

policy to meet the needs of cars, and stage-2 policies accompany other subthemes of car-oriented perspectives. For example, even though efficient land use for urban mobility and low emission zones are projected in the plan, we could not see statements about appealing public spaces. Therefore, Norway-NTMP is not close to the stage-1 perspective. Furthermore, it follows sustainable mobility policies with each subtheme but pursues stage-3 perspective partly.

As we mentioned before, all these results are based on the perspective of the national governments for the future. Therefore, it is beneficial to discuss how these perspectives actually fit current situations in those countries. These perspectives could be different with existing policies and situations. For example, California-NTMP acknowledges that past implementations and current urban areas are pretty car-oriented, and car trip share is high. However, the plan focuses on demand management, ToD and mixed-used land development, and liveable city policies to change this fact. On the other hand, Singapore-NTMP shows existing implementations in line with the city of places, and the plans want to continue in this line. Further studies could expand this discussion with more evidence about existing situations.

Previous studies showed that these three perspectives could exist at a time in a city; for example, city centres typically can host stage-3 policies with more space dominance, inner-city areas can have options for alternatives to car use, and outer-city areas could be car-oriented because of dispersed land development (Jones *et al.*, 2018; Halpern, 2018). Now, the results of this dissertation show this circumstance from the central government's perspective. In that, these policy perspectives can co-exist with one another as plans in one country simultaneously.

Jones stated that most cities in the world are in stage-1 and he listed three preconditions that are needed for a successful transition to sustainable mobility stage and then potential transition through stage-3 (Jones, 2016);

- 1.) dense land-use patterns to support walkability,
- 2.) comparable door-to-door speeds of alternative modes,
- 3.) car use restrictions.

We could see these policies together in some master plans. However, policymakers should consider that car-use restrictions could be effective and accepted by the public where the first two conditions are achieved successfully (Jones, 2016).

In the developing world, the potential increase in car ownership with wealth and increasing urbanisation will pressure to achieve more sustainable and liveable cities

(Jones, 2014). To avoid the same trajectory in western Europe and move to stage-3, Jones underlined the importance of suitable administrative organisations, proper financial mechanisms and acceptability of policies by the public (2016). In LICs and MICs, we could see many proposed reforms to arrange governance systems, particularly structural reforms. In addition, we noticed awareness campaigns for behavioural change in developing countries except Belize. Furthermore, investments for stage-2 appeared in their plans. However, although these recommendations seem to exist slightly in developing countries, providing continuous financial resources, and implementing the plans at local levels might be challenging. Therefore, funding, urban transport institutions, and monitoring of implementations highly matter to the success.

Regarding policy types, we could see a variety of policy types in plans. However, in Utah-NTMP, even though it provides general aims and intentions about urban transport, we could not see a variety in policy instruments. This NTMP focussed on mostly financial instruments. While the master plan of Norway mainly covers investments and fund allocation for urban transport projects, we can notice some policies for other instrument types but not information-based ones. In other master plans, we could see various instrument types at a certain level. Because of the nature of master plans, unsurprisingly, the strategic theme seems notably seen. On the other hand, in NTMPs, regulatory and economic instruments were more chosen than information ones. Even though the information theme is poorly represented, awareness campaigns seem adequately seen; we could not notice those in only NTMPs of Belize, Utah and Norway. Governance reforms seem considerably represented with all codes. However, as we discussed in the results, governance reforms, especially ones for structures, are more tent to present in master plans of developing countries (LICs and MICs).

Generally, NTMPs provide possible policy instruments to be used in cities. However, Singapore, a city-state, California, NSW and Utah, which are federated states, show more specific policies to be used locally in their national plans. As stated previously, for an objective, policymakers could provide one or a bunch of policy instrument types as in those NTMPs (Rist, 1998; Rode, Heeckt & da Cruz, 2019). While those available policy instruments can guide local authorities, selecting the suitable policy instruments at the right time is crucial to achieving objectives successfully. For this decision, Rist states that policymakers should consider the circumstances of the problems, capabilities of institutions run these policies, fiscal burdens of instruments and political costs (1998). These concerns, which Rist points out, are tried to handle in some NTMPs, and

these plans consider budget allocation for proposed actions, governance reforms and capacity buildings for local authorities.

7.2 Conclusion

In conclusion, although the 3-stage is a historical development process in Western European cities, we could see perspectives of this process in national transport plans nowadays. Therefore, the 3-stage process could be used to assess national urban transport policies in terms of sustainable and liveable cities. While these urban transport policies reflect perspectives of the 3-stage process differently, each type of policy instrument exists in countries' policy agendas at different patterns, and the use of those can vary. Even though car-oriented policies could be seen in HICs, stage-3 policies exist slightly more in HICs than in other countries. The reason for that could be that they experienced the negative externalities of cars before others. Another reason could be that their transport ministries might be slightly more capable of following and evaluating new trends and implementations in terms of skills and number of professionals. Apart from this difference, we could notice the variety in appearance of perspectives in countries as we discussed above. Moreover, in most plans, each perspective is slightly different from what is experienced in Western Europe. Economic development, geographical conditions, demographics forms, political environments, and cultural norms could be factors that shape countries' perspectives on urban transport. The historical development of the 3-stage process is unique in Western European cities, and the existing land use forms and many historical external triggers were also factors in this process. However, the failures and successes in this development process are facts to be learned by other countries and cities. Therefore, in addition to these lessons, central governments should consider their own countries' circumstances, resources, structures and processes of institutions and applicability of policy instruments while planning their future for urban transport. The taxonomy used in this dissertation could be useful for policymakers to see how different and coercive policy instruments are available to achieve their objectives and aims. Furthermore, policymakers should consider local circumstances regarding the applicability of policy instruments in each city and different policy instruments regarding their coerciveness levels on the public rather than focusing on one type of policy.

8 BIBLIOGRAPHY

- Alando, W. & Scheiner, J. (2016) Framing Social Inclusion as a Benchmark for Cycling-Inclusive Transport Policy in Kisumu, Kenya. *Social Inclusion*. [Online] 4 (3), 46–60. Available from: doi:10.17645/si.v4i3.546.
- Alotaibi, O. & Potoglou, D. (2017) Perspectives of travel strategies in light of the new metro and bus networks in Riyadh City, Saudi Arabia. *Transportation Planning and Technology*. [Online] 40 (1), 4–27. Available from: doi:10.1080/03081060.2016.1238572.
- Anciaes, P. & Jones, P. (2020) Transport policy for liveability – Valuing the impacts on movement, place, and society. *Transportation Research Part A: Policy and Practice*. [Online] 132, 157–173. Available from: doi:10.1016/j.tra.2019.11.009.
- Baldwin, A. & Shuttleworth, K. (2021) *How governments use evidence to make transport policy*. [Online]. Available from: <https://www.instituteforgovernment.org.uk/publications/transport-policy> [Accessed: 16 August 2021].
- Banister, D. (2008) The sustainable mobility paradigm. *Transport Policy*. [Online] 15 (2), 73–80. Available from: doi:10.1016/j.tranpol.2007.10.005.
- Banister, D. (2005) *Unsustainable Transport: City Transport in the New Century*. [Online]. London, UK, Taylor & Francis. Available from: <https://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=5121690> [Accessed: 8 June 2021].
- Barter, P.A. (1999) *An International Comparative Perspective on Urban Transport and Urban Form in Pacific Asia: The Challenge of Rapid Motorisation in Dense Cities*. PhD thesis. Murdoch University.
- Boyatzis, R.E. (1998) *Transforming Qualitative Information: Thematic Analysis and Code Development*. London, SAGE Publications.
- Braun, V. & Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*. [Online] 3 (2), 77–101. Available from: doi:10.1191/1478088706qp063oa.
- Buehler, R. (2009) Determinants of Automobile Use: Comparison of Germany and the United States. *Transportation Research Record: Journal of the Transportation Research Board*. [Online] 2139 (1), 161–171. Available from: doi:10.3141/2139-19.
- Buehler, R., Pucher, J. & Altshuler, A. (2017) Vienna’s path to sustainable transport. *International Journal of Sustainable Transportation*. [Online] 11 (4), 257–271. Available from: doi:10.1080/15568318.2016.1251997.
- Buehler, R., Pucher, J., Gerike, R. & Götschi, T. (2017) Reducing car dependence in the heart of Europe: lessons from Germany, Austria, and Switzerland. *Transport Reviews*. [Online] 37 (1), 4–28. Available from: doi:10.1080/01441647.2016.1177799.

- Cassell, C. & Symon, G. (2004) *Essential Guide to Qualitative Methods in Organizational Research*. London, SAGE Publications.
- Department of Transportation (2021) *California Transportation Plan 2050*. [Online]. Sacramento, California, Department of Transportation. Available from: <https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/ctp-2050-v3-a11y.pdf>.
- Department of Transportation (2019) *Utah's Unified Transportation Plan 2019-2050*. [Online]. Salt Lake City, Utah, Department of Transportation. Available from: <https://unifiedplan.org/>.
- Diao, M. (2019) Towards sustainable urban transport in Singapore: Policy instruments and mobility trends. *Transport Policy*. [Online] 81, 320–330. Available from: doi:10.1016/j.tranpol.2018.05.005.
- Dotson, E. (2011) Institutional and Political Support for Urban Transport. In: Harry T. Dimitriou & Ralph Gakenheimer (eds.). *Urban Transport in the Developing World*. Cheltenham, UK, Edward Elgar Publishing. pp. 262–301.
- European Commission (2017) *Sustainable urban mobility: European policy, practice and solutions*. [Online]. Luxembourg, Publications Office of the European Union. Available from: <https://data.europa.eu/doi/10.2832/51274> [Accessed: 8 June 2021].
- Gallo, M. & Marinelli, M. (2020) Sustainable Mobility: A Review of Possible Actions and Policies. *Sustainability*. [Online] 12 (18), 7499. Available from: doi:10.3390/su12187499.
- Ghosh, B. & Schot, J. (2019) Towards a novel regime change framework: Studying mobility transitions in public transport regimes in an Indian megacity. *Energy Research & Social Science*. [Online] 51, 82–95. Available from: doi:10.1016/j.erss.2018.12.001.
- Goodwin, P. (2004) *The Economic Cost of Road Traffic Congestion*. [Online]. London, UK, University College London Available from: <https://discovery.ucl.ac.uk/id/eprint/1259/>.
- Gössling, S. (2013) Urban transport transitions: Copenhagen, City of Cyclists. *Journal of Transport Geography*. [Online] 33, 196–206. Available from: doi:10.1016/j.jtrangeo.2013.10.013.
- Greater London Authority (2018) *Mayor's Transport Strategy*. [Online]. London, UK, Greater London Authority. Available from: <https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf>.
- Halpern, C. (2018) *Historical transport policy developments: comparative analysis report (D4.3)*. [Online]. CREAT Project. Available from: <http://nws.euocities.eu/MediaShell/GetMediaBytes?mediaReference=id173988>.

- Hidalgo, D. & Díaz, R. (2014) Advancing Urban Mobility with National Programs: Review of Colombia's National Urban Transport Policy. *Transportation Research Record: Journal of the Transportation Research Board*. [Online] 2451 (1), 113–120. Available from: doi:10.3141/2451-13.
- Hysing, E. (2009) Greening Transport—Explaining Urban Transport Policy Change. *Journal of Environmental Policy & Planning*. [Online] 11 (3), 243–261. Available from: doi:10.1080/15239080903056417.
- IEA (2018) *Data & Statistics*. [Online]. 2018. IEA. Available from: <https://www.iea.org/data-and-statistics/data-browser> [Accessed: 8 August 2021].
- ITF (2019) *ITF Transport Outlook 2019*. [Online]. Available from: https://read.oecd-ilibrary.org/transport/itf-transport-outlook-2019_transp_outlook-en-2019-en [Accessed: 8 August 2021].
- Jones, P. (2014) The evolution of urban mobility: The interplay of academic and policy perspectives. *IATSS Research*. [Online] 38 (1), 7–13. Available from: doi:10.1016/j.iatssr.2014.06.001.
- Jones, P. (2016) The evolution of urban transport policy from car-based to people-based cities: is this development path universally applicable? In: *Proceedings of the 14th World Conference on Transport Research*. [Online]. 10 July 2016 14th World Conference on Transport Research: Shanghai, China. p. Available from: <http://www.wctrs-conference.com/>.
- Jones, P., Anciaes, P., Buckingham, C., Cavoli, C., et al. (2018) *Urban Mobility: Preparing for the Future, Learning from the Past*. [Online]. CREATE Project. Available from: <http://nws.eurocities.eu/MediaShell/GetMediaBytes?mediaReference=id173997>.
- Kenworthy, J. (2011) An international comparative perspective on fast-rising motorization and automobile dependence. In: Harry T. Dimitriou & Ralph Gakenheimer (eds.). *Urban Transport in the Developing World: A Handbook of Policy and Practice*. Cheltenham, UK, Edward Elgar Publishing. pp. 71–112.
- Land Transport Authority (2019) *Land Transport Master Plan 2040*. [Online]. Singapore, Land Transport Authority. Available from: https://www.lta.gov.sg/content/ltagov/en/who_we_are/our_work/land_transport_master_plan_2040.html.
- Leeuw, F.L. (1998) The Carrot: Subsidies as a Tool of Government-Theory and Practice. In: Merie-Louise Bemelmans-Videc, Ray C. Rist, & Evert Vedung (eds.). *Carrots, sticks, and sermons: Policy Instruments and Their Evaluation*. New Brunswick, New Jersey; London, Transaction Publishers. pp. 77–102.
- Lemaira, D. (1998) The Stick: Regulation as a Tool of Government. In: Merie-Louise Bemelmans-Videc, Ray C. Rist, & Evert Vedung (eds.). *Carrots, sticks, and sermons: Policy Instruments and Their Evaluation*. New Brunswick, New Jersey; London, Transaction Publishers. pp. 59–76.

- Malasek, J. (2016) A Set of Tools for Making Urban Transport More Sustainable. In: *Transportation Research Procedia*. [Online]. 2016 pp. 876–885. Available from: doi:10.1016/j.trpro.2016.05.059 [Accessed: 8 June 2021].
- May, A., Boehler-Baedeker, S., Delgado, L., Durlin, T., et al. (2017) Appropriate national policy frameworks for sustainable urban mobility plans. *European Transport Research Review*. [Online] 9 (1), 7. Available from: doi:10.1007/s12544-017-0224-1.
- May, T. & Crass, M. (2007) Sustainability in Transport: Implications for Policy Makers. *Transportation Research Record: Journal of the Transportation Research Board*. [Online] 2017 (1), 1–9. Available from: doi:10.3141/2017-01.
- Ministry of Infrastructure, Transport and Networks (2019) *National Transport Plan for Greece: Final Transport Plan Report*. [Online]. Athens, Greece: Ministry of Infrastructure, Transport and Networks. Available from: http://www.nationaltransportplan.gr/wpcontent/uploads/2019/06/Final_NTPG_en_20190624.pdf.
- Ministry of Transport (2020) *Government Policy Statement on Land Transport*. [Online]. Available from: <https://www.transport.govt.nz/area-of-interest/strategy-and-direction/government-policy-statement-on-land-transport-2021/>.
- Ministry of Transport (2019) *National Transport Policy: 2019-2030*. [Online]. Putrajaya, Malaysia: Ministry of Transport. Available from: <http://dpn.mot.gov.my/indexEN.html>.
- Ministry of Transport and Communications (2017) *National Transport Plan 2018–2029: English summary*. [Online]. Oslo, Norway: Ministry of Transport and Communications. Available from: <https://www.regjeringen.no/contentassets/7c52fd2938ca42209e4286fe86bb28bd/en-gb/pdfs/stm201620170033000engpdfs.pdf>.
- Ministry of Transport and Public Works (2018) *Malawi National Transport Master Plan: Final Report*. [Online]. Lilongwe, Malawi: Ministry of Transport and Public Works. Available from: <https://www.malawi.gov.mw/>.
- Ministry of Works and Transport (2008) *The National Transport Master Plan Including a Transport Master Plan for Greater Kampala Metropolitan Area*. [Online]. Kampala, Uganda: Ministry of Works and Transport. Available from: http://ric.works.go.ug/rc/files/1.1_National_transport_master_plan.pdf.
- Moncada A., C.A., Jones, P. & A. Escobar, D. (2018) Evolution of Transport Policies in Latin-America, Stages and Steps Forward. *Modern Applied Science*. [Online] 12 (7), 59. Available from: doi:10.5539/mas.v12n7p59.
- Office of the Prime Minister (2018) *Comprehensive National Transportation Master Plan*. [Online]. Belmopan, Belize: Office of the Prime Minister :The Department of Public-Private Sector Dialogue. Available from: <https://edc.gov.bz/governmentpolicies/projects/cntmp/>.

- Planning Institute of Jamaica (2009) *Vision 2030 Jamaica Transport Sector Plan 2009-2030*. [Online]. Kingston, Jamaica: Planning Institute of Jamaica. Available from: <https://www.pioj.gov.jm/>.
- Pojani, D. & Stead, D. (2015) Sustainable Urban Transport in the Developing World: Beyond Megacities. *Sustainability*. [Online] 7 (6), 7784–7805. Available from: doi:10.3390/su7067784.
- Reigner, H. (2016) Neoliberal Rationality and Neohygienist Morality. A Foucauldian Analysis of Safe and Sustainable Urban Transport Policies in France. *Territory, Politics, Governance*. [Online] 4 (2), 196–215. Available from: doi:10.1080/21622671.2015.1123647.
- Rist, R.C. (1998) Choosing the Right Policy Instrument at the Tight Time: The Contextual Challenges of Selection and Implementation. In: Merie-Louise Bemelmans-Videc, Ray C. Rist, & Evert Vedung (eds.). *Carrots, sticks, and sermons: Policy Instruments and Their Evaluation*. New Brunswick, New Jersey; London, Transaction Publishers. pp. 59–76.
- Rode, P., Floater, G., Thomopoulos, N., Docherty, J., et al. (2017) Accessibility in Cities: Transport and Urban Form. In: Gereon Meyer & Susan Shaheen (eds.). *Disrupting Mobility: Lecture Notes in Mobility*. Lecture Notes in Mobility. [Online]. Cham, Springer International Publishing. pp. 239–273. Available from: doi:10.1007/978-3-319-51602-8_15 [Accessed: 29 May 2021].
- Rode, P., Heeckt, C. & da Cruz, N. (2019) *National Transport Policy and Cities: Key policy interventions to drive compact and connected urban growth*. [Online]. p.62. Available from: <http://newclimateconomy.net/content/cities-working-papers>.
- Roggenbuck, D.C. & Roggenbuck, C. (2019) Making Sense of ‘Cities’: A thematic analysis of Australian cities policy from 1991 onwards. In: *Proceeding of the 9th State of Australian Cities National Conference*. 2019 Peth, Australia, 9th State of Australian Cities National Conference. p.
- Stephenson, J., Spector, S., Hopkins, D. & McCarthy, A. (2018) Deep interventions for a sustainable transport future. *Transportation Research Part D: Transport and Environment*. [Online] 61, 356–372. Available from: doi:10.1016/j.trd.2017.06.031.
- Stopher, P. & Stanley, J. (2014) *Introduction to transport policy*. Cheltenham, UK - Northampton MA, USA, Edward Elgar Publishing Limited.
- Teoh, R., Anciaes, P. & Jones, P. (2020) Urban mobility transitions through GDP growth: Policy choices facing cities in developing countries. *Journal of Transport Geography*. [Online] 88, 102832. Available from: doi:10.1016/j.jtrangeo.2020.102832.
- The Department of Transport (2016) *National Transport Master Plan (NATMAP) 2050 Synopsis Report*. [Online]. Pretoria, South Africa: The Department of Transport. Available from: <https://www.transport.gov.za/natmap-2050>.

- The National Transport Development Policy Committee (2014) *India Transport Report: Moving India to 2032*. [Online]. New Delhi, India: The National Transport Development Policy Committee. Available from: [https://niti.gov.in/planningcommission.gov.in/docs/sectors/index.php?sectors=National%20Transport%20Development%20Policy%20Committee%20\(NTDPC\)](https://niti.gov.in/planningcommission.gov.in/docs/sectors/index.php?sectors=National%20Transport%20Development%20Policy%20Committee%20(NTDPC)).
- The Worldbank (2020) *Urban population (% of total population) | Data*. [Online]. 2020. Available from: <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS> [Accessed: 31 May 2021].
- Tønnesen, A., Krogstad, J.R., Christiansen, P. & Isaksson, K. (2019) National goals and tools to fulfil them: A study of opportunities and pitfalls in Norwegian metagovernance of urban mobility. *Transport Policy*. [Online] 81, 35–44. Available from: doi:10.1016/j.tranpol.2019.05.018.
- Towns, W. & Henstra, D. (2018) Federal policy ideas and involvement in Canadian urban transit, 2002-2017: FEDERAL POLICY IDEAS AND CANADIAN URBAN TRANSIT. *Canadian Public Administration*. [Online] 61 (1), 65–90. Available from: doi:10.1111/capa.12247.
- Transport for NSW (2012) *NSW Long Term Transport Master Plan*. [Online]. Chippendale, NSW: Transport for NSW. Available from: <https://www.transport.nsw.gov.au/sites/default/files/media/documents/2017/nsw-transport-masterplan-final.pdf>.
- Transport Malta (2016) *National Transport Master Plan: 2025 Malta*. [Online]. Floriana, Malta: Transport Malta. Available from: <https://www.transport.gov.mt/strategies/strategies-policies-actions/national-transport-strategy-and-transport-master-plan-1343>.
- Tsay, S.-P. & Herrmann, Vi. (2013) *Rethinking Urban Mobility: Sustainable Policies the Century of the City*.
- Tyler, N. (2015) *Accessibility and the Bus System: Transforming the World*. [Online]. ICE Publishing. Available from: doi:10.1680/aabs2ed.59818 [Accessed: 1 June 2021].
- Urban Development Vienna (2015) *Thematic concept: Urban Mobility Plan Vienna Together on the Move*. [Online]. Vienne, Austria: Vienna City Administration, Municipal Department. Available from: <https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008443.pdf>.
- Vaismoradi, M., Turunen, H. & Bondas, T. (2013) Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study: Qualitative descriptive study. *Nursing & Health Sciences*. [Online] 15 (3), 398–405. Available from: doi:10.1111/nhs.12048.
- Vedung, E. (1998) Policy Instruments: Typologies and Theories. In: Merie-Louise Bemelmans-Videc, Ray C. Rist, & Evert Vedung (eds.). *Carrots, sticks, and sermons: Policy Instruments and Their Evaluation*. New Brunswick, New Jersey; London, Transaction Publishers. pp. 21–58.

Vedung, E. & van der Doelen, F.C.J. (1998) The Sermon: Information Programs in the Public Policy Process Choice, Effects, and Evaluation. In: Merie-Louise Bemelmans-Videc, Ray C. Rist, & Evert Vedung (eds.). *Carrots, sticks, and sermons: Policy Instruments and Their Evaluation*. New Brunswick, New Jersey; London, Transaction Publishers. pp. 103–128.

World Bank (2014) *Formulating an Urban Transport Policy: Choosing Between Options*. [Online]. Available from: <https://openknowledge.worldbank.org/handle/10986/20950>.

World Bank (2021) *World Bank Country and Lending Groups – World Bank Data Help Desk*. [Online]. July 2021. World Bank Country and Lending Groups. Available from: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups> [Accessed: 21 August 2021].





Policy Perspective Themes	Policy Perspective Sub-themes	Code	Policy Type Themes	Policy Type Sub-themes	Description
Car-oriented	Fostering motor vehicle needs	Aiming road network development	Strategic	Strategic	Setting goals/objectives/strategies/vision/intentions to increase road network in urban areas
	Fostering motor vehicle needs	Regulations to improve parking performance	Regulatory	Planning & infrastructure design	Regulations, standards, rules to manage parking space to improve parking performance
Car-oriented	Fostering motor vehicle needs	Guideline for urban road	Information	Guidelines	Providing guidelines for urban road design and planning
Car-oriented	Fostering motor vehicle needs	Financing-provision to maximise vehicle capacity	Economic	Financial	Providing financing schemes/funds/projects to maximise vehicle capacity of existing urban streets and roads
Car-oriented	Fostering motor vehicle needs	Parking provision	Economic	Financial	Providing financing schemes/funds/projects for parking provision in urban areas
Car-oriented	Fostering motor vehicle needs	Road building	Economic	Financial	Providing financing schemes/funds/projects to build/enhance urban road networks
Car-oriented	Fostering motor vehicle needs	Fuel levy for road funding	Economic	Taxes	Introducing levies for funding further road projects
Car-oriented	Fostering motor vehicle needs	Road pricing for new road investments	Economic	Pricing-charging	Introducing road prices to fund further road projects
Car-oriented	Traffic Management	Regulation for safety	Strategic	Operational	Safety regulations through drivers such as alcohol control and limits, rules, etc
Car-oriented	Traffic Management	Accommodating traffic management	Regulatory	Operational	Providing traffic management schemes/optimisation measures/police controls to regulate traffic for easing congestion
Car-oriented	Traffic Management	Promoting safety for car drivers	Information	Awareness campaigns	Safety awareness campaigns/public education/additional driving lessons to promote the safer drive
Car-oriented	Traffic Management	Real time information for traffic management	Information	Information-data	Providing real-time information and information systems to optimise/improve traffic management
Car-oriented	Traffic Management	Financing traffic management systems	Economic	Financial	Providing financing schemes/funds/equipment/capitals for traffic management systems
Car-oriented	Traffic Management	Safety provision	Economic	Financial	Providing financing schemes/funds/equipment/infrastructure to improve safety through drivers
Car-oriented	Road for Dev.	Roads for economic development	Strategic	Strategic	Taking road development as economic development/economic competitiveness in goals/objectives/strategies/intentions
Car-oriented	Road for Dev.	Roads for transport development	Strategic	Strategic	Aiming urban road development for transport development in goals/objectives/strategies
Car-oriented	Limiting Environmental Problems of Private-cars	Aiming clean moto-vehicles in urban transport	Strategic	Strategic	Aiming to have more clean vehicles (less emission and more energy efficient) in urban transport without stating particular actions
Car-oriented	Limiting Environmental Problems of Private-cars	Aiming reduce noise level on roads	Strategic	Strategic	Aiming to reduce noise level without stating the specific measure
Car-oriented	Limiting Environmental Problems of Private-cars	Regulation for noise pollution of vehicles	Regulatory	Operational	Introducing limits/standards/regulations to control the noise level
Car-oriented	Limiting Environmental Problems of Private-cars	Emission standards	Regulatory	Vehicle standards	Introducing standards/limits to control emissions arisen from cars
Car-oriented	Limiting Environmental Problems of Private-cars	Efficiency standards	Regulatory	Vehicle standards	Introducing standards/limits to control energy efficiency levels of private cars
Car-oriented	Limiting Environmental Problems of Private-cars	Promoting clean vehicles	Information	Awareness campaigns	Awareness programs/educations/media activities to promote cars with fewer emissions and more energy efficient
Car-oriented	Limiting Environmental Problems of Private-cars	Building noise barriers for roads	Financial	Infrastructure	Projects to build noise barriers to mitigate noise pollutions resulted from roads
Car-oriented	Limiting Environmental Problems of Private-cars	Government clean vehicle procurement	Economic	Financial	Mandates/plans for procurement of clean cars for government fleets
Car-oriented	Limiting Environmental Problems of Private-cars	Providing electric charging stations	Economic	Financial	Providing financing schemes/funds/projects to provide electric charging stations for e-cars
Car-oriented	Limiting Environmental Problems of Private-cars	Incentives for clean moto-vehicles	Economic	Incentive-Subsidies	Providing fiscal incentives/tax reductions/subsidies for clean vehicles
Car-oriented	Limiting Environmental Problems of Private-cars	Taxes on vehicles for emission and efficiency	Economic	Taxes	Introducing or increasing taxes for cars that are less energy-efficient and high emission

Sustainable Mobility	Active Travel	Aiming active travel	Strategic	Strategic	Setting goals/objectives/aims to improve active travel options and trip shares (without stating particular policies and actions)
	Active Travel	Regulations for active travel	Regulatory	Planning & infrastructure design	Introducing standards, rules, regulations for active travel planning and design
Sustainable Mobility	Active Travel	Guidelines for active travel planning	Information	Guidelines	Providing design and planning guidelines for active travel
Sustainable Mobility	Active Travel	Improving skills for active travel planning	Information	Skill-knowledge	Improving skill and knowledge for active travel planning
Sustainable Mobility	Active Travel	Promoting active travel	Information	Awareness campaigns	Proposals/action plans for awareness campaigns/education activities to promote active travel and healthy transport
Sustainable Mobility	Active Travel	Building sidewalks-footways	Economic	Financial	Projects/funds/plans to build sidewalks
Sustainable Mobility	Active Travel	Building walking paths	Economic	Financial	Providing financing schemes/funds/plans to build walking paths
Sustainable Mobility	Active Travel	Financing-Provision of bike sharing	Economic	Financial	Providing funds/projects/plans for bike-sharing facilities and infrastructures
Sustainable Mobility	Active Travel	Improving pedestrain facilities	Economic	Financial	Providing funds/projects/plans to improve pedestrian facilities in the urban environment (e.g., pavements, resting benches, crossings, etc.)
Sustainable Mobility	Active Travel	Investing cycling infrastructure	Economic	Financial	Providing financing schemes/funds/plans for building/improving bicycle parks/cycling paths/other infrastructures
Sustainable Mobility	Active Travel	Incentives for active travel	Economic	Incentive-Subsidies	Fiscal incentives/subsidies/tax relaxations to promote active travel
Sustainable Mobility	Public Transport	Aiming integrated PT	Strategic	Strategic	Setting goals/objectives/strategies for integrated public transport without stating particular actions
Sustainable Mobility	Public Transport	Aiming to improve PT networks	Strategic	Strategic	Setting goals/objectives/aims to improve public transport networks without stating particular projects or funds
Sustainable Mobility	Public Transport	Aiming to improve quality-performance of PT	Strategic	Strategic	Setting goals/objectives/aims to improve quality and performance of public transport services without stating particular projects or funds
Sustainable Mobility	Public Transport	Environmental standards for PT	Regulatory	Vehicle standards	Setting environmental standards for public transport vehicles and operations (such as emission, energy efficiency, noise level etc.)
Sustainable Mobility	Public Transport	Regulations to improve quality-performance of PT	Regulatory	Operational	Introducing/enhancing regulations for operators, services or local authorities to improve public transport performance
Sustainable Mobility	Public Transport	Database-Real Time Information for PT	Information	Information-data	Providing database and real-time information to improve performance and quality of public transport systems
Sustainable Mobility	Public Transport	Guidelines for PT	Information	Guidelines	Providing guidelines for public transport planning, operations, services
Sustainable Mobility	Public Transport	Improving skills-knowledge of transport workers	Information	Skill-knowledge	Proposals/action plans to improve skills and knowledge of workers/professionals/operators of urban transport systems
Sustainable Mobility	Public Transport	Financing PT infrastructure-network	Economic	Financial	Providing financial schemes/funds/plans for building/expanding/improving/enhancing public transport infrastructure
Sustainable Mobility	Public Transport	Financing-provision for PT operations	Economic	Financial	Providing financial schemes/funds/plans to improve quality/performance of public transport operations
Sustainable Mobility	Public Transport	Financing-provision integrated PT	Economic	Financial	Providing financing schemes/funds/plans to achieve/enhance integrated public transport systems (e.g., integrated payment systems, MaaS, etc.)
Sustainable Mobility	Public Transport	Providing environmental friendly fleet	Economic	Financial	Providing financial schemes/funds/plans/procurements for environmental friendly fleets for public transport services

Policy Perspective Themes	Policy Perspective Sub-themes	Code	Policy Type Themes	Policy Type Sub-themes	Description
Sustainable Mobility	Public Transport	Incentives for PT operators	Economic	Incentive-Subsidies	Incentives/subsidies/tax relaxations for public transport operators
Sustainable Mobility	Public Transport	Incentives for PT users	Economic	Incentive-Subsidies	Incentives/subsidies/affordable fares for public transport users
Sustainable Mobility	Modal Shift and Road Space Reallocation	Aiming modal-shift	Strategic	Strategic	Setting goals, vision, objectives, aims to decrease private car use and increase the modal share of other modes
Sustainable Mobility	Modal Shift and Road Space Reallocation	Aiming multi-modality	Strategic	Strategic	Setting goals, vision, objectives, aims for multi-modality (without stating particular actions)
Sustainable Mobility	Modal Shift and Road Space Reallocation	Aiming to shared mobility	Strategic	Strategic	Setting goals, vision, objectives, aims for shared mobility (without stating particular actions)
Sustainable Mobility	Modal Shift and Road Space Reallocation	Parking management	Regulatory	Operational	To discourage car use in city centres; restrictions for parking, increasing parking charges, limiting parking spaces etc.
Sustainable Mobility	Modal Shift and Road Space Reallocation	Regulation for road space reallocation	Regulatory	Planning & infrastructure design	Regulating road spaces to providing more space alternative modes to private cars
Sustainable Mobility	Modal Shift and Road Space Reallocation	Data-information for multimodality	Information	Information-data	Providing real-time information or data to enhance multimodality
Sustainable Mobility	Modal Shift and Road Space Reallocation	Guideline for road space reallocation	Information	Guidelines	Providing design guidelines for road space reallocation
Sustainable Mobility	Modal Shift and Road Space Reallocation	Promoting modal shift	Information	Awareness campaigns	Awareness campaigns, media activities, public education to promote the modal shift from using private cars
Sustainable Mobility	Modal Shift and Road Space Reallocation	Building cycle lanes on roads	Economic	Financial	Providing financing schemes/funds/projects for dedicated cycle lanes on existing roads
Sustainable Mobility	Modal Shift and Road Space Reallocation	Financing-provision for multimodality	Economic	Financial	Providing financing schemes/funds/projects to support multimodality (e.g., Ma5, park&ride facilities, integrated interchange stations, etc.)
Sustainable Mobility	Modal Shift and Road Space Reallocation	Investing Bus lanes on roads	Economic	Financial	Providing financing schemes/funds/projects for dedicated bus lanes on existing roads
Sustainable Mobility	Modal Shift and Road Space Reallocation	Incentives for shared mobility	Economic	Incentive-Subsidies	Proposals/action plans for incentives/tax relaxations/subsidies for users/entrepreneurship of shared mobility systems
Sustainable Mobility	Modal Shift and Road Space Reallocation	Tax-charges on car ownerships	Economic	Taxes	Introducing or increasing taxes for car ownerships

City of Places	Appealing Public Spaces	Aiming public realm and community cohesion by public spaces	Strategic	Strategic	Setting goals/objectives/aims for improving public realm/livability/community cohesion through public spaces in urban transport
City of Places	Appealing Public Spaces	Providing shared spaces	Regulatory	Planning & infrastructure design	Regulating existing roads for shared space and shared roads with active travel modes
City of Places	Appealing Public Spaces	Road closure for community spaces	Regulatory	Planning & infrastructure design	Temporary or permanent road closures for community activities, pedestrian centric streets and street activities
City of Places	Appealing Public Spaces	Guidelines for shared public spaces	Information	Guidelines	Providing guidelines for shared spaces
City of Places	Appealing Public Spaces	Providing guideline for public spaces	Information	Guidelines	Providing guidelines for public spaces to improve ambience and environments of streets
City of Places	Appealing Public Spaces	Investments for appealing public spaces	Financial	Infrastructure	Providing financing schemes/funds/projects for attractive public spaces
City of Places	Healthy Streets and Reducing Traffic Level	Aiming healthy streets	Strategic	Strategic	Setting goals/objectives/aims to have healthy streets where people can easily/safely walk and cycle with reducing car movement (without stating particular actions and measures)
City of Places	Healthy Streets and Reducing Traffic Level	Low emission zone	Regulatory	Planning & infrastructure design	Introducing low emission zone in city centres to reduce vehicle traffic and improve walkability
City of Places	Healthy Streets and Reducing Traffic Level	Traffic Calming and Speed Restrictions	Regulatory	Operational	Introducing lower speed limits in urban areas and traffic calming measures
City of Places	Healthy Streets and Reducing Traffic Level	Congestion charge	Economic	Pricing-charging	Introducing congestion charge to reduce vehicle traffic in city centres
City of Places	ToD and mixed-use development	Aiming compact and mixed-used urban areas	Strategic	Strategic	Setting goals/objectives/aims/vision/plans to achieve such mixed-use/dense urban areas where people can shortly reach their activities without using car
City of Places	ToD and mixed-use development	Aiming less travel	Strategic	Strategic	Setting goals/objectives/aims to reduce general travel needs with such as improve e-commerce/remote working
City of Places	ToD and mixed-use development	Aiming ToD	Strategic	Strategic	Setting goals/objectives/aims/vision/plans to achieve transport oriented development
City of Places	ToD and mixed-use development	Regulations for compact and mixed-used urban areas	Regulatory	Planning & infrastructure design	Proposals/action plans to update/improve/re-publish regulations/standards for transport and land use planning to achieve compact/dense urban areas
City of Places	ToD and mixed-use development	Guidelines for ToD	Information	Guidelines	Providing guidelines for transport oriented development
City of Places	ToD and mixed-use development	Skill&knowledge for ToD	Information	Skill-knowledge	Improving skills and knowledge for transit-oriented development
City of Places	ToD and mixed-use development	Funding compact and mixed-used development	Economic	Financial	Providing funds/projects for compact and mixed-use land development
City of Places	ToD and mixed-use development	Land value capturing for ToD	Economic	Taxes	Introducing land value capturing to support transit-oriented development
City of Places	ToD and mixed-use development	Incentives for compact and mixed-use d.	Economic	Incentive-Subsidies	Introducing fiscal incentives to support compact and mixed-use land development

Aligning roles and responsibilities of bodies	Governance	Structure	Defining or aligning roles and responsibilities of bodies and institutions of urban transport
Capacity building for bodies	Governance	Structure	Planning capacity improvement or building for urban transport bodies
Devolving power to local bodies	Governance	Structure	Devolving power to local bodies for decentralisation in urban transport planning, decision-making, policymaking
Introducing new bodies-agencies	Governance	Structure	Introducing new authorities, institutions, bodies for urban transport
Changes-proposals on financial systems	Governance	Process	Introducing changes and proposals on existing financial systems about urban transport (funding systems, grants, alternative financial sources, etc.)
Database for urban transport management	Governance	Process	Databases, surveys, keeping and providing statistics about urban transport to better governance and policymaking
Introduce performance assessment	Governance	Process	Introducing performance assessment tools, techniques, methods for urban transport operations, services, infrastructures etc.
Legislative changes	Governance	Process	Proposals/plans for legislative changes or amendments
Project assessment procedure	Governance	Process	Introducing project assessment methods or tools for urban transport investments and projects
Enhancement for policy-making procedure	Governance	Process	Introducing new methods, processes, tools for policymaking in urban transport