Legal reflections on private investment in green transport infrastructure in South African cities

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Dissertation accepted in fulfilment of the requirements for the degree *Master of Laws in Perspectives on Law* at the North-West University

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Graduation ceremony: May 2021

Student number: 27020355

This study was funded by the National Research Foundation of South Africa (NRF) (Grant No. 115581) and the Faculty of Law of the North-West University (NWU) as part of the research of the South African Research Chair in Cities, Law and Environmental Sustainability.

All viewpoints and errors remain the student's own.

"though i walk through the valley of the shadow of death, i will fear no evil: for thou art with me; thy rod and thy staff they comfort me."

Psalm 23:4

Acknowledgements

I wish to extend my gratitude and appreciation to the following people and organisations that made this study possible:

- The Lord Almighty, from where I draw my strength, courage, and resilience.
- The National Research Foundation (NRF) for substantial financial assistance and the research infrastructure made available to me (Grant No. 115581).
- The Faculty of Law, North-West University, for substantial financial assistance.
- The institutional offices of the North-West University, for substantial financial assistance.
- My supervisors Prof. Anel du Plessis and Dr Kolapo Omidire. I will forever be thankful for your continued support, guidance, enthusiasm, motivation, constant encouragement and "tough love". This would not have been possible without you.
- Thank you to my colleagues at the South Africa Research Chair of Cities, Law and Environmental Sustainability (CLES). Your support and supervision will always be appreciated.
- To my parents, A.K.A my cheerleaders, Catherine, and Peter Lebete Solomon Mofokeng. Thank you for being my pillars of strength, teaching me how to be resilient and preserver in the good and bad times. Thank you for your love, sacrifices, hard work and unfailing support throughout this journey. This would not have been possible without you.
- To my siblings, Tsholofelo and Lesego Mofokeng, for your unconditional love, support, and constant encouragement during this journey. Thank you for all the laughs and constant reminders as to why I am doing this.

- To my friends. Thank you for the support, encouragement and understanding throughout the duration of my studies.

Abstract

South Africa is facing rapid urbanisation marked by challenges such as overpopulation and poor mobility associated with urban growth. Since urban mobility depends on transportation, it requires transport infrastructure that is socially, economically and environmentally sustainable, and fit for purpose. Hence, there is a need for environmentally sustainable transport infrastructure that also meets social demands and is economically viable. This kind of transport infrastructure is sometimes referred to as "green transport infrastructure" (GTI). However, relevant for present purposes is the fact that GTI is as costly as it is desirable.

Traditionally, urban infrastructure is financed by the public sector. However, alternative means of finance must be sourced to cater to the increasing needs of society for economic and social infrastructure. These alternative means of finance include borrowing or attracting capital from private investors. The success of private investments in public transport infrastructure depends on whether South Africa's legal framework makes provision for the protection of investments to facilitate a well-established investment climate for GTI. Therefore, the question is whether South African investment and local government law and policy enable or frustrate private investments in GTI.

The study discusses the dynamic and functional relationship between private investments and the development of GTI that needs to be regulated by South African law. It is revealed that there are gaps in the law regulating private investments in GTI; but there are also specific legal provisions serving as a conduit for establishing a more robust South African legal framework for private investments in GTI.

Keywords:

Transportation; South African cities; local government law; investment law; urban law; green transport infrastructure

List of Abbreviations

ASCE	American Society of Civil Engineers
ASTF	African Sustainable Transport Forum
AU	African Union
BEE	Black Economic Empowerment
BIT	Bilateral Investment Treaties
CC	Climate Change
DFA	Development Facilitation Act
EIA	Environmental Impact Assessment
EMCA	Environmental Management Cooperation Agreement
FDI	Foreign Direct Investment
GCF	Green Climate Fund
GG	Government Gazette
GI	Green Infrastructure
GTI	Green Transport Infrastructure
GTS	Green Transport Strategy
IDA	Infrastructure Development Act
IIO	Infrastructure and Investment Office

IIP	Infrastructure Investment Plan
IJERPH	International Journal of Environmental Research and Public Health
ISA	Infrastructure South Africa
IUDF	Integrated Urban Development Framework
JTEP	Journal of Transport, Economics and Policy
JTSCM	Journal of Transport and Supply Chain Management
MEC	Member of Executive Council
MDPI	Multidisciplinary Digital Publishing Institute
NDP	National Development Plan
NUA	New Urban Agenda
PICC	Presidential Infrastructure Coordinating Committee
PPP	Public-Private Partnership
SAJEMS	South African Journal of Economic and Management Sciences
SAMJ	South African Medical Journal
SDC	Sustainable Development Code
SDG	Sustainable Development Goal
SPV	Special Purpose Vehicle
SSRN	Social Science Research Network
UCLG	United Cities and Local Governments

UCLGA	United Cities and Local Governments of Africa
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Programme
UNSCP	United Nations Sustainable Cities Programme
USA	United States of America
WHO	World Health Organisation
WJSSR	World Journal of Social Science Research

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1 Introduction

1.1 Background

Rapid urbanisation is a reality in African countries such as South Africa,[1] marked by challenges such as overpopulation, public safety and environmental concerns, as well as the threat of climate-related risks.[2] Unsustainable transport infrastructure and poor mobility are immediate and specific problems associated with urbanisation and rapid population growth in South African cities.[3] Urban transport is sometimes unsafe, unaffordable, inefficient and unavailable due to the continual rise in population size and the high demand for transportation.[4] For city dwellers to become more mobile and sustainably connected, there is a need for significant change in peoples' mobility.[5] Mobility, together with the inclusivity of urbanites,[6] can be realised through improved transport and transport infrastructure.[7] However, mobility depends on infrastructure that is socially, economically, and environmentally sustainable.[8]

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1 Harison *et al* "Materialities, Subjectivities and Spatial Transformation in Johannesburg" 3-4. Also see Thakali 2015 https://www.iol.co.za/news/south-africa/gauteng/rapid-urbanisation-strains-cities-1951177.

2 Zhang 2016 *Habitat International* 241. Also see Mensah and Castro "Sustainable Resource Use and Sustainable Development: A Contradiction?!" 3.

3 Rodrigue *The Geography of Transport Systems* 248-258. Also see Jennings "Public Transport Interventions and Transport justice in South Africa: A Literature and Policy Review" 766 and Mthimkulu "Southern African Solutions to Public Transport Challenges" 811. Also see Turok "South Africa's Tortured Urbanisation and the Complications of Reconstruction" 9, 22. Unsustainable transport infrastructure is defined as transport infrastructure that is incapable of supporting the mobility needs of a society in a manner least damaging to the environment and that does not impair the mobility of future generations.

4 Rodrigue *The Geography of Transport Systems* 248-258. Also see Van der Berg *Municipal planning law and policy for sustainable cities in South Africa* 28.

5 Department of Transport Green Transport Strategy for South Africa: (2018-2050) 19, 24.

6 South African Cities Network 2020 https://www.sacities.net/inclusive-cities/. "The inclusivity includes the provision of opportunities for all city dweller to share in the social and economic opportunities and resources of city life."

7 Corwin 2019 https://www.weforum.org/agenda/2019/01/want-a-more-inclusive-society-start-with-mobility/.

8 European Commission *Transport Infrastructure Expert Group Report* 12.

Mobility in cities also features on the global development agenda, which addresses the need for the improvement of cities and the well-being of their inhabitants. The United Nations (UN) Sustainable Development Goals (SDGs) call upon all countries to provide access to safe, accessible, and sustainable transport systems for all, by improving road safety and expanding public transportation, for example.[9] In the South African context, suitable city mobility and transport infrastructure,[10] as designed for the use of the general public,[11] depends on infrastructure that meets social demands, is environmentally friendly and encourages economic development.[12]

Transport infrastructure is imperative for encouraging economic growth within a country as well as for achieving and maintaining a sustainable transport environment.[13] In this context, environmentally sustainable transport infrastructure is associated with the transition to a low(er) carbon economy. It is occasionally also referred to as "green transport infrastructure" (GTI).[14] The reality is that GTI is as costly as it is desirable.[15] Typically, there are financial and resource constraints in the public sector regarding transport infrastructure projects. However, the government has the potential to make up for the shortfall in revenue through investment.[16] Hence, there is a need for the government to find alternative sources of finance that minimise the total cost of finance

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9 United Nations 2020 https://www.un.org/sustainabledevelopment/cities/.

10 Transport infrastructure is understood as a facet of the physical transport features and facilities that fall within the boundaries of an area intended to meet the needs of people in an area. See Godfrey and Zhao 2016 *Coalition for Urban Transitions* 4.

11 Policy objectives in the Draft Revised White Paper on National Transport Policy (2017) (hereinafter the White Paper on National Transport policy). Also see Wang *et al* 2018 *IJERPH* 2.

12 Policy objectives in the White Paper on National Transport policy. Also see Wang *et al* 2018 *IJERPH* 2. International Institute of Sustainable Development 2019 https://sdg.iisd.org/news/south-africa-launches-green-transport-strategy/. "Sustainable mobility includes a better provision of infrastructure and services to support the movement of goods and people". Wang *et al* 2018 *IJERPH* 2.

13 Policy objectives in the White Paper on National Transport policy. Also see Wang *et al* 2018 *IJERPH* 2. A sustainable transport environment is an environment where transportation and transport facilities are built and operate in a setting and atmosphere that foster socio-economic development and environmental protection and conservation.

14 Kopp, Block, and Iimi *Turning the Right Corner Ensuring Development through a Low-Carbon Transport Sector* 1, 15. Green transport infrastructure is discussed in greater detail below.

15 Sustainable Energy Africa *Sustainable Energy Solutions for South African Local Government: A Practical Guide* 125.

16 Marsh and McLennan Insights *Infrastructure Failure and Shortfall* 3.

on the public sector.[17] The need is occasionally satisfied by borrowing or attracting capital from private investors.[18]

1.2 Green infrastructure and the fit of public transportation

Transport infrastructure which encompasses the three pillars of sustainability - social, economic and environmental - has been refined and incorporated into an internationally recognised concept, namely, green infrastructure (GI).[19] GI is generally referred to as a network of multifunctional green "spaces", both new and existing, both rural and urban, which is integral to the health and quality of life of communities.[20] GI denotes a specific approach to development. It should be seen as a network of infrastructures aimed at combatting pressing environmental challenges by building with and in nature.[21] GI also promotes dynamic and forward-thinking solutions as to how best to mitigate the causes and impacts of climate change (CC).[22] However, defining and applying the definition of GI presents challenges in terms of the different financial and innovative resources and geographical locations of every country.[23]

As a form of GI, green transport infrastructure (GTI) refers to any kind of transport infrastructure that is eco-friendly and has a limited negative impact on the surrounding environment and community.[24] It follows that GTI involves the efficient and effective use of resources. It refers to the modification or building (of transport infrastructure and

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17 National Audit Office *The Choice Of Finance for Capital Investment* 6. Also see JP Morgan *Infrastructure Investing* 2. These alternative private sources of finance will further ensure that investments made are recouped and earn a fair return over the lifespan of the asset.

18 See para 3.3.1 in chapter 3 below.

19 Black, Tara and Pakzad 2016 *International Journal of Environmental Protection* 1.

20 Institution for Sustainable Communities 2020 https://sustain.org/about/what-is-a-sustainable-community/. "A sustainable community considers and addresses multiple human needs, not just one at the exclusion of all others. It is a place where people of diverse backgrounds and perspectives feel welcome and safe, where every group has a seat at the decision-making table, and where prosperity is shared."

21 Jongman *Encyclopedia of Ecology* 371.

22 European Commission *Building a Green Infrastructure for Europe* 5.

23 See paras 2.3 and 2.5 in chapter 2 below. Also see Zuniga-Teran *et al* 2020 *Journal of Environmental Planning and Management* 710.

24 Conserve Energy Future 2020 https://www.conserve-energy-future.com/modes-and-benefits-of-green-transportation.php.

facilities) with the environment and sustainability in mind. The objective is environmentally sustainable mobility.[25]

Green mobility and greening the transport sector have become a global imperative as a result of the increasing greenhouse gas emissions in the transport sector that have a detrimental effect on the environment and quality of life of commuters.[26] Accordingly, international policy instruments, such as the SDGs (in particular, Goals 9, 11 and 13)[27] and the UN's New Urban Agenda (NUA),[28] directly and indirectly feature improved mobility and environmentally sound transportation infrastructure in an effort to achieve a sustainable future for urban and rural communities worldwide.[29]

1.3 Urban green transport infrastructure in South African cities

South Africans are primarily dependent on public transport, which compromises of taxis, buses and trains.[30] However, there are also millions of private vehicles on city roads.[31] The physical infrastructure that is needed for mobility overall includes road infrastructure, functional and efficient rail infrastructure, and bus and railway stations. This physical transport infrastructure needs to be sustainably developed and improved. Socio-economic conditions in South African cities have delayed recognisable development in the transport sector and transport infrastructure.[32] Hence, current and future infrastructure development must take place in the context of the law and policy framework for sustainable development.

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25 See para 2.2.1 in chapter 2 below.

26 Serraglio 2019 *SCIELO* 22. Organisation for Economic Co-operation and Development *Mobilising private investment in sustainable transport infrastructure* 4.

27 Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation,
Goal 11: Make cities inclusive, safe, resilient and sustainable,
Goal 13: Take urgent action to combat climate change and its impacts.

28 Habitat III New Urban Agenda UN Doc A/RES/71/256 (2017).

29 United Nations *New Urban Agenda: Habitat iii* 11, 15. Also see United Nations *Urban-rural Linkages: Guiding Principles* 2 and Articles 28 and 50 of the New Urban Agenda: Habitat iii.

30 Aropet "Southern African Solutions to Public Transport Challenges" 805.

31 City of Cape Town 2020 https://www.tct.gov.za/en/transport/getting-around/private-transport/.

32 Peters 2016 https://www.gov.za/blog/transport-infrastructure-key-development.

In relation to sustainable infrastructure development, there exists a legal framework regulating infrastructure development in South Africa. This framework comprises a suite of laws and policies such as the *Infrastructure Development Act* 23 of 2014.[33] The Act provides for the necessary facilitation of public infrastructure development which is of significant economic and social importance to South Africa.[34] Moreover, as infrastructure development has the potential to deliver the three pillars of sustainability,[35] the environmental management principles embedded in the *National Environmental Management Act* 107 of 1998 (NEMA) will typically apply.[36] The principles of environmental law, such as the principle that development must be socially, environmentally and economically sustainable, will apply to transport infrastructure development. These principles also suggest what GTI should look like in a South African context, considering the country's unique history and challenges.[37]

1.4 Private investment in transport infrastructure

GI creates an avenue to foster economic growth.[38] This bodes well for much-needed government investment in GTI. However, GTI is an expensive project to undertake.[39] Traditionally, urban infrastructure is financed by the public sector.[40] However, the public

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33 See para 4.5 in chapter 4 below. Other policies and strategies include the *Green Transport Strategy*, The Department of Public Works' Strategic Plan and Green Building Framework.

34 Preamble of the *Infrastructure Development Act* 23 of 2014.

35 Murray *The Critical Role of Infrastructure for the Sustainable Development Goals* 3.

36 Section 2 of the *National Environmental Management Act* 107 of 1998. Section 2(3) of *NEMA*. Also see *White Paper on National Climate Change Response Policy*, 2011. Also see para 4.3.2 in chapter 4 below.

37 South Africa is further committed to lowering its emissions and mitigating climate change.

38 Bobbins and Culwick 2015 *Journal of Public Administration* 34. Also see Culwick and Bobbins *A Framework for a Green Infrastructure Planning Approach in the Gauteng City-Region* 7. Phahlane 2018 https://www.bizcommunity.com/Article/196/582/182681.html.

39 Sustainable Energy Africa *Sustainable Energy Solutions for South African Local Government: A Practical Guide* 125. Also see Hayes 2019 https://www.investopedia.com/terms/p/projectfinance.asp. See chapter 3.

39 Organisation for Economic Co-operation and Development *Infrastructure Financing Instruments and Incentives* 7.

40 Organisation for Economic Co-operation and Development *Infrastructure Financing Instruments and* Incentives 7. Also see De Lille *Sustainable Infrastructure Development Symposium South Africa* 3. Public sector funding is considered by some experts as the most effective way to grow South Africa's economy while responding to the socio-economic needs of all South Africans.

sector can fund public urban infrastructure only to the extent that such funding is consistent with the country's fiscal health, including its borrowing capacity and future budget flexibility.[41] This has prompted the South African government to seek alternative sources of funding for crucial assets that contribute to the country's economic health, such as transport infrastructure.

Private sector financing is an alternative source of finance which may be used to finance economic and social infrastructure.[42] Therefore, infrastructure development in cities could be financed through an arrangement whereby private sector funds are derived directly from privately owned enterprises in the form of long-term investments.[43] Other financial arrangements may be through hybrid agreements involving the government and private sector parties in the form of private-public partnerships (PPPs) to finance long-term development facilities like transport infrastructure.[44] Additionally, cities can also attract private finance for development projects *inter alia* through direct borrowing in the form of loans, bonds, and equity or joint venture investments, as well as private project finance.[45] It should be noted that all of the financing options mentioned above may be used to finance GTI in South African cities.[46] Private investment as a financing option is appropriate for transport infrastructure as transport infrastructure is classified as an economic infrastructure with unique investment characteristics such as inelastic demand and longevity, which may lead to high returns and financial sustainability in the long term.[47] However, this depends on whether or not South Africa's legal framework

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41 Department of Transport "Financing, Funding and Charging" 6.

42 United Nations Global Compact Network South *Africa Private Sector Contribution to South Africa's 2019 Voluntary National Review on Sustainable Development Goals* 16.

43 Informa 2019 https://technology.informa.com/616391/smart-city-projects-can-draw-from-various-types-of-investments-and-funding-strategies. Also see The Infrastructure Consortium for Africa *Infrastructure Financing Trends in Africa- 2018* iii.

44 These arrangements and financial options will be discussed in detail in Chapter 3.

45 See chapter 3 below.

46 Department of National Treasury *Chapter 6: Leveraging Private Finance* 79-81.

47 Chan *et al Public Infrastructure Financing: An International* Perspective 31. Also see Merk *Financing Green Urban Infrastructure 28*. See also Kemp and Stephani *Urban Transport Innovations Worldwide: A Handbook of Best Practices Outside the United States* 221 Also see The Infrastructure Consortium for Africa *Infrastructure Financing Trends in Africa- 2018* iv.

adequately provides for the protection of investments and investors.

1.5 South African law on private investment in green transport infrastructure in metropolitan municipalities

Private investments in green urban infrastructure require certain features, which include the ability and capacity to finance a large-sum project for long-term tenures. South Africa's legal framework should be able to protect and support an environment in which a well-established and sustainable investment in GTI can thrive. Due to recent events such as the COVID-19 pandemic,[48] the Minister of Finance had indicated that policy reforms would promote an "increase in investments in public infrastructure by driving private sector investments in infrastructure."[49] Making changes to South Africa's laws would help achieve economic growth and environmental protection through the development of GTI in South African municipalities, for example.[50]

In as much as investments are highly regulated, law and policy can serve as an impediment or an enabler for investment in the transport infrastructure environment. South Africa has a range of legislation and policies applicable to investments in cities, be it in financial capital or other developments.[51] The legislation and policies as they apply to investments in GTI in metropolitan municipalities will be discussed in the study. In this regard, two main fields of law apply. These are investment law and local government finance law.[52] South African investment legislation creates a comprehensive and uniform framework for the regulation of both local and foreign investments.[53] This framework ensures that foreign investors are on equal standing with local investors in terms of

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48 Recent events include the global pandemic (COVID-19), which presented a major health and financial market shock while also fracturing South Africa's supply and demand systems. See Ramaphosa *Sustainable Infrastructure Development Symposium South* Africa 2. Also see De Lille *Sustainable Infrastructure Development Symposium South Africa 3*.

49 Ramaphosa *Sustainable Infrastructure Development Symposium South Africa* 2.

50 South African Government *Sustainable Infrastructure Development Symposium South Africa* 8.

51 South African Government 2020 https://www.gov.za/about-sa/finance#legislation. Also see the *Public Finance Management Act* 1 of 1999.

52 See the detailed discussion in Chapter 4.

53 Jeffery "The Investment Bill and FDI" 18.

compliance with domestic legislation.[54] Local government finance law, on the contrary, regulates financing options by local government only.[55]

GTI competes for financial resources from the public sector and the private sector against other projects in the economy which also require finance. This is particularly so for South Africa's metropolitan municipalities, which cannot provide all the funding required for the development of GTI. Any shortfall in financial resources required for GTI by municipalities may have to be supplemented by private investment. This underscores the relevance of such a study as this, which aims to determine whether or not the South African legal framework is capable of promoting and protecting private investment in GTI in the country's metropolitan municipalities.

1.6 Research Question

This study seeks to provide an answer to the following question: How and to what extent does South African law facilitates and hinder private investment in green transport infrastructure in the country's cities?

1.7 Objectives of the study

The objective of the study is to assess and determine if, and to what extent, South African law facilitates or frustrates private investment in GTI in municipalities. In order to fulfil this objective, the following subsidiary objectives are set:

1. To critically explore the meaning of GTI as a global imperative and its relevance for South Africa;

2. To analyse private investment as a tool for sustainable development in cities generally;

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54 Jeffery "The Investment Bill and FDI" 19.

55 Sections 152(1) and 153(a) of the *Constitution of the Republic of South Africa,* 1996 (hereinafter the *Constitution*).

3. To critically analyse the South African legal framework relevant to private investment in infrastructure development, and its application to green municipal transport infrastructure in metropolitan municipalities;

4. To establish how South African law enables or obstructs private investment in green transport infrastructure in the country's metropolitan municipalities; and

5. To make suggestions to reinforce the law if it facilitates - or to improve the law if it obstructs private investment in GTI.

1.8 Assumptions and hypothesis

1.8.1 Hypothesis

The South African legal framework can, through incentives, as well as through the mitigation of risk, encourage and protect private investment in GTI.

1.8.2 Assumptions

1. South Africa is urbanising at a rapid pace in that more than half of the country's population is urbanised.

2. Improved mobility in South African cities depends on the availability of an improved transportation infrastructure.

3. It is possible to "green" the transportation infrastructure in South Africa.

4. Green infrastructure denotes an environmental approach to infrastructure development and the purposes that the infrastructure should serve.

5. Private investors tend to invest in projects that are more efficient, technologically innovative and financially profitable.

1.9 Research methodology

This is a desktop-based legal study. In order to understand and contextualise GTI and private investment in metropolitan municipalities, the study is informed by law and disciplines such as urban, geographic and local government studies.

The study explores the following primary sources of law: international law instruments, the *Constitution*, legislation, policy documents from the national, provincial, and local government spheres, and case law. The primary sources are supplemented by secondary sources of law, including but not limited to scholarly books, journal articles, reports, and internet sources. For the purposes of sketching the context of GI development and the need for more sustainable cities generally, the international law and policy relating to urban development are briefly discussed. The scope of the study is, however, confined to understanding how national law facilitates or obstructs private investment in local transport infrastructure.

1.10 Structure of the study

Chapter 2 of this study discusses GTI in the broader context of international, African regional and South African law to determine the different interpretations of GTI in developing and developed countries. The chapter sketches a background and lays a theoretical foundation of GTI as a global imperative.

Chapter 3 explores private financial investment as a tool for sustainable development in cities through the lens of GTI. The chapter also assesses how sustainable development in cities is financed while examining how financial investments can aid as a measure to develop cities sustainably.

Chapter 4 examines and provides an extensive discussion of the South African law framework on financial investment in urban GTI. The chapter discusses the essence of private financial investment and the relevant legal framework in South Africa. The chapter also discusses the legal framework for local government financing.

Chapter 5 concludes this work with the main findings and recommendations. The chapter summarises the findings and conclusions and makes recommendations for the future interpretation, development and promotion of GTI in South African cities through private investments. The chapter will also identify aspects of the study which could benefit from future legal research.

2 Green transport infrastructure as a global imperative with local relevance

2.1 Introduction

Globally, urbanisation is accompanied by different challenges.[1] A common challenge lies in the inefficient mobility attributable to unavailable and inaccessible transport systems.[2] The challenges arising from urbanisation arguably place strain and pressure on transport systems and transport infrastructure in cities.[3] The development of sustainability in cities, as a UN objective, embodies development aimed at safety, resilience, inclusivity and sustainability.[4] Relevant to transport infrastructure, the UN's SDGs (Goal 11 in particular) calls upon countries to provide access to safe, accessible and sustainable transport systems for all, by improving road safety and expanding public transportation.[5] City mobility of the kind envisioned in Goal 11 strongly depends on the availability of proper transport infrastructure that is socially, economically and environmentally sustainable.[6] However, urbanisation and the impacts of global warming require the development of "environment concerned" transport infrastructure. For this reason, GTI could potentially answer the demands arising from urbanisation and the impacts of CC.

Defining and expounding on the concept of GTI presents several challenges. These include the geographical area, the economic status of a country, and whether a country is developed or developing. This chapter attempts to describe GTI with reference to international and African regional policies and instruments as relevant for the South

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1 United Nations Department of Economic and Social Affairs *The Speed of Urbanization Around the World* 1-2. See para 1.1 in chapter 1 above.

2 Rodrigue *The Geography of Transport* Systems 248-258. Also see Van der Berg *Municipal Planning Law and Policy for Sustainable Cities in South Africa* 28.

3 European Automobile Manufacturers Association *The 2030 Urban Mobility Challenge: ACEA's Contribution* 3.

4 United Nations *Development Programme 2019* https://www.undp.org/content/undp/en/home/sustainable-development-goals/background/.

5 United Nations 2020 https://www.un.org/sustainabledevelopment/cities/.

6 Cervero 2014 *Journal of Regional and City Planning* 179-181.

African context. The objective of this chapter is to define GTI for the South African city context by determining why it is deemed important for sustainable urban development in an era of global change, unprecedented urbanisation and the impact of human footprints on the global environment.

2.2 Mobility and transport realities

Transport infrastructure creates various opportunities in cities, particularly economic opportunities, which subsequently increases the economic value of property in cities, for example, based on the connection between mobility and other socio-economic aspects of cities.[7] These transport infrastructures (inclusive of "public transportation hubs")[8] provide access to activities ranging from the social to the economic and from the formal to the informal.[9] By recognising and anticipating these dynamics, various plans and operations can be implemented to the benefit of the public.[10]

South Africa has the most modern and well-developed transport infrastructure in Africa as it hosts the largest air and rail networks on the continent.[11] This infrastructure provides access to various activities, as just said. However, apartheid planning left South Africa with transport networks to which the majority of the citizens do not have access. They live in areas with no reliable transport systems or adequate transport infrastructure.[12] Post-apartheid, South Africa was left with transport systems that lacked connectivity and integration. Notwithstanding, the country has progressively worked towards the

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7 Okraszewska *et al* 2019 *MDPI Sustainability* 2. Also see United Cities and Local Government *Mobility and The SDGs: A Safe, Affordable, Accessible and Sustainable Transport System for all* 1-2.

8 Public transportation hubs refer to places or systems/stations where passengers arrive and depart using public transport, get access to public transportation, or change between vehicles and/or transport modes. Public transport hubs include train stations, bus stops, airports and taxi ranks. See Bollinger *Improving Quality of Life Through Transit Hubs* 3, 8.

9 Okraszewska *et al* 2019 *MDPI Sustainability* 2. Also see United Cities and Local Government *Mobility and The SDGs: A Safe, Affordable, Accessible and Sustainable Transport System for all* 1-2.

10 United Nations *Human Settlements Programme Leading Change: Delivering the New Urban Agenda through Urban and Territorial Planning* 15.

11 Brand South Africa 2017 https://www.brandsouthafrica.com/investments-immigration/business/economy/infrastructure/south-africas-transport-network#:~:text=South%20Africa%20has%20a%20modern,and%20both%20coasts%20of%20Africa.

12 UN *Transport* 1-2.

improvement and development of modern and efficient transport systems and infrastructure. Events in South Africa such as the 2010 FIFA World Cup resulted in significant development and progress in the transport sector,[13] presenting opportunities for access to various economic and social activities.[14]

Transport systems are part of the backbone of South Africa's socio-economic activities and aid in the economic and social development of the country by enabling the movement of people and goods.[15] Incidentally, transport systems and infrastructure carry substantial implications for the environment. These systems also have significant implications for sustainable development, including atmospheric pollution, urban sprawl and spatial inequality.[16] This requires that the country shift to greener transport systems and infrastructure to address issues such as greenhouse gas emissions and apartheid spatial planning.[17]

Although the shift to greener transport systems and infrastructure may address various challenges in the transport sector, the mobilisation of finances for transport planning and development poses a challenge to the progressive realisation of environmentally sustainable transport infrastructure. Although funding mechanisms in the private sector, including various grants, are available to develop improved transport infrastructure, these mechanisms are meant to be financed partly by the fiscus including and partly by funds raised from users. However, GTI funding aided by user charges cannot be sustained with the level of unemployment, unequal economic opportunities and unaffordable transport systems in South Africa.[18] There is therefore a need for investments in GTI by private-sector entities. However, the current state of the transportation infrastructure may not necessarily attract investment. This is due to the fact that cities have outdated and ageing

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13 "The 2010 FIFA World Cup has accelerated city transport planning and construction in the host cities and has offered a unique opportunity to significantly upgrade the public and non-motorized transport infrastructure. Associated construction projects are contributing significantly to the provision of additional land-based and public transport capacity." UN *Transport* 6.

14 UN *Transport* 1-2.

15 UN *Transport* 1-2. SACN *et al South African Cities Green Transport Programme* 11.

16 UN *Transport* 1.

17 SACN *et al South African Cities Green Transport Programme* 11.

18 UN *Transport* 1-2.

transport systems that will probably not be able to cater for future generations and their environmental and socio-economic needs.[19] Given that it is not likely that (any sphere of) the government will provide all of the financial resources required for the development of environmentally sustainable transport infrastructure, the attraction of private investment to cities is a factor to be considered in the transition to greener transport systems and infrastructure.

South Africa has recently begun transitioning towards greener practices in the transport sector with the help of the private sector. For example, the *Rea Vaya* (Bus Rapid Transit) and Gautrain Rapid Rail Link are considered to be examples of best practice in the transport sector.[20] In 2008 the *Rea Vaya* was considered one of the largest CC initiatives in the City of Johannesburg. It replaced shoddy, old-fashioned bus systems with buses that make use of pollution reduction equipment.[21] Similarly, the Gautrain is an innovative form of public transportation that ensures smart mobility through the use of modern technology that facilitates the movement of people and goods by way of an environmentally friendly transport option.[22]

It can be seen that South Africa is progressing towards new and innovative climate-resilient and environmentally friendly transport systems and infrastructure.[23] Also, these systems have additional benefits similar to sustainable transport infrastructure.

It is important to differentiate between sustainable transport infrastructure and GTI.

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19 Oosthuizen and Schalekamp *The Future of Urban Mobility in South Africa: Planning for and Improving Public Transport Services in an Equitable Manner* 1-2. Also see Standard Bank date unknown https://bizconnect.standardbank.co.za/sector-news/transport/guides/transport-sector-is-a-vehicle-for-growth-in-south-africa%E2%80%99s-economy.aspx.

20 UN *Transport* 9.

21 "The Department of Transport is assisting 7 other South African cities in planning and implementing similar plans". UN *Transport* 9. See also City of Johannesburg 2008 https://www.joburg.org.za/media_/MediaStatements/Pages/2008%20Press%20Releases/2008-10-07-Johannesburg's-Rea-Vaya-project-an-environmental-first-.aspx#:~:text=THE%20Rea%20Vaya%20Bus%20Rapid,as%20a%20result%20of%20transportation.

22 CNBC Africa date unknown https://www.cnbcafrica.com/brandcom/2020/07/15/gautrain-why-it-matters/.

23 Gulati and Scholtz 2020 *The Case for Investment in Green Infrastructure in African Cities* 10, 17.

2.2.1 GTI in the framework of sustainable transport infrastructure

Gray refers to the notion of sustainability as undertaking actions towards treating the world as if we intend to continue to stay in it.[24] Still, there is no widely accepted definition for sustainable transport infrastructure, but it can be understood as infrastructure that

> ... allows the basic access needs of individuals and societies to be met in a manner consistent with human and ecosystem health, and with equity within and between generations; is affordable, operates efficiently, offers a choice of transport mode, and supports a vibrant economy; limits emissions and waste within the planet's ability to absorb them, minimizes the consumption of non-renewable resources, limits the consumption of renewable resources to the sustainable yield level, reuses and recycles its components, and minimizes the use of land and the production of noise.[25]

This description of sustainable transport infrastructure partially draws on the three pillars of sustainability, namely, economic, social and environmental development.

Firstly, urban transport infrastructure is *socially sustainable* when the utilisation of it and its mobility benefits are fairly distributed to all despite any differences in socio-economic status.[26] Social sustainability in transport infrastructure abolishes any inequality of access and affordability of transport systems and the use of particular transport infrastructure based on income, social and physical differences.[27]

Secondly, sustainable urban transport infrastructure is considered to comprise of *economic* infrastructure. This is evident in the translation of investments in sustainable infrastructure into employment for the society, business expansion and accelerated economic growth. Sustainable urban transport infrastructure is considered economically

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24 Gray *Accounting for the Environment* 280. Treating the world as if we intend to stay also means treating all aspects of a city, important or least important, including transport infrastructure as if we intend to stay and utilising the infrastructure for centuries to come. Also see The Centre for Sustainable Transport *Defining Sustainable Transport* 3.

25 The Centre for Sustainable Transport *Defining Sustainable Transport* 6. Also see Rand Europe *et al SUMMA: Deliverable 2 of Workpackage 1: Setting the Context of Defining Sustainable Transport and Mobility* 15.

26 Cervero 2014 *Journal of Regional and City Planning* 180.

27 Social and physical differences include gender, ethnicity, age and disabilities. Cervero 2014 *Journal of Regional and City Planning* 181.

sustainable when the relevant financial resources are appropriately used to increase the social and economic benefits of the infrastructure to individuals.

Lastly, urban transport infrastructure also relates to *environmental* sustainability. An environmentally sustainable transport system

> ...allows generally accepted objectives for health and environmental quality to be met, for example, those concerning air pollutants and noise proposed by the World Health Organization (WHO); does not result in the worsening of adverse global phenomena such as climate change; does not endanger public health or ecosystems and meets needs for access consistent with the use of renewable resources at or below their rates of regeneration and the use of non-renewable resources at or below the rates of development of renewable substitutes.[28]

Based on the above definition, sustainable transport infrastructure is a policy goal, while GTI forms part of it. Thus, although GTI promotes environmentally sustainable transport systems that have a positive effect on both the environment and people, the positive effects have features of sustainable development.[29] These features include infrastructure that is built within and operates in the natural environment, and energy-efficient technologies for both vehicles and the infrastructure used[30] in which waste- and water-reduction technologies and biodiversity protection design features are prioritised.[31] These features on their own do not sufficiently define GTI and its multiple functionalities. A definition of GTI is considered hereunder.

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28 Cervero 2014 *Journal of Regional and City Planning* 178-179.

29 For example, GTI has features that aid in developing resilient cities where CC is concerned, in decreasing the health risks associated with incidents of extreme weather due to CC, and in growing the country's economy as an improved and sustainable economic infrastructure through job creation. Also see para 2.3 below in chapter 2.

30 Lee *et al* 2013 *Journal of Construction Engineering and Management* 2. "Green roads is a collection of sustainability best practices that can be applied to roadway construction. Green roads consist of required best practices and voluntary best practices. Required best practices should be satisfied as a minimum requirement, whereas voluntary best practices may optionally be considered to enhance sustainability."

31 Environmental Protection Agency date unknown https://www.epa.gov/green-infrastructure/what-green-infrastructure. Stormwater runoff is a major cause of water pollution in urban areas. When rain falls on our roofs, streets, and parking lots in cities and their suburbs, the water cannot soak into the ground as it should. Stormwater drains through gutters, storm sewers, and other engineered collection systems and is discharged into nearby water bodies. The stormwater runoff carries trash, bacteria, heavy metals, and other pollutants from the urban landscape. Higher flows resulting from heavy rains also can cause erosion and flooding in urban streams, damaging habitat, property, and infrastructure.

2.3 Defining green transport infrastructure

Societies and economies rely on transport infrastructure, which is vital for a country's economic growth and social stability.[32] While investments in transport infrastructure provide social benefits to its users, namely the general public, these benefits tend to overshadow the "less tangible" though equally essential benefits of the investments to the environment.[33] Hence the need for a GI to potentially yield social and environmental benefits.

The provision of GI is deemed a crucial strategy for reconnecting vital areas to urban hubs as well as restoring and improving their functional roles.[34] The strategy is an acknowledgement that natural phenomena are equally as, if not more, essential to societal and economic well-being as what is considered to be ordinary infrastructure. Accordingly, as the name suggests, GI encompasses -

> a network of multifunctional green spaces, both new and existing, both rural and urban, which supports the natural and ecological processes and is integral to the health and quality of life of sustainable communities.[35]

As relevant to transport infrastructure, GTI can deliver a wide range of new and improved transport systems with the purpose of improving environmental conditions capable of improving people's health and quality of life.[36]

GTI as a form of GI is flexible and the term has been interpreted in different ways. For example, in addition to the description provided above, GTI has been referred to as an

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32 John, Marrs and Neubert *et al Green Infrastructure Handbook- Conceptual and Theoretical; Background, Terms and Definitions* 10.

33 John, Marrs and Neubert *et al Green Infrastructure Handbook- Conceptual and Theoretical; Background, Terms and Definitions* 10.

34 Interreg Centrak Europe 2020 https://www.interreg-central.eu/Content.Node/What-is-Green-Infrastructure-.html.

35 Department for Communities and Local Government *Planning Policy Statement 12: Creating Strong Safe and Prosperous Communities Through Local Spatial Planning* 5. See also Van Wyk "Green(ing) Infrastructure" 1.

36 Interreg Centrak Europe 2020 https://www.interreg-central.eu/Content.Node/What-is-Green-Infrastructure-.html.

"approach" or a "conceptual framework for understanding the valuable services nature provides the human environment."[37] GTI has also been described as

> the relevant transport infrastructure that collectively does not leave problems or costs for future generations to solve or bear present builders and users of the system should pay such costs today. These costs are not limited to environmental externalities, but also include social and other economic impacts caused by transportation.[38]

GTI can also be understood along the lines of its following characteristics.[39] The infrastructure should have a unique value in its potential to contribute to environmental protection in addition to providing other social and economic benefits. Accordingly, the asset should be a definable structure capable of resulting in a strategy, plan or decision that adds value to the conservation, restoration and management of the environment.[40] These characteristics suggest that the different elements of GTI may be found in different land uses such as transport and recreational uses.

The function that GTI should serve further assists in understanding what it is. For example, in developed countries GTI may form part of the transition to climate mitigation and adaptation or could simply be transport infrastructure that is aesthetically pleasing.[41] In developing countries, the transition to GTI can provide employment, provide a better quality of life and promote social integration, for example.[42] Taking the United Kingdom (UK), the United States of America (USA) and Europe as examples, GTI is generally applied as a tool to rethink the value of natural environmental features.[43] However, in a country such as South Africa, GTI may be applied to address a variety of urbanisation

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37 Silverstein and Green date unknown https://www.asla.org/greeninfrastructure.aspx.

38 United Nations Economic and Social Commission for Asia and the Pacific *Sustainable Urban Transport Systems: An Overview* 3.

39 Section 2(2) of *NEMA*. Institute for European Environmental Policy *Green Infrastructure Implementation and Efficiency* 7.

40 Institute for European Environmental Policy *Green Infrastructure Implementation and Efficiency* 7. These characteristics also feature in Section 2(2) of *NEMA*- "Environmental management must place people and their needs at the forefront of its concern and serve their physical. psychological, developmental, cultural and social interests equitably."

41 Haruna and Oppong *et al* 2017 *Cogent Social Sciences* 1-2.

42 Department of Transport Green Transport Strategy for South Africa: (2018-2050) 14, 48. Also see SACN *Developing a Public Transport Investment Assessment Framework* 8.

43 Bobbins *A Framework for a Green Infrastructure Planning Approach in the Gauteng City-Region* 13.

challenges such as spatial inequality.[44] It follows that there is a continuum of possible functions that GTI can serve, ranging from being infrastructure that is also pleasing to the city dweller's eye, to serving key socio-economic transformation purposes. But GTI can also serve a mix of these functions. For example, new or improved "green streets" and "green bridges" can bring the benefits of nature into the built environment,[45] while creating new jobs and boosting a country's economy, and can also help to facilitate the creation of economic activities which may endure for decades and benefit generations to come.[46]

In summary, then, GTI denotes transport infrastructure that is environmentally and socially sustainable while meeting the transportation (mobility) and associated socio-economic needs of people.[47] The relevance of GTI for sustainable urban development is gaining prominence and has also not escaped the focus of international and African regional policy-makers, as is explained in the succeeding paragraphs.

2.4 Global action towards sustainable mobility in cities

Recent developments in global urban development policy suggest that there is a worldwide focus on sustainable cities (urban development) and the factors that help make cities sustainable.[48] This follows on the projection that by 2030 a large part of the world's population will be concentrated in cities.[49] One of the critical matters in cities is mobility.[50] In this context "mobility" is a means of distributing resources and opportunities through

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44 Peters 2016 https://www.gov.za/blog/transport-infrastructure-key-development. Also see Turok "Worlds Apart: Spatial Inequalities in South Africa" 1.

45 Silverstein and Green date unknown https://www.asla.org/greeninfrastructure.aspx.

46 Stafford and Faccer *Steering Towards a Green Economy* 15.

47 South African Government News Agency 2014 https://www.sanews.gov.za/south-africa/sas-growing-economy-increases-demand-transport-infrastructure.

48 Van der Berg 2017 *Obiter* 558.

49 UN *World Cities Report 2016* iii.

50 UN *Economic Commission for Africa Transport for Sustainable Development: The Case of Inland Transport* 7.

a certain social structure or network in which personal and collective well-being are affected.[51]

The sections to follow explore how the notion of sustainable mobility in cities is gaining traction in global law and policy in different sectors and indicate why this may be relevant to GTI development in South African cities.

2.4.1 International climate change law and policy

Natural causes and human activities such as industry and transportation have led to greenhouse gasses being discharged into the atmosphere, consequently causing the earth's climate to deteriorate.[52] The transport sector is often labelled as a significant contributor to CC.[53] The direct manner in which the transport sector contributes to climate disruption as a greenhouse gas emitter is through the combustion of fossil fuels.[54] This has resulted in mechanised transportation being highlighted as a human activity to be cautious of and addressed accordingly regarding CC and its impacts.[55]

As CC evolves in rapid stages, the United Nations Framework Convention on Climate Change (UNFCCC)[56] provides the basis for international action to mitigate CC and adapt to its impacts.[57] For the present purposes, adaptation refers to the adjustment of ecological, social, or economic systems in response to CC and its impacts.[58] Adaptation further relates to the change in processes, practices and structures to mitigate potential

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51 Kaufmann *et al* 2004 *Journal of Urban and Regional Research* 747. Also see Wang and He *Mobility, Sociability and Well-being of Urban Living* viii.

52 Crane-Droesch *Environmentally Sustainable Transport and Climate Change: Experiences and Lessons from Community Initiatives* 6.

53 Organisation for Economic Co-operation and Development *Mobilizing private investment in sustainable transport infrastructure* 4; also see Crane-Droesch *Environmentally Sustainable Transport and Climate Change: Experiences and Lessons from Community Initiatives* 6 and World Health Organisation *Health Co-benefits of Climate Change Mitigation- Transport Sector: Health in the Green Economy* 6, 13. UN *United Nations Framework Convention on Climate change* 16.

54 Cohen *Low Carbon Frameworks: Transport* 1.

55 The Consious Club 2019 https://www.theconsciouschallenge.org/ecologicalfootprintbibleoverview/climate-change-transport.

56 United Nations Framework Convention on Climate Change UN Doc A/RES/48/189 (1992).

57 UN *United Nations Framework Convention on Climate change* 14.

58 UN 2020 https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/what-do-adaptation-to-climate-change-and-climate-resilience-mean.

damage or promote any (unlikely) benefit from opportunities which may be attributable to CC.[59] Adaptation takes many shapes and forms depending on the country in which it is undertaken and its capabilities, as some adaptation solutions are not "one-size-fits-all" solutions.[60]

Greening the transport sector and transport infrastructure may potentially contribute to a sustainable future as a CC adaptation measure. For instance, GTI and systems such as bridges and roads with stormwater management may guard against floods and further improves water quality.[61] Transport infrastructure is further considered vulnerable to CC impacts since it is susceptible to damage caused by the CC impacts elements during its estimated operational period.[62] To limit the susceptibility of transport infrastructure to the impacts of CC, GTI may be a solution.[63] Green mobility and GTI may further promote forward-thinking responses to the need to combat the impacts of CC that could enable a country to implement potential CC mitigation and adaptation measures.[64] For example, GTI includes energy-efficiency and carbon reduction installations as a climate mitigation measure.[65]

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59 UN 2020 https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/what-do-adaptation-to-climate-change-and-climate-resilience-mean.

60 UN 2020 https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/what-do-adaptation-to-climate-change-and-climate-resilience-mean.

61 European Commission *Green Infrastructure and the Transport Sector* 1-2. "Stormwater runoff is one of the fastest growing sources of pollution. When rain hits rooftops, parking lots and roads instead of wetlands, forests and grasslands, it tends to run into storm drains that are directly connected to our waterways. Green infrastructure practices mimic natural habitats and absorb excess water. This reduces the amount of pollution in our waterways. They can also help conserve water while preserving water quality. Green infrastructure practices include permeable pavements, rain gardens, bioretention cells (or bioswales), vegetative swales, infiltration trenches, green roofs, planter boxes, rainwater harvesting (rain barrels or cisterns), rooftop (downspout) disconnection, and urban tree canopies." See United States Environmental Protection Agency date unknown https://www.epa.gov/water-research/stormwater-management-and-green-infrastructure-research.

62 Department of Environmental Affairs *National Climate Change Adaptation Strategy: Republic of South Africa* 55.
Department of Environmental Affairs *National Climate Change Adaptation Strategy: Republic of South Africa* 55. Goyol and Pathirage *Climate Change Impacts on Transport Infrastructure in Agrarian Communities and Policy Implications for Agricultural Trade and Food Security in Nigeria* 1-5.

64 European Commission *Building a Green Infrastructure for Europe* 5.

65 Department of Transport *Green Transport Strategy for South Africa: (2018-2050)* 8. Also see the White Paper on National Climate Change Response Policy 8, 26.

The implementation of GTI under the guidance of international instruments such as the UNFCC must be underpinned by financial and administrative systems.[66] In other words, high-quality and adequately managed climate-resilient transport infrastructure is required, accompanied by proper funding and investments.[67] For example, investment in more energy-efficient and low-carbon transport solutions could help to reduce the quantity of the transportation sector's greenhouse gas emissions.[68] As an international starting point for the financing of CC mitigation and adaptation measures, the *Paris Climate Change Agreement* (Paris Agreement),[69] as an agreement within the UNFCCC, deals with greenhouse gas emission mitigation, adaptation and finance.[70]

International CC agreements provide a roadmap for state parties to prepare and protect their countries from detrimental foreseen and unforeseen CC impacts,[71] thus conferring the duty on all countries to have mitigation duties in terms of the Agreement.[72] However, through taking action to mitigate and adapt to the impacts of CC, the Paris Agreement recognises that many developing countries might suffer the most from the impacts of CC based on their having insufficient financial resources and investments to create resilient mitigation infrastructure, for example.[73] Consequently, the Paris Agreement established a framework for global climate action and the support of developing nations.[74]

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66 Sustainable Energy Africa *Sustainable Energy Solutions for South African Local Government: A Practical Guide* 125.

67 Draft National Climate Change Adaptation Strategy GN 644 (2019) 23.

68 Wilkins 2017 https://blogs.worldbank.org/ppps/fighting-climate-change-green-infrastructure.

69 Paris Agreement FCCC/CP/2015 (2015).

70 Denchak 2018 https://www.nrdc.org/stories/paris-climate-agreement-everything-you-need-know#sec-summary.

71 United Nations Economic Commission for Europe *Climate Change Impacts and Adaptation for International Transport Networks* 57-59.

72 United Nations Economic Commission for Europe *Climate Change Impacts and Adaptation for International Transport Networks* 57-59.

73 Denchak 2018 https://www.nrdc.org/stories/paris-climate-agreement-everything-you-need-know.

74 The Primary Agreement encompasses a plan for developed and able countries to provide financial resources to assist developing countries to mitigate and increase their cities' resilience to CC. While parties are not legally bound to contribute to financing the mitigation and adaptation measures of other countries, they are encouraged to assist the latter countries with financial support.

The Green Climate Fund (GCF) has been set up under the UNFCCC to assist developing countries to combat CC, among other objectives.[75] In addition, the GCF has the aim of serving the Paris Agreement by supporting the goal of keeping the average global temperature rise below two degrees Celsius.[76] The GCF is working towards the implementation of the Paris Agreement by creating potential climate finance for the use of developing countries as parties to the Paris Agreement committed to combatting CC.[77] The Fund pays particular attention to countries that are most vulnerable to the effects of CC, particularly African states.[78] An appropriate example of the GCF at work would include a project in which cities transitioning to low-carbon activities but facing financial constraints are assisted to secure funding for sustainable urban infrastructure.[79] Such cities will have access to the GCF, which will provide financial instruments for investments in climate-resilient urban infrastructure such as GTI.[80]

2.4.2 Instruments and policies for sustainable urban development

2.4.2.1 New Urban Agenda

The NUA envisages cities and human settlements that fulfil their social function with a view to progressively achieving the full realisation of the right to equal access to quality infrastructure, including mobility and transportation.[81] Environmentally sustainable

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75 Lianbiao and Fan 2014 *Journal of Systems Science and Systems Engineering* 269.

76 Denchak 2018 https://www.nrdc.org/stories/paris-climate-agreement-everything-you-need-know#sec-summary.

77 Green Climate Fund 2020 https://www.greenclimate.fund/about.

78 Green Climate Fund 2020 https://www.greenclimate.fund/about.

79 Sims *et al Simplified Approval Process: Transport* 1. Also see Green Climate Fund 2020 https://www.greenclimate.fund/project/fp086.

80 Lefevre and Leipziger *Transport Readiness for Climate Change Finance: A Framework to Access Climate Finance in the Transport Sector* 12. Also see Green Climate Fund 2020 https://www.greenclimate.fund/project/fp086.

81 The NUA: The NUA is defined as an "action-oriented" document that prepares countries to undertake active services towards a sustainable future through sustainable urban development at a local level. The NUA is primarily understood as the derivation of global principles, policies and standards required to achieve sustainable urban development. Furthermore, it is suggested that it may potentially assist countries to transform the way people manage and live in cities. The NUA sets a new vision of sustainable urban development to assist cities in dealing with the constant changes and challenges that come with the demographics of a country during the urbanisation trend. The NUA envisions the use and enjoyment of cities and human settlements by all, while promoting inclusivity and the provision

transport infrastructure receives attention in the NUA as GTI is usually built within other technical infrastructure in public spaces taking into consideration land use, energy efficiency, economy and resilience.[82]

However, developing countries, including those in Africa, are unable to achieve climate-resiliency in cities.[83] Thus, the NUA has created a pathway that encourages developing countries to venture into sustainable and efficient energy use to further sustainable development in cities.[84] The NUA envisages cities that promote safe, accessible urban mobility as well as resource-efficient transport systems and infrastructure,[85] giving particular attention to the transport needs of all, particularly those in rural or poor and informal settlements.[86] To fully achieve this, the Agenda envisions that the objectives underlying sustainable cities could be realised through actions at a global, national and local level if "policymakers" adopt the Agenda's principles based on the needs peculiar to their cities.[87]

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of safe, healthy, resilient and sustainable cities. UN *New Urban Agenda* 5 and Okraszewska *et al* 2019 *MDPI Sustainability* 1, 5. Also see UN Habitat 2020 https://unhabitat.org/about-us/new-urban-agenda and Charles 2016 https://www.weforum.org/agenda/2016/11/last-month-a-new-global-agreement-to-drive-sustainable-urban-development-was-reached-so-what-is-it-and-happens-next/. Also see United Cities and Local Government *Mobility and The SDGs: A Safe, Affordable, Accessible and Sustainable Transport System for all* 1-2. Paragraphs 50, 54, 113, 114 and 116 of the NUA, in particular, emphasise the centrality of sustainable and accessible mobility and transport in an urban society that builds around innovative and inclusive planning, territorial integration and safe, accessible public spaces.

82 Okraszewska *et al* 2019 *MDPI Sustainability* 2.

83 UN *New Urban Agenda: Habitat iii 9*. Also see Streck and Von Unger 2016 *Journal for European Environmental and Planning* Law 6-7; also see Climate Nexus 2020 https://climatenexus.org/climate-change-news/common-but-differentiated-responsibilities-and-respective-capabilities-cbdr-rc/. The NUA recognizing the different challenges faced by each country further reiterates the Paris Agreements core legal principle of "common but different responsibilities and respective capabilities" 151-153. The legal principle acknowledges the different capabilities and responsibilities of individual countries in addressing climate change in different degrees. This principle further reverts to the notion of GTI being interpreted as a slightly different concept for each country depending on its status (whether developed or developing) and capabilities. The response to this principle by parties has reflected an understanding of the shared burden in reaching the Paris Agreement goals and NUA objectives.

84 UN Office for South African Cooperation Climate Partnerships for A Sustainable Future: An Initial Overview of South-South Cooperation *Climate Change in The Context of Sustainable Development and Efforts to Eradicate Poverty* 37, 41.

85 UN *New Urban Agenda: Habitat iii* 14.

86 UN *New Urban Agenda: Habitat iii* 7. Okraszewska *et al* 2019 *MDPI Sustainability* 1-2.

87 Serraglio *et al* 2019 *SCIELO* 31.

2.4.2.2 Sustainable Development Goals

Cities, mobility and transport also feature in the SDGs. The SDGs situate transport infrastructure as being relevant to improved and efficient sustainable development in cities through GTI.[88] Transportation and transport infrastructure, in the general sense, are referred to in a number of the SDGs.[89] The relevance of transport to the SDGs and their targets could be direct or indirect.[90] For example, sustainable transport and mobility indirectly receive attention in Goals 9, 11 and 13.[91]

First, Goal 9 of the SDGs aims to:

> build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.[92]

Goal 9 is based on three interconnected pillars, namely infrastructure, industry and innovation.[93] These pillars share the objective of exploring innovative ways to solve development challenges, building resilient infrastructure by promoting sustainable industrialisation, and fostering innovation.[94] Goal 9 has been directly associated with the *Fourth Industrial Revolution* (Industry 4.0) since the latter appears to have hastened

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88 United Cities and Local Government *Mobility and The SDGs: A Safe, Affordable, Accessible and Sustainable Transport System for all* 3. Also see Mosaberpanah and Khales 2013 *ASCE* 444-445. Also see Transport Environment *Transport and Sustainability: The Social Pillar 1*-4.

89 Eccles 2019 https://www.forbes.com/sites/bobeccles/2019/08/14/the-importance-of-the-transportation-sector-to-the-sustainable-development-goals/#43b983346b24.

90 UN *Analysis of the Transport Relevance of Each of the 17 SDGs* 3.

91 Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation; Goal 11: Make cities inclusive, safe, resilient and sustainable; and Goal 13: Take urgent action to combat climate change and its impacts.

92 UN *Analysis of the Transport Relevance of Each of the 17 SDGs* 12.

93 International Institution of Sustainable Development 2017 https://sdg.iisd.org/commentary/policy-briefs/how-can-progress-on-infrastructure-industry-and-innovation-contribute-to-achieving-the-sdgs/. Also see Open Development Mekong 2018 https://opendevelopmentmekong.net/topics/sdg9-industry-innovation-and-infrastructure/.

94 International Institution of Sustainable Development 2017 https://sdg.iisd.org/commentary/policy-briefs/how-can-progress-on-infrastructure-industry-and-innovation-contribute-to-achieving-the-sdgs/.

technological innovation in the last few years. Consequently, Industry 4.0 could provide a basis for "climate-adapted" infrastructure and climate-resilient development in cities.[95]

Goal 9 is interlinked with many of the other SDGs such as the development of sustainable cities and communities (in Goal 11) and climate change action (in Goal 13). Goal 11 promoted the aspiration to achieve resilience and sustainable development that will enhance cities by making them safe and inclusive.[96] Thus, due to the trend of urbanisation in cities accompanied by increased pressure on the environment and an accelerated demand for essential services and adequate infrastructure,[97] mobility and transport infrastructure have become vital to achieving Goal 11.[98] Achieving Goal 11 through sustainable transport infrastructure is possible through working towards target 11.b, which encourages the integration of transport policies and plans towards inclusion, resource efficiency, mitigation and adaptation to CC, which determine the effectiveness and resilience of transportation systems.[99]

Much like target 11.b of Goal 11, global Goal 13 also has targets directed at achieving climate resiliency through comprehensive sustainable transport solutions incorporating the greening of vehicle manufacturing and infrastructure construction to help reduce greenhouse gas emissions by the transport industry.[100] It follows that actions aimed at enhancing the resilience of transportation infrastructure could prepare and protect countries and provide a response to the impacts of CC.[101] Goal 13 reiterates the notion

95 Open Development Mekong 2018 https://opendevelopmentmekong.net/topics/sdg9-industry-innovation-and-infrastructure/.

96 Koch 2018 *International Journal of Geo-Information* 3.

97 UN 2020 https://www.unenvironment.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-11.

98 Koch 2018 *International Journal of Geo-Information* 3. Also see Okraszewska *et al* 2019 *MDPI Sustainability* 2.

99 UN *Analysis of the Transport Relevance of Each of the 17 SDGs* 14.

100 UN *Analysis of the Transport Relevance of Each of the 17 SDGs* 16.

101 World Bank 2020 https://www.worldbank.org/en/topic/transport/publication/enhancing-the-climate-resilience-of-africas-infrastructure-the-roads-and-bridges-sector.

that the NUA encourages policymakers on the international, national and local levels to regulate the actions taken towards the betterment of cities for future generations.[102]

As mentioned above, Goals 9, 11 and 13 propose that every action by member states regarding transportation should be taken towards the furtherance and creation of sustainably inclusive transportation systems for all within sustainable and resilient cities. However, as the NUA states, these actions are not as simple for every country as per the "common but different responsibilities and respective capabilities" principle. This principle will thus be explored in the African context in relation to GTI and sustainable mobility.

2.4.2.3 Agenda 2063

The African Union (AU) adopted Agenda 2063 as a development agenda specifically for the African continent. Incidentally, the agenda reflects on various aspects of urban development, including transforming Africa into a more sustainable continent.[103] Agenda 2063 remains Africa's strategic framework for inclusive growth and sustainable development for the continent's transformation.[104] Transport infrastructure finds relevance in Agenda 2063's first aspiration-

> Cities and other settlements are hubs of cultural and economic activities, with modernised infrastructure, and people have access to all the basic necessities of life including … public transport.[105]

Agenda 2063 is deemed to have created a roadmap for continental development.[106] The AU developed Agenda 2063 as an endogenous plan to build social assets, much-needed infrastructure and public goods, among other things.[107] Relatable to Goal 11,[108] Agenda

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102 Serraglio *et al* 2019 *SCIELO* 31.

103 European Commission 2019 https://ec.europa.eu/knowledge4policy/publication/agenda-2063-africa-we-want_en.

104 Department of International Relations and Cooperation *African Union: Agenda 2063 A Call to Action* 6. Also see The African Union Commission 2015 *Agenda 2063 Framework Document* iii.

105 Department of International Relations and Cooperation *African Union: Agenda 2063 A Call to Action* 10.

106 African Union 2020 https://au.int/en/agenda2063/overview.

107 The African Union Commission *Agenda 2063 Framework Document* iii.

108 "By 2030 sustainable African regional and national infrastructure for socio-economic growth, affordable and equitable access for all".

2063 aspires to develop and improve cities into "hubs" of cultural and economic settlements with modernised, sustainable infrastructure, including the possibility of public transportation. To deliver the goals set by Agenda 2063, the AU - through the Transport Policy Paper – advocates the adoption of an integrated approach to delivering sustainable transport.[109] The approach sets out to create a common policy framework to deliver safe, affordable and efficient transport at continental, regional and country level. The approach integrates road, rail, air and urban transport infrastructure as well.

2.4.2.4 African Sustainable Transport Forum

Inasmuch as Agenda 2063 sets out *inter alia* to improve the current state of transport, mobility and transport infrastructure in African cities, it cannot achieve its goals on its own. For this reason, and to further and efficiently execute and realise the objectives of Agenda 2063, African countries and particular forums such as the African Sustainable Transport Forum (ASTF) have worked towards the integration of sustainable transport into the region's development.[110] Since Agenda 2063 identifies infrastructure interconnectedness as an enabler of social and economic development in African countries,[111] African governments have committed themselves to developing and maintaining reliable, modern and sustainable infrastructure in both rural and urban areas in accordance with Agenda 2063.[112]

Various African countries,[113] particularly Kenya,[114] together with the World Bank and UN-Habitat, launched the African Sustainable Transport Forum (ASTF) to focus on the

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109 African Union Transport Policy Framework (White Paper) 2016.

110 International Institution of Sustainable Development 2014 http://sdg.iisd.org/news/african-countries-adopt-sustainable-transport-framework/.

111 United Nations Environment Programme 2014 https://www.unenvironment.org/news-and-stories/press-release/he-president-kenyatta-kenya-and-un-secretary-general-ban-ki-moon.

112 United Nations Environment Programme 2014 https://www.unenvironment.org/news-and-stories/press-release/he-president-kenyatta-kenya-and-un-secretary-general-ban-ki-moon.

113 African Transport Policy Program 2020 https://www.ssatp.org/country.

114 African Transport Policy Program 2014 https://www.ssatp.org/en/events/africa-sustainable-transport-forum-astf.

challenges of the day-to-day realities of transport in Africa.[115] The World Bank has referred to the ASTF as "a major African step to make sustainable transport a reality."[116] Desperately needed in African cities, the ASTF generally refers to a platform for integrating sustainable transport into Africa's policies and the implementation thereof.[117] The ASTF typically focusses on accessible and sustainable infrastructure.[118] The purpose of the ASTF is to integrate sustainable transport into Africa's development and planning processes and increase the funding allocated to sustainable transport programmes in Africa.[119] Furthermore, the ASFT has analysed possible solutions in the context of green growth and emissions reductions.[120] In doing so the forum has grouped actions together into priority areas including vehicle emissions, accessibility and sustainable infrastructure, as well as other enabling conditions required to improve access to transport, reduce air pollution and address the associated health concerns.[121]

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115 Stalmans 2014 https://europa.eu/capacity4dev/public-group-transport/event/africa-sustainable-transport-forum-summary-outcomes. Also see Gorham and Teravaninthorn 2014 https://blogs.worldbank.org/transport/major-african-step-make-sustainable-transport-reality. These challenges include congestion, climate emissions, associated health concerns, accessibility, and road safety. The international concept of sustainable energy-efficient transport and mobility may range from technological solutions to improved behaviour as well as radical changes in the way cities are designed and maintained. However, the interpretation of this concept is usually not linked to Africa and African cities. As a continent primarily with developing countries, Africa faces unique challenges when it comes to urban mobility. Transportation in African cities is often associated with traffic growth and congestion due to urbanisation as well as minimal formal public services compounded by inadequate transport infrastructure. See Stucki *Policies for Sustainable Accessibility and Mobility in Urban Areas of Africa* 1. Also see Gorham and Teravaninthorn 2014 https://blogs.worldbank.org/transport/major-african-step-make-sustainable-transport-reality.

116 Gorham and Teravaninthorn 2014 https://blogs.worldbank.org/transport/major-african-step-make-sustainable-transport-reality.

117 United Nations Environment Programme date unknown https://www.unenvironment.org/explore-topics/transport/what-we-do/africa-sustainable-transport-forum.

118 United Nations Environment Programme 2020https://www.unenvironment.org/explore-topics/transport/what-we-do/africa-sustainable-transport-forum/accessibilty-and-sustainable.

119 International Institute of Sustainable Development 2020 http://sdg.iisd.org/events/first-ministerial-and-policy-conference-on-sustainable-transport/.

120 UN Environment Programme 2020 https://www.unenvironment.org/explore-topics/transport/what-we-do/africa-sustainable-transport-forum/why-does-africa-sustainable.

121 UN Environment Programme 2020 https://www.unenvironment.org/explore-topics/transport/what-we-do/africa-sustainable-transport-forum/why-does-africa-sustainable. Also see International Institute of Sustainable Development 2020 http://sdg.iisd.org/events/first-ministerial-and-policy-conference-on-sustainable-transport/. However, it is generally acknowledged in Africa that in order to combat the challenges hindering sustainable mobility and to further sustain development gains, it should identify more environmentally, economically and socially sound sustainable development

Based on the above, it is evident that sustainable transport and mobility are receiving attention in various international and African regional law and policy instruments. These laws and policies suggest that sustainable transportation and mobility is required and encouraged in order to create resilient, inclusive and sustainable urban areas. Thus, the internationally accepted notion of sustainable mobility in cities is prominent in global law and policy and may be relevant for GTI development. This is due to the fact that international global law and policy require the transport sector to play a big role in climate-resiliency, adaptation and overall environmental change. This may be of relevance to GTI development in South African cities.

2.5 Conceptualising GTI in the South African context

In considering the relevance of GTI to the South African context, it is essential to note that the country is ranked as one of the ten worst countries for the adverse impacts of both public and private social and economic activities on the environment.[122] It is documented that only 1.01% of South Africa's energy comes from green sources.[123] Thus, GTI is considered important for South Africa as its introduction would equip public and private entities and individuals to perform their social and economic activities without harming or damaging the environment. This would allow South African urban areas to adapt to CC and its impacts while creating climate-resilient spaces.

Accordingly, implementing GTI in the South African context would have to include conceptualising transport infrastructure designed and built with nature and the natural environment in mind in addition to improving mobility and urban-rural linkages progressively, thereby improving the current state of the environment. This improvement would consequently increase South Africa's contribution to a safe and healthy

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mechanisms. Africa could use its infrastructure deficit to transition to greener investments by using the environmentally sound innovations available. See African Development Bank *Facilitating Green Growth in Africa: Perspectives from the African Development Bank* 3.

122 MoneySuperMarket 2017 http://businessghana.com/site/news/general/147420/African-Countries-Rank-in-the-Top-10-for-the-Lowest-Environmental-Impact.

123 MoneySuperMarket 2017 http://businessghana.com/site/news/general/147420/African-Countries-Rank-in-the-Top-10-for-the-Lowest-Environmental-Impact.

environment *inter alia* by increasing the number of green resources used in developing environmentally sustainable infrastructure.

GTI in South African cities must include the social (and economic) dynamics related to the diverse of the population, such as language, ethnicity, nationality, socio-economic standing, social or economic activities and interactions as well as peoples' dwellings in particular.[124] GTI is relevant to South African cities since all the social and economic activities are presently situated around urban areas. Therefore, an environmentally cautious transport infrastructure yielding social benefits would be considered ideal in South African cities. This is evident in the progress South Africa has made thus far. In this regard, the *Green Transport Strategy* (GTS)[125] promotes *inter alia* the creation of a transport system that is environmentally friendly, and which positively contributes to the country's economic growth and the socio-economic status of its people. The GTS envisages a transport sector that contributes to the efforts to combat the impacts of CC and to promote behavioural changes in public and private entities and individuals by making a commitment to invest resources in green energy transport infrastructure.[126] The GTS is discussed in more detail below.[127]

2.6 Concluding remarks

This chapter has differentiated between sustainable transport infrastructure and green transport infrastructure.[128] The differentiation is aimed at setting a basis for the focal aspect of transport infrastructure development, which is the environmental and green aspect of transport infrastructure development. While this differentiation and description of GTI have provided a picture of how GTI should look and the features it should have, GTI has had to be explicitly defined based on an understanding of the purpose and benefits of GTI. The chapter has defined GTI as transport infrastructure that showcases

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124 Department of Transport *Chapter 1: Overview* 5. Also see Datafirst 2018 https://microdata.worldbank.org/index.php/catalog/3017.
125 See para 4.5.4 in chapter 4 below.
126 See para 4.5.4 in chapter 4 below.
127 See para 4.5.4 in chapter 4 below.
128 See para 2.2.1 above.

features capable of environmental protection, creating cities resilient to the impacts of CC while redressing spatial inequality and urbanisation through urban-rural linkages, for example.[129] This definition addresses various sustainable development issues such as socio-economic development through one central aspect - environmental protection, management and resilience. It is evident that the diverse definitions and understandings of GTI are not always applicable, considering the geographical location, demographics, challenges and realities of transport infrastructure in every country.[130]

The chapter has also examined the theoretical foundation of GTI as a global imperative and its relevance to South African cities.[131] The chapter has assessed the physical reality of transport systems and infrastructure in South African cities.[132] This assessment addressed the relevance of the internationally recognised understanding and conceptualisation of GTI in the South African context.[133]

The remainder of the chapter discussed the content of the relevant international climate law and policies as well as the international law that features GTI as a subject.[134] The discussion of these laws and policies situated GTI in the context of South African cities by highlighting the importance of sustainable development in urban areas which are faced with rapid urbanisation, a degrading natural environment, and global change.

With the above in mind, it is apparent that GTI should be developed in South African cities to fulfil the need for environmentally friendly transport infrastructure that will act as an urban-rural link that contributes to climate resilience. In addition, GTI in South Africa is needed to protect the natural environment whilst addressing a range of other unique challenges. The following chapters consider how GTI can be realised in South

129 See para 2.3 above.
130 See para 2.1 and 2.3 above.
131 See para 1.7 and 1.10 in chapter 1 above.
132 See para 2.2 above.
133 See para 2.4 and 2.5 above.
134 See para 2.4 above.

African cities. Chapter 3 discusses the role that private investment can play in the achievement of GTI in South African municipalities.

3 Private investment as a tool for sustainable development in cities

3.1 Introduction

The world is faced with the need for sustainable development, as explained in Chapter One of this study.[1] Sustainable development in cities requires collective action from both the public sector and the private sector. Although several financing mechanisms may be used to stimulate this,[2] private investments in particular are becoming increasingly relevant to the finance of large-sum urban infrastructure projects.[3] Private investments in public infrastructure enable cities to take advantage of alternative finance mechanisms.

The objective of this chapter is to analyse private investments as a mechanism to finance GTI and enhance sustainable development in cities. The chapter examines the types of private finance mechanisms available for sustainable development in cities, particularly infrastructure development. Also, the chapter considers and identifies the problems and prospects that accompany private investments in this context.

3.2 The role of private finance in the pursuit of sustainable cities

In order to understand the role of private finance in the context of sustainable infrastructure development, it is critical to recognise the diverse industries and entities in the private sector that may provide such private funding.[4] These industries and entities

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1 See para 2.4 in chapter 2 above. Brundtland 1987 http://www.un-documents.net/our-common-future.pdf. Evans *et al Governing Sustainable Cities* 13. Sustainable development refers to development that meets the social and environmental needs of the present without compromising the ability of future generations to enjoy a healthy environment and social and economic opportunities, as well as to meet their own needs. It follows that sustainable development requires ordinary citizens and other role players (public and private sector agents) not to overuse resources. It simultaneously places an obligation on the public sector and other sectors to provide measures towards achieving sustainable development within cities.

2 PWC *Increasing Private Sector Investment into Sustainable City Infrastructure* 3, 17-22. Also see UNSDSN 2016 https://sdgcities.guide/chapter-3-enabling-conditions-for-sustainable-development-861a7bad0df0.

3 UNSDSN 2016 https://sdgcities.guide/chapter-3-enabling-conditions-for-sustainable-development-861a7bad0df0.

4 UN *Report of the Intergovernmental Committee of Experts on Sustainable Development Financing* 10.

range from households and the financial sector (including banks and financial institutions) to multinational corporations.[5] Private sector entities are neither legally obliged to contribute to nor responsible for the financing of sustainable cities. Private sector entities are profit-motivated.[6] They would typically invest in projects thought likely to create more wealth.[7] However, their investments in projects sponsored by cities occasionally have social and environmental benefits attached to them.

In city-sponsored projects, the private financier's role is to provide innovative financial solutions to financing issues arising from the project. These innovations may include instruments and vehicles designed to offset and mitigate project finance risks, for example.[8] The innovative financial solutions provided in the form of private investments for public infrastructure projects typically specify financing mechanisms and contractual arrangements with sponsors, governments and contractors, and provide appropriate security for debts.[9]

3.2.1 Private finance in the context of sustainable urban infrastructure development

Sustainable urban infrastructure development encompasses projects that reduce the adverse impact of the projects on the environment and support the integration of nature-based assets into urban development. Sustainable infrastructure development in cities may help improve the climate resilience of urban areas by improving the ability of infrastructure to cope with the adverse impacts of CC, as was explained in chapter 2 of this study. In addition, alternative private sources of finance can contribute to creating resilience against the impacts of CC and delivering sustainable infrastructure development

5 UN *Report of the Intergovernmental Committee of Experts on Sustainable Development Financing* 10.
6 Carroll 1991 *Business Horizons* 40.
7 Moyo 2018 *SAJEMS* 3.
8 Organisation for Economic Co-operation and Development *Infrastructure Financing Instruments and Incentives* 7.
9 Maree *A Perspective on Infrastructure Finance* 46.

to meet the accelerated infrastructure needs and demands of people resulting from urbanisation.[10]

Urbanisation is considered the most significant potential driver of productivity and growth in the global economy.[11] Thus, if cities seize the productivity benefits associated with urban growth, the country may easily and quickly shift to more economically and environmentally sustainable patterns of growth.[12] Additionally, urban infrastructure that a country plans, executes and maintains in its cities has the potential to produce both economic and climate benefits for an extended period.[13] However, building sustainable urban infrastructure is capital-intensive. Thus, a range of investments across multiple sectors is required.[14]

Incidentally, a range of public finance instruments is available to cities, which can be used to support sustainable infrastructure.[15] However, how to meet the massive financial requirements for urban infrastructure development is a significant challenge for the public sector, the reason being that various municipal governments in developing countries have insufficient and limited public financial resources, and sustainable development of infrastructure in cities is one of many projects competing for these scarce resources.[16]

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10 Von Gunten and Mainelli *Financing the Transition: Sustainable Infrastructure in Cities* 1. Also see Colenbrander and Barau 2019 *International journal of Urban Sustainable Development* 237-238. Also see Cho date unknown https://newcities.org/evaluating-sustainable-infrastructure-development-new-cities/. See also Bielenberg and Kerlin *et al* 2016. https://www.globalinfrastructureinitiative.com/article/financing-change-how-mobilize-private-sector-financing-sustainable-infrastructure. International instruments and urban policies such as Goal 11 of the SDGs, the NUA and the Paris Agreement recognise the central importance of cities for climate safety and for enhancing human well-being and quality of life. Furthermore, sustainable infrastructure development is a vital component of ensuring the integration of the projects to better serve those who live in cities.

11 Turok and McGranahan *Urbanisation and Economic Growth: The Arguments and Evident for Africa and Asia* 446.

12 Floater and Dowling *et al* 2018 *Coalition for Urban Transitions* 4.

13 Floater and Rode *et al Cities and The New Climate Economy: The Transformative Role of Global Urban Growth* 4. Floater and Dowling 2018 *Coalition for Urban Transitions* 5. For example, the 2030 Agenda has goals that should be met by 2030. If this is done, the benefits might sustain the pursuit of these goals into the future.

14 Floater and Dowling *et al* 2018 *Coalition for Urban Transitions* 5.

15 Von Gunten and Mainelli *Financing the Transition: Sustainable Infrastructure in Cities* 8.

16 Godfrey and Zhao 2016 *Coalition for Urban Transitions* 5. Von Gunten and Mainelli 2015 *Financing the Transition: Sustainable Infrastructure in Cities* 6.

Although massive levels of domestic and international private sector finance and investment are available, financing sustainable urban infrastructure presents considerable challenges.[17] It is suggested that the financing gap for sustainable infrastructure primarily lies in the lack of investor familiarity with greener technologies and projects.[18] A discussion of private finance in the context of sustainable infrastructure development in cities raises the question as to why finance matters to delivering sustainable urban growth.[19] The use of private sector finance in infrastructure development is widely promoted, since it allows countries to bridge their infrastructure financing deficit, amongst other things.[20]

3.2.2 Private investments in sustainable transport infrastructure

The private sector is a potential source of investment in transport infrastructure.[21] Private entities will ordinarily choose to invest in public infrastructure as part of a business expansion effort.[22] Undeniably, investors see the opportunity to make a profit when investing in energy-efficient and sustainable infrastructure upgrades and developments where built transport infrastructure is concerned. However, in making an investment decision on a public sector infrastructure project, a private investor will consider, among other factors, expenditure relative to cash-flow, appropriate risk management methodologies and the potential availability of fair returns on the capital invested.[23] The instruments and incentives that cities use to attract private sector investments in infrastructure are factors to be considered by private investors. Private investors may be offered subsidies by law to encourage investments in GI as a means of developing the capacity for climate resilience, for example.[24]

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17 Von Gunten and Mainelli 2015 *Financing the Transition: Sustainable Infrastructure in Cities* 6.

18 Bielenberg and Kerlin *et al* 2016 https://www.globalinfrastructureinitiative.com/article/financing-change-how-mobilize-private-sector-financing-sustainable-infrastructure.

19 Floater and Dowling *et al* 2018 *Coalition for Urban Transitions* 4.

20 Floater and Dowling *et al* 2018 *Coalition for Urban Transitions* 4.

21 Du Toit and Chibira *Civil Engineering Siviele Ingenieurswese* 26.

22 Chappelow 2020 https://www.investopedia.com/terms/i/infrastructure.asp.

23 Prinsloo 2019 https://saiia.org.za/research/the-pitfalls-of-private-sector-investment-in-infrastructure financing/ and Calitz and Fourie 2007 *Bureau for Economic Research* 11.

24 Discussion of these subsidies is not within the scope of this study.

Investors seek stability and predictable outcomes, as a stable demand leads to a stable market for finance.[25] Private investors therefore seek markets with high demand as well as large transactional sizes.[26] For private finance to be a solution to the green transport infrastructure gap in cities, there has to be a market for green urban transport investment projects, a good return on investment, and risks capable of being mitigated.[27] The anticipated rapid rise in urbanisation as well as the scarcity of shared resources and services such as transportation have increased the demand for mobility, making the transportation sector a reasonably stable market.[28] Where there is a stable demand, there is likely to be a financial market for investors to predict the outcomes from investments. For example, transport infrastructure is classified as social and economic infrastructure with unique investment characteristics such as inelastic demand and longevity, which may lead to high returns and financial sustainability in the long term.[29] Transport infrastructure has the potential to create a significant opportunity for private investors to engage in selective investments in consideration of the obvious trends and demands.[30]

Countries such as South Africa continuously establish platforms that encourage private sector investments by presenting unique opportunities to meet both the growing transport demand and their development goals. For instance, South Africa has created a platform in the form of a symposium for sustainable infrastructure development to explore private sector investment opportunities in infrastructure.[31] This platform provides for superior quality infrastructure, to allow for a more efficient economy, improved

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25 Merk "Financing Green Urban Infrastructure" 28. Also see Kemp and Stephani *Urban Transport Innovations Worldwide: A Handbook of Best Practices Outside the United States* 221 and Chan *Public Infrastructure Financing: An International Perspective* 15.

26 McKinsey and Company *A New Decade for Private Markets* 4.

27 Macomber 2011 *Journal of Corporate Finance* 64.

28 Macomber 2011 *Journal of Corporate Finance* 64.

29 Chan *et al* Public *Infrastructure Financing: An International Perspective* 31. Also see The Infrastructure Consortium for Africa *Infrastructure Financing Trends in Africa- 2018* iv. "Investment in economic infrastructure was typically much higher than social infrastructure investment. Further, economic infrastructure investment appears to have been more volatile than investment in social infrastructure." See the definition of transport infrastructure in para 1.1.

30 Macomber 2011 *Journal of Corporate Finance* 64.

31 Sustainable Infrastructure Development Symposium South Africa 2020 https://sidssa.org.za/.

productivity and living standards.[32] Most importantly, the platform makes provision for innovative funding models for infrastructure and investing in infrastructure.[33] This, in turn, provides a ready guide for potential investors in infrastructure. It is important, however, to consider the innovative funding models against the backdrop of whether or not South Africa's legal framework has the potential to facilitate a well-established and sustainable investment climate for GTI.[34]

3.3 Private finance for green transport infrastructure

The planning, execution and maintenance phases for sustainable transport infrastructure can be longer and more expensive than for traditional infrastructure projects, since they require a specific design for the environment and expertise in project and infrastructure finance.[35] There is also a gap in the financial resources available for the development of infrastructure in many cities. In order to address the finance gap, governments are increasingly turning to the private sector to finance projects.[36] Private finance has the potential to fill the financing gap for urban green infrastructure such as transport infrastructure.[37] Differentiated instruments are available, and cities can use such instruments to attract private finance for urban green infrastructure.[38] Some of these instruments are suitable for GTI as a long-term project that requires a substantial amount of capital. Potentially suitable types of private finance instruments are discussed below, together with the advantages and disadvantages of such instruments.

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32 Sustainable Infrastructure Development Symposium South Africa 2020 https://sidssa.org.za/.
33 Sustainable Infrastructure Development Symposium South Africa 2020 https://sidssa.org.za/.
34 See para 4.2 in chapter 4 below.
35 International Institute for Sustainable Development 2020 https://www.iisd.org/topic/financing-sustainable-infrastructure.
36 Green Finance Platform 2020 https://greenfinanceplatform.org/sectors/transport.
37 Saussier *et al Financing Green Urban Infrastructure* 28.
38 Saussier *et al Financing Green Urban Infrastructure* 28.

3.3.1 Types of private finance for public infrastructure including green transport infrastructure

Cities can attract private finance for development projects through various instruments including *inter alia* direct borrowing in the form of loans, bonds, and equity or joint venture investments.[39] The choice of financing instruments for GTI in cities is not explicitly linked to the model employed for the provision of transport infrastructure.[40] However, the instruments of financing will have an impact on how each funding model functions.[41] For example, it would not necessarily be sustainable to choose a financing instrument that is common but which does not function in a way that is appropriate for large and technical projects like GTI.

3.3.1.1 Borrowing instruments: private debt

Infrastructure can be financed through private debt finance by way of long-term borrowing for the construction, development and maintenance of public infrastructure assets.[42] The use of debt financing is justified by the rationale of spreading out the costs of public infrastructure investments via recurring periodic repayments through an agreed period of tenure. With the choice of private debt instruments, local governments can immediately obtain the capital needed to build capital projects without significant delay.

Private debt, as a source of finance for green transport infrastructure, could take the form of loans or bonds.[43] These loans and bonds could be from various institutions and entities, ranging from banks and financial institutions to other private commercial entities and persons. Loans and bonds are similar in the sense that both are considered to be financial assistance mechanisms that are sustainable in the long run,[44] and both are ideal

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39 Department of National Treasury *Chapter 6: Leveraging Private Finance* 81.
40 UN *Innovative Ways for Financing Transport Infrastructure* 3-4.
41 UN *Innovative Ways for Financing Transport* Infrastructure 3-4.
42 Chen and Bartle *Infrastructure Financing: A Guide for Local Government Managers* 12.
43 Department of Transport 2017 https://www.transport.gov.za/documents/11623/39906/12_FinancingFundingCharging2017.pdf/c0f27c6d-8a93-4109-ac70-f4d882ff6dc45.
44 Van Veenhuizen *Cities Farming for the Future: Urban Agriculture for Green and Productive* Cities 118.

instruments for financing large capital projects.[45] However, loans and bonds differ in various ways, including *inter alia* their repayment schedules as well as how the instruments are structured and how they operate.

A loan, in general, is defined as the lending of funds to finance a specific project.[46] In the context of transport infrastructure, a loan may finance a transportation project.[47] For transport infrastructure, the loan is usually long-term. In addition to the repayment of the principal amount, the borrower agrees to pay interest to the lender on the amount borrowed. The interest is based on floating rates, according to an agreement. An interest rate is said to be floating in that subject to financial market conditions as determined by the economy and the financial position of the borrowing party from time to time, the interest rate may increase or reduce.[48] Private debt is usually amortised in the form of agreed repayments spread out over the agreed duration of the loan,[49] mostly comprising of interest and capital.[50] For GTI being developed in cities, loans would be an ideal financing option, as the project would be new and innovative.[51] Thus, loans could finance infrastructure, as they often have tenure exceeding the period of construction of the subject infrastructure, attracting debt finance.[52] The repayment takes place over a long period post construction.

A short-term loan is not likely to be ideal for financing transport infrastructure, as such infrastructure is usually long-term, and there will be a mismatch between the tenure of the loan and the repayment period, which is typically the lifespan of the infrastructure.

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45 Department of National Treasury *Chapter 6: Leveraging Private Finance* 81.

46 Corporate Finance Institute 2020 https://corporatefinanceinstitute.com/resources/knowledge/finance/loan/.

47 Law Insider 2020 https://www.lawinsider.com/dictionary/infrastructure-loan.

48 SACN *Securing Municipal Finance in South* Africa 18. See also Department of National Treasury *Chapter 6: Leveraging Private Finance* 79.

49 "Amortization is the process of spreading out a loan into a series of fixed payments. While each monthly payment remains the same, the payment is made up of parts that change over time. A portion of each payment goes towards interest costs and reducing the loan balance" Pritchard 2020 https://www.thebalance.com/how-amortization-works-315522.

50 SACN *Securing Municipal Finance in South Africa* 20. See also Department of National Treasury *Chapter 6: Leveraging Private Finance* 79.

51 Veenhuizen *Cities Farming for the Future: Urban Agriculture for Green and Productive Cities* 118.

52 Ehlers *Understanding the Challenges for Infrastructure Finance* 13.

The institution or entity that offers the loan takes a considerable risk in making such loans. However, various risks subside as the project progresses, which may make long-term infrastructure loans a less risky borrowing instrument in the long run for the development of GTI within cities.[53]

Aside from loans as a debt instrument, local governments can secure financing for GTI through the issuance of bonds. A bond is referred to as a debt instrument in the form of an entity selling a bond for annual interest payments.[54] The bond issuer will promise to repay the bondholder at a predetermined date while paying interest to the bondholder for the duration of the bond.[55] Bonds are reliable sources of finance for large infrastructure projects such as green transport infrastructure. Bonds have the potential to address long-term gaps in infrastructural development, considering that the tenure of a bond can go up to and beyond thirty years.[56]

Relevant to GTI, local governments are likely to prefer a type of bond financing referred to as "revenue bonds". These are typically issued to finance infrastructure projects related to public facilities that have a particular user.[57] For instance, transport infrastructure and transport systems are developed for use by the general public. They may include toll roads and railway lines. Thus, a bond issued for public transportation is secured by the pledge of a reasonably guaranteed source of revenue generated from the infrastructure project funded by the bond. An example is revenue realised in the form of tolls which road users are charged consequent upon a bond-financed road development.

Like any other infrastructure financing instrument, there are advantages and disadvantages for the obligor of loans and bonds. Comparatively, the key advantages of loans compared to bonds lie in the fact that long-term infrastructure projects need a

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53 Ehlers *Understanding the Challenges for Infrastructure* Finance 13.

54 Pettinger 2017 https://www.economicshelp.org/blog/2225/money-personal-finance/difference-between-bonds-and-loans/.

55 Pettinger 2017 https://www.economicshelp.org/blog/2225/money-personal-finance/difference-between-bonds-and-loans/.

56 Department of National Treasury *Chapter 6: Leveraging Private Finance* 81.

57 Chen and Bartle *Infrastructure Financing: A Guide for Local Government Managers* 12.

gradual disbursement of funds. Bank loans are sufficiently flexible, and disbursements can take place as funds are required, thereby avoiding the payment of interest on amounts not immediately required.[58] The financial proceeds realised from bonds are available to the bond issuer immediately on the completion of the fundraising exercise, and the issuer is liable to pay the coupons as agreed whether or not the fund has been expended on the project. Furthermore, infrastructure projects are relatively more likely to require debt restructuring when unforeseen events occur, and banks can quickly negotiate restructurings among one another.

In contrast, the restructuring of bonds after completion and disbursement may be complex and challenging without resulting in the failure to repay a debt with the coupons.[59] However, it is important to note that for extremely long-term infrastructure developments running into decades, not many banks have the capacity to wait for the anticipated time period. Bonds have an advantage over loan instruments for long-term projects in that entities having long-term obligations, and institutions like insurance and pension fund enterprises find them convenient and rewarding.

3.3.1.2 Hybrid agreements

Given the financial and other resource constraints faced by the public sector concerning financing infrastructure development, innovative funding solutions are required to address infrastructure deficiencies. This can be done through full or partial privatisation, with the latter taking the form of hybrid financing agreements in the form of PPPs.[60] This form of private finance for GTI may range from conventional financing methods to innovative mechanisms. Under South Africa law, a PPP is defined as

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58 Ehlers *Understanding the Challenges for Infrastructure Finance* 12-13. Also see Mezui 2013 https://ecdpm.org/great-insights/financing-infrastructure/unlocking-infrastructure-development-africa-infrastructure-bonds-2/ "As infrastructure projects involve a capital-intensive construction phase that must be financed, loan structures are more common in infrastructure project finance than bonds as they are more flexible. Loans can be drawn down gradually during construction."

59 Ehlers *Understanding the Challenges for Infrastructure Finance* 12-13.

60 Delmon *Private Sector Investment in Infrastructure: Project Finance, PPP Projects and PPP Framewor*k 4-5.

> a contract between a government institution and private party, where: the private party performs an institutional function or uses state property in terms of output specifications; substantial project risk (financial, technical, operational) is transferred to the private party and the private party benefits through unitary payments from government budgets or user fees.[61]

Generally, and in the context of transport infrastructure, a PPP is an agreement between a government entity such as a municipality and a private party in which the latter assumes the substantial financial risk in the financing, building and operation of an infrastructure project.[62] A PPP between the public sector and a private entity is a contract which specially caters for long-term projects that require the transfer of financial risk to the private sector.[63] In most circumstances where the private sector finances an infrastructure project, the private sector will assume the full risk accompanying the funding for the development of the project as an investment until the fund is recouped, or for the lifecycle of the project, depending on the agreement. It should be noted that optimal risk allocation between the parties assigns each risk to the party that can best manage it. The government should, therefore, assume the risks that its private partner cannot bear.[64] In this manner, when the private sector cannot take the transfer of full risk with a moderate profit, public and private sector entities will typically enter into a financing agreement to accomplish a common goal.[65] The financing agreement will require that the public and private entity enjoin their resources and work in partnership. Therefore, the collaboration between the parties will be based on a combination of the strength of the public sector's mandate to deliver services,[66] and the aim of the private sector to generate profit.[67]

PPPs in transport infrastructure are considered to have the capacity to fill the gap between

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61 National Business Initiative *An Introduction to PPPs in South Africa* 6.

62 Delmon *Private Sector Investment in Infrastructure: Project Finance, PPP Projects and PPP Framework* 4-5.

63 National Business Initiative *An Introduction to PPPs in South Africa* 6.

64 Bruchez *Public Private Partnerships (PPPs) in South Africa: To what extent are PPPs suitable for the long-term development of infrastructure in South Africa*? 8.

65 Bruchez *Public Private Partnerships (PPPs) in South Africa: To what extent are PPPs suitable for the long-term development of infrastructure in South Africa?* 24.

66 Section 152(1)(b) of the *Constitution*.

67 Delmon *Private Sector Investment in Infrastructure: Project Finance, PPP Projects and PPP Framework* 4-5.

the costs of the investment needed and the resources available to ensure that infrastructure is delivered.[68] The private partner will be in control of the development, the management and asset maintenance, the service provision and the investment, in exchange for regular payments by the government and possible user charges.[69] To work seamlessly and effectively, a long-term agreement is executed by the parties, making provision for how the skills and assets of each sector, and the process of decision-making,[70] are shared in delivering the infrastructure. Furthermore, the rights and duties of both parties must be clearly defined in the contract.

Since PPPs leverage private capital and private sector skills to fund infrastructure,[71] a PPP agreement is appropriate where there is a need to facilitate rapid and skilful infrastructure development, as in the transport sector. For example, municipalities can provide land as their equity contribution while the private sector party provides long-term funds for the development, ensuring budgetary certainty throughout the project's lifetime in addition to the skills of the private party to supplement the government's existing in-house skills.[72] Municipalities can gain advantages from private-sector expertise and experience in the construction of the infrastructure. Relevant to this, the development of PPPs for economically viable projects eases the pressure on the municipality's budget and allows for the better allocation of funds towards addressing other social needs of the community. It follows that PPPs have the potential to provide various benefits where the government is lacking. The growing collaboration with the private sector in developing sustainable infrastructure may also aid in the increased efficiency of the operation and management

68 Saussier 2013 *Journal of Economic Behaviour and Organisation* 143.
69 Araujo and Southerland 2010 *SSRN Electronic Journal* 6.
70 Landow and Carol 2012 *Public Performance and Management Review* 728.
71 National Business Initiative *An Introduction to PPPs in South Africa* 8.
72 Department of National Treasury *Chapter 6: Leveraging Private Finance* 78. Also see National Business Initiative 2019 *An Introduction to PPPs in South Africa* 8.

of such infrastructure.[73] Therefore, PPPs have the potential to provide the additional resources needed to meet the growing needs of investment in the sector.[74]

For parties to a PPP to benefit from the collaborations and ensure the success of PPPs as a financing option for transport infrastructure, there are conditions to be satisfied. The following conditions ensure the success of PPPs in the context of infrastructure. The public sector must expressly define its long-term needs, specification and standard of the infrastructure and the performance required from all parties involved. No full or total payment should be made before the asset is delivered, so that should substandard infrastructure be built a reduction in payment can be made. The public sector party is usually required to give the control of the planned asset and accompanying resources to the private sector party to ensure that the party that bears the risk receives an appropriate return on its investment for an agreed period. Lastly,[75] there should be express and defined lines of accountability and responsibility between the public and private sector parties.[76] According to Murphy,[77] if all these criteria are met, there is no valid reason why a PPP should fail.

With particular reference to infrastructure development in South Africa by way of PPPs, a legislative framework has been developed at national, provincial and local levels.[78] The legislative framework, mainly that at a local level, will be discussed and analysed in detail in the next chapter.[79]

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73 United Nations Economic and Social Commission for Asia and the Pacific *A Guidebook on Public-Private Partnership in Infrastructure* 2.

74 United Nations Economic and Social Commission for Asia and the Pacific *A Guidebook on Public-Private Partnership in Infrastructure* 2.

75 Grimsey and Lewis *Public Private Partnerships: The Worldwide Revolution in Infrastructure Provision and Project Finance* 6-7.

76 Murphy 2008 *Canadian Public Administration* 120.

77 Murphy 2008 *Canadian Public Administration* 120.

78 Mitchell *Capacity Development for Partnerships in South Africa: Increasing Service Delivery Through Partnerships Between Private and Public Sector* 5, 19.

79 See chapter 4 below.

3.3.1.3 Project finance

It is suggested that a widely accepted or universal definition of project finance does not yet exist.[80] This is because, in the ordinary sense of providing finance for infrastructure development, every method, including loan and bond instruments as well as PPPs, can be discussed under the general head of project finance. Notwithstanding, through the processes of exploring financing options a working definition of project finance has been developed as

> a way of financing capital projects that depends for its security on the expected cash flow of the project itself rather than on guarantees from the borrower or third parties. [81]

In simple terms, project finance refers to the financing of long-term projects such as long-term infrastructure and industrial projects.[82] The debt and equity used to finance these projects are subsequently returned to the financier from the cash flow generated by the project.[83] Therefore, entities which provide finance under project finance transactions lend against the anticipated cash-flow arising from the project to be established.

A diverse array of projects is typically financed through project finance, including greenfield projects.[84] A rare example of such a greenfield project would be GTI in cities where the transport infrastructure is developed from scratch without building on existing infrastructure.[85] Compared to the other financial agreements, project finance is invariably more expensive than raising traditional finance, especially in view of the fact that the financing party is investing capital in "yet-to-exist" infrastructure, based only on the

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80 Dentons *A Guide to Project Finance* 2.

81 Grimsey and Lewis *Public Private Partnerships: The Worldwide Revolution in Infrastructure Provision and Project Finance* xiv.

82 Hayes 2019 https://www.investopedia.com/terms/p/projectfinance.asp.

83 Hayes 2019 https://www.investopedia.com/terms/p/projectfinance.asp.

84 EMIX 2020 https://www.exim.gov/what-we-do/loan-guarantee/project-structured-finance/our-approach-to-project-finance. A Greenfield project is a work which is not following a prior work. In infrastructure the projects on unused lands where there is no need to remodel or demolish an existing structure are called Greenfield Projects. Projects which are modified or upgraded are called brownfield projects.

85 EMIX 2020 https://www.exim.gov/what-we-do/loan-guarantee/project-structured-finance/our-approach-to-project-finance.

anticipated cash flow to be generated if and when the successful construction of the infrastructure is achieved and the project is put into operation.[86] Equally important is the fact that project finance involves a considerable dedication of management time and expertise in implementing, monitoring and administering the financial resources during the life of the project.[87]

Project finance as a type of infrastructure financing encompasses features that distinguish it from the standard financing options. A strict project finance transaction is a financing option which has a non-recourse policy. There is no recourse to the counterparty. The non-recourse policy stipulated in project finance agreements entitles the lender to repayments only from the profits of the project being financed and not from any other assets of the borrower, should the project being established not make a profit.[88] The usual parties involved in project finance transaction are the equity investor and the entity undertaking to establish the infrastructure asset, generally referred to as the "project sponsor".[89] All parties in the project have particular roles to play as stipulated in an agreement, together with responsibilities, obligations and entitlements.[90]

In the context of infrastructure development, the private sector entity does not necessarily lend directly to the government entity. Instead, the government entity and the private investor party establish a special purpose vehicle (SPV) for the sole purpose of creating infrastructure development. The SPV is a corporate entity created by the parties to isolate the financial and accompanying risks of a potentially high-risk project.[91] Relevant to GTI development as a novel concept in the pursuit of sustainable cities, an SPV to create the GTI may be established by the parties to undertake the development as a risky project while protecting the lender from the impacts of the risks, should they

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86 Switala *Project Finance and Obtaining Sufficient Funding for the Successful Completion of Your Project* 4.

87 Dentons 2013 *A Guide to Project Finance* 4.

88 Fight *Introduction to Project Finance: Essential Capital Markets* 3-6.

89 Together with the parties mentioned, other parties include contractors and equipment suppliers, operators, financial, legal and technical advisors as well as regulatory agencies.

90 Serghini date unknown https://youssef-serghini.weebly.com/parties-to-a-project-financing.html. Also see Fight *Introduction to Project Finance: Essential Capital Markets* 2.

91 Chen 2020 https://www.investopedia.com/terms/s/spv.asp.

transpire.[92] Subsequently, funds are advanced to the SPV by way of equity or a loan, considering the anticipated cash-flow that will arise from the project to be established as the means of repayment of the loan.[93] In the event that the infrastructure does not make the desired profit, or any profit that is projected during the evaluation, the SPV and the private party are perforce not able to get repayments from the party of the government.

The risks accompanying a project can either attract project financing or hinder potential equity investments in the project. For example, transaction risks pertaining to such matters as the success of the project, the guarantee of earnings,[94] and the protection of the lenders are considered by potential private investors in determining whether or not to make such investments.[95] Since these risks may be an issue to potential investors, the investors will decide on their ability to mitigate the risks.

3.4 Problems and prospects of private finance

Like other financial transactions related to infrastructure projects, there are challenges attached to project finance. These may impact on the success or the failure of the project. However, it is possible to solve problems, and if the risks associated with project finance are addressed, monitored and adequately mitigated, the project will most likely be successful. The challenges and the prospects of utilising private finance for the development of GTI are discussed below.

3.4.1 Prospects of private infrastructure finance agreements

The private sector is profit-motivated and not necessarily driven by the motive of utility underlying public sector operations. There is a likelihood that the private sector would have capabilities to manage resources better and deliver results at lower costs. Many

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92 Chen 2020 https://www.investopedia.com/terms/s/spv.asp.

93 Barker *Review of Land Use Planning: Final Report- Recommendations* 153.

94 The lenders should be able to anticipate or gauge the amount of money they are expecting and will receive from the project should they finance the project.

95 The protection of creditors/lenders is of most importance, especially to the creditors, since the question will arise as to how the borrower will give the creditors assurance that the latter will receive the guaranteed earnings.

countries have procedures to compare the long-term monetary and project delivery prospects of private finance agreements for public infrastructure with purely public financing for infrastructure.[96] While both private and public-sector infrastructure projects require upfront capital, they offer the prospect of an improved economy and significant benefits to society.[97] Therefore, when the private and public sector reach a financing agreement for public infrastructure, there are good prospects of promoting sustainable development.[98]

Private finance in transport infrastructure offers a positive contribution to a country's economy, thereby improving it, and perhaps influencing it towards a "green economy".[99] For example, finance in transport infrastructure not only takes the financial strain off the public sector but also supports the country's economy in bridging the infrastructure financing deficit.[100] Investments by multiple stakeholders in environmentally sustainable economic infrastructure such as GTI can further stimulate economic activities in a country.

Investments in infrastructure enable private businesses and individuals to produce goods and services more efficiently. Private finance in infrastructure further addresses the economic and social aspects of sustainable development through being beneficial for both businesses and households and consequently the entire economy.[101] However, the nexus

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96 Posner *et al Public-Private Partnerships: The Relevance of Budgeting* 3.

97 Helm *Public and Private Financing for Infrastructure* 5.

98 The World Bank 2019 https://www.worldbank.org/en/topic/financialsector/brief/infrastructure-finance.

99 "A green economy is low-carbon, resource-efficient and socially inclusive. In a green economy, growth in income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services." Jones *et al Services and the Green Economy* 11. UNEP 2020 https://www.unep.org/explore-topics/green-economy/about-green-economy.

100 South African Institute of International Affairs 2020 https://saiia.org.za/research/the-pitfalls-of-private-sector-investment-in-infrastructure-financing/.

101 Stupak *Economic Impact of Infrastructure Investment* 8. "For businesses, infrastructure can help to lower fixed costs of production, especially transportation costs, which are often a central determinant of where businesses are located. For households, a wide variety of final goods and services are provided through infrastructure services, such as water, energy, and telecommunications. Infrastructure benefits the economy overall, as it allows more goods and services to be produced with the same level of inputs, fostering long-term economic growth."

between investments in infrastructure and economic growth in a country differs. It also differs in different sectors of an economy.[102]

Relevant to GTI as infrastructure in a developing country such as South Africa, investments in the economic infrastructure are suggested to produce more substantial "gains" in economic output than investments in social infrastructure such as other public buildings.[103] Increases and improvements in the economic output subsequently positively affect the economy itself, and therefore society in general.[104] For example, investments in infrastructure are likely to positively impact on employment through job-creation in various stages of the development of the infrastructure.[105]

South Africa needs to maintain and expand its economic infrastructure in order to support both its economic growth and its social development goals.[106] The use of private finance to develop public infrastructure when governments have limited resources could help support these goals. It is suggested that where there is economic growth in a country, it is likely to positively affect society through granting access to efficient and better essential services, access to social and economic activities, and the opportunities to further contribute to economic growth.

The private financing of GTI could create economic opportunities, and the social prospects are rooted in job creation and improved mobility for the general public. High-quality, sustainable transport infrastructure could reduce social inequality while contributing to social inclusiveness in cities.[107] Economic growth and significant social benefits are prospects which private financiers can hope to achieve throughout all the stages of the development of infrastructure. The benefits that private financing could produce could be greater than those which the public sector might be able to produce. Meanwhile,

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102 Javid 2019 *MDPI Sustainability* 1-2.
103 Stupak *Economic Impact of Infrastructure Investment* 8.
104 Stupak *Economic Impact of Infrastructure Investment* 8.
105 International Labour Organisation date unknown http://www.ilo.org/asia/projects/WCMS_099513/lang--en/index.htm.
106 National Planning Commission *Economic Infrastructure: The Foundation of Social and Economic* Development 160.
107 Civil Engineering Contractors Association 2020 *The Social Benefits of Infrastructure Investments* 8.

notwithstanding the anticipation of the generation of positive economic, social and environmental benefits, there are also challenges to and impediments against private finance of infrastructure development.

3.4.2 Pitfalls and impediments related to private infrastructure financing in public infrastructure

Private finance of infrastructure development often has some shortcomings.[108] However, there are measures designed to overcome these challenges.[109] The shortcomings of private capital investment in infrastructure include factors ranging from the fact that private financiers lack a development mandate for public utilities. If they choose to participate, they are somewhat selective in their choice of projects, unless the realisation of profit is guaranteed. Private finance investors tend to be risk averse.

A significant shortcoming is related to the fact that being strictly selective of the infrastructure projects they invest in, private finance investors tend to follow trends. Hence, in recent times there has been a shift to Industry 4.0, and private finance has been concentrated in the technology, renewable energy and transport sectors.[110] Private finance investors may be attracted to economic infrastructure such as transport infrastructure for its guaranteed returns on investments. However, this does not necessarily mean that every transport infrastructure project will be financed. Investors will consider other problems such as the risks attached to an infrastructure project and the possible risk mitigation measures attached to the project.

Infrastructure project risks vary from the type of infrastructure, the infrastructure sector, and the purpose of the infrastructure. Transport infrastructure projects are not free from risks.[111] It is important to note that especially environmental risks are associated with large infrastructure projects. Environmental risk is the risk of physical damage to the

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108 Prinsloo *The pitfalls of Private Sector Investment in Infrastructure Financing* 2.

109 Prinsloo *The pitfalls of Private Sector Investment in Infrastructure Financing* 2, 6. See para 3.4.1 in chapter 3 above.

110 Civil Engineering Contractors Association *The Social Benefits of Infrastructure Investments* 8.

111 See para 3.3.1.3 and 3.4.2 in chapter 3 above.

environment, which is sometimes irreversible. The damage caused by a large infrastructure construction project may occur during the construction phase or the operation and maintenance phase. Indeed, such damage is not limited only to that which the infrastructure can cause. Environmental risk includes the potential harm to the infrastructure asset itself. Many infrastructure projects are located in urban areas or sensitive environments which are susceptible to environmental harm and damage caused by *force majeure* occurrences such as fire and other natural catastrophic events.[112] Thus, the determination of present environmental risk will depend on the environmental characteristics and sensitivity of projects surrounding the area.[113] Private investors will consider the environmental risk of the GTI development based on the damage and harm to the environment GTI may cause during the development stages. These damages may be reversible, granted that GTI in its built form aims to protect and preserve the environment. However, this may not be possible in all cases.

Secondly, financial risk is of concern to private investors. Having provided funding for the infrastructure project, they have to deal with anxiety as to whether or not the project will be successful.[114] In the context of infrastructure development "financial risk" refers to the degree of uncertainty on the return of investments or the potential financial loss inherent in an investment decision.[115]

Another aspect of financial risk relates to the potential fluctuation in project costs. The estimated cost of GTI, as a new project, may increase due to the occurrence of unanticipated events through many stages of the development of the infrastructure. This risk may discourage investors who have allocated a fixed sum of money to the investment in the infrastructure project.[116] Indeed, the fact that some infrastructure projects depend on private finance are incomplete may be attributed to inadequate consideration of this

112 Spaić *Legal Aspects of Mitigating Risks in Project Finance* 83.
113 Marsh *Environmental Risks in Infrastructure Projects* 2.
114 Mattar *Risk in Global Infrastructure Project Financing* 40.
115 Investor 2020 https://www.investor.gov/introduction-investing/investing-basics/what-risk.
116 Klein 2018 https://www.brookings.edu/research/four-ways-to-make-wiser-infrastructure-investments/.

financial risk prior to the commencement of the project.[117] Many infrastructure projects fail due to developers spending years building infrastructure with no full financial capacity.[118] Fortunately, the risk of price fluctuation is considered minor and controllable, compared to other aspects of financial risk.

Yet another aspect of financial risk is the unanticipated change in projected earnings from the project when it becomes operational. A change in the projected earnings can be caused by inflation, interest or exchange rate fluctuation, or taxation, each of which on its own is an aspect of financial risk. These risks are typically interconnected. For example, inflation reduces purchasing power, which is a risk for investors receiving repayments on a bond booked at a fixed coupon rate.[119]

Lastly, legal risk needs to be taken into consideration where many different parties and stakeholders are involved. Legal risks are linked to the potential crystallisation of the risk associated with the relevant governance structure of the project and the legal framework applicable to the type of infrastructure and sector.[120] For a potential GTI project in South Africa, any changes in the interpretation of NEMA and the Draft Revised *White Paper on National Transport Policy* (National Transport Policy),[121] for example, would be considered a legal risk which may affect the success or otherwise of the project. It is the private investors' responsibility to analyse the legal framework applicable to the infrastructure, to establish if it is worthy of their investment.[122] Private investors in GTI should ensure the legal environment relevant to their private investment is favourable and to protect their investments. Among the many possible ways the law can change and constitute a legal risk to project financing are issues of the enforcement of contracts and security dispute resolution, the enforcement of agreements and property ownership. These legal risks are usually prominent where there are multiple parties in the agreement, including

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117 Beckers *et al Risk Allocation: Tools for Infrastructure Development in Frontier Markets* 6. Klein 2018 https://www.brookings.edu/research/four-ways-to-make-wiser-infrastructure-investments/.

118 Beckers *et al Risk Allocation: Tools for Infrastructure Development in Frontier Markets* 6.

119 Investor 2020 https://www.investor.gov/introduction-investing/investing-basics/what-risk.

120 Beckers *et al Risk Allocation: Tools for Infrastructure Development in Frontier Markets* 6.

121 Draft Revised White Paper on National Transport Policy (2017).

122 Spaić *Legal Aspects of Mitigating Risks in Project Finance* 40.

the private investor, the local government representatives, the contractors and the financial and legal advisors. Since the initial private agreement to finance GTI is a contract in its nature, together with the *essentialia* of the agreement,[123] risk mitigation should be equally included.[124]

Flowing from the foregoing, private investments are a viable financing mechanism option for the development of infrastructure, including GTI. Notwithstanding this, private investment in infrastructure development has shortcomings and advantages. The South African parliament has enacted relevant legislation to regulate different aspects of infrastructure development. The relevant applicable legislation is discussed in the next chapter.

3.5 Concluding remarks

The objective of this chapter has been to identify and validate private financing as a potential tool for the easy realisation of the objective of municipalities in South Africa to develop urban transport infrastructure in cities. The above discussion shows that the private finance of infrastructure development works in ways that benefit the public sector, the private sector and society in general.[125] These benefits include benefits to the economic growth of the country, yielding job opportunities for the community, the delivery of profit and financial returns from the development of infrastructure for the private sector investors, and the development of the new infrastructure, contributing to the government's developmental mandate of environmentally friendly and resilient cities.[126]

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123 Maxwell "Obligations and Terms" 4. Essentialia are those distinctive terms used to identify or classify a contract as one of the specific contracts recognised by our common law.

124 Rouse 2018 https://searchdisasterrecovery.techtarget.com/definition/risk-mitigation. Risk mitigation refers to a strategy to prepare for, guard against and lessen the effects of potential risks. Risk mitigation focusses on the avoidance or partial avoidance of disasters. Risk mitigation strategies involve taking the necessary steps to reduce the adverse effects of potential disasters.

125 See para 3.2 above.

126 See para 3.2 and 3.3 above.

It is a fact that different infrastructure projects serve different purposes,[127] so different financing options and financial structures need to be used.[128] Relevant to GTI, the private finance option is subject to the consideration of several factors, including the asset's cost and lifespan.[129] While many of the financing options discussed are suitable for the development of GTI in South African cities,[130] the project financing structure of private investments appears to be a more suited financing option for GTI.[131] However, project financing through private investment, like any other private finance option, has both positive and negative aspects to it.[132] These determine whether private investment is viable as a way of financing the development of GTI in cities.

The benefits of private investment in GTI primarily stem from the potential of economic growth. The pitfalls, however, predominantly lie in the risk factors, particularly regarding investments in environmentally friendly urban transport infrastructure.[133] Although the SPV that may be created by the government and private investor together could mitigate these risks, they need mitigation from higher authorities with legal standing.[134] For instance, the measures used to mitigate these risks require regulation in the South African legal framework. Additionally, a regulatory body is required to ensure these measures are taken in accordance with the law.[135] This requirement means that mitigation through South African financial and insurance law may attract and support private investments in GTI.[136]

Given that potential SPVs may mitigate finance risks,[137] the South African finance and investments legal regimes also serve as appropriate mitigants against financial risks and

127 See para 1.8 in chapter 1 above.
128 See para 3.3 and 3.3.1 above.
129 See para 3.3 above.
130 See para 3.4 above.
131 See para 3.3.1.3 above.
132 See para 3.5 above.
133 See para 3.5.2 above.
134 See para 3.4.1.3 above.
135 See chapter 4 and 5 below.
136 See para 4.2 in chapter 4 below.
137 See para 3.4.2 above.

legal risks attached to private investment in GTI.[138] Although these mitigants may facilitate the realisation of private investment for GTI, the South African legal framework pertaining to the protection of investment in general, and private investment in green municipal transport infrastructure in particular, seeks to promote and assure the security of private investments in GTI.[139] The legal framework pertaining to private investment in green municipal transport infrastructure is discussed in the next chapter.

[138] See para 3.6 above.
[139] See para 3.6 above.

4 The South African legal framework relevant to private investment in green municipal transport infrastructure

4.1 Introduction

Understandably, different sectoral laws, policies, principles, norms and standards form an integral part of the regulatory framework applicable to the type of infrastructure, its development and finance. When government regulates an infrastructure sector, it imposes direct and indirect control over the type of decisions or actions taken by individual entities in that sector.[1] This regulatory framework will be assessed in an attempt to determine if and how South African law facilitates or stifles private investment in GTI in the country's cities.

Given the multidimensional nature of private investment in GTI in municipal areas, the regulatory framework includes laws and policies from a range of different sectors. These range from the private investment sector, public sector, environment and energy sector to the infrastructure development and transport sector. Thus, this chapter analyses the South African legal framework relevant to private investment in infrastructure development and its application to green municipal transport infrastructure in metropolitan municipalities. The chapter aims to assess if, overall, the legal framework encourages or impedes private investments in GTI.

4.2 Applicable investment and finance-related law

Due to the shortage of financial resources, the required management skills and accountability in the public sector for commercial infrastructure development in cities,[2] there is sometimes a need for the public sector to look for alternative sources of finance.

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1 Maluleka *Transport Economic Regulatory Intervention in the Transport Infrastructure: A Public-Private Partnership Exploratory Study* 4.

2 Department of National Treasury *Public Sector Infrastructure Update* 143.

These alternatives include private sector investments.[3] However, as explained in chapter 3 of this study, private investors are not likely to participate in infrastructure development unless the legal environment is conducive to the investments being contemplated. The process of determining whether or not the legal environment is conducive requires the uncovering of the framework of applicable law. Relevant law would regulate the legal obligations and contractual agreements between the private and public sector, for example.

Unlike local government finance law, the investment and finance law applicable to private investment is not a big part of the South African regulatory sector. Private investment legislation is minimal and direct in its purpose. All of the statutes discussed below have the objective of protecting investors and their investments. These statutes may provide pointers as to how investment and finance law may indirectly encourage investment in South Africa's various sectors. Inasmuch as such extensive protection may encourage investment, it could also deter investors from investing.

4.2.1 Protection of Investment Act 22 of 2015

As one of the leading countries on the African continent to attract foreign investment, South Africa has attracted investments in most of its sectors.[4] As is to be expected, such investment needs to be protected. The *Protection of Investments Act* 22 of 2015 (Investments Act) protects investors and their investments. A primary objective of the Investments Act is to achieve a balance between the rights and obligations of investors and the public interest.[5] The question, however, remains as to what extent the Investments Act protects investors, and whether or not provisions in other legislation limit the extent of that protection.

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3 See para 3.2.2 in chapter 3 above.

4 Magubane 2018 https://www.dlapiper.com/en/southafrica/insights/publications/2018/11/africa-connected-doing-business-in-africa/investment-projection-legislation-in-south-africa/#:~:text=On%20July%2013%2C%202018%2C%20the,that%20apply%20to%20all%20investors.

5 Section 4(a) of the *Promotion of Investments Act* 22 of 2015.

One of the ways in which the Investments Act aims to protect investors is to deal directly with investor-state relations, particularly the legal aspects of investment agreements.[6] This enables foreign investors to resolve disputes with the South African government. This occurred in the case of *Piero Foresti, Laura de Carli and others v The Republic of South Africa* (*Piero Foresti v RSA)*.[7] Briefly, a foreign mining investor requested international arbitration against the South African government concerning bilateral investment treaties (BIT's) between the latter and Italy, as well as between South Africa, Belgium and Luxembourg. The claimants alleged that the South African government had denied them fair and equitable treatment as the latter divested parts of the claimants' investments to historically disadvantaged South Africans as part of black economic empowerment (BEE) in accordance with legislation.[8] The claimant further asserted that those actions harmed their economic interests in South Africa, and breached specific terms of the applicable BIT. The arbitration award against the government was dismissed, based on justifiable prejudice.[9] The *Piero Foresti* v *RSA* case became an interesting matter in the determination of the scope of protection extended by the Investments Act to investors and foreign investors in particular.[10]

Furthermore, the Investments Act emphasised that government can justifiably take measures that redress historical, economic and social inequalities and injustices.[11] These measures may have an impact of unilaterally diminishing foreign investors' rights under

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6 Govender 2019 "South Africa" 179-180.

7 *Piero Foresti, Laura de Carli and others v The Republic of South Africa* 2007 ICSID Case No. ARB(AF)/07/01.

8 *Mineral and Petroleum Resources Development Act* 28 of 2002.

9 *Piero Foresi v RSA* para 4.

10 *Piero Foresi v RSA* para 2. Magubane 2018 https://www.dlapiper.com/en/southafrica/insights/publications/2018/11/africa-connected-doing-business-in-africa/investment-projection-legislation-in-south-africa/#:~:text=On%20July%2013%2C%202018%2C%20the,that%20apply%20to%20all%20investors.

11 Section 12 of the *Investment Act*. See also Magubane 2018 https://www.dlapiper.com/en/southafrica/insights/publications/2018/11/africa-connected-doing-business-in-africa/investment-projection-legislation-in-south-africa/#:~:text=On%20July%2013%2C%202018%2C%20the,that%20apply%20to%20all%20investors.

the Investments Act.[12]

The protection of investors and their investments is justifiably limited as per the Investments Act's aim to balance the rights and obligations of the investors and those of the public.[13] The latter particularly relates to redressing past imbalances, promoting national and cultural heritage and practices, and fostering economic development through providing opportunities to all. This automatically places a wedge between the opportunities and capabilities of foreign investors in South African sectors since the actions and decisions by South African sectors may constitute justifiable discrimination.[14] Since the *Constitution* and the Investment Act provide for equal national treatment, this provision is not excluded from limitation and fair discrimination.[15] Incidentally, this can be seen as one of the hindrances that stifle private investment in sustainable transport infrastructure, where historically disadvantaged individuals are preferred in adjudging the award of investment opportunities and benefits, where such preferences and benefits disadvantage other local and foreign investors. However, it may also be seen that such preference would encourage private investments in GTI where historically disadvantaged individuals receive opportunities to broaden the scope of their investments, innovativeness and technology in their private businesses. For example, these investments would create more opportunities for some through the socio-economic development and upliftment of historically disadvantaged individuals in South Africa.

4.2.2 Infrastructure Investment Plan 2020

South Africa has had to work towards establishing plans to adapt to recent events, including the COVID-19 pandemic, which has shocked the economy and other sectors.[16] One of the sectors affected by the pandemic is infrastructure development. The Infrastructure Investment Plan of 2020 (IIP) sets out the trajectory designed to transform

12 Govender 2019 "South Africa" 181.
13 Sections 4(a) and 12 of the *Investment Act*.
14 Section 9 of the *Constitution*.
15 Section 36(1) of the *Constitution*.
16 South African Government 2020 https://www.gov.za/speeches/media-statement-minister-public-works-and-infrastructure-patricia-de-lille-infrastructure.

the country's economy while addressing the historical social, economic and spatial injustices in the country.[17] The IIP fosters private investments in long-term public transport infrastructure to the extent that it aims to improve brownfield infrastructure sustainably and develop greenfield infrastructure for environmental sustainability in cities and towns.[18]

In order to ensure its effectiveness in facilitating private investments in GTI, the IIP has established an administrative body to assist in unlocking funding and investments for infrastructure projects, named Infrastructure South Africa (ISA).[19] Through ISA the IIP is in the process of adapting the infrastructure procurement framework to foster significant infrastructure investment.[20] Furthermore, specific strategic projects, including land transport infrastructure, have been gazetted to be implemented in the future.[21] The IIP undoubtedly supports and encourages private investment in GTI through adapting infrastructure frameworks and publishing government gazettes (GG) stating which special transport infrastructure projects are prioritized for investments.[22] The inclusion of special transport infrastructure projects in GG's also ensures that the organs of state responsible for implementing the IIP present economically viable and executable projects to private sector investors.[23]

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17 South African Government 2020 https://www.gov.za/speeches/media-statement-minister-public-works-and-infrastructure-patricia-de-lille-infrastructure.

18 South African Government 2020 https://www.gov.za/speeches/media-statement-minister-public-works-and-infrastructure-patricia-de-lille-infrastructure. Also see Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 38. Also see EMIX 2020 https://www.exim.gov/what-we-do/loan-guarantee/project-structured-finance/our-approach-to-project-finance. See also fn 81 in para 3.3.1.3 in chapter 3 above.

19 South African Government 2020 https://www.gov.za/speeches/media-statement-minister-public-works-and-infrastructure-patricia-de-lille-infrastructure.

20 South African Government 2020 https://www.gov.za/speeches/media-statement-minister-public-works-and-infrastructure-patricia-de-lille-infrastructure.

21 Reg 3 in GN 812 in GG 43547 of 24 July 2020. Also see South African Government 2020 https://www.gov.za/speeches/media-statement-minister-public-works-and-infrastructure-patricia-de-lille-infrastructure.

22 Reg 3 in GN 812 in GG 43547 of 24 July 2020. Also see South African Government 2020 https://www.gov.za/speeches/media-statement-minister-public-works-and-infrastructure-patricia-de-lille-infrastructure.

23 Planting 2020 https://www.dailymaverick.co.za/article/2020-07-28-governments-r340bn-infrastructure-investment-announced-to-acclaim-and-misgivings/.

4.3 The national legal framework on environmental management

South African environmental law comprises of the Constitution, framework and sector environmental laws. The laws discussed in this section include the Constitution, NEMA, the National Climate Change Response White Paper, and the Draft Climate Change Bill. The suite of environmental laws discussed below do not have the objective of attracting or facilitating private investments in GI, but if finds application to green municipal transport infrastructure as they relate to the protection and management of the natural environment. The discussion below aims to assess whether the national legal framework on environmental management facilitates or impedes private investments in GTI.

4.3.1 Constitution of the Republic of South Africa, 1996

Section 24 of the *Constitution* explicitly grants an environmental right to everyone. It confers the right to a healthy and safe natural environment, which is closely linked to other human rights such as the right to health, for example.[24] Therefore, there is a connection between the quality of the environment and the health of communities living in these natural environments.[25]

Section 24 of the *Constitution* applies to GTI by virtue of the fact that one of the primary purposes of GTI is to ensure that not only is the natural environment protected, but the transport infrastructure built in and around the natural environment is healthy and safe for the local communities.[26] This right focusses on the protection of the environment while progressively promoting social and economic development for future generations.[27] Thus, section 24 applies to GTI, since GTI is deemed to be a measure to help promote an environment that is not detrimental to human health or well-being.

When ensuring public health, a duty is placed on various actors, including public authorities, private actors and citizens. Moreover, investing in measures that will ensure

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24 South African Human Rights Commission *Chapter 8: Environmental Rights* 337
25 South African Human Rights Commission *Chapter 8: Environmental Rights* 337.
26 See para 2.2.1 and 2.3 in chapter 2 above.
27 See para 2.2.1 in chapter 2 above.

public health, such as the development of GTI, rests on both private actors and public authorities. This is based on the horizontal and vertical applicability of environmental rights.[28] Therefore, it follows that investing in GTI is a cost-effective way of investing in and promoting people's health.

The *Constitution* finds further relevance in that it states that developmental local government should promote a safe and healthy environment.[29] Thus, the *Constitution* promotes investment in GTI through stipulating the objectives of local government in its chapter 7. As local government works towards attaining these objectives, it must do so within its financial and administrative capacities.[30]

Since the development of infrastructure in municipalities is overseen by local government, the financial burden on local government to provide a safe and healthy environment through GTI, for example, can be too significant. It is for this reason that the *Constitution* makes provision for all spheres of government to co-operate with one another in good faith by assisting and supporting one another.[31] This support and assistance can range from financial to administrative support, where needed to fulfil fundamental rights. Therefore, the *Constitution* does foster and promote investment in GTI as a measure that can be used to promote a safe and healthy environment. However, the drawback is that the *Constitution* does not make any direct reference to a right to transportation or mobility, or the provision of transportation.[32]

Although the *Constitution*, itself, does not directly refer to the right to transportation, the *Constitution* provides for the national government organs of state in the transport sector to set a robust regulatory policy framework for efficient and accommodative transport

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28 Sections 8(1) and 8(2) of the *Constitution*.
29 Section 152(1)(d) of the *Constitution*.
30 Section 152(2) of the *Constitution*.
31 Section 41(1)(h)(ii) of the *Constitution*.
32 The *Constitution* does not contain a right to transport or mobility. However, it does make indirect reference to transportation through the right to the freedom of movement in Section 21 of the *Constitution*.

systems, as well as to oversee such regulation.[33] This is in addition to the support and assistance other spheres of government may provide to local government in investing in GTI to promote a healthy environment. In the transport sector, the environmental right, the interrelationship between environmental protection and sustainable development, and the fulfilling of these rights by the relevant parties may lead to the improvement of the natural environment and human health or well-being.[34] Thus, the *Constitution* promotes the greening of transport infrastructure through incorporating the right to a healthy environment. Ultimately section 24 of the *Constitution* gives rise to other legislative measures relevant to GTI such as environmental legal frameworks and plans.

4.3.2 The National Environmental Management Act 107 of 1998

NEMA contains environmental principles and the instruments to ensure that such principles are realised.[35] It contains a variety of environmental management principles applicable to organs of state and every other entity.[36] The section 2 NEMA principles on environmental management serve as the legal foundation for a system of behaviour regarding environmental protection and the mitigation of harm to the natural environment.[37] The section 2 principles are enabling to the extent that they act as a legislative guideline for decisions pertaining to the management of projects such as the erection of GTI.[38] For example, the principles call for actions and decision-making from the state and private entities to mitigate any harm to the environment through the development of GTI in the natural environment.[39]

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33 Schedule 4A of the *Constitution*. Also see Department of National Treasury *Trends in Intergovernmental Finance* 100. Examples of the regulatory policy frameworks includes the 1996 *White Paper on National Transport Policy* and the *National Land Transport Transition Act*. Examples of the management of land infrastructure are the South African National Roads Agency, the South African Rail Commuter Corporation and the Road Traffic Management Corporation.

34 Department of National Treasury *Trends in Intergovernmental Finance* 110.

35 Kidd *Environmental Law* 5.

36 Section 2 of *NEMA*. Every other entity/person includes natural and juristic persons.

37 Sections 2(1)(a) and 2(1)(b) of *NEMA*.

38 Section 2(1)(c) of *NEMA*.

39 Sections 2(1)(c), 2(4)(a)(ii) and 4(a)(vii) of *NEMA*.

Other than the section 2 principles in NEMA enabling private investments in GTI, section 28 also finds application to the present context. The section 28 duty of care has been interpreted to mean that all public and other entities have the legal obligation or responsibility to avoid acts or omissions likely to cause harm to the natural environment.[40] It finds application to GTI in that an obligation is placed on the public sector and the private investor to reasonably prevent any pollution, degradation and environmental harm during the planning, construction and operation stages of GTI. The failure to avoid such harm constitutes an offence.[41] Parties guilty of such an offence may be liable for a fine of up to R1 million, or imprisonment of up to a year.[42] The duty of care principle can also be read together with the polluter pays principle, because the objective of the latter principle supports the concept of the duty to care for the environment.[43] This positive duty means that should any environmental harm be caused by a project, the perpetrator must pay for the restoration. Therefore, the investor, whether public or private, should invest in measures that will prevent any harm from being caused during the lifespan of the infrastructure. This is in line with the principle of taking precautionary measures to avoid causing harm to the environment. Therefore, private investments in GTI are encouraged to the extent that there should be investments in innovative, efficient and effective measures to guard against any environmental damage.

Other instruments in the NEMA regime that may help facilitate private investment in GTI include an environmental management cooperation agreement (EMCA) to further enforce the section 2 principles and the section 28 duty to care.[44] The agreement will

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40 Vombhoni *Critical Analysis of the Law on Duty to Care to the Environment in South Africa: Challenges and Prospects* 20.

41 Section 28(14) of *NEMA*. Vombhoni *Critical Analysis of the Law on Duty to Care to the Environment in South Africa: Challenges and Prospects* 7.

42 Section 28(14) of *NEMA*. Vombhoni *Critical Analysis of the Law on Duty to Care to the Environment in South Africa: Challenges and Prospects* 7.

43 Vombhoni *Critical Analysis of the Law on Duty to Care to the Environment in South Africa: Challenges and Prospects* 23-24.

44 Section 35 of *NEMA*.

act as an environmental governance instrument.[45] The EMCA is typically used where environmental regulation fails to supplement traditional environmental legislation such as NEMA.[46] For example, NEMA does not explicitly provide for the financing aspect of projects that should consider all aspects of sustainable development and how such may impact on the environmental management of the development of such projects. Together with the EMCA, NEMA may be used as a guide for agreements between private investors and municipalities.

Environmental impact assessments (EIAs) can also act as environmental instruments to aid in enabling private investment in GTI in municipalities. The process of private investment in GTI requires actions and decisions, ranging from the financial to the environmental. NEMA requires that environmental authorisation is to be obtained before any activities or decisions listed in NEMA are commenced.[47] Any action or decision on the development of GTI may not commence without an environmental authorisation if listed in section 24(2) NEMA.[48] The EIA acts as a legislative requirement that strives for the best environmental option in the development of projects while considering the practicality of costs and technology, for example. It follows that NEMA, together with environmental principles found in other instruments, including the EMCA and the EIA, fosters private investments in GTI built in the natural environment.

4.3.3 National Climate Change Response White Paper, 2011

South Africa's response to CC has the objective of integrating environmental resilience in sustainable social development.[49] This integration can be done through the development of GI to mitigate and adapt to the impacts of CC, as well as to combat the associated

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45 Seekoe *The Environmental Management Cooperation Agreement as a Co-Operative Environmental Governance Tool in a Segmented Environmental Administration* 34.

46 Seekoe *The Environmental Management Cooperation Agreement as a Co-Operative Environmental Governance Tool in a Segmented Environmental Administration* 34.

47 Section 24(2) of NEMA. Also see Activity Number 12 and 27 in Appendix 1 in GN R984 in GG 38282 of 4 December 2014.

48 Activity Number 12 and 27 in Appendix 1 in GN R984 in GG 38282 of 04 December 2014.

49 Green Growth Knowledge Platform 2014 https://www.greengrowthknowledge.org/national-documents/south-africa-national-climate-change-response-white-paper.

health threats, such as diseases related to exposure to air pollution.[50] For instance, the *National Climate Change Response Plan White Paper* (NCCRP)[51] addresses the management of the transition to a climate-resilient low-carbon economy while also addressing the Republic's over-riding national priorities for sustainable development and environmental health.[52] Thus, the NCCRP indirectly encourages private investment in projects such as GTI, which not only fosters the transition to climate-resilient cities but does so through identifying development needs that include improved transport infrastructure.

The NCCRP supports private investment in GTI to the extent that the Transport Flagship Programme, as an integral part of the NCCRP,[53] was established.[54] Relevant to GTI, this programme requires the Department of Transport (DoT) to develop plans specifically catering for affordable, lower-carbon public transport systems. These systems can use climate-resilient technologies while ensuring that sustainable development environmental and social needs in municipalities are met.[55]

As South Africa's principal CC policy, the NCCRP undoubtedly encourages private investment in GTI in municipalities through the establishment of programmes and instruments aimed at the reduction of greenhouse gas emissions, while simultaneously fulfilling the developmental needs in these municipalities. The NCCRP also endorses private investment in GTI by acknowledging that the South African government recognises the importance of private sector funding in achieving national CC response aims. Thus, in the process of transitioning to a reduction in greenhouse gas emissions and meeting development needs, the NCCRP suggests the forging of effective partnerships with the private sector to explore financing mechanisms, including private investments.

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50 Garland 2014 *SAMJ* 1-2.
51 *National Climate Change Response White Paper,* 2011.
52 Section 1 of the NCCRP.
53 Section 8 of the NCCRP.
54 Section 8.5 of the NCCRP.
55 Section 5.6.2 of the NCCRP.

4.3.4 The Draft Climate Change Bill, 2018

The *Draft Climate Change Bill* (CC Bill)[56] acknowledges that CC is an imminent threat to the environment and requires an immediate, effective and well-coordinated response.[57] The CC Bill also acknowledges that the anthropocentric CC presents a threat not only to the environment but also to human societies and human health.[58] Similar to the NCCRP, the CC Bill intends to deliver an integrated and coordinated response to these impacts of CC. In addition to the aim of stabilising greenhouse gas concentrations in the atmosphere,[59] the CC Bill has the object of strengthening resilience and reducing vulnerability to climate change by building social, economic and environmental resilience.[60] Specific measures need to be undertaken in order to achieve this resilience. These measures may include GI. Also known as environmental infrastructure, GI is infrastructure that is meant to protect human health and safeguard the environment.[61] Consequently, GTI, as a form of GI, will foster environmental and social resilience in cities against the impacts of CC.

The CC Bill proposes that every organ of state must contribute to the policies, plans and decisions of all three spheres of government that exercise functions that affect CC, or those that aim to achieve, promote and protect a sustainable environment.[62] The CC Bill suggests that policies and strategies should be formulated in order to guide the development of infrastructure that will act as a measure to create social and environmental resilience in municipalities. For example, these policies and strategies will ensure social and environmental resilience in municipalities by guiding the process of developing GTI.

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56 *Climate Change Bill* GN 508 of 8 June 2018.

57 Preamble of the CC Bill.

58 Business Tech 2018 https://businesstech.co.za/news/energy/250747/south-africa-has-a-new-climate-change-bill-heres-what-you-need-to-know/.

59 Section 2(c) of the CC Bill. Also see Mkhize 2018 https://www.golegal.co.za/climate-change-bill-south-africa/.

60 Section 2(b) of CC Bill.

61 See para 2.1, 2.2.1, 2.3 and 2.5 in chapter 2 above.

62 Mkhize 2018 https://www.golegal.co.za/climate-change-bill-south-africa/.

4.4 National energy law and policy

South Africa is a developing country where specific energy sources are produced and used in various sectors.[63] For example, coal is exploited and used for electricity, and liquid fuels and gas are used in the transport sector. Other natural and renewable sources of energy such as wind, solar and hydro energy have not been exploited to their full potential. Solar energy is considered to be one of the most practical possible solutions to the shortage of energy in South Africa.[64] There is a need for a shift in the ongoing reliance on coal, gas and oil to more renewable sources of energy. These renewable sources of energy include solar energy, since South Africa has become one of the leading countries currently investing in renewable energy.[65] It is for this reason that various energy laws and legislation in South Africa aim to promote the use of diverse energy resources.[66] Since futuristic and innovative solutions and resources for various developments attract investments, these diverse energy projects may potentially attract investors in developing GTI.

4.4.1 The National Energy Act 24 of 2008

The National Energy Act (NEA)[67] provides for integrated energy planning that acknowledges and considers the factors attached to the supply, transformation and demand for energy.[68] The transport sector consumes a large proportion of the fossil fuels produced in South Africa, but it could also use regulated alternative sources of energy. Therefore, the integrated energy required by the NEA could serve as a guide for investments in energy-related infrastructure such as greener transport systems and infrastructure. The plan also provide guidelines for the appropriate technology to meet energy demands in sectors such as the transport sector.[69] Therefore, the NEA indirectly

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63 Du Plessis *Transactions on Ecology and the Environment* 104.
64 Bischof-Niemz and Creamer *South Africa's Energy Transition: A Roadmap to a Decarbonised Low-cost and Job-rich Future* iv.
65 Murombo 2015 *Journal of Energy and Natural Resources Law*, 320-321.
66 Preamble of the *National Energy Act* 34 of 2008.
67 *National Energy Act* 24 of 2008.
68 Section 6(2) of the NEA.
69 Section 6(6) of the NEA.

encourages investment in innovative and sustainable technologies to develop transport infrastructure such as GTI to decrease the excessive energy usage of the transport infrastructure.

The NEA encourages private investment in GTI through the development of integrated energy plans and research into innovative technologies that may be used to develop GTI. These plans may also include mechanisms to finance such technologies. However, it should be noted that there are no distinctive principles of energy law like sustainable energy usage in South Africa's regulatory framework, much like the principles encompassed in NEMA. This gap in the energy law impedes private investment in GTI because it creates uncertainty in the sense that energy-related matters in developing GTI through privately financed GTI are not taken into consideration.

4.4.2 The White Paper on Energy Policy, 1998

The *White Paper on Energy Policy* (1998)[70] states that the government must work towards establishing measures to reduce energy-related emissions by the transport sector,[71] amongst other sectors, that are harmful to the environment and human health.[72] The transport sector, inclusive of transport systems and transport infrastructure, accounts for an average of 24% of the total energy consumption in South Africa, and more than 90% of transport energy is derived from liquid fuels.[73] These historic statistics have shown that there is a need to diversify the fuels used in the transport sector as well as to develop innovative international transport technologies and energy-efficient measures to operate such transport systems. An example of these innovative transport technologies would be

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70 *White Paper on the Energy Policy of the Republic of South Africa*, 1998. Also see section 24(a) of the *Constitution*.

71 Section 6.3 of the *White Paper on the Energy Policy of the Republic of South Africa*, 1998. Also see Department of Environmental Affairs and Tourism *South Africa Country Report Fourteenth Session of The United Nations Commission on Sustainable Development* 6, 8-9.

72 Section 3.2.2.4 of the *White Paper on the Energy Policy of the Republic of South Africa*, 1998.

73 Section 6.3 of the *White Paper on the Energy Policy of the Republic of South Africa*, 1998.

new infrastructure that links renewable energy supplies to the existing transport infrastructure for optimum, sustained efficiency.[74]

As established above,[75] cities can attract private investments through futuristic and innovative projects. The need to diversify the fuels used in the transport sector and to develop innovative transport technologies for greener and sustainable transport infrastructure as per the *White Paper on Energy Policy* may be a way in which cities could attract investors. Therefore, the *White Paper on Energy Policy* could encourage private investment in GTI in South African municipalities.

4.4.3 National Development Plan 2030

The National Development Plan (NDP) aims to create an energy sector that will contribute to both economic growth and social and environmental development in South Africa.[76] However, the transition to an energy sector that could aid in the successful development of economic infrastructure and environmentally friendly development such as GTI would require large investments.

The NDP envisions an integrated energy sector that could increase the development of environmentally sustainable and energy-efficient transport infrastructure in South African municipalities.[77] It envisions this energy sector with adequate investments in economic infrastructure by 2030.[78] Therefore, the NDP describes the need for a diverse energy market that encourages investor opportunities for financing innovative and sustainable energy solutions as well as renewable energy sources.[79] It indirectly facilitates private

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74 Section 7.2.2 of the *White Paper on Renewable Energy*, 2003.

75 See para 2.2 and 2.2.1 in chapter 2 above. Also see para 3.5.2 in chapter 3 above and para 4.2.2 in chapter 4.

76 The Skills Portal 2017 https://www.skillsportal.co.za/content/basics-sas-energy-law.

77 Department of the Presidency 2012 *National Development Plan 2030: Our Future- Make it Work* 37-37.

78 Department of the Presidency 2012 *National Development Plan 2030: Our Future- Make it Work* 37-38.

79 National Science and Technology Forum *6 – Developing A Strong Network of Economic Infrastructure-Transport, Energy, Water Resources, and ICT* 2-3.

investment in GTI by unveiling the opportunities for investment in a growing sector due to rising energy demand.

4.5 National transport and infrastructure development law

Transport infrastructure is key to sustainable development in a country. Thus, when it comes to GTI specifically, the transport sector and infrastructure development are indispensable. Hence, South Africa's transport systems and infrastructure require legislation and policies that act as an efficient and integrated infrastructure regulatory framework for the entire development, upgrading and rehabilitation of transport infrastructure to ensure that such transport infrastructure is sustainable.[80] In addition, legislation and policies must provide for and promote financial mechanisms to be used to achieve upgraded versions of sustainable transport infrastructure. Therefore, the discussion below aims to assess whether the national transport and infrastructure development encourages or hinders private investment in the desired environmentally sustainable transport infrastructure.

4.5.1 The Infrastructure Development Act 23 of 2014

The primary statute which is relevant to GTI is the *Infrastructure Development Act* (IDA).[81] The IDA prioritises infrastructure development and provides for the

> facilitation and co-ordination of public infrastructure development which is of significant economic or social importance in the Republic.[82]

The IDA aims to improve the management and monitoring of the developed and underdeveloped public infrastructure during all life-phases for the present and future generations.[83] Transport infrastructure has a life span of decades. However, this cannot

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80 Preamble of the *Western Cape Transport Infrastructure* Act 1 of 2013.

81 *Infrastructure Development Act* 23 of 2014.

82 Preamble of the IDA. Also see Cliffe Dekker Hofmeyr 2014 https://www.cliffedekkerhofmeyr.com/en/news/press-releases/2014/projects/infrastructure-development-act-signed-into-law.html.

83 Preamble of the IDA. Also see Department of Planning, Monitoring and Evaluation *Public Infrastructure Delivery and Construction Sector Dynamism in the South African Economy* 26.

be interpreted to mean that the development of sustainable transport infrastructure is a once-off transaction. Sustainable infrastructure requires construction, operation, development and maintenance in a manner that considers its longevity and benefits. The objective of the IDA is to provide for practices and procedures which ensure that infrastructure development is not undertaken "merely in a transactional manner" but in a manner that seeks to advance the Republic's development goals, including skills development and job creation.[84]

The IDA establishes the Presidential Infrastructure Coordinating Committee (PICC)[85] which, together with the Infrastructure and Investment Office (IIO), is responsible for developing the Republic's infrastructure investment strategy and creating expertise and capacity in the government to further infrastructure development. In connection with funding a project, the idea of the project will go through project evaluation, including inputs from both the private and the public sectors. After that, if the project is identified as a candidate for potential funding, it will go through mechanisms encompassed in the IDA.[86] The IDA promotes private investment in sustainable transport infrastructure to the extent that it provides measures and mechanisms such as investments and financial committees and councils to achieve economically viable infrastructure development in South Africa.[87] Transport infrastructure is a type of economic infrastructure. Thus, the IDA will encourage private investment in the development of GTI, which by its nature will support economic growth in South Africa through infrastructure development.

The IDA provides for the development of public infrastructure, which is of significant economic and social importance to the Republic,[88] but it does not make any mention of the *environmental* component of sustainability in the development of public infrastructure. It could therefore in principle stifle private investment in environmentally

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84 Section 2(1)(i) of the IDA. Also see Department of Planning, Monitoring and Evaluation *Public Infrastructure Delivery and Construction Sector Dynamism in the South African Economy* 26.

85 Sections 2(1)(a) and 3(1)(a) of the IDA.

86 Barclay 2020 https://www.pinsentmasons.com/out-law/analysis/infrastructure-south-african-economic-recovery.

87 Sections 4(j) and 6(3)(b)(vii) of the IDA.

88 Preamble of the IDA.

sustainable transport infrastructure in the sense that, according to the Act, social and economically significant infrastructure is to be prioritised.[89]

4.5.2 National Land Transport Act 5 of 2009

The *National Transport Act* (Transport Act)[90] explicitly regulates plans and actions towards the fulfilment of the purpose of transforming the national land transport systems initiated by the preceding *National Land Transport Transition Act*.[91] The institutions and bodies established under the Transport Act monitor the safe transportation of public passengers through the improved transformation and restructuring of national land transport systems and infrastructure.[92] GTI complements the Transport Act to the extent that GTI provides this expected and anticipated positive transformation in national land transport systems and infrastructure by providing forward-thinking solutions to environmentally harmful transportation systems. However, providing these solutions is likely to be expensive.

The Transport Act confers on municipalities the responsibility to financially plan for land transport systems, transport infrastructure and the maintenance thereof. In addition to this financial provision, the Transport Act promotes infrastructure investment pertaining to land transport and infrastructure. It empowers a Member of the Executive Council (MEC) to ensure that there is a linkage between matters impacting on the land transport environment, including environmental issues, and investments in infrastructure.[93] This linkage requires the organs of state responsible for the transformation and development of land transport infrastructure in their jurisdiction to ensure that when developing transport infrastructure, environmental issues and investments in infrastructure are considered.

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89 Preamble of the IDA.
90 *National Transport Act* 5 of 2009.
91 *National Land Transport Transition Act* 22 of 2000.
92 Department of Tourism *National Land Transport Act 5 of 2009 (NLTA)*. The *Road Transport Act* 74 of 1977 similarly deals with the movement and transportation of goods on public roads.
93 Section 9(g) of the Transport Act.

It follows that the Transport Act indirectly promotes investment in GTI through commanding organs of state to consider environmental issues and efficiently manage investments in transport infrastructure and systems.[94]

4.5.3 White Paper on National Transport, 1996

The *White Paper on National Transport*, 1996 reiterates the constitutional right to provide environmentally healthy essential services that promote social and economic development.[95] This right can be realised by providing an integrated, viable and sustainable transport infrastructure better equipped to tackle 21st-century challenges and fulfil its goals as well through granting access to the general public to safe, effective and efficient transportation.[96] The *White Paper on National Transport* envisions that such economically, socially, and environmentally sustainable infrastructure will be financed through a combination of user charges, hybrid agreements and private sector investment.[97] Therefore, transport infrastructure development legislation encourages private investment in GTI as a measure to obtain sustainable development in cities through policy implementation and the implementation of integrated transport plans, among other things. However, it is still uncertain as to whether the *White Paper on National Transport* has improved the status of South Africa's transport infrastructure. Theoretically, transport-related and road legislation, strategies and policies such as the abovementioned could facilitate private investment in GTI, but the implementation of this may be a factor hindering the progress towards GTI financed by private investors because of limited implementation measures and bodies.

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94 Sections 9(g) and (h) of the Transport Act.

95 South African Government 1996 https://www.gov.za/documents/national-transport-policy-white-paper.

96 *National Transport Policy White Paper*, 1996.

97 *National Transport Policy White Paper*, 1996. Also see Department of Transport 2020 https://www.gov.za/documents/national-transport-policy-white-paper.

4.5.4 Green Transport Strategy for South Africa (2018-2050)

As suggested a few times already, a more improved, sustainable and greener transport system has the potential to boost a country's economic growth and create jobs.[98] To realise and exploit this possibility, South Africa has launched its first-ever GTS.[99] Through the GTS, South Africa aims to promote green mobility and ensure that the transport sector encourages and supports the country's economic growth targets whilst protecting the environment.[100] The GTS aims to promote environmentally friendly transport systems and infrastructure through the minimisation of the adverse impacts of the environment, while addressing current and future transport demands.

The GTS envisions the reduction of transport-related environmental impacts by 5% by 2050 by initiating innovative green alternative transformations in the transport sector.[101] An example of green alternatives transport systems includes non-motorised transport infrastructure that will reduce environmentally harmful impacts on the environment by public transportation.[102] In order for the GTS to reach its objective of facilitating the transport sector's transition to climate-resilient transport systems and infrastructure,[103] the transition will require financial resources, significant long-term finance and private investment.[104]

The success of the GTS's objective to facilitate the transformation to environmentally friendly transport systems and infrastructure depends largely on long-term

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98 John, Marrs and Neubert *et al Green Infrastructure Handbook- Conceptual and Theoretical; Background, Terms and Definitions* 10. Also see para 2.2 above.

99 See para 2.5 in chapter 2 above.

100 Makwitting 2018 https://www.sabcnews.com/sabcnews/sa-launches-green-transport-strategy/.

101 Department of Transport: South Africa *Green Transport Strategy for South Africa: (2018-2050)* 21. See also International Institute for Sustainable Development 2019 https://sdg.iisd.org/news/south-africa-launches-green-transport-strategy/.

102 Department of Transport: South Africa *Green Transport Strategy for South Africa: (2018-2050)* 24. Yazid *et al* "The Use of Non-Motorized for Sustainable Transport in Malaysia" 126. *Non*-motorised transport infrastructure includes transport infrastructure that could be used by transport to travel without using or relying on an engine or motor for movement. This include walking and bicycle, and using small-wheeled transport (skates, skateboards, push scooters and hand carts) and wheelchair.

103 Department of Transport: South Africa *Green Transport Strategy for South Africa: (2018-2050)* 6.

104 Department of Transport: South Africa *Green Transport Strategy for South Africa: (2018-2050)* 7.

investments.[105] Although the GTS requires long-term finance and investments in greener transport systems and infrastructure, the strategy requires proactive action from various role players. These actions include the preparation of detailed business plans, and more strategies and implementation measures for private investment in GTI.[106] The GTS suggests that all future investments in the transport sector "should be informed by the vision, guiding principles, and strategic objectives of the GTS."[107] It provides guidelines and principles to ensure the effectiveness of these investments in new concepts such as GTI. Moreover, the GTS provides an enabling environment for private investments in greener transport infrastructure through establishing guiding principles where other policy frameworks create barriers against private investments in GTI.[108]

4.6 The suite of national law on local government

4.6.1 The relevance of local government law

Local government is the sphere of government that is the closest to the people.[109] It is for this reason that local government has a developmental role to play as enshrined in the *Constitution*.[110] Developmental local government means that

> local government is committed to work with citizens and groups within the community to find sustainable ways to meet their social, economic and material needs and improve the quality of their lives.[111]

Local government is thus required to take reasonable steps, within its available resources, to ensure that municipalities sustainably develop municipalities and infrastructure in a way that improves the quality of life and the health of the people in the municipalities.[112]

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105 Department of Transport: South Africa *Green Transport Strategy for South Africa: (2018-2050)* 7.
106 International Institute for Sustainable Development 2019 https://sdg.iisd.org/news/south-africa-launches-green-transport-strategy/.
107 Department of Transport: South Africa *Green Transport Strategy for South Africa: (2018-2050)* 26.
108 Department of Transport: South Africa *Green Transport Strategy for South Africa: (2018-2050)* 47-48.
109 Educational Training Unit date unknown https://www.etu.org.za/toolbox/docs/localgov/webdevlocgov.html#important.
110 Section 153 of the *Constitution*.
111 Section B(1) of the *White Paper on Local Government*, 1998.
112 Section 152(1)(b) of the *Constitution*. Also see Educational Training Unit date unknown https://www.etu.org.za/toolbox/docs/localgov/webdevlocgov.html#important.

This developmental mandate speaks to the competency of local government. Local government must be financially and administratively sound enough to achieve this developmental mandate.[113] Unfortunately, local government usually has limited financial and administrative resources. The reality is that municipalities need to adopt a developmental approach and work with both communities and private sector entities to develop municipalities' sustainably. One of the ways in which municipalities can realise their developmental mandate is fulfilling the constitutional environmental right.

The *Constitution* confers duties and responsibilities on local government concerning aspects of sustainable development, for example. These include the overall responsibility of local government (in cooperation with other spheres of government) to fulfil the constitutional environmental right.[114] Local government is required to take reasonable legislative and other measures to promote environmental health and safety *inter alia* through the prevention of pollution.[115] However, the environmental mandate of local government is further emphasised in section 152(1)(b) of the *Constitution*. Section 152(1)(b) of the *Constitution* makes local government jointly responsible for the fulfilment of the constitutional environmental right by requiring local government to promote a safe and healthy environment.

Coupled with local governments responsibility and object to promote a safe and healthy environment, the *Constitution* confers other responsibilities on local government to achieve sustainable development.[116] The *Constitution* expects local government to develop public infrastructure in their areas with the local governments share of the Republic's national revenue.[117] More specifically, local government is responsible for land transport infrastructure in its area of jurisdiction,[118] which includes the undertaking the planning, construction, financing and maintenance of such infrastructure. The sustainable

113 Section 152(2) of the *Constitution*.
114 Section 152(1)(c) of the *Constitution*. Also see section 24(b) of the *Constitution*.
115 Section 24(b)(ii) of the *Constitution*.
116 Sections 152(1)(b) and 152(1)(c) of the *Constitution*.
117 Section 227(1)(a) of the *Constitution*.
118 Sections 155(6)(a) and (7), section 156(1(a) and schedule 4 Part B of the *Constitution*.

development of public land transport infrastructure should be done within the local governments available financial and administrative resources and competencies.[119] However, local government is not in practice competent in its financial, administrative and management capacity, inevitably leading to poor infrastructure development and maintenance.[120] Therefore, alternative financing options, including investments from the private sector, are needed. The section below discusses the provisions of local government law on the financial aspects of developing environmentally sustainable transport infrastructure.

4.6.2 Local Government: Municipal Systems Act 32 of 2000

The pursuit of sustainable mobility in cities requires capable and competent city-level authorities responsible for the social, economic and environmental administration of a city. The *Local Government: Municipal Systems Act* (Municipal Systems Act)[121] empowers local government to fulfil its constitutional objectives by regulating local government's planning, participatory and service delivery systems.[122] Additionally, the Municipal Systems Act regulates the process of assigning powers and functions to local government.

The Municipal Systems Act indirectly regulates the environmental duties of local government by imposing the responsibility on municipalities to find solutions for problems relating to local government generally,[123] such as sustainably developing cities. Additionally, the Municipal Systems Act imposes a duty on the council of a municipality to ensure that municipal services are delivered in an economically and environmentally

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119 Section 152(2) of the *Constitution*.

120 Brand 2016 https://citymonitor.ai/politics/heres-why-south-africas-local-governments-need-change-their-ways-2411.

121 *Local Government: Municipal Systems Act* 32 of 2000.

122 Parliamentary Monitoring Group date unknown https://static.pmg.org.za/bills/municipalsystemsact.htm. Also see section 10A of the *Municipal Systems Act*. These municipalities have to receive adequate funding to fulfil the assigned powers and functions.

123 Indirect regulation refers to the *Municipal Act* making provisions for certain actions and decisions which can be include actions and decisions relevant to the environment and sustainable development in municipalities. Section 39(3)(c) of the *Municipal Systems Act*.

sustainable manner.[124] It is crucial to ensure that municipalities receive adequate funding to deliver these municipal services sustainably. The Municipal Systems Act indirectly encourages municipalities to deliver basic services through local government's equitable share of the national government revenue, in accordance with the Constitution.[125] However, the Municipal Systems Act does not limit the sources of municipal revenue. A municipality can deliver municipal services through external mechanisms such as private sector institutions.[126] The municipality and an external entity can collaborate in delivering municipal services through an agreement.[127]

A service delivery agreement may also be in the form of a PPP between a municipal entity and an external private entity. The service delivery agreement may also constitute a project finance agreement, as discussed in chapter 3 above.[128] This agreement could ensure that the private sector entity provides adequate funding while the municipality delivers municipal services. However, should municipalities decide to use these external mechanisms, the quality of the services provided should not diminish. Therefore, additional legislation and policy have been adopted to ensure that the services offered by municipalities are financially sustainable.[129]

4.6.3 Local Government: Municipal Finance Management Act 56 of 2003

The *Local Government: Municipal Finance Management Act* (MFMA)[130] is the primary law regulating municipal finance.[131] The MFMA aims to modernise financial management

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124 Section 4(2)(d), 73(2)(c) and 73(2)(d) of the *Municipal Systems Act*.

125 Sections 9(1)(a)(i) and 2(a)(i) of the *Municipal Systems Act*. Also see section 227(1)(a) of the *Constitution*.

126 Section 76(b) of the *Municipal Systems Act*.

127 Section 76(b) of the *Municipal Systems Act*. According to section 1 of the *Municipal Systems Act, a service delivery agreement* means "an agreement between a municipality and an institution or person mentioned in section 76(b) in terms of which a municipal service is provided by that institution or person, either for its own account or on behalf of the municipality."

128 Section 76(b)(i) of the *Municipal Systems Act*. Also see para 3.4 above.

129 This legislation includes the *Local Government: Municipal Finance Management Act 56* of 2003, *Public Finance Management Act* 1 of 1999 and the *White Paper on Local Government*, 1998.

130 *Local Government: Municipal Finance Management Act* 56 of 2003.

131 Corruption Watch 2014 https://www.corruptionwatch.org.za/local-government-in-south-africa-part-4-the-law/.

practices by local government in order to maximise the capacity of municipalities to deliver services to communities.[132] Hence, the MFMA provides for the borrowing of funds by municipalities in the form of long- and short-term debts and PPPs.[133] It would seem that the MFMA regulates the way in which local governments acquire funding from private sector entities in order to close the financial gap, thus hindering the provision of sustainable transport infrastructure to communities. However, the financing option of private investment is not included because the MFMA only provides for the acquisition of funding from private sector entities.[134]

The MFMA does not support or promote private investments in the sense that it regulates private sector finance options, but private investments are not one of them. The MFMA stifles private investments in green transport infrastructure in South African cities to the extent that it only allows for the public sector to acquire debt to develop infrastructure instead of healthier finance options such as private infrastructure. Thus, the MFMA is generally a barrier against long-term environmental investment.[135] It has a budget cycle of three years.[136] This budgetary constraint has caused concerns relating to any attempts to include investments in the interpretation of the provisions of the MFMA. For instance, the budget cycle of three years has caused barriers in much-needed CC adaptation investments.[137] The nature of the budgetary process required in the MFMA provides a barrier against long-term investment in greener infrastructure aimed at combatting the impacts of CC. However, it is suggested that the key impediment for private investment in environmentally friendly infrastructure is not the MFMA but the application of the MFMA in certain project financing agreements.[138] Nonetheless, the MFMA does not appear to be

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132 Department of National Treasury date unknown http://mfma.treasury.gov.za/Pages/Default.aspx.
133 Sections 45, 46 and 120 of the MFMA.
134 Sections 45 and 46 of the MFMA.
135 Culwick *et al A Framework for a Green Infrastructure Planning Approach in the Gauteng City-Region* 53.
136 Section 16(23) of the MFMA.
137 Culwick *et al A Framework for a Green Infrastructure Planning Approach in the Gauteng City-Region* 53.
138 Culwick *et al A Framework for a Green Infrastructure Planning Approach in the Gauteng City-Region* 53.

investment-friendly in that it does not explicitly provide for private investment in infrastructure.

4.6.4 Public Finance Management Act 1 of 1999

The *Public Finance Management Act* (PFMA),[139] much like the MFMA, promotes good financial management by all spheres of government in the Republic.[140] Sound financial management to ensure all expenditure, assets and liabilities are managed effectively by all spheres of government is encouraged to maximise service delivery through the effective use of limited resources.[141] The PFMA also attempts to ensure that there are financial accountability and transparency in all spheres of government.[142]

The PFMA emphasises accountability for results. The aim of the PFMA is also to improve the operational efficiency of government spending.[143] For instance, should a municipality receive funding from a private entity, it should be able to show that the finances are being used for the appropriate purpose. This is referred to as the value-for-money concept.[144] GTI development is quite expensive. Therefore, should the government receive financial resources to develop the infrastructure, the quality and sustainability should match the amount invested.

As established above, South Africa is taking measures to ensure CC mitigation by formulating new national climate change law, amongst other things.[145] The purpose of

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139 *Public Finance Management Act* 1 of 1999.

140 Roman *Financial Reporting and the Public Finance Management Act in the Western Cape* 3. "The recent *Local Government: Municipal Finance Management Act* (MFMA), 2004, adopts the same principles of accountability and transparency as the PFMA. However, the MFMA is relevant to the local municipalities while the PFMA is relevant to Provincial and National departments. They are, however, seen as sister pieces of legislation."

141 Market Supply Network date unknown https://marketsqr.com/government_supplier_community/w/legislations/2683.public-finance-management-act-pfma.

142 Roman *Financial Reporting and the Public Finance Management Act in the Western Cape* 17, 48.

143 Preamble of the PFMA.

144 Roman *Financial Reporting and the Public Finance Management Act in the Western Cape* 17, 48.

145 Business Tech 2019 https://businesstech.co.za/news/government/361490/south-africa-to-introduce-new-climate-change-law/. See para 4.3.4 above.

this formulation is to create a smooth transition to a lower-carbon economy and society.[146] This transition will require investments in the low carbon economy from all spheres of government and the private sector. Private sector investment can play an essential role in decarbonising the economy through innovation and financing.[147] The development of long-term CC mitigation infrastructure in the context of sustainable development will require efficient government spending, which includes the smart use of private investment. The value-for-money concept emphasised by the PFMA will be applied in private sector investments in green sustainable public transport systems and infrastructure.[148] Therefore, the PFMA supports private investments in public GTI to the degree that the public sector players responsible for developing the infrastructure are accountable and transparent in their financial dealings.

4.6.5 White Paper on Local Government, 1998

As already said,[149] local government lacks administrative and financial capacity.[150] Thus, private investments are required to build administrative and financial capacity *inter alia* to meet development targets.[151] The White Paper states that

> private sector investment in municipal infrastructure is required to meet the costs of inherited backlogs, and interventions to enable the involvement of both private sector institutions and public sector financial intermediaries.[152]

The White Paper thus encourages private investment to develop sustainable infrastructure by acknowledging the potential role the private sector and public sector can play in mobilising funds for environmentally sustainable infrastructure in municipalities.[153] Also, the White Paper promotes private investment in GTI to the extent

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146 Business Tech 2019 https://businesstech.co.za/news/government/361490/south-africa-to-introduce-new-climate-change-law/.

147 Barlette *et al Driving Low-Carbon Growth Through Business and Investors Action* 1, 3-4.

148 Roman *Financial Reporting and the Public Finance Management Act in the Western Cape* 48.

149 See para 4.6.1 above.

150 Brand 2016 https://citymonitor.ai/politics/heres-why-south-africas-local-governments-need-change-their-ways-2411.

151 Section B para 1.3 of the *White Paper*.

152 Section G of the *White Paper*.

153 Department of National Treasury *Leveraging Private Finance* 85.

that it recognises that the integration and coordination of the private and public sector in developing urban sustainability through *inter alia* environmental management and transport infrastructure can transform the lives of South Africans. Therefore, intending to transform and improve the quality of lives of South Africans in both urban and rural areas, the White Paper supports private investment in GTI by stressing the need for private investment at the local level.

4.6.6 Integrated Urban Development Framework 2016

The aim of the IUDF to bring about spatial integration and transformation is rooted in three elements, one of which is transport.[154] This policy envisions the restructuring and transformation of urban spaces through transportation by improving public transportation and urban transport infrastructure, and promoting coordination between transport modes.[155] It is suggested that the planning of transport infrastructure and the infrastructure itself should be underpinned by low-carbon, climate-resilient, energy and resource-efficient aspects of infrastructure.[156] These are all critical for creating sustainable and integrated human settlements.[157]

Integrated mobility and transportation systems are vital aspects of integrated urban development and resilience.[158] However, public transport infrastructure in South Africa is severely under-invested in land transport infrastructure upgrades and maintenance.[159] The under-investment is due to insufficient municipal funding and limited municipal budgets. In order to achieve integrated transport and mobility, the IUDF prioritises long-term targets such as the reduction of vehicle emissions and switching to greener fuels to

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154 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 36.

155 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 36.

156 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 37.

157 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 37.

158 Connective Cities 2020 https://www.connective-cities.net/en/topics/integrated-urban-development.

159 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 36-37.

reduce the negative impact of transport on the environment and surrounding community members.[160] Another priority is private infrastructure investments in either greenfield or brownfield transport infrastructure.[161] Although the IUDF sources alternative and innovative financing instruments to increase funding through tax increments and user charges,[162] private investments are particularly necessary for contributing to the achievement of the IUDF's goal of spatial transformation.

The IUDF reiterates the fact that private investors have a vested interest in land value remaining stable and increasing.[163] Private investors are not attracted to low-income areas as viable investment locations.[164] Inclusive, multi-functional urban spaces and human settlements with sustainable transport infrastructure as envisioned by the IUDF will foster growth in private investments in sustainable transport infrastructure, subsequently allowing for investment in integrated human settlements and transport systems. Therefore, the IUDF directly encourages private investment in GTI to the extent that it refers to specific ways in which cities can attract private investments in urban areas with environmentally friendly transport infrastructure.

4.6.7 National Development Plan 2030

The NDP suggests that public transport infrastructure should be prioritised when it comes to infrastructure investment as part of urban development.[165] It encourages the development of GTI through private investment in that it suggests that sustainable urban

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160 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 57-58.

161 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 38. Also see EMIX 2020 https://www.exim.gov/what-we-do/loan-guarantee/project-structured-finance/our-approach-to-project-finance. A greenfield project would be transport infrastructure in cities developed from scratch without building on existing infrastructure. Brownfield projects, on the other hand, are projects that involve upgrades and improvements on existing infrastructure.

162 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 9.

163 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 9. Also see South African Government 2020 https://www.gov.za/WorldCitiesDay2021.

164 Department of Cooperative Governance and Traditional Affairs *Integrated Urban Development Framework* 63.

165 Department of the Presidency *National Development Plan 2030: Our Future- Make it Work* 35, 36.

development is possible through the implementation of plans developed by all spheres of government (particularly local government in its communities). For example, GTI is being planned, built and maintained by the public sector but funded by the private sector against the anticipated cash-flow that will be generated by the infrastructure. The NDP also promotes private investments in environmentally friendly transport infrastructure to the extent that it calls for South Africa to reduce greenhouse gas emissions and improve energy-efficiency in transport infrastructure to protect the natural environment and mitigate the effects of CC.[166] The NDP proposes that this reduction be enforced *inter alia* through environmental management frameworks and prioritising investment in infrastructure that will reduce carbon emissions.[167]

Based on the above, it is evident that local government finance law and legislation and local government policies strongly encourage private investment in environmentally sustainable transport infrastructure. However, the legal framework pertaining to local government and the law and policies discussed above are complex. It cannot be suggested without a thorough assessment that all of them, combined either directly or indirectly, facilitate private investment in GTI. Therefore, further research is needed into this complex legal framework to assess whether the combined South African legal framework directly and adequately promotes private investment in GTI.

4.7 Concluding remarks

Chapter 4 set out to determine whether the South African legal framework facilitates or hinders private investment in GTI.[168] Environmental law and energy law support and encourage greener transport systems and infrastructure to the extent that GTI fosters environment health and safety, and much-needed energy-efficiency. Nevertheless, environmental management and energy legislation makes no direct reference to any financing mechanisms that can finance the development of GTI. Alternative statutes and

166 Department of the Presidency *National Development Plan 2030: Our Future- Make it Work* 38.
167 Department of the Presidency *National Development Plan 2030: Our Future- Make it Work* 36, 38.
168 See papa 4.1 above.

policy filled this gap in the law.[169] National transport infrastructure law and policy, as well as national law on local government finance and infrastructure, directly spoke to the promotion of private investments in GTI.[170] However, it only spoke towards private investments as a way to collaborate with or assist local government in financing public infrastructure. This constitutes an example of a lack of clarity in the South African legal framework as to private investments in GTI as private sector entities only aim to generate profit, not assist the public sector. Fortunately, sustainable development plans and frameworks attempt to steer private investments in transport infrastructure in South Africa.[171]

Collectively, the South African legal framework discussed above encourages private investments in GTI to foster environmental health and safety in urban and rural areas. However, some legislative pieces and policies create barriers in private investments in GTI to the extent that it either only advocates for acquiring of debts from private entities or does not refer to investments as a finance option at all for the development of infrastructure.[172] However, the legislation that does not facilitate private investments or GTI can be read with other laws and policies. Although there are various draft policies such as the *Promotion and Protection of Investments Bill*, 2015 and the *Draft Revised White Paper on National Transport Policy*, 2017 that contribute to developing laws and policies regulating private investments in GTI, they have not yet made it to the status of enforceable law. The combination reveals the potential for a need to revise some aspects of the South African legal framework, thereby constituting a more robust legal framework that is capable of attracting private investors in GTI to the cities. Some recommendations for review are contained in chapter 5.

169 See paras 4.4 and 4.5 above.
170 See paras 4.4 and 4.5 above.
171 See paras 4.5.5 and 4.5.6 above.
172 See para 4.6.3 above.

5 Conclusion and recommendations

5.1 Introduction

Briefly, the overall purpose of the study has been to determine how and to what extent South African law facilitates or hinders private investment in GTI in the country's municipalities.[1] The reason for attempting this determination was to assess from the perspective of law whether the country is ready for the long-term development of novel, extraordinarily expensive transport infrastructure involving various role players such as local government and private investors. This assessment is aimed at providing potential private investors with an idea as to the extent that the South African legal framework encourages private investment in GTI through the protection and security of the investments, as well as through the mitigation of any financial and legal risks attached to the development of GTI.[2]

The main objective of this study was to assess and determine whether South African law and policy facilitate or frustrate private investment in GTI in metropolitan and underdeveloped local municipalities.[3] In order to achieve this objective, the study approached the research question through analysing GTI as a global imperative in order to derive a local definition and understanding of GTI to apply to the domestic law, and also attempted to determine how GTI in the local context could be financed through private entities.[4]

Chapter 2 of this study analysed the broad definition and subsequently the understanding of GTI in the context of South African municipalities through the perspective of international, African regional and South African law to determine the different interpretations of GTI.[5] As a point of departure, the study visualised the reality of South Africa's current transport systems and infrastructure in order to determine and identify

1 See para 1.7 in chapter 1 above.
2 See para 1.6 in chapter 1 above. Also see para 1.8.1 in chapter 1 above.
3 See para 1.7 in chapter 1 above.
4 See paras 1.8 and 1.10 in chapter 1 above.
5 See para 1.7 in chapter 1 above. Also see para 2.1 in chapter 2.

what is needed to fill and sustainably maintain the transport infrastructure gap.[6] The chapter differentiated GTI from sustainable transport infrastructure in order to focus on the environmental aspect of the development of GTI.[7] In identifying the distinguishing features of GTI, the chapter defined GTI from an international perspective.[8] The study established an understanding of GTI as a global imperative to reach global urban goals, create CC resilient cities and provide protection of the environment for the present and future generations by building in and with the natural environment.[9] Through this determination, the study applied the definition of GTI to South Africa as a developing country with unique challenges.[10]

Chapter 3 of the study identified the various private finance options available for bridging the financial gap in transport in the pursuit of sustainable development in South African cities.[11] This chapter identified, defined and applied these private finance mechanisms to the development of GTI.[12] The chapter specifically analysed private investment as a tool for sustainable development in cities generally.[13] The conclusion reached was that private investment through project finance is a practical option for financing the development of GTI.[14]

Based on the finding that private investment is a suitable finance option, this chapter explored the prospects and pitfalls of private investment in GTI to assess the advantages and disadvantages of private investments in GTI.[15] This chapter found that the security of investments, the protection of investments and investors, and protection from risk are primary features that need to be considered in private investment in GTI.[16]

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6 See para 2.2 in chapter 2 above.
7 See para 2.2.1 in chapter 2 above.
8 See para 2.3 in chapter 2 above.
9 See para 2.4 in chapter 2 above.
10 See para 2.5 in chapter 2 above.
11 See chapter 3. Also see para 3.3 in chapter 3 above.
12 See para 3.2.2 in chapter 3 above.
13 See paras 3.3.2, 3.5 and 3.6 in chapter 3 above.
14 See paras 3.4 and 3.5 in chapter 3 above.
15 See para 3.4 in chapter 3 above.
16 See para 3.4 in chapter 3 above.

Chapter 4 reviewed the various laws and policies applicable to private investment in infrastructure,[17] environmental management and protection, greener transport infrastructure and local government's influence on private financing.[18] The chapter set out to provide a clear answer to the question of whether the existing law and policy either facilitates or hinders private investments in GTI in the pursuit of sustainable development in municipalities.[19] To answer the question, chapter 4 assessed the very few statutes and plans relevant to private investment in GTI.[20] It also discussed the other features that might encourage investment in environmentally sustainable infrastructure, such as energy-efficiency and the capacity of other sources of energy to operate transport systems and infrastructure.[21]

The chapter contributed answering the research question of this study by approaching it through the national law regulating the actions and decisions of organs of state responsible for the development of infrastructure in municipalities.[22] It identified local government legislation that makes provision for private entities to assist in alleviating the financial burden placed on municipalities by making provision for certain agreements between local government and private entities.[23] These laws and policies may appear not to effectively support private investment, in particular, to finance GTI.[24] The chapter proceeded to assess the other legislation and plans in place to improve cities through the cooperation of all sectors in the Republic, which encouraged and supported private investment in infrastructure development for various reasons, including the environmental benefits new and improved transport infrastructure may bring.[25]

On the whole, the main objective of this study was determine whether the South African legal framework promotes or obstructs private investment in GTI, to proffer an answer

17 See para 4.2 in chapter 4 above.
18 See chapter 4 above.
19 See para 1.7 in chapter 1 above. Also see para 4.1 in chapter 4 above.
20 See para 4.2 in chapter 4 above.
21 See para 4.3 in chapter 4 above.
22 See chapter 4 above.
23 See para 4.5 in chapter 4 above.
24 See paras 4.6.7 and 4.7 in chapter 4 above.
25 See paras 4.6.6 and 4.6.7 in chapter 4 above.

to the question as to what extent the legal framework encourages or hinders private investments and attracts private investors in GTI in South African cities.[26] The conclusion drawn is that there is a potential for the reinforcement of the South African legal framework to make it more effective in the promotion of private investments generally, and in particular, in environmentally sustainable transport infrastructure.[27]

5.2 Main findings from the perspective of law

The following are the central findings of the study:

5.2.1 The concept of GTI is underpinned by international and regional law and policy

The concept of GTI primarily finds relevance in global and regional law and policy to the extent that the features and benefits of GTI promote what the laws and policies stand for. International and regional law and policy envision resilient and sustainable urban areas *inter alia* through CC mitigation and adaptation, greening various sectors (including the transport sector), and developing innovative environmentally sustainable transport infrastructure as part of sustainable human settlements and cities. Additionally, the study found that these international and regional laws and policies also make provision for financial instruments for investments for funding environmental urban infrastructure. Thus, the concept of GTI, and private investments therein, are underpinned by provisions in global and regional law and policy through the provisions of environmentally friendly, climate-resilient urban infrastructure as well as investments and the funding of sustainable transport and infrastructure.

5.2.2 Private investment is the ideal finance mechanism for developing GTI

The study recognised the expensive nature of GTI, and the processes attached to the development of GTI that need additional financing.[28] This recognition led to the finding that alternative financing mechanisms such as private investment are a suitable option in

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26 See paras 1.6 and 1.7 in chapter 1 above.
27 See chapter 4 above.
28 See para 3.3 in chapter 3 above.

South African cities.[29] However, private investments in GTI have various risks attached to them, including financial and legal risks. Legal risk is linked to the relevant governance structure and the legal framework applicable to the type of infrastructure and sector. The study found that the existence of legal risk suggested that there was a need for relevant and applicable legislation to regulate different aspects of GTI. Although legal risk and other types of risk can ordinarily be mitigated, the mitigation must stem from higher authorities with legal standing.[30] Thus, this fulfils the overall objective of the South African legal framework encouraging private investments in GTI through the mitigation of risks.[31]

5.2.3 The South African legal framework has gaps that may hinder private investments in GTI

The study found that South African investment and finance law intends to promote both foreign and local investment in public infrastructure and assets in the country.[32] However, specific provisions in the statutes may not achieve this intention. Thus, investment and finance law may hinder private investment in GTI to the extent that it creates uncertainty for foreign investors in regard to the state and security of their investments.[33] This uncertainty stems from the investment legislation containing provisions that favour local private investors, in the sense that the latter may receive favour based on his or her situation vis-à-vis the history of the country - whether the investor or business was previously disadvantaged, past imbalances, and the issue of equal national treatment.[34] This uncertainty in the investment law leaves a gap in the law in regard to foreign investments.

Part of the legal framework, the IIP, was established with the aim of facilitating private investments in GTI *inter alia* by establishing regulatory bodies that would cultivate private

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29 See para 3.4 and 3.5 in chapter 3 above.
30 See para 3.4.1.3 in chapter 3 above.
31 See para 1.7 in chapter 1 above.
32 See para 4.2 in chapter 4 above.
33 See para 4.2.2 in chapter 4 above.
34 See paras 4.2.2 and 4.2.3 in chapter 4 above.

investment in public infrastructure.[35] Unfortunately, this has produced further uncertainty in the law, since this newly established plan has no regulatory standing.

The South African legal framework on environmental management and protection does not make specific reference to private investments in environmentally sustainable transport infrastructure.[36] This constitutes a barrier in determining whether private investments are a potential finance option for infrastructure that will benefit and protect the environment. However, the *Constitution* encourages private investments in GTI to the extent that the environmental right is a right that should be guarded by the private sector as well through any measures available.[37] The study finds that as the *Constitution* supports private investment in GTI, other environmental management and energy law and policy should also encourage private investments in GTI, since their provisions should be consistent with the provisions of the supreme law, the Constitution.

The study further found that local government law and policy welcome private investment in GTI to the extent that it assists in the realisation of local government's objectives in accordance with the Constitution, to ensure a safe and healthy environment and sustainable development.[38] However, local government law does not facilitate private investment in GTI as it predominantly provides for loans, debts and PPPs as ways in which public infrastructure can be developed.

5.3 Recommendations

Based on the findings above, the study proposes the following:

1. It is suggested that the national government should review the Investments Act with a view to clarifying the position of foreign investors in public infrastructure in the Republic. This review is necessary to clarify the extent which the advantages granted to local investors may be applicable when it comes to the Investments

35 See para 4.2.2 in chapter 4 above.
36 See paras 4.3.2, 4.3.3 and 4.4.4 in chapter 4 above.
37 See para 4.3.1 in chapter 4 above.
38 See para 4.6 in chapter 4 above.

Act's empowering provisions. In this regard, these provisions include the statement that any organ of state can take justified measures to redress past inequalities, uphold the rights in the *Constitution* and protect the environment.[39] A misapplication might prejudice the interests and rights of potential private investors. This has the potential to discourage rather than facilitate private investment in GTI.

2. It is recommended that the environmental protection and management legal framework of South Africa be reviewed and revised to include private finance options such as investments (instead of loans, debts and PPP's) among the financial measures that can be used to ensure environmental protection and management in communities. This could serve as a way to broaden the measures that can be used to provide a safe and healthy environment as per the Constitution.

3. A law reform process is recommended, leading to the inclusion of private sector finance options in national transport and infrastructure development laws and policies. The incentivisation of private sector finance should be prioritised so that *inter alia* more environmentally sustainable infrastructure can be financed. This would increase the extent to which long-term GTI development could be financed. Also, it would encourage overall greener infrastructure development in the Republic.

4. It is recommended that the national legislator should consider broadening the scope of the finance mechanisms used to achieve sustainable development in existing local government legislation to include private investment instead of long- and short-term loans and PPPs only. This would allow for effective developmental local governance with strong financial competency to efficiently deliver services as well, and it would also promote environmental health and safety.

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[39] See paras 4.2.1 and 4.2.2 in chapter 4 above.

5.4 Questions for future research

It became evident throughout this study that there are aspects of private investment in GTI and the applicable legal framework in South Africa that could benefit from additional and further research. The remaining legal research areas include:

1. GTI as it complements the environmental right in the *Constitution* and its relevance in other national sector laws such as the law on environmental protection and management.

2. The essence of private investment in public infrastructure, with a focus on the degree of legal protection of investors and the security of investments in investment and finance law.

3. A legal inquiry into how investment related law and legislation, such as the Investments Act could be used to help redress historical, social, and economic inequalities that remain prevalent in South African cities and towns.

4. An estimation of how exactly local government finance laws may have to be amended to foster private investment in developing urban infrastructure in South African metropolitan areas as well as secondary cities and towns.

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