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URBAN ROAD TRANSPORT AND ENVIRONMENTAL SUSTAINABILITY IN NIGERIA: A LEGAL COMPLIANCE ANALYSIS

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Abstract

Urban road transport remains the dominant mode of transportation in Nigerian cities and plays a central role in urban development. However, it has also contributed significantly to traffic congestion, air pollution and rising greenhouse gas emissions. Unlike advanced cities where urban transport systems increasingly promote environmental sustainability, Nigeria's urban road transport subsector continues to operate unsustainably, largely due to institutional, regulatory and compliance deficiencies rather than the absence of legal frameworks. Using doctrinal legal research methodology and empirical data from authorised online sources, this article examined Nigeria's legal, policy and institutional frameworks governing environmental sustainability in the urban road transport subsector. It analysed key instruments, including the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act 2007 (as amended in 2018), vehicular emissions regulations, the Climate Change Act 2021 and the Environmental Impact Assessment Act 1992. The study found that despite extensive legislation, enforcement remains weak, compliance is poor and public awareness is limited. Consequently, environmental pollution persists, with high vehicular emissions, limited adoption of emissions-reduction technologies and inadequate urban transport infrastructure. The article concludes that environmental sustainability in Nigeria's urban road transport subsector requires effective enforcement, strengthened institutional capacity, improved transport infrastructure and sustained public sensitisation. It recommends strengthening enforcement, promoting cleaner road transport technologies, modernising urban transit systems and intensifying public awareness efforts to concretise environmental sustainability in Nigeria's urban road transport sector.

Keywords: Urban Road Transport, Legal Compliance, Environmental Sustainability, Emissions.

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1.1 Introduction

Transportation is defined as the movement or conveyance of persons and merchandise over defined distances.[1] Historically, transportation involved walking long distances and the usage of animals or canoes, which was mostly tedious and time-consuming, until it all changed when vehicles, aircraft, trains, and ships powered by engines were invented. Contemporary innovations in transportation have cut travel time significantly, providing more comfort and safety.[2] The road transport sector is particularly significant because the motor vehicle, otherwise known as a car, is one of the most common means of personal, private transportation over distances once canvassed by private horse-driven carriages, with personal vehicles accounting for over 85% of passenger vehicles worldwide.[3] The developments in the motor vehicle industry have led to different kinds and sizes suitable for personal carriage, passenger, or cargo services, which have made them a necessity for individuals or families to own.

But as with all means of transportation, road transportation leaves a negative impact on the environment. Cars rely on fossil fuels to be powered, while the road on which they drive is mostly made from asphalt or bitumen, which is derived primarily from fossil fuels.[4] There are more than 1.5 billion motor vehicles globally,[5] each of which emits carbon dioxide and other substances that cause harm to the environment and contribute to up to 25% or more global CO2 and GHG emissions, contributing to climate change.[6] According to reports, road transportation contributes about 3.53 billion metric tonnes of CO2 to global CO2 emissions.[7] Due to this, governments around the world are taking steps to reduce the environmental impacts of cars through adopting electric or solar vehicles, increasing mobility by low-emission buses, increasing the number of trees along the roads, incorporating emissions reduction technology in vehicles to reduce the overall impact, among others.[8] Through policy, legal and institutional frameworks, countries

[1]Cambridge Dictionary, Cambridge University Press and Assessment 2023. <https://dictionary.Cambridge.org/dictionary/english/transportation> Accessed 20th December 2025.

[2] B. Van Wee, J. A. Annema and J. Kohler, '*Innovations in Transport: Success, Failures and Societal Impacts*' (Edward Elgar Publishing, 2022).

[3] H. Brunner and Others, 'Evaluation of Various Means of Transport for Urban Areas' *Energy Sustainability and Society* (2018) 8 (9) 1-11.

[4] M. Tanyıldızı, and E. O. Karaca, 'The Superiorities of Concrete Roads over Asphalt Roads', 1st Advanced Engineering Days (2021) 48-50.

[5] Ivan Grujić and Others, 'Numerical Analysis of Hydrogen Fueled IC Engine' 19th Conference on Thermal Science and Engineering of Serbia, Serbia, October 22–25, 2019, 450.

[6] W. Zhang, X. Fang and C. Sun, 'The Alternative Path for Fossil Oil: Electric Vehicles or Hydrogen Fuel Cell Vehicles?' *Journal of Environmental Management* (2023) 341 118019.

[7] W. So, 'Light-duty Vehicle Carbon dioxide Emissions Worldwide 2010-2022' (Statistica: 20th January 2026). <https://www.statista.com/statistics/1388092/carbon-dioxide-emissions-cars-vans-transport/> Accessed 21st January 2026.

[8] V. Venkatesh and A Awasthi, 'Evaluation of Factors for Adoption of Alternative-Fuel-Based Vehicles' *Sustainability* (2025) 17 (18) 8243. X. Wang and Others, 'Transportation Carbon Reduction Technologies: A Review of Fundamentals, Application, and Performance' *Journal of Traffic and Transportation Engineering (English Edition)* (2024) 11 (6) 1340-1377.

around the world are promoting cleaner models of road transportation,[9] going ahead to change road construction materials from asphalt to concrete, which is not primarily sourced from fossil fuels.[10]

Nigeria particularly needs these legal, policy and institutional frameworks as part of its efforts to decarbonise to meet its net-zero emissions goals and promote a cleaner environment. This is because Nigeria's urban areas and cities are congested, and cars are major contributors to urban pollution and CO2 emissions.[11] Vehicular emissions represent a major, rapidly growing source of air pollution and greenhouse gases (GHGs) in Nigeria, with road transport accounting for approximately 13.7% to 15.3% of national GHG emissions.[12] The sector is the highest consumer of fossil fuels and is responsible for nearly half (roughly 48%) of Nigeria's total CO_2 emissions from fuel combustion.[13] Private cars and trucks are among the heaviest polluters in Nigeria.[14]

Accordingly, this article, therefore, examines Nigeria's urban road transport sector to assess the effectiveness of existing legal, policy and institutional frameworks in promoting environmental sustainability through compliance. Specifically, it seeks to analyse the scope of environmental compliance obligations applicable to the sector, evaluate the extent to which these obligations have been implemented in practice, identify the challenges undermining effective compliance, and propose practical measures for achieving a more environmentally compliant and sustainable urban road transport system in Nigeria.

1.2 Conceptual Clarifications

1.2.1 Urban Road Transport

Urban road transport refers to the movement of people, goods and services within urban areas, cities, or metropolitan areas through road-based infrastructure.[15] This infrastructure includes the roads/highways themselves. The vehicular systems include private cars, taxis, buses and trucks. Urban road transport encompasses the road networks, vehicular systems, traffic management and practices that shape urban mobility therein. Thus, urban road transport is not just the road

[9] UNDP, 'What is Sustainable Transport and what role does it play in tackling Climate Change?' (UNDP: 3rd June 2025). <https://climatepromise.undp.org/news-and-stories/what-sustainable-transport-and-what-role-does-it-play-tackling-climate-change#> Accessed 21st January 2026.

[10] S. Barbhuiya, T. Qureshi and B. B. Das 'Advancing Sustainable Pavements: A Review of Low-Carbon Construction Materials and Practices' *Discover Concrete and Cement* (2025) 1 (19) 1-71.

[11] A. O. Oluwakoya, 'A Comprehensive Assessment of Transportation Emissions in Nigeria: Trends, Drivers, and Impacts' *Proceedings of the Nigerian Academy of Science* (2023) 16 (1) 61-71.

[12] Transport, Climate and Sustainability Global Status Report - 4th Edition, 'Nigeria' 2025. <https://gsr4.slocat.net/wp-content/uploads/sites/2/2025/06/Nigeria.pdf#> Accessed 12th April 2026.

[13] A. Eyinade, 'Mainstreaming Climate Action into Nigeria's Transportation Sector' (Africa Policy Research Institute: 22nd December 2025). <https://afripoli.org/mainstreaming-climate-action-into-nigerias-transportation-sector#> Accessed 11th April 2026.

[14] 'S. A. Ajayi and Others, 'The Impact of Traffic Mobility Measures on Vehicle Emissions for Heterogeneous traffic in Lagos City' *Scientific African* (2023) 21, e01822.

[15] Y. Gao and J. Zhu, 'Characteristics, Impacts and Trends of Urban Transportation' *Encyclopedia* (2022) 2 1168–1182.

infrastructure; it connects the urban area socio-economically, influencing life, accessibility and productivity within the city.[16]

In developed cities/urban areas around the world, a good urban road transport sector is characterised by well-maintained roads, organised traffic systems, limited or non-existent traffic congestion, well-planned public transit systems such as bus rapid transit (BRT), as well as bus lanes, cycling lanes and pedestrian walkways.[17] This system encourages integration within cities, faster mobility and lower carbon emissions and is what this article recommends should be adopted in urban areas and cities in Nigeria.

1.2.2 Environmental Sustainability

Environmental sustainability refers to the capacity of humans to interact with the ecosystem in ways that preserve their existence and viability for both present and future generations.[18] It emphasises the responsible use of natural resources, reduction of environmental degradation and promotion of practices that maintain ecological balance.[19] Practically, environmental sustainability requires minimising waste and emissions reduction, adopting renewable energy and biodiversity conservation so that the environment and its resources can be viable for present and future generations.[20] These aims are to promote the resilience of ecosystems and are the crux of climate discourse today.

In transportation, sustainable transportation is the key term used to explain how transportation, including urban road transport, can be environmentally sustainable.[21] Through incorporating emission reduction technology in vehicles, phasing out those that emit harmful gases, adopting electric, solar, hydrogen or gas-powered vehicles, building road with more concrete instead of asphalt, incorporating trains and buses to reduce the use of private cars, environmental sustainability in urban road transport can be achieved and is what this article recommends for Nigeria to fully adopt in line with its climate goals.

[16] J. S. Toledano, 'The Efficiency of Urban Public Transport and its Impact on Environmental Sustainability' *Sustainable Technology and Entrepreneurship* (2025) 4 100097 1-14

[17] G. Cheng, X. Liu, Y. Pei, 'A Review of Research on Public Transport Priority based on CiteSpace' *Journal of Traffic and Transportation Engineering (English Edition)* (2023) 10 (6) 1118-1147.

[18] W. D. N. M. S. Tennakoon, M. P. N. Janadari and I. D. Wattuhewa, 'Environmental Sustainability Practices: A Systematic Literature Review' *European Journal of Sustainable Development Research* (2024) 8 (3) 1-18. N. Patterson, 'What is Environmental Sustainability? Goals with Examples' (South New Hampshire University: 20th September 2024). <https://www.snhu.edu/about-us/newsroom/stem/what-is-environmental-sustainability#> Accessed 21st January 2026.

[19] ibid.

[20] ibid*.* J. Mensah, 'Sustainable Development: Meaning, History, Principles, Pillars and Implications for Human Action: A Literature Review' *Cogent Social Sciences* (2019) 5: 1653531 6. Tennakoon, Janadari and Wattuhewa, (n. 18).

[21] I. Heidari, A. T. Eshlaghy and S. M. S. Hoseini, 'Sustainable transportation: Definitions, Dimensions, and Indicators – Case Study of Importance-Performance Analysis for the City of Tehran' *Heliyon* (2023) 9, e 20457 1-17.

1.2.3 Legal Compliance

Legal compliance refers to the adherence of individuals, organisations, and institutions to established laws, regulations and standards set by governing authorities.[22] It involves aligning operational practices with statutory requirements such as environmental requirements, as this article considers. Compliance involves both preventive measures, in order to mitigate the risks of sanctions or punishment and punitive measures which foster accountability and institutional trust. This article underscores the existence of several environmental laws and regulations. Widespread and optimal compliance with these laws and regulations enforced by the regulatory bodies, depending on how well these laws are suited to tackle current environmental challenges, can significantly contribute to achieving environmental sustainability in Nigeria's urban road transport sector.

1.3 Legal, Policy and Institutional Framework for Environmental Compliance in Nigeria's Road Transport Sector

This section considers Nigeria's major legal, policy and institutional framework that provide for environmental protection and compliance in the nation's road transport sector. They are considered hereunder.

1.3.1 Legal Framework

1.3.1.1 Constitution of the Federal Republic of Nigeria, 1999 (as amended)

Nigeria's 1999 Constitution (as amended) is its supreme law.[23] Under its Fundamental Objectives and Directive Principles of State Policy, the Constitution provides for the preservation and protection of the environment, going ahead to specify that the water, land, air, wildlife and forest of Nigeria should be safeguarded by the State.[24] This is particularly important to urban road transport as the environmental effects thereof continue to increase. Steps must be taken to control and limit pollution arising from urban road transport, and the Constitution empowers the government to take measures for that purpose.[25]

1.3.1.2 National Environmental Standards and Regulations Enforcement Agency (NESREA) Act, 2007 (as amended in 2018)

The Act creates NESREA, Nigeria's foremost environmental protection agency. Under the Act, the Agency is responsible for the protection of the environment, conservation of biodiversity and sustainable development of the country's natural resources in general.[26] Additionally, the responsibility to work with stakeholders and other related agencies in and outside Nigeria to

[22] J. Donoghue, 'What is Legal Compliance?' (Diligent: 10th January 2023). <https://www.diligent.com/resources/blog/steps-evaluating-legal-compliance> Accessed21st January 2026. A. Wattoo, 'Corporate Governance and Legal Compliance' *International Journal of Law and Policy* (2025) 3 (12) 27-48.
[23] Constitution of the Federal Republic of Nigeria 1999 (as amended), s. 1.
[24] ibid, s. 20.
[25] ibid.
[26] NESREA Act, 2007 (as amended in 2018) s. 2.

implement and enforce environmental rules, standards, laws, and guidelines, among others, lies with the Agency.[27] Furthermore, the Act empowers the Agency to adopt programmes for setting standards and regulations for the prevention, reduction and elimination of pollution and other forms of environmental degradation in the nation's environment and for its restoration and enhancement thereof.[28]

Since transportation-sourced pollution is rampant, the Act reflects additional powers and duties of the Agency to make regulations for the control of air pollution originating from vehicles.[29] The enforcement of compliance with existing regulations and recommended programmes to control noise originating from transportation or other activities is also directed under the Act.[30] The Act goes ahead to prohibit the discharge of hazardous substances into the air, land or waters of Nigeria or adjoining shorelines, except as otherwise permitted or authorised under any law in force in Nigeria.[31] Discharge from any source, including vehicles, is therefore prohibited.[32] Regulations made pursuant to the Act and relevant to this article are looked at hereunder. The existence of this Act is commendable, but implementation is not widespread enough. Transportation-sourced pollution, especially air pollution, is still high even with the presence of standards and regulations, as this article considers.

1.3.1.3 National Environmental (Control of Vehicular Emissions from Petrol and Diesel Engines) (CVE) Regulations, 2011

The Regulations were enacted with the aim of restoring, preserving and improving the quality of air, reducing air pollution and improving the health of residents who live in urban areas that are susceptible to vehicular pollution.[33] The Regulation provides for vehicular emission standards stipulating that vehicles in Nigeria which do not comply with the standards and provisions thereto should not be assembled, manufactured or imported;[34] and petrol and diesel engines must not be operated in a manner that exceeds the standards set under the Schedules to the Regulation.[35]

Emission tests are required to be carried out under the Regulations, and where emissions exceed, the engines are not to be operated.[36] Additionally, the Regulations prohibit the importation of vehicles that do not have approved emission reduction technology.[37] Since vehicular emissions are

[27] ibid. s. 7.
[28] ibid, s. 8.
[29] ibid, s. 20 (d).
[30] ibid, s. 22.
[31] ibid, s. 27-29.
[32] ibid.
[33] National Environmental (Control of Vehicular Emissions from Petrol and Diesel Engines) (CVE) Regulations, 2011, reg. 1.
[34] ibid, reg. 3 (4), 20.
[35] ibid, reg. 3, 8, 17.
[36] ibid, reg. 9, 19.
[37] ibid, reg. 3 (4) (b).

among the most toxic to the environment and to humans, the existence of these Regulations is commendable, but implementation is limited as these Regulations are not properly enforced, nor are they known by the public, which is a challenge this article notes.

1.3.1.4 Climate Change Act, 2021

Nigeria's foremost climate law, the Act, provides a framework for achieving reduced greenhouse gas (GHG) emissions, promoting green growth and achieving sustainable socioeconomic development for all.[38] Accordingly, under the Act, Nigeria needs to create programmes, policies, among others, on climate change mitigation and adaptation, attain net zero GHG emissions by 2050-2070 in line with Nigeria's international climate change commitments; and implement measures and standards that promote low carbon economy and sustainable livelihood.[39]

The Act establishes the National Council on Climate Change to make policies and decisions on all matters concerning climate change in Nigeria.[40] The Council is also vested with powers to bring about the implementation of targets and guidelines to achieve emissions and other climate change-causing materials regulation and reduction.[41] The Minister responsible for Transportation and for Environment are members of the Council.[42] Under the Act, Nigeria's Climate Change Action Plan is also expected to prescribe measures for renewable energy use for transportation,[43] which includes road transport. Quite important that the Transport and Environmental Ministers are members of the Council to ensure the formulation and implementation of strategies aimed at emissions reduction in the transport sector, including road transport.

1.3.1.5 Federal Road Safety Commission (Establishment) Act, 2007

This Act establishes the Federal Road Safety Commission.[44] The Act is instrumental as it provides that regulations may be made by the Commission relating to the emission of smoke and of visible vapour, ashes and excessive noise from vehicles.[45] This indicates the fundamental importance of environmental protection within the road transport sector, even though effective enforcement to limit vehicle-sourced pollution is low.

[38] Climate Change Act, 2021, s. 1.
[39] ibid.
[40] ibid, s. 3 (1).
[41] ibid, s. 4.
[42] ibid, s. 5 (a) (b) (c) and (l).
[43] ibid, s. 20 (4) (b) (vii).
[44] Federal Road Safety Commission (Establishment) Act, 2007, s. 1.
[45] ibid, s. 5 (h), (l) (i) (ii)

1.3.2 Policy Framework for the Promotion of an Environmentally Sustainable Road Transport Sector in Nigeria

Nigeria has several policies that encourage environmental sustainability in its road transport sector. These are discussed below:

1.3.2.1 Nigeria's Transport Policy 2010

Nigeria's National Transport Policy 2010, being the nation's first comprehensive transport policy adopted in the 21st century, provides a framework for the planning, development and regulation of the country's transport system.[46] Central to the policy is the recognition that transport is not only an economic facilitator but also a significant source of environmental pollution.[47] The long-standing neglect of rail and inland waterways has entrenched dependence on road transport, thereby intensifying congestion, fuel consumption, vehicular emissions and urban environmental degradation.[48]

The policy acknowledges the existence of structural weaknesses within the road transport sector, including deteriorated infrastructure, ineffective traffic management, weak regulatory enforcement and poor vehicle standards.[49] These deficiencies are both operational and have a negative impact on the environment. Poor road conditions increase fuel use and vehicle operating costs, while congestion in major urban corridors results in higher atmospheric pollution.[50] The policy thus situates environmental sustainability as an integral component of road transport reform.

The Policy proposes legislative enactments, institutional facilitation and regulatory oversight, public-private partnerships to improve road infrastructure, improved road maintenance, traffic control and urban transport management to reduce congestion, fuel wastage and improve mobility.[51] Pedestrian facilities, intersections and passenger infrastructure are to be incorporated to enhance efficiency and walkability.[52] Inland waterways and rail transportation are also to be developed to reduce overdependence on road transport and overall emissions therefrom.[53] The policy indeed provides a pathway for Nigeria to achieve sustainable transportation, but this depends on strengthening enforcement and compliance mechanisms, infrastructure, upgrading vehicle emission standards and expanding urban public transport systems.

[46] O. F. Dickson, 'A Review of Nigeria's National Transport Policy: The Indispensable Role of Technology and Innovation (TI)' *The Expression: An International Multidisciplinary e-Journal* (2019) 5 (6) 1-10.
[47] National Transport Policy 2010, 2.
[48] ibid, 24 and 31.
[49] ibid, 25.
[50] ibid
[51] ib*id,* 24-38.
[52] ibid, 36.
[53] ibid, 2, 24, 31.

1.3.2.2 National Energy Policy 2003

Nigeria's National Energy Policy was developed by the Energy Commission of Nigeria to provide a framework for energy production and utilisation.[54] It is relevant to road transport, especially due to its emphasis on diversification beyond fossil fuels, promotion of renewable energy and integration of environmental sustainability into energy planning.[55] The policy highlights energy efficiency and conservation measures, which are critical for reducing the carbon footprint of road transport.[56] The federal government is beginning to promote the use of natural gas for commercial vehicles, but its safe and widespread application has been contested by stakeholders and the masses.[57]

1.3.2.3 Nigeria's Energy Transition Plan 2021

Nigeria's Energy Transition Plan builds upon the foundational objectives of the National Energy Policy, which emphasises energy utilisation, diversification, efficiency and reduced dependence on fossil fuels. While the Policy established a broad framework for sustainable energy development across sectors, the Energy Transition Plan gives practical direction to these goals by outlining a clear pathway towards decarbonisation and net-zero emissions.

Nigeria's Energy Transition Plan, launched in 2021, represents the nation's landmark commitment to achieving net-zero emissions by 2060.[58] It positions road transport as a critical sector for decarbonization, emphasising electrification of mobility through electric buses and vehicles, expansion of charging infrastructure and integration of renewable energy in transport systems.[59]

The Plan also emphasises the importance of a just transition so that vulnerable populations and communities can benefit from cleaner transport solutions. The Plan is indeed a commendable plan as it seeks to balance economic growth with environmental protection.[60] This is the highlight of environmental sustainability. But for the Plan to be successful, financing, institutional coordination and technological adoption are fundamental, which this article hammers on.

1.3.2.4 National Environmental Policy, revised 2016

Nigeria's National Environmental Policy, implemented through the National Environmental Standards and Regulations Enforcement Agency (NESREA), provides the regulatory backbone for environmental sustainability in Nigeria.[61] The Policy mandates the use of environmental impact

[54] National Energy Policy 2003, 1-2.
[55] ibid, 4.
[56] ibid, 47.
[57] J. D. Obele, 'Trends and Perceptions Regarding the Decline of CNG Vehicles in Nigeria' *Journal of Accounting, Marketing and Management Research* (2025) 12 (2) 108-113.
[58] Nigeria Energy Transition Plan. <https://energytransition.gov.ng/#> Accessed 22nd January 2026.
[59] ibid <https://energytransition.gov.ng/transports/> Accessed 22nd January 2026.
[60] Nigeria Energy Transition Plan. <https://energytransition.gov.ng/#> Accessed 22nd January 2026.
[61] National Environmental Policy, revised 2016.

assessment for major projects impacting the environment, enforces pollution control measures and promotes the adoption of environmentally friendly technologies.[62]

Applied to road transport, the policy seeks to mitigate environmental harm from infrastructure development and vehicle operations, by promoting the construction of better infrastructure, pollution reduction technologies and enforcing environmental standards.[63] Nonetheless, enforcement challenges persist, with urban air pollution from vehicles, weak institutional monitoring and enforcement, even with regulations in place.

1.3.2.4 National Climate Change Policy (2021-2030)

Nigeria's National Climate Change Policy (2021–2030) provides a comprehensive policy framework for addressing climate change through coordinated mitigation and adaptation actions across key sectors of the economy.[64] The Policy adopts a multi-sectoral approach aimed at reducing greenhouse gas emissions, enhancing climate resilience and promoting low-carbon development in line with Nigeria's international obligations under the Paris Agreement.[65]

In relation to the transport sector, the Policy recognises transportation as a significant source of emissions and underscores the need to integrate climate considerations into transport planning, promote energy efficiency and encourage a transition to cleaner mobility options.[66] The Policy underscores the need to promote low-carbon mobility options and energy efficiency in transport planning.[67] By emphasising emissions reduction, institutional coordination and sustainable development, the Policy reinforces the relevance of environmental compliance within Nigeria's urban road transport sector and complements existing environmental and transport regulatory frameworks.

1.3.3 Institutional Framework

1.3.3.1 National Environmental Standards and Regulatory Enforcement Agency

The National Environmental Standards and Regulations Enforcement Agency (NESREA) is the primary institution responsible for enforcing environmental laws, standards and regulations.[68] Under the NESREA Act 2007 (as amended in 2018), the Agency is mandated to control air pollution, regulate vehicular emissions, enforce compliance with environmental standards and coordinate national efforts aimed at environmental protection, including pollution arising from road transport activities.[69]

[62] ibid
[63] ibid
[64] Nigeria National Climate Policy 2021-2030 <https://www.preventionweb.net/publication/nigeria-national-climate-change-policy-2021-2030> Accessed 11th April 2026.
[65] ibid.
[66] ibid.
[67] ibid.
[68] NESREA Act 2007 (as amended in 2018), s. 2.
[69] ibid, s. 7, 8.

In the context of urban road transport, NESREA's effectiveness is often constrained by limited technical capacity, insufficient funding, and overlapping responsibilities with state agencies.[70] Despite these challenges, NESREA remains central to the regulation of vehicular emissions and the implementation of national environmental policies, serving as the primary federal authority for ensuring compliance with environmental standards in the transport sector.

1.3.3.2 Federal Ministry of Environment

The Federal Ministry of Environment plays a central policy-making and supervisory role in environmental governance.[71] Through NESREA and related agencies, the Ministry oversees the development and implementation of national environmental policies and ensures compliance with environmental obligations applicable to road transport and infrastructure projects.[72] The Ministry also coordinates Nigeria's commitments under international environmental agreements, ensuring that national policies align with global best practices.

1.3.3.3 National Council on Climate Change

The National Council on Climate Change, established under the Climate Change Act 2021, is responsible for coordinating Nigeria's climate mitigation and adaptation efforts.[73] The Council provides policy direction on emissions reduction and sustainable development, including measures affecting the transport sector.[74] The inclusion of the Ministers responsible for Environment and Transportation within the Council[75] underscores its relevance to urban road transport emissions and sustainability governance. Its influence is particularly significant in driving the adoption of low-carbon technologies and aligning transport sector reforms with Nigeria's net-zero commitments.

1.3.3.4 Federal Road Safety Commission

The Federal Road Safety Commission (FRSC) is another important agency established under the Federal Road Safety Commission (Establishment) Act 2007[76] that also plays a fundamental institutional role in environmental compliance within the road transport sector. Beyond road safety regulation, the FRSC is empowered to make and enforce regulations relating to vehicle conditions, including the emission of excessive smoke and noise, which have direct environmental implications in urban areas.[77]

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[70] E. O. Enakireru and G. W. Ekakitie, 'Appraisal of the Legal Framework and Regulation on Automobile Emissions: Nigeria Perspectives' *Journal of Environmental Law & Policy* (2024) 4 (3) 1-19.
[71] Federal Ministry of Environment, 'About.' <https://environment.gov.ng/mandate/> Accessed 11th April 2026.
[72] ibid.
[73] Climate Change Act, 2021, s. 3 (1).
[74] ibid; National Council on Climate Change, 'About.' <https://climatecouncil.gov.ng/#About> Accessed 11th April 2026.
[75] Climate Change Act 2021, s. 5 (1).
[76] Federal Road Safety Commission (Establishment) Act 2007, s. 1
[77] ibid, s. 5.

The Commission conducts periodic vehicle inspections and public awareness campaigns on roadworthiness and environmental compliance. However, the FRSC faces challenges such as inadequate inspection infrastructure, limited personnel, and the prevalence of ageing vehicles on Nigerian roads.[78] Strengthening the FRSC's capacity is essential for improving compliance with environmental standards in the urban road transport sector.

1.3.3.5 Federal Ministry of Transportation

The Federal Ministry of Transportation is responsible for transport policy formulation and sectoral oversight.[79] Its role includes developing strategies for efficient and sustainable transport systems[80] and collaborating with environmental institutions to integrate environmental considerations into road transport planning and operations.[81] The Ministry's Department of Road Transport and Mass Transit Administration is vested with the overall responsibility of policy formulation and administration for road transport and mass transit operations in the country.[82]

The Ministry is equipped to work together with the Ministry of Environment and its agencies to integrate sustainability considerations into transport planning. The Ministry's leadership is crucial for fostering innovation, encouraging the adoption of cleaner transport technologies, and ensuring that transport sector growth aligns with environmental objectives.[83]

1.4 Overview of the Effects of Urban Road Transportation on the Environment

Road transport is the most common form of transport in Nigeria, being also the most affordable transport means both in Nigeria and Africa. Nigeria has high vehicular usage, with about 10-13 million vehicles operating in the country.[84] Vehicles affect the environment through pollutant emissions, noise emissions and biodiversity disruptions as discussed below.

1.4.1 Pollutant Emissions

Vehicular transportation is one of the largest causes of air pollution. Hydrocarbons (petrol), when burned in the engines (through combustion) and emitted via the exhaust pipes, what is released into the atmosphere includes: Carbon dioxide, nitrogen oxides, Sulphur oxides, and particulate

[78] A. J. Gana and J. A. Emmanuel, 'Road Transportation and Traffic Law Enforcement in Nigeria: A case study of the Federal Road Safety Corps (FRSC)' *West African Journal of Industrial & Academic Research* (2014) 11 (1) 134-151.
[79] Federal Ministry of Transportation, Nigeria, 'About.' <https://transportation.gov.ng/about/> Accessed 12th April 2026.
[80] ibid.
[81] ibid.
[82] Federal Ministry of Transportation Nigeria, 'Department of Road Transport and Mass Transit Administration.' <https://transportation.gov.ng/ova_dep/road-transport-mass-transit-administration/> Accessed 11th April 2026.
[83] ibid.
[84] G.K. Ayetor and Others, 'Investigating the State of Road Vehicle Emissions in Africa: A Case Study of Ghana and Rwanda' *Transportation Research Interdisciplinary Perspectives* (2021) 11, 5. R. Iwunze, '77% of Vehicles on Nigeria's Roads Uninsured-NIA', (Vanguard Newspapers: 7th May 2021). <https://www.google.com/amp/s/www.vanguardngr.com/2021/05/7-of-vehicles-on-nigerias-roads-uninsured-nia/amp/> Accessed 22nd February 2026.

matter.[85] which are toxic. Smoke, smog and soot are released in large quantities since there can be hundreds of vehicles passing through and within an urban area, and these substances stay suspended in the atmosphere, reducing the air quality and putting human and plant/animal health at risk.[86] Additionally, these substances, especially Sulphur and Nitrogen oxides, when they react with oxygen, water, and other chemicals, are among the causal factors of acid rain, which is very toxic.[87]

Soot, smog and haze, which are major problems in cities around the world, are partly caused by emissions from urban vehicle movements in congested cities in Nigeria. It has been noted that traffic can cause up-to 90% of these pollutant emissions in urban cities.[88] The presence and effects of these are seen in Nigerian cities, including Port Harcourt,[89] Lagos,[90] Benin,[91] Enugu[92] and Kano.[93] The soot, smog and haze make cities unhealthy and barely liveable.[94] Since road transport in Nigeria is fuelled by hydrocarbons, more than half of GHG emissions from the country come from it and although an increase in the use of sustainable models and public transportation will effectively reduce emissions,[95] Nigerian cities have not been largely explored, nor adapted to this.

1.4.2 Biodiversity Concerns and Noise Pollution

In Nigeria, the construction and presence of this infrastructure in certain areas affects surrounding flora and fauna and threatens biodiversity, thereby leading to the displacement of species of plants and animals or resulting in the total loss of ecosystems in the area. This concern was raised during the proposed construction of the Cross River super highway as recently as 2016.[96] Similarly, the

[85] New York State Department of Environmental Conservation, 'Controlling Air Pollution from Motor Vehicles.' <https://dec.ny.gov/environmental-protection/air-quality/controlling-motor-vehicle-pollution> Accessed 22nd February 2026.
[86] Union of Concerned Scientists, 'Cars, Trucks, Buses and Air Pollution', 2008, updated September 2023. <https://www.ucsusa.org/resources/cars-trucks-buses-and-air-pollution> Accessed; 22nd February 2026.
[87] K. C. Weathers, D. L. Strayer and G. E. Likens, 'Fundamentals of Ecosystem Science' (2nd Ed. Elsevier, 2021). <https://www.sciencedirect.com/topics/earth-and-planetary-sciences/acid-rain> Accessed 22nd February 2026.
[88] A. O. Atubi, 'Transport and the Environment: Towards Reducing Road Traffic Emissions in Nigeria' *STECH* (2015) 4 (1) 71.
[89] A. C. Nkwocha and Others, 'Environmental Assessment of Vehicular Emission in Port-Harcourt City, Nigeria' *International Journal of Environment, Agriculture and Biotechnology (IJEAB)* (2017) 2 (2) 906-911.
[90] M. Maduekwe and Others, 'Road Transport Energy Consumption and Vehicular Emissions in Lagos, Nigeria: An Application of the LEAP Model', *Transportation Research Interdisciplinary Perspectives* (2020) 6 100172.
[91] W. A. Raji, L. A. Jimoda and J. K. Odobor, 'Assessment of Vehicular-Induced Emissions in some Selected Areas in Benin City' Journal of Applied Sciences and Environmental Management (2021) 25 (8) 1535-1539.
[92] J. O. Nwadiogbu and Others, 'Contributions of Vehicular Traffic to Carbon Monoxide Emissions in Enugu Metropolis, Nigeria' *Archives of Applied Science Research* (2013) 5 (6) 189-192.
[93] O.J. Okunola and Others, 'Assessment of Gaseous Pollutants along High Traffic Roads in Kano, Nigeria' *International Journal of Environment and Sustainability*, (2012) 1 (1) 1-15.
[94] Atubi (n. 88).
[95] Madueke (n. 90).
[96] M. I. Mahmoud and Others, 'Alternative Routes for a Proposed Nigerian Superhighway to Limit Damage to Rare Ecosystems and Wildlife' *Tropical Conservation Science*. 2017 10. <https://journals.sagepub.com/doi/full/10.1177/1940082917709274> Accessed 22nd February 2026.

construction of the coastal highway raised biodiversity protection and environmental concerns.[97] Although EIAs of road projects are conducted, implementation of mitigation efforts remains an issue.[98] This puts the surrounding environment at risk.

Concerning noise pollution, noise emissions from vehicles in urban and densely populated areas in Nigeria, either from the constant honking or engine sound, are a daily occurrence, and whilst the effects are not so severe, prolonged vehicular noise causes annoyance and irritation to people.[99] living or working nearby.

1.5 Environmental Compliance in Nigeria's Urban Road Transport Sector: What it entails

Environmental compliance is the action by which an individual or organisation adheres to every applicable environmental law, regulation, rule, standard, policy and code.[100] Environmental compliance in Nigeria's urban road transport sector represents the operationalisation of environmental laws, standards and policies within the everyday functioning of transport systems. It involves ensuring that road transport activities, whether infrastructure development, vehicle operation or traffic management, are conducted in ways that minimise ecological harm and align with national sustainability objectives. In Nigeria's rapidly expanding urban areas, where road transport dominates mobility, compliance is fundamental to governance and needs to link transport efficiency with environmental protection.

At the institutional level, compliance is directed under the mandates of NESREA and state environmental management agencies, which enforce pollution and emissions reduction measures upon road users and environmental impact assessments (EIA) for transport projects.[101] The National Transport Policy 2010 at its time provided a framework for integrating environmental considerations into transport planning, while the National Environmental Policy reinforces the need for sustainable practices across sectors.[102] More recently, Nigeria's Energy Transition Plan has introduced a climate-oriented dimension to compliance, emphasising the electrification of

[97] S. Alabede, 'Protecting the Coastline along Lagos-Calabar Coastal Highway' (The Nation: 13th October 2025). <https://thenationonlineng.net/protecting-the-coastline-along-lagos-calabar-coastal-highway/> Accessed 22nd January 2026.

[98] Federal Ministry of Environment, 'New Ado-Iyin Road, EIA Report' 2020. <https://ead.gov.ng/wp-content/uploads/2020/09/final-NEW-ADO-IYIN-ROAD-EIA-report.pdf> Accessed 22nd January 2026. African Development Bank, 'Ebonyi State Ring Road Project: Environmental and Social Impact Assessment (ESIA) Summary' 2018. <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Environmental-and-Social-Assessments/Nigeria_-_Ebonyi_State_Ring_Road_Project_-_ESIA_Summary.pdf> Accessed 22nd January 2026.

[99] European Environment Agency, 'Health Impacts of Exposure to Noise from Transport' 2022. <https://www.eea.europa.eu/en/analysis/indicators/health-impacts-of-exposure-to-1> Accessed 22nd January 2026.

[100] Geo Forward, Environmental Compliance Definition' 2022. <https://www.google.com/amp/s/www.geoforward.com/environmental-compliance/> Accessed 22nd January 2026.

[101] NESREA Act 2007 (as amended in 2018). Rivers and Lagos State's Environmental Management Laws.

[102] National Transport Policy 2010, 2.

mobility and the adoption of renewable energy technologies.[103] Together, these frameworks establish the legal and policy architecture within which compliance is expected to operate.

But in practice, environmental compliance entails several interrelated processes. Road infrastructure projects need to undergo EIA to evaluate environmental consequences and suggest mitigation strategies before approval.[104] Transport operators and private car owners also need to adhere to vehicle emission standards stipulated under the NESREA Act and the CVE Regulations, ensuring that cars, buses and trucks meet acceptable limits for pollutants.[105] Compliance also extends to waste management practices, including the proper disposal of used oils, tyres, and other transport-related materials that pose risks to urban ecosystems. Furthermore, compliance extends to the public being trained on compliance requirements and activities to increase awareness and adherence thereof.

The adoption of cleaner technologies, such as electric buses and alternative fuels, which will reduce the sector's carbon footprint and align with Nigeria's net-zero commitments are also fundamental.[106] Ultimately, legal compliance entails more than legal adherence; it represents a holistic commitment to sustainability, which can be achieved through thorough planning, strong regulation and institutions, effective enforcement and public participation. But the realities and challenges with compliance, however, remain uneven in Nigeria and are discussed hereunder.

1.6 Challenges to Environmental Compliance in Nigeria's Urban Road Transport Sector

Several interrelated challenges undermine effective environmental compliance in Nigeria's road transport sector.

1.6.1 Limited Enforcement of Legal, Policy and Institutional Framework

A major challenge to environmental compliance in Nigeria's urban road transport sector is the limited enforcement of existing legal, policy and institutional frameworks. Although several laws, policies and regulations establish standards for controlling vehicular emissions and promoting environmental sustainability, enforcement of compliance remains limited and inconsistent in practice.[107]

Furthermore, compliance is hindered by the weak enforcement capacity of regulatory agencies, particularly the lack of adequate equipment and technical resources needed to conduct routine vehicular emission testing as mandated by law.[108] This institutional limitation, combined with a poor vehicle maintenance culture among road users, has significantly reduced compliance with emission standards.

[103] Nigeria Energy Transition Plan (n. 84).
[104] EIA Act 1992.
[105] NESREA Act 2007, s. 22. CVE Regulations 2011, reg. 3 (4), 20.
[106] S. C. Nwokolo, E. L. Meyer and C. C. Ahia, Credible Pathways to Catching Up with Climate Goals in Nigeria' *Climate* (2023) 11 196.
[107] Enakireru and Ekakitie (n. 70).
[108] ibid.

1.6.2 Limited Level of Awareness concerning Environmental Legislation and Regulations

Another critical challenge is the low level of public awareness concerning existing environmental regulations. For instance, the CVE Regulations 2011 prohibit prolonged engine idling in enclosed or partially enclosed spaces[109] and the operation of petrol engines emitting visible smoke.[110] However, practices such as excessive engine idling and the operation of visibly smoky vehicles remain widespread among Nigerian drivers,[111] largely because road users are unaware of the legal consequences of their actions. This contributes to the persistence of smoke and soot, which are harmful to the environment and limit the level of compliance with the laws thereof.

1.6.3 Infrastructure and Economic Constraints

Infrastructure and economic constraints further compound the problem. As Schwela and Haq found, Nigeria's cities suffer from ineffective and inadequate public transport, an increase in congestion, and inadequate and deficient implementation of vehicle emission standards.[112] Rising fuel prices have also placed economic pressure on road users,[113] while cleaner alternatives such as compressed natural gas (CNG) vehicles, electric vehicles and other green transport technologies which Nigeria's federal government seeks to mainstream in Nigeria[114] remain financially inaccessible to most Nigerians upfront, and the maintenance infrastructure remains limited.[115] These structural, institutional and socio-economic challenges collectively demonstrate that existing legal and regulatory measures have yet to translate into effective environmental sustainability within Nigeria's urban road transport sector, necessitating further reforms and targeted interventions.[116]

1.7 Conclusion

This article has examined Nigeria's road transport sector with particular attention to the role of environmental compliance in shaping its sustainability trajectory. The discussion highlighted how the legal, policy and institutional framework provide the regulatory and institutional basis for integrating environmental considerations into urban road transport operations. Indeed, while these frameworks articulate ambitious goals, their effectiveness depends greatly on consistent

[109] CVE Regulations 2011, reg. 13.
[110] ibid, reg. 8 (2).
[111] Fueling Agile Solutions, 'Why engine idling is costing Nigerian fleet owners more than they think and how to fix it.' <https://fuelingagilenigeria.com/why-engine-idling-is-costing-nigerian-fleet-owners-more-than-they-think-and-how-to-fix-it/> Accessed 12th April 2026.
[112] Schwela and Haq (n. 111).
[113] T. Saanyol, 'Fuel crisis fuels inflation as transport, food prices rise across markets' (Tribune Online: 16th March 2026). <https://tribuneonlineng.com/fuel-crisis-fuels-inflation-as-transport-food-prices-rise-across-markets/> Accessed 17th March 2026.
[114] A. Eyinade (n. 13) 9.
[115] ibid; J. Onyeama, 'High fuel prices spur CNG, yet barriers slow adoption' (Business Day News: 13th April 2026). <https://businessday.ng/news/article/high-fuel-prices-spur-cng-yet-barriers-slow-adoption/> Accessed 13th April 2026.
[116] A. O. Obadiah, J. N. Nwazi and J. O. Abusomwan, 'Automobile Emissions in Nigeria: An X-ray of Enforcement Mechanisms for Control' *African Journal of Law, Ethics, and Education* (2025) 8 (2) 214-231.

implementation, stronger institutional capacity and improved regulatory coordination. Environmental legal compliance has emerged as a decisive factor in ensuring that the transportation sector, especially urban road transport systems, reduces environmental harm while meeting mobility demands. If committed leadership is put in place to actualise these measures, Nigeria's urban road transport sector can be transformed into a sector that balances mobility, accessibility and environmental awareness.

The following findings highlight the practical realities of environmental compliance in Nigeria's urban road transport sector and expose the key factors limiting the effectiveness of existing legal frameworks.

1.7.1 Weak Enforcement of Vehicular Emissions Laws

The analysis of Nigeria's legal and regulatory frameworks reveals that, although several laws, regulations and institutions exist to address urban road transport-related challenges, their effectiveness remains limited. This article finds that despite the clear provisions of the National Environmental (Control of Vehicular Emissions from Petrol and Diesel Engines) Regulations 2011, which prohibit the importation and operation of vehicles without approved emissions-reduction technologies and restrict the use of engines exceeding prescribed emission limits, non-compliant vehicles dominate Nigerian roads.[117]

Nigeria records one of the highest levels of vehicle usage relative to population size in Africa,[118] with correspondingly high carbon dioxide and greenhouse gas (GHG) emissions. The country also ranks among the most polluted in terms of air quality on the continent.[119] Vehicles manufactured several decades ago and emitting visible pollutants continue to operate daily within urban centres, reinforcing Nigeria's reputation as a destination for end-of-life and second-hand vehicles.[120]

This indicates that although emissions standards are clearly established under existing regulations, regulatory agencies lack adequate equipment, technical capacity and consistency in monitoring and sanctioning non-compliant vehicles,[121] resulting in the continued operation of highly polluting and ageing vehicle fleets, contributing to Nigeria's share of CO2 emissions from vehicles.

1.7.2 Fragmented Mandates and Limited Inter-agency Coordination

Nigeria's Ministry of Transport and Ministry of Environment are the two federal ministries relevant to this paper. Within these ministries are the Federal Road Safety Commission and the National Environmental Standards and Regulatory Enforcement Agency. These two agencies have

[117] CVE Regulations 2011, reg. 3 (4).

[118] R. Fletcher, 'Africa Faces 1.1 Million Deaths Annually from Air Pollution – Second Largest Risk After Malnutrition' Health and Environment, October 2022. <https://healthpolicy-watch.news/africa-faces-1-million-deaths-annually-from-air-pollution-second-only-to-malnutrition/> Accessed 23rd February 2026.

[119] D. D. Sasu, 'CO2 Emissions in Africa 2021, by Country', 2023. <https://www.statista.com/statistics/1268395/production-based-co2-emissions-in-africa-by-country/> Accessed 23rd February 2026.

[120] E. Adeh, 'Net Zero Target Uncertain With 40% Used Vehicles Dumped in Nigeria, Others' (Thisday: 28th February 2022. <https://www.thisdaylive.com/index.php/2022/02/28/net-zero-target-uncertain-with-40-used-vehicles-dumped-in-nigeria-others?/> Accessed 23rd February 2026.

[121] Enakireru and Ekakitie (n. 70).

similar mandates of enforcing environmental compliance in the road transport sector as their establishment legislations indicate.[122] However, the current environmental challenges in Nigeria's urban road transport sector across its cities indicate challenges in coordination and synergy. For major Nigerian cities as authors have noted, the fragmented institutional mandates and poor inter-agency coordination significantly undermine environmental compliance in Nigeria's urban road transport sector, leading to enforcement gaps and weak regulatory outcomes.[123]

1.7.3 Inadequate and Outdated Vehicle Systems and Urban Transport Infrastructure

Available compliance assessments further suggest that a significant proportion of public and private vehicles in Nigeria's cities fail emission standards during the limited testing conducted by regulatory agencies.[124] The findings also show that Nigeria's public transport systems remain underdeveloped, with increased congestion and elevated emission levels.[125] The underdevelopment of efficient public mass transit systems has exacerbated congestion, increased emissions and constrained the adoption of low-emission mobility solutions, thereby weakening environmental sustainability efforts.[126] As the global transport sector moves steadily towards cleaner and greener vehicle technologies, Nigeria's urban road transport sector remains far from full adoption of sustainable mobility practices.

The conclusive finding of this study is that Nigeria's urban road transport sector is constrained not by the absence of legal and policy frameworks, but by weak enforcement, limited institutional capacity, inadequate infrastructure and low public awareness. Although existing laws establish standards capable of promoting environmental sustainability, poor compliance and implementation have allowed high vehicular emissions, ageing vehicle fleets and underdeveloped public transport systems to persist. Addressing these deficiencies, therefore, requires strengthening enforcement mechanisms, improving institutional coordination, investing in modern transport infrastructure and promoting behavioural change, which underpin the recommendations advanced in this study.

[122] FRS (Establishment) Act 2007, s. 5. NESREA Act 2007, as amended in 2018, s. 20.
[123] A. O. Oluwakoya, 'Regulatory Frameworks and Enforcement Mechanisms in Urban Transport Governance: A Case Study of Lagos State' *RUN Contemporary Journal of Politics and Administration* (2024) 3 (1) 18-31. M. A. Suleiman and D. P. Dahida, 'Public Transportation and Sustainable Urban Mobility: Socio-Economic and Environmental Dimensions in Abuja, Nigeria' *International Journal of Innovative Development and Policy Studies* (2026) 14 (1) 317-334, 330.
[124] P. S. Obayendo, 'Vehicle Inspection for reducing Emission: Stakeholders Workshop on Air Quality and Transportation Challenges in Nigeria.' <http://cdn.cseindia.org/userfiles/Vehicle-Inspection-for-Reducing-Emissions.pdf> Accessed 23rd February 2026. B. N. Okafor, 'Environmental Implications of Non-Compliance with Road Setbacks Standards in the Awka Capital Territory' *International Journal for Innovative Research in Multidisciplinary Field* (2020) 6 (9) 36.
[125] D. Schwela and G. Haq, '*Transport and Environment in Sub-Saharan Africa*', Stockholm Environment Institute, 2013, 1-4.
[126] Enakireru and Ekakitie (n. 70).

The following recommendations, if implemented, will place Nigeria on a pathway to achieving environmental sustainability in its urban road transport sector. They include the following:

1.7.4 The need to strengthen legal and policy enforcement and institutional capacity by equipping environmental and transport regulatory agencies with adequate emissions-testing facilities, trained personnel and clear enforcement powers, while ensuring consistent sanctions against non-compliant vehicles. To encourage public acceptance and cooperation, it is important to enhance public awareness and environmental mitigation measures through continuous sensitisation campaigns on legal compliance and responsible road use, complemented by urban greening initiatives such as tree planting to improve air quality and support emissions reduction.

1.7.5 There is also the need to improve institutional coordination among environmental, transport and road safety authorities to eliminate fragmented mandates and ensure coherent implementation of environmental sustainability standards within urban road transport governance. This improvement must be supported with the training and retraining of staff on their varied institutional roles and responsibilities.

1.7.6 Finally, it is imperative that there be a modernised and expanded urban transport infrastructure through sustained investment in efficient, low-emission mass transit systems, alongside incentives for adopting cleaner transport technologies such as compressed natural gas (CNG) and electric vehicles. This should be supported by promoting sustainable urban mobility planning by integrating non-motorised transport infrastructure, including pedestrian walkways and cycling lanes, to reduce congestion, excessive vehicle use and emissions.