

Assessing National Transport Policies, and Projects for SDG Delivery – Case of Urban India

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Abstract

The transport sector is central to climate action, contributing 24% of global direct CO₂ emissions, with road transport as the dominant source. In India, although transport accounts for only 10% of national emissions, rapid urbanization and rising incomes are expected to escalate urban travel demand and emissions. This paper assesses India's urban transport policies and programmes for their alignment with the Sustainable Development Goals (SDGs), and their broader climate and equity implications. Using a novel rating framework, we evaluate the legal status, scope, and intervention types across a diverse policy landscape- missions, frameworks, acts, and schemes. We map these interventions against categorized SDG targets and themes, and statistically assess their contribution to inclusive, low-carbon urban mobility. Despite fragmented systems and limited clean energy adoption, the sector offers significant mitigation potential. Our findings highlight key policy gaps and opportunities, offering guiding principles to strengthen SDG integration in transport planning. This paper contributes to the discourse on aligning urban transport with climate and development goals in the Global South.

Keywords: transport policies, SDGs, inclusive transport, systematic assessment, urban and gender equity

1. Introduction

The transport sector is integral to Greenhouse Gas (GHG) emission reduction efforts due to its substantial and increasing emissions footprint. Globally, it contributes approximately 24% of direct CO₂ emissions, with road transport responsible for nearly 75% (Our World in Data, 2024). India's share is still low at about 10% of CO₂ emissions, with road transport contributing 88% (Jain & Rankavat, 2023). However, India's high population contributes to higher GHG emissions, even though it has the least per capita emissions. Rising incomes, increasing purchasing power, and high rate of urbanisation are expected to increase travel demand and, consequently, GHG emissions under a business-as-usual scenario in the urban transport sector. Hence, urban transport is a priority in India's Nationally Determined Contributions (NDCs), India's ambitious Viksit Bharat 2047, and sub-national mitigation policies – to fully decarbonize the economy by 2047 (Prime Minister's Office, 2024).

Neither India's NDCs have specific transport sector GHG emission reduction targets, nor do other national government pronouncements such as Viksit Bharat, Net-Zero by 2070, etc. Nonetheless, a wide range of measures for urban transport, intercity transportation infrastructures, sustainable logistics, and inland waterways are proposed in the NDCs. Sustainable and green transport is emphasised as a vital strategy to achieve the ambitious target of CO₂ emissions intensity reduction of 33-35% between 2005 and 2030 (MoEFCC, 2022). India's National Action Plan for Climate Change (NAPCC) includes initiatives to increase the share of public transport, improve vehicle efficiency, and enhance penetration of biofuels (MoEFCC, 2008). India has also proposed an action plan to achieve Agenda 2030, pertaining to the Sustainable Development Goals (SDGs). Firstly, SDG11, pertaining to inclusive and sustainable cities, has transport-related targets. Secondly, all other SDGs have links with urban transport. Hence, the urban transport policies and programmes need to be assessed for their contribution to economic growth, and sustainable and equitable development. The SDGs contain targets for economic growth, sustainable development, and equity. In this paper, we assess the urban transport policies and programmes in India for their contribution to achieving select SDGs and their selected targets.

The National Urban Policy Framework (NUPF) identifies several systemic issues in India's urban transport, including fragmented public transport systems, inadequate road-based public transport, insufficient non-motorized transport infrastructure, and the absence of comprehensive parking policies. Additionally, challenges related to accessibility for differently-abled individuals and safety concerns for women restrict equitable access to public transport (MoHUA, 2020). Reliance on fossil fuels, slow adoption of clean energy technologies, inadequate public transport infrastructure, and growing dependence on private vehicles impede progress (Shalini & Chandramohan, 2024). Despite these challenges, the transport sector offers significant opportunities for emissions reductions (Our World in Data, 2024).

The paper employs an innovative rating system to evaluate their effectiveness by examining direct and indirect interactions between transport policies and SDG targets. Finally, we provide insights into effective policies that support Inclusive Low-Carbon Urban Transport and offer guiding principles to strengthen SDG integration into the transport policy framework. Through this, the paper aims to highlight a broader discourse on aligning transport policies with climate and development goals for cities of the Global South.

Section 2 lays out the relationship between urban transport and the SDGs based on the literature assessment. Section 3 presents the methodology for assessing the transport policies in the Indian context. Policy terrain in the Indian context is multi-faceted and complex, involving several types of instruments ranging from Mission, Frameworks, Acts and Ordinances, Rules, Policies, Programmes, and Schemes. We refer to all these as 'policies' going forward in this paper. While several policies focus on minimising the transport sector's environmental impacts, no legislation comprehensively addresses all components of urban transport, which includes public, private, informal, and shared mobility. To attain a holistic perspective of national commitments toward sustainable urban transport, we reflect on a few salient features of the existing policies. Section 4 presents the assessment of the urban transport policies and programmes landscape in India.

We have undertaken the following analysis using the interventions proposed in the policies and SDG targets:

- i) Assessing the nature of policies such as legal status, policy scope and policy type and total interventions proposed in each policy
- iii) Categorisation of SDG targets into policy themes and assessing interventions proposed in each policy that support the SDG themes
- iv) Categorisation of interventions into policy categories (called intervention-category) and assessing these against the SDG themes.

Section 5 presents a systematic assessment of the urban transport policies and programmes in achieving the SDGs through deploying statistical means. Section 6 presents the discussion and conclusion of the paper.

2. Urban Transport & SDG Relationship

Transport has strong links with Sustainable Development Goals (SDGs). While recent sustainable transportation literature focuses on decarbonisation pathways, the literature on transport planning's impact on socioeconomic conditions, public health, and environmental justice developed since the late 1980s must also be brought within the transport policies assessment framework. We find wide application of the SDG framework in developmental studies (Neumann, 2019), providing broad connections between the SDGs and urban transport (SLoCaT, 2018). These are followed by several advanced studies suggesting these relationships, for example (i) identifying synergies and trade-offs of urban transport initiatives with SDGs (Mahadevia, Mukhopadhyay, Lathia, & Gounder, 2023), (ii) contextualising impacts of urban transport projects on SDGs in cities of the Global South (Mahadevia, Lathia, & Mukhopadhyay, 2024), and (iii) by quantifying SDG potential of urban India's transport sector (Mahadevia, Lathia, & Mukhopadhyay, 2024). Below we discuss the link of urban transport with the SDGs related to economic growth, equity, well-being, and overall sustainability and quality of life.

Urban Transport's relationship with Poverty Alleviation (SDG1) & Economic Growth (SDG8): Transport is inseparably linked to socio-economic development (Mahadevia, Mukhopadhyay, Lathia, & Gounder, 2023). Transport networks reduce poverty by providing access to economic opportunities and, in turn, increase travel demand, creating a two-way relationship between transport and poverty alleviation (OECD, 2021) (Mahadevia, Mukhopadhyay, Lathia, & Gounder, 2023). Public transport interventions like Bus Rapid Transit (BRT) are reported as effective poverty reduction strategies in the Global South (Vaz & Venter, 2012) by generating employment and providing accessibility for work at affordable costs.

Urban Transport's Relationship with Urban and Gender Equity (SDG10 & SDG5): The lack of a holistic planning approach in the cities of the Global South creates fragmented and inconvenient transport systems that often exclude the urban poor and other disadvantaged groups (Pucher, Korattyswaropam, Mittal, & Ittyerah, 2007),

curbing their access to opportunities and exacerbating their poverty and causing spatial mismatch (Anand and Tiwari, 2006; Beyazit, 2011; Mahadevia, Mukhopadhyay, Lathia, & Gounder, 2023; WRI, 2019). Transport is also crucial to women's empowerment, helping them access economic opportunities and participate in civic and public life (Shah, Vishwanath, Vyas, & Gadepalli, 2017; Venter et al, 2007). Yet transport systems in cities worldwide fail to cater to women and girls, curbing their mobility and restricting their economic and interpersonal growth (Mahadevia, 2015).

Urban Transport's Relationship with Public Health & Well-being (SDG3 & SDG13): The intersection of urban transport and health unfolds in the context of air quality, physical activity, access to healthcare services, cardiovascular diseases, mental well-being, and GHG emissions. These links become even more important in the Global South for two main reasons: it experiences more exacerbated impacts of climate change as it hosts more than half of the global population living in poverty (Glazener, et al., 2021), and it is rapidly motorising and increasing dependence on conventional automobiles leading to local air pollution and population shifting away from active transport (Mahadevia, Mukhopadhyay, Lathia, & Gounder, 2023).

Urban Transport's Relationship with Quality of Life in Cities (SDG2, SDG11): Transport plays a crucial role in enabling access and inclusion in two ways: first, by allowing access to affordable housing and essential services (Mahadevia, Lathia, & Mukhopadhyay, 2024). Secondly, through universal design and inclusive planning, urban transport systems improve accessibility, mobility, and, in turn, quality of life for all, especially vulnerable socio-economic groups (Mahadevia, Lathia, & Mukhopadhyay, 2023). At times, when transport planning- especially the expansion of road infrastructure or public transport routing- is not context-sensitive, it leads to the loss of natural, cultural, or built heritage, negatively affecting citizens' quality of life (Chamseddine & Boubkr, 2020).

3. Assessment of Transport Policies - Methodology

In this section, we present the methodology for assessing the urban transport policy landscape in India. It includes identifying SDG targets that are used for the assessment of national transport policies and programmes, framework for the descriptive assessment of the policies, assessment of the interventions proposed in each of the policy for their achieving of the SDG targets, and then assigning SDG target achievement scores for the each of the interventions proposed in the policies. For this analysis, 18 national policies and the 56 interventions identified across all 18 policies are assessed against the 19 SDG targets. The 56 interventions are combined into nine broad categories of policy categories such as Urban Planning, Infrastructure, Finance & Governance, Technology and Innovation, and others.

3.1 Identifying Relevant SDG Targets for Policy Assessment

The established interrelationship between transport and SDG targets forms the foundation for the assessment of the transport policies and programmes. Based on an extensive literature review of about 250 publications, we identify 19 SDG targets that directly or indirectly affect low-carbon urban transport (Mahadevia et al., 2023). The 19 SDG targets were clubbed by themes prevalent in urban planning and urban transport literature. These themes are listed below.

- i. Poverty and Alleviation and Economic Growth: includes 4 SDG targets (SDG1.4, SDG2.3, SDG8.4 and SDG9.1)
- ii. Urban and Gender Equity: includes 3 SDG targets (SDG4.8, SDG5.5, and SDG10.1)
- iii. Public Health & Well-being: includes 7 SDG targets (SDG3.6, SDG3.9, SDG7.3, SDG12.3, SDG12.C, SDG13.1 and SDG13.2)
- iv. Quality of Life: Well-being: includes 5 SDG targets (SDG6.1, SDG11.1, SDG11.2, SDG11.6, and SDG17.14)

A detailed description of SDG targets' relationship with urban transport is described in the following section.

3.2 Framework for Profiling Relevant Policies¹

18 national-level policies addressing the urban passenger transport sector were used for the evaluation (see Table 1 for details). The selected policies were profiled based on the authors' experience of working on the urban transport sector in India. The parameters used for profiling are:

- i. **The legal Statute of the policy** assesses whether the policy is mandatory (legally binding), partially mandatory (some components of the policy are legally binding), or voluntary (no components are legally binding).
- ii. **Urban Scope of the policy:** assesses whether the policy is 'Urban Influencing' (drafted with a national scope that indirectly affects cities), 'Urban Focused' (drafted precisely for all urban areas), or 'City-Centric' (drafted for selected cities)

- iii. **Policy Instrument Type:** assesses whether the policy nature is ‘Regulatory’ (manifests as rules, directives of mandates), ‘Economic’ (manifests as taxes, subsidies, grants, and funds), ‘Governance’ (manifests as governance structures or mechanisms), or ‘Informative’ (manifests as guidance documents).
- iv. **Implementation Cost of the policy** assesses if the policy will High, Medium or Low implementation cost.
- v. **Technology Integration of the policy** assesses if the policy required High, Medium or Low dependence on technology.

Table 1. Policies used for the Assessment

Policy Code	Policy Name	Responsible Agency	Legal Stature	Urban Scope	No. of Interventions
P1	Motor Vehicles (Amendment) Act, 2019	Ministry of Road Transport and Highways (MoRTH)	Mandatory	Urban-influencing	13
P2	National Urban Transport Policy (NUTP), 2014	Ministry of Housing and Urban Affairs (MoHUA)	Non-mandatory	Urban-focused	29
P3	National Transit Oriented Development (TOD) Policy, 2017	Ministry of Housing and Urban Affairs (MoHUA)	Non-mandatory	Urban-focused	7
P4	Metro Rail Policy, 2017	Ministry of Housing and Urban Affairs (MoHUA)	Mandatory	Urban-focused	5
P5	Second Auto Fuel Vision And Policy 2025, (2014)	Ministry of Petroleum and Natural Gas	Partially mandatory	Urban-influencing	1
P6	Fuel Economy Standards	Bureau of Energy Efficiency (BEE), Ministry of Power	Mandatory	Urban-influencing	1
P7	National Policy on Biofuels, 2018	Ministry of Petroleum and Natural Gas	Non-mandatory	Urban-influencing	4
P8	Taxi Policy Guidelines, 2016	Ministry of Road Transport and Highways (MoRTH)	Non-mandatory	Urban-focused	4
P9	National Electric Mobility Mission Plan 2020 (NEMMP), 2013	Ministry of Heavy Industries & Public Enterprises	Non-mandatory	Urban-influencing	5
P10	FAME Scheme – Phase I & II, 2015 & 2019	Ministry of Heavy Industries & Public Enterprises	Non-mandatory	Urban-influencing	7
P11	Charging Infrastructure For EVs - Revised Guidelines and Standards	Bureau of Energy Efficiency (BEE), Ministry of Power	Partially mandatory	Urban-influencing	1
P12	India’s NDCs Related to Transport Sector	Ministry of Environment, Forest and Climate Change (MoEFCC)	Non-mandatory	Urban-influencing	4
P13	Automotive Mission Plan 2016-26 (AMP 2026), 2015	Ministry of Heavy Industries & Public Enterprises	Non-mandatory	Urban-influencing	5
P14	National Sustainable Habitat Parameters For Urban Transport Under NMSH	Minister of Urban Development (MoUD)	Non-mandatory	Urban-focused	14
P15	AMRUT, 2015	Ministry of Housing and Urban Affairs (MoHUA)	Mandatory	City-specific	9
P16	Smart Cities Mission, 2015	Ministry of Housing and Urban Affairs (MoHUA)	Mandatory	City-specific	14
P17	Draft Green Urban Mobility Scheme (Proposed)	Ministry of Housing and Urban Affairs (MoHUA)	NA	Urban-focused	18
P18	National Clean Air Programme, 2019	Ministry of Environment, Forest and Climate Change (MOEFCC)	Non-Mandatory	Urban-influencing	2

Source: Prepared by Authors

3.3 Identifying Interventions under Each Policy to Assess its Implementation Scope:

To further decode each policy and programme documents (often ranging several hundred pages), we listed ‘action items’ or interventions recommended in the policies and programmes. We decided to look at the interventions because each policy or programmes have multiple interventions suggested. Hence, looking at only policies does not help in assessing their impacts on SDGs. Each intervention within the policies and programmes would support the achievement of the SDG targets.

We first listed recommendations under each policy (details attached in Annexure 1); 142 interventions were identified across all policies. Since there were several overlapping interventions, we mapped recurring interventions across all policies. These led us to a total of 56 unique recurring interventions that were identified across 18 policies. We then condensed the 56 interventions into 9 broad intervention categories: Urban Transport Planning, Infrastructure, Public Transport, Private Transport, Non-Motorised Transport, Traffic Management, Road Safety, Finance and Governance, and Technology and Innovation (detailed list attached in Annexure 1). We would discuss later; however, some interventions were found in multiple policies and are more popular, but, certain interventions are included in only a few policies. Hence, for a systematic assessment of the policies and programmes, we have assessed these by teasing out the interventions proposed in these. Further, bunching of interventions into categories helps us in assessing which type of interventions have gained easy inclusion in the policies vs which type of interventions are left out. For example, technology related interventions are observed in multiple policies whereas governance related interventions are scarce to be found in the policies.

3.4 Systematic Assessment of Policies

The assessment of transport policies has been carried out through a structured approach to assess their potential for alignment with transport-related SDGs. Instead of evaluating the potential impacts of the policy (which would require on-ground implementation of a policy in a specific city context), this paper focuses on the ‘presence’ of provisions for SDGs within a policy based on our understanding of these linkages assessed from the literature review presented in Section 2. This approach ensures the exercise’s adaptability and scalability, as impact assessments are inherently contextual and subjective.

Policies 1 to 18 form the X-axis of the assessment, while the 19 SDG targets (clubbed under 4 SDG Themes) form the Y-axis. For the assessment, we scan through each policy to assign a binary (0-1) scale to each policy-SDG target cell, where ‘0’ denotes the absence of provisions, and ‘1’ indicates the presence of provisions to advance the SDG. This binary score for each SDG theme is added; i.e. If policy 1 contains provisions for 3 of the 7 SDG targets in ‘Public health and well-being’ theme, it’s score for that theme is 3 (refer Figure 1 for example). All 4 SDG-theme scores are added to identify the policies with maximum provisions for SDG targets. Hence, each policy’s total score is between 0-and 19. This analysis is given in Table 3.

No.	Policy	Policy Description	Instrument Type	Theme: Poverty Alleviation & Economic Growth				SDG Theme Total
				SDG1.4	SDG2.3	SDG8.4	SDG9.1	
2	National Urban Transport Policy (NUTP), 2014	The National Urban Transport Policy (NUTP), 2014, envisions Indian cities as engines of economic growth by prioritising people-centric transport systems. It emphasises moving people rather than vehicles and aims to ensure safe, affordable, and sustainable access to jobs, education, and recreation. Key objectives include integrating transport into urban planning, promoting public transport and non-motorised modes, minimising travel distances, and improving access for marginalised populations. The policy advocates equitable road space allocation, multi-modal transport systems, intelligent traffic management, road safety, cleaner technologies, and private sector involvement. It mandates Comprehensive Mobility Plans for funding and aligns with national policies on fuel standards and technology.	Governance	Target: By 2030, ensure equal rights to resources, services, and property for the poor and vulnerable. 1	Target: By 2030, double agricultural productivity and incomes of small-scale food producers, with a focus on equal access to resources and opportunities. 1	Target: By 2030, improve global resource efficiency and decouple economic growth from environmental degradation, with developed countries leading. 1	Target: Develop sustainable, resilient infrastructure for economic growth and equitable access for all. 1	4

Figure 1. Example of Binary Scoring for each Policy * SDG Theme

The same method is applied for the interventions, where the 55 interventions form the X-axis and the SDG Targets form the Y-axis. Since each intervention is informed by multiple policies, assigning a binary rating (0-1) is gross. So, we assign a scale of (-2 to +2), where -2 indicates weakest provision of the SDG target in the policy bundle (i.e. <25% policies from the policy bundle have a provision for a particular SDG target), and +2 indicates the strongest provision (i.e. <75% policies from the policy bundle have a provision for a particular SDG target). A detailed table indicating the ratings is mentioned below. Hence, each intervention’s total score ranges from -38 to +38.

Table 2. Rating Scale for Interventions

0-25% policies with assignment '1'	(-2)	Cancelling: Makes it impossible to reach the target.
26-45% policies with assignment '1'	(-1)	Constraining: Limits options on target.
45-55% policies with assignment '1'	(0)	Neutral: No significant positive or negative interactions.
56-75% policies with assignment '1'	(+1)	Enabling: Creates conditions that further the target.
75-100% policies with assignment '1'	(+2)	Indivisible: Inextricably linked to the achievement of the target.

Source: Authors & Mahadevia et al. (2023)

4. Profiling India's Urban Transport Policy

The urban transport policy landscape consists of four core missions: the National Mission on Sustainable Habitat (NMSH), addressing transport-related environmental impacts; the National Mission on Electric Mobility (NMEM), advancing electrification to mitigate air pollution and greenhouse gas emissions; the SMART Cities Mission, integrating Intelligent Transport System (ITS) components for efficiency; and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), emphasizing non-motorized transport infrastructure. The National Urban Policy Framework (NUPF) promotes equitable road space allocation, prioritizing pedestrian and cyclist safety and universal mobility access. Legislative tools such as the Motor Vehicle Act (and amendments), Fuel Standards, and Electric Vehicle (EV) Charging Infrastructure Standards underpin sustainable urban transport by ensuring road safety, controlling emissions, and accelerating EV adoption. Policies like the Vehicle Scrappage Policy and FAME scheme, alongside the comprehensive National Urban Transport Policy (NUTP, 2014), integrate land-use and transport strategies to achieve systemic impact. To understand the nature of transport policies and their linkages with SDGs, we present a brief profiling of the 18 transport policies and programmes.

For list of policies see Table 1.

I. Legal Stature of Policies: Fifty-nine per cent of the policies are non-mandatory, 23% are mandatory, and 12% are partially mandatory (Figure 2). There is no clarity about the legal status of Policy No. P17 (Table 1). Motor Vehicles Act (Amendment) Act, 2019, and Fuel Economic Standards are among the few mandatory policies. This indicates that most policies rely on voluntary compliance or incentivized adoption rather than strict enforcement mechanisms. There is limited reliance on legally binding measures for urban transport.

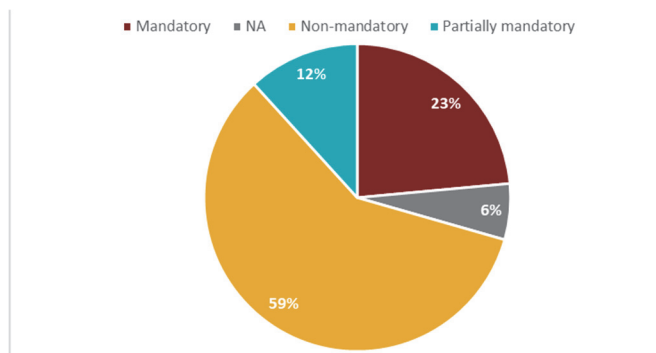


Figure 2. Legal Stature of Policies

II. Urban Scope of Policies: 53% of policies are urban influencing, 35% of policies are urban-focused, and 12% of policies are city-specific in their urban scope (Figure 3). Most policies are 'Urban influencing', as these are acts or schemes drafted by the union government, such as the Fame Scheme – Phase I & II (2015 & 2019). 'Urban Focused' policies guide a city's urban development, like the National Urban Transport Policy, 2014. 'City-centric' policies comprise dedicated programmes like Atal Mission for Rejuvenation and Urban Transformation (AMRUT), 2015 and 2021, implemented at the city level. Thus, most policies have a broader influence on urban areas without specifically targeting cities, suggesting a generalised approach to urban transport interventions. A relatively smaller proportion of policies are designed with precise city-level objectives.

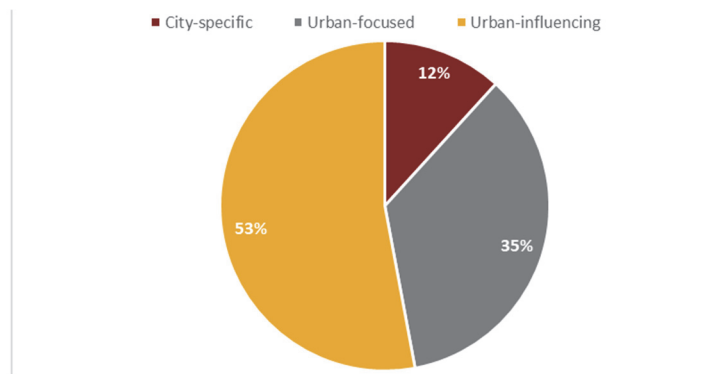


Figure 3. Urban Focus of Policies

III. Instrument Type of Policies: Given the complex structure of Indian policies, profiling the instrument type at the policy level often misses the nuances. Hence, we profile instrument types at the intervention-level. Of the 55 interventions identified, ‘Economic’ and ‘Regulatory’ are the most recurring policy instruments, with 38% and 31% share in the total interventions (Figure 4). About 24% of interventions are informative, and 7% are governance-related. Intervention related to improving the transport system's efficiency through measures like electrification of the vehicle fleet, promotion of Mass Transit Systems, and adoption of alternative fuels make about 51% of the total recommendations across Intervention categories. The large share of policy interventions is capital-intensive and technology-driven, probably hard for cities to implement due to lack of financial resources. This indicates why national transport policies have not significantly impacted cities to date: they lack both a holistic vision for sustainable transport and a focused approach for addressing the existing problems directly.

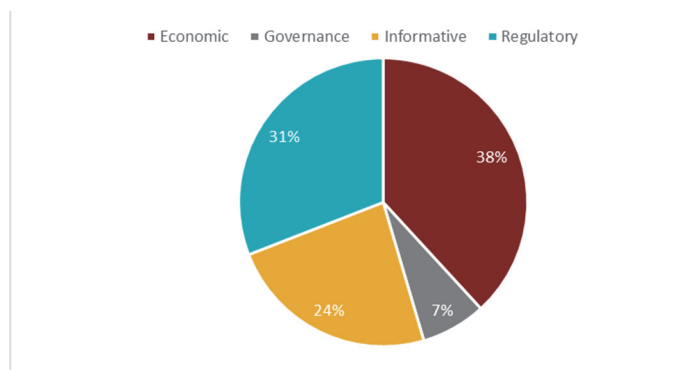


Figure 4. Instrument Type of Policies

IV. Implementation Cost: Like the above category, this analysis is also conducted at the intervention-level. Of all 155 interventions, about 60% have ‘High’ implementation costs, and the remaining 40% is split equally between ‘Medium’ and ‘Low’. Intervention Categories like ‘Technology & Innovation’, ‘Infrastructure’, and ‘Private Transport’ contribute the most to ‘High’ implementation costs. These include interventions like ‘Establishing a State-wide Road Accident Database Management System’, ‘Providing NMT Infrastructure Network (like Footpaths, and Cycle-tracks)’ and ‘Promoting R&D in Clean Vehicle Technology - Setting up Incubator Facilities’. Intervention categories like ‘Urban Transport Planning’ have the highest ‘Low’ implementation cost interventions.

V. Technology Integration: The analysis in this category is also conducted at the intervention level. About 47% of the total interventions have ‘High’ technology integration/ dependence, 15% have ‘Medium’ and 38% have ‘Low’ technology integration. Intervention Categories like ‘Technology & Innovation’ and ‘Public Transport’, with interventions like ‘Integrate Intelligent Transport Management System (ITMS)’, ‘Integrated Multi-modal Mobility’, and ‘Electronic Monitoring and Enforcement of Road Safety’ contribute the most to ‘High’ technology dependence. Intervention Categories like ‘Finance and Governance’ and ‘Urban Transport Planning’ have the ‘Lowest’ dependence on Technology.

5. Transport Policies' SDG-Delivery: Results & Discussion

5.1 Policy-Level Analysis

Like mentioned in Section 3.4, a binary score of 0-1 is added for each policy and SDG target, indicating presence of SDG target's provision in the policy. The Table 3 summarizes combined SDG-theme totals for all policies. National Urban Transport Policy (P2) (NUTP), 2014 and National Sustainable Habitat Parameters for Urban Transport under NMSH (P14) have very high scores (18, and 17 out of 19 respectively), indicating the highest SDG target-related provisions. National Transit Oriented Development (TOD) Policy, 2017 (P3) follows third with a relatively lower score in 'Public Health and Well-being' theme (3 out of 7). India's NDCs (P12) related to the transport sector, contain provisions for all SDG themes except 'Urban and Gender Equity', resulting in a score of 12. AMRUT 2015 (P15), (with a score of 1) follows next with one of the lowest scores in 'Public Health and Well-being' SDG theme. Interestingly, the Metro Rail Policy, 2017, and Charging Infrastructure for EV have the lowest total score of 2 and 3 respectively, indicating negligible SDG provision – counter-intuitive as one would assume that policies around Mass Transport would fare well in SDG delivery. The Motor Vehicle Act, 2019 (P1) and Smart Cities Mission (P16), 2015 also have a relatively low SDG score, with the Smart Cities Mission having no provision for two SDG themes – Urban and Gender Equity and Quality of Life. This highlights that while the Smart Cities Mission aimed to deliver citizen-centric services (intending to result in better Quality of Life), it does not contain any provisions to enable that.

The policies with high scores for SDG target alignment, namely the P2, P14, P3, and P12, are non-mandatory in character. Hence, even if these have higher alignment with the SDG targets, these have lower chances of being implemented. AMRUT (P15) with a high SDG target alignment score is the only one in the top-scoring policies that is mandatory. In contrast, the mandatory policies, namely the P1, P16, Fuel Economy Standards (P6), Charging Infrastructure for EVs - Revised Guidelines and Standards (P11), and Metro Rail Policy, 2017 (P4) have low SDG alignment score.

Across SDG Themes, the 'Poverty Alleviation & Economic Growth' fares well in 5 of the 18 policies with provisions for at least 3 of the 4 SDG targets in the theme. Metro Rail Policy, and Taxi Policy Guidelines also have minimal provisions for this theme, despite being a transport supply-side policy that concerns employment in the transport sector. 10 of the 18 policies have no provisions for 'Urban and Gender Equity', indicating their low priority in Indian transport policy landscape. The National Urban Transport Policy, National Transit Oriented Development, and the National Mission for Sustainable Habitat address all 3 of this theme's SDG targets; even among the 5 policies that have some provision for this theme, Gender Equity related target (SDG5.5), has the lowest provision – indicating the lack of gender mainstreaming in Transport Policies, despite study after study highlighting the need for it. Even policies that address Gender Equity in transport- like National Urban Transport Policy, National Mission for Sustainable Habitat, & AMRUT - the provisions are limited to women's safety. Gender mainstreaming in public transport route planning and non-motorized transport infrastructure remains a distant goal. Every policy contains some provision for 'Public Health and Well-being' SDG targets; with National Urban Transport Policy, National Mission for Sustainable Habitat, Nationally Determined Contributions and the Green Urban Mobility Scheme faring well. For 'Quality of Life' SDG theme, 2 policies have no provision, and 7 policies have minimal provisions.

Table 3. SDG Coverage in Urban Transport Policies

No.	Policy	SDG Themes				Total Score (Total 19 SDG Targets)
		Poverty Alleviation & Economic Growth (4 SDG targets) - Total Score	Urban and Gender Equity (3 SDG targets) - Total Score	Public Health & Well-being (7 SDG targets) - Total Score	Quality of Life - (5 SDG targets) - Total Score	
P2	National Urban Transport Policy (NUTP), 2014	4	3	6	5	18
P14	National Sustainable Habitat Parameters for Urban Transport Under NMSH	4	3	5	5	17

P3	National Transit Oriented Development (TOD) Policy, 2017	3	3	3	5	14
P12	India's NDCs Related to Transport Sector	3	1	5	3	12
P15	AMRUT, 2015	3	1	2	4	10
P7	National Policy on Biofuels, 2018	2	1	3	2	8
P17	Draft Green Urban Mobility Scheme (Proposed)	2	0	4	2	8
P13	Automotive Mission Plan 2016-26 (AMP 2026), 2015	1	1	3	2	7
P5	Second Auto Fuel Vision and Policy 2025, (2014)	2	0	3	1	6
P8	Taxi Policy Guidelines, 2016	1	0	2	3	6
P9	National Electric Mobility Mission Plan 2020 (NEMMP), 2013	2	0	3	1	6
P10	FAME Scheme – Phase I & II, 2015 & 2019	2	0	3	1	6
P18	National Clean Air Programme, 2019	2	0	3	1	6
P1	Motor Vehicles (Amendment) Act, 2019	1	1	2	1	5
P6	Fuel Economy Standards	2	0	2	1	5
P16	Smart Cities Mission, 2015	2	0	3	0	5
P11	Charging Infrastructure for EVs - Revised Guidelines and Standards	1	0	2	0	3
P4	Metro Rail Policy, 2017	0	0	1	1	2

Source: By the authors

Note: The numbers in each cell represent number of interventions in each policy adhering to SDG themes. Hence, in Motor Vehicles (Amendment) Act, 2019, 1 intervention support to SDG targets related to poverty alleviation and economic growth. The last column is the total of the interventions that support the SDG targets in a particular policy.

5.2 Intervention-level Analysis

As discussed in section 3.4, the recurring interventions across policies were identified. Hence, each intervention was included in more than 1 policy. To identify the most potent interventions, we add a rating scale (from -2 to +2) to each intervention-SDG target cell, where -2 indicates the weakest interaction and +2 indicates the most potent interaction with each SDG. The rating scale indicates the degree of provision of the cluster/ bundle of policies that inform the intervention. For instance, if an intervention is informed by 10 policies, then the provision of each SDG target across those 10 policies are assessed and a scale of -2 to +2 is assigned. So, if 7 of the 10 policies have provisions for SDG11.1 (example), then that intervention has a rating of '+1' for SDG11.1.

The interventions promoting SDGs are listed in descending order of their score in Table 4. Transport Impact Assessments (34), organising Intermittent Public Transport (IPT) (34), establishing a state-wide Road Accident Database (34), and establishing Service Level Benchmarks (SLBs) (32) have significant potential to support SDG targets. Additional key actions include integrating land use and transport planning (31), enhancing road infrastructure (22), Comprehensive Mobility Plan (CMP) (25), and conducting capacity-building initiatives (21). Furthermore, implementing Transportation Demand Management (TDM) measures, establishing an Urban Transport Fund (UTF), ensuring universal accessibility, and adopting policies for urban street vendors are crucial for advancing sustainable transport and achieving SDGs.

The interventions with the lowest SDG-delivery potential include those related to granting taxi permits, regulating taxi aggregators, pricing (-16), and developing a National Transportation Policy (-18). Other low-impact policies impose stringent punishments for faulty road design, drunk driving, over-speeding, and violations of helmet and seatbelt laws (-18). Additionally, policies aimed at compensating road accident victims, improving driver quality through enhanced training and testing, and protecting Good Samaritans in accidents (18) have limited contributions to SDGs. Establishing a state-level Road Safety Fund and creating a National Road Safety Board show comparatively lower potential for advancing SDGs.

Table 4. Interventions and SDG Scores

Intervention Category (IC)*	Transport Intervention**	Type of Instrument	Technology Integration Level	Implementation Cost	Poverty Alleviation - Score	Urban & Gender Equity-Score	Public Health & Well-being - Score	Quality of Life - Score	Total Score
IC1	Conducting Transport Impact Assessment	Informative	Medium	Low	8	6	10	10	34
IC4	Organized Intermittent public transport (IPT) as feeder to main transport system	Economic	Medium	Medium	8	6	10	10	34
IC6	Establishing a state-wide Road Accident Database Management System	Informative	High	High	8	6	10	10	34
IC1	Establishing Service level benchmarks (SLBs)	Regulatory	Low	Medium	8	6	8	10	32
IC1	Integrated Land Use and Transport Planning	Regulatory	Medium	Medium	7	6	8	10	31
IC2	Providing road network and associated facilities	Economic	Low	High	7	6	5	10	28
IC1	Preparation of Comprehensive Mobility Plan (CMP)	Informative	Low	Medium	5	5	5	10	25
IC7	Conduct capacity building & skills development activities	Informative	Low	Medium	5	4	6	7	22
IC5	Transportation Demand Management (TDM) through measures like car limited zones, congestion pricing zones, no-emission zones, high parking charges etc.	Regulatory	High	High	6	3	6	6	21

IC7	Establishing Urban Transport Fund (UTF)	Governance	Low	High	6	3	6	6	21
IC2	Ensuring Universal accessibility for differently abled and senior citizens	Economic	Medium	High	6	3	6	5	20
IC4	Adoption and implementation of policy for Urban Street Vendors	Regulatory	Low	Low	5	1	3	6	15
IC4	Encourage initiatives like Rahagiri (no motor vehicle) days, bike sharing schemes and EV mobility	Informative	Low	Low	4	0	6	4	14
IC4	Providing NMT Infrastructure - footpaths, cycling tracks etc	Economic	Low	High	5	1	3	2	11
IC2	Ensure safer road infrastructure by incorporating 'zero black spots' policy and issuing safety design guidelines	Regulatory	Medium	High	2	2	2	2	8
IC3	Providing Mass-transit System (MTS)	Economic	High	High	4	-1	2	3	8
IC6	Road Safety knowledge and awareness through education, training and publicity campaigns	Informative	Low	High	2	2	2	2	8
IC3	Establish integrated waterways transportation	Economic	High	High	4	-1	2	2	7
IC7	Establishing Unified Metropolitan Transport Authority (UMTA)	Governance	Low	Medium	2	0	2	3	7
IC1	Integrate Transit-oriented development (TOD) planning	Regulatory	Medium	Medium	2	1	-3	6	6
IC7	Providing financial and fiscal measures to support development and promotion of biofuels	Economic	High	High	2	-1	3	2	6
IC8	Implementation of Fuel Economy	Regulatory	High	Low	4	0	2	0	6

	Standards for passenger cars, HDVs & LCVs								
IC3	Providing city bus service	Economic	Medium	High	3	-2	1	1	3
IC8	Implementation of Bharat Stage (BS) emission norms	Regulatory	High	Low	2	-1	2	0	3
IC2	Providing parking facilities and infrastructure	Economic	Medium	High	2	-2	-1	2	1
IC3	Providing multi-modal integration	Economic	High	High	3	-1	-4	3	1
IC5	Integrate Intelligent Transport Management System (ITMS)	Economic	High	High	2	-3	3	-1	1
IC9	Deployment of hybrid/electric vehicles (Evs) through Demand side incentives	Economic	High	High	2	-3	1	0	0
IC4	Ensuring safety of pedestrians and NMT	Regulatory	Low	High	1	-2	1	-2	-2
IC6	Electronic monitoring and enforcement of road safety	Regulatory	High	High	1	-1	0	-3	-3
IC9	An indicative target of 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel is proposed by 2030	Informative	High	Low	0	-2	-2	-2	-6
IC9	Development of Second Generation (2G) ethanol technologies, advance biofuels and its commercialization	Informative	High	High	0	-2	-2	-2	-6
IC7	Fiscal & taxation measures to increase automotive production	Economic	High	High	-4	-2	-2	-2	-10
IC1	Providing first and last mile connectivity	Economic	Low	High	-1	-3	-5	-3	-12
IC9	Promoting R&D in clean vehicle technology; Setting up incubator facilities	Informative	High	High	0	-5	-2	-5	-12

IC1	State govts. to frame their own EV policy	Informative	High	Low	0	-6	-2	-6	-14
IC9	Supply side incentives for manufactures of EV & components	Economic	High	High	0	-6	-2	-6	-14
IC9	Encourage interlinking of renewable energy sources with charging infrastructure	Economic	High	High	0	-6	-2	-6	-14
IC9	An Electric Vehicle (EV) research and manufacturing zone shall be established	Economic	High	High	0	-6	-2	-6	-14
IC2	Providing charging infrastructure for e-vehicles	Economic	High	High	-1	-6	-3	-7	-17
IC1	Developing a National Transportation Policy	Informative	Low	Low	-4	-2	-6	-6	-18
IC6	Compensation for road accident victims	Economic	Low	High	-4	-2	-6	-6	-18
IC6	Improving Quality of Driver by strengthening efficient and effective driver training and testing infrastructure	Informative	High	High	-4	-2	-6	-6	-18
IC7	Setting up dedicated Road Safety Fund at state level	Governance	Low	High	-4	-2	-6	-6	-18
IC7	Creation of National Road Safety Board	Governance	Low	High	-4	-2	-6	-6	-18
* IC refers to: IC1-Urban Transport Planning, IC2-Infrastructure, IC3-Public Transport, IC4-Non-Motorised Transport, IC5-Traffic Management, IC6-Road Safety, IC7-Finance & Governance, IC8-Private Vehicles, IC9-Technology & Innovation									
** Non-exhaustive list of Interventions.									

Source: Prepared by the authors

5.2.1 Intervention-wise Policy Assessment across Intervention-Categories

To obtain a more robust understanding of which Intervention-Categories (ICs) are most ‘successfully’ supported in the current policy landscape, we present Intervention Categories summary of the interactions (Table 4). Across all 1,045 interactions, about 28% are ‘very weak’ in nature, 12% are ‘weak’, 13% are ‘neutral’, 16% are ‘strong’, and 32% are ‘very strong’. Out of the 48% of interventions that support SDGs (‘strong’ and ‘very strong’ interactions combined), Urban Planning and Technology & Innovation Intervention Categories make the largest share, followed by Infrastructure.

Urban Transport Planning: This thematic has 10 interventions (& 190 interactions), focusing on creating a strategic and sustainable approach to urban mobility through integrated planning, policy development, and innovative frameworks. It has the highest share of ‘very strong’ interactions (48%) and the second highest share of SDG-supporting interactions (56%).

Infrastructure: This thematic has 5 interventions (& 95 interactions), focusing on developing and enhancing urban transport infrastructure to ensure accessibility, efficiency, and inclusivity. It has a 32% share of ‘very strong’ interactions and a 51% share of SDG-supporting interactions.

Public Transport: This thematic has 7 interventions (& 133 interactions), focusing on strengthening and expanding sustainable public transit systems to reduce congestion and emissions. It has a 24% share of ‘very strong’ interactions and a 43% share of SDG-supporting interactions. Interestingly, this Intervention Categories also has the highest share of ‘Neutral’ interventions, indicating a lack of coverage in most transport policies.

Non-Motorised Transport (NMT): This Intervention Categories has 4 interventions (& 76 interactions), emphasising infrastructure development for promoting active transportation (mainly walking and cycling) as sustainable mobility options. It has a 26% share of ‘very strong’ interactions and a 50% share of SDG-supporting interactions, despite 30% being ‘neutral’. This thematic has the lowest share of ‘weak’ and ‘very weak’ interventions (20%), highlighting the largely synergistic nature of this Intervention Categories despite its low coverage across policies.

Traffic Management: This thematic has 4 interventions (& 57 interactions), addressing regulation and optimising urban traffic flow to reduce congestion and emissions. Key strategies include Transportation Demand Management (TDM) measures, like car-limited zones, congestion pricing, no-emission zones, and high parking charges. It has a 27% share of ‘very strong’ interactions and the highest share of SDG-supporting interactions (61%), indicating that traffic management is addressed across several existing policies as a tool for enabling SDGs.

Road Safety: This thematic has 9 interventions (& 171 interactions) detailing measures to reduce road accidents, improve infrastructure, and enhance user safety, including strict enforcement of laws related to road design, drunk driving, and helmet/seat belt usage. It has a 31% share of ‘very strong’ interactions and a 39% share of SDG-supporting interactions. Interestingly, it has the second highest share of ‘weak’ and ‘very weak’ interventions (55%), owing to its narrow focus and restrictive nature.

Finance & Governance: This thematic has 7 interventions (& 133 interactions), covering fiscal, taxation and organisational interventions. It has a 25% share of ‘very strong’ interactions and a 54% share of SDG-supporting interactions.

Private Transport: This thematic has 7 interventions (& 133 interactions), focusing on implementing strict emission and fuel economy standards for emission reduction. It has the lowest share of ‘very strong’ interactions (16%), owing to its narrow scope towards ‘Inclusivity’, yet 43% share of SDG-supporting interactions, due to its effectiveness in delivering emission reduction.

Technology and Innovation: This thematic has 8 interventions (& 152 interactions), promoting sustainable transport solutions through R&D and adopting clean technologies. Although it has the second highest share of ‘very strong’ interactions (38%), its narrow scope towards ‘inclusivity’ generates the highest share of ‘weak’ and ‘very weak’ interventions (61%) across Intervention Categories.

It is critical to note the policy instrument type to understand its SDG-delivery potential for on-ground applicability. 66% Traffic Management and 60% Urban Planning interventions are ‘Regulatory’, indicating relatively high SDG-delivery potential, owing to their clarity and certainly in implementation. Although Non-motorised Transport interventions have a higher score, it will require a regulatory foundation for maximising its on-ground potential, as its interventions are equally distributed across ‘Regulatory’, ‘Economic’ and ‘Informative’ (33% each). Infrastructure strategies are 33% ‘Regulatory’ and 66% ‘Economic’, indicating a need for monitoring mechanism to maximise on-ground potential. 80% Public Transport interventions are ‘Economic’, indicating a similar push towards Infrastructure strategies for ensured implementation. Additionally, some interventions with high scores in Road Safety, and Financing & Governance, are essentially ‘Regulatory’ and ‘Governance’ instruments, indicating moderate on-ground potential for implementation.

6. Conclusion

The Indian transport policy landscape presents a concerning dichotomy: policies with high SDG alignment (NUTP, NMSH) lack mandatory implementation mechanisms, while enforceable policies demonstrate minimal sustainability integration. This implementation paradox is exemplified by Metro Rail and EV frameworks—celebrated as sustainability champions yet scoring dismally (2-3/19) on SDG alignment. Notably, across all four SDG themes, ‘Urban and Gender Equity’ has the least presence in current policies, with 56% entirely ignoring these considerations despite established research on differential mobility needs. Conversely, ‘Public Health and Well-being’ receives the most coverage, revealing how transportation policies remain fixated on visible, tangible concerns (like air pollution) rather than conceptualizing mobility as a means to broader socio-economic well-being.

This narrow focus is further evidenced by the Smart Cities Mission, which promotes citizen-centric services while lacking any provisions for ‘Quality-of-Life’ parameters. Collectively, these findings suggest a pattern of systematic disjuncture between stated sustainability objectives and embedded implementation mechanisms that fail to embed substantive sustainability and equity mechanisms necessary for meaningful impact.

We find the main challenge in implementing ‘Inclusive’ policies is the high reliance on voluntary adherence or incentivized adoption mechanisms, as opposed to strict enforcement mechanism. While this approach may facilitate broader initial acceptance, its long-term impact is minimal, requiring sustained commitment to their interventions. The study also reveals a relative underrepresentation of policies formulated with specific objectives tailored to urban environments. This lack of localized focus affects the ability to effectively address the India’s distinct urban challenges. Hence, embedding these policies within the city’s development plans and mobility plans is crucial to advancing sustainable outcomes in urban India.

A substantial proportion of policy efforts are directed towards enhancing the efficiency of the transport system through significant capital-intensive investments. The widespread promotion of vehicle electrification, the expansion of mass transit infrastructure, and the adoption of alternative fuel sources underscore a clear commitment to improvements in operational efficacy. While these are important, the study indicates that the existing policy landscape focuses on readily achievable, less complex interventions, instead of long-term comprehensive strategies. There is a notable trend of generalized interventions that lack the specificity for practical implementation. This disparity between overarching policy statements and actionable strategies may hamper effective execution. Hence, sub-national and city-centric policies must prioritize inclusive and integrated transport planning, and large-scale infrastructure improvement for non-motorized transport users.

For future transport policy development, several key priorities emerge. Incorporating more robust enforcement mechanisms to ensure the effective and timely realization of policy objectives. Furthermore, a greater emphasis on context-specific goals at the city level will enable the design of more targeted and impactful interventions. This transition towards more localized, enforceable, and readily implementable strategies will be indispensable in shaping a truly efficacious and sustainable transport paradigm.

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Notes

Note 1. A popular policy assessment category as identified in Rode, P., Heeckt, C., da Cruz, N.F. 2019.

Appendix A

Interventions under each policy

Policy No.	Intervention	Transport Intervention Category
P1	Developing a National Transportation Policy	Urban Transport Planning and Policy
	Ensure safer road infrastructure by incorporating ‘zero black spots’ policy and issuing safety design guidelines	Infrastructure
	Guidelines related to grant of taxi permits, regulation of taxi aggregators, taxi operations, pricing, defining taxi categories etc.	Public Transport
	Ensuring safety of pedestrians and NMT	Non-motorised Transport (NMT)
	Protection of Good Samaritans in case of accidents	Traffic Management
	Planning for Freight Traffic: regulation of heavy motor vehicles (HMTVs) such as trucks, buses and lorries	Traffic Management
	Stringent punishment for faulty road design, engineering and maintenance, drunk-driving, over-speeding, violation of helmet and seat-belt laws etc.	Road Safety
	Compensation for road accident victims	Road Safety
	Electronic monitoring and enforcement of road safety	Road Safety
	Road Safety knowledge and awareness through education, training and publicity campaigns	Road Safety
	Safer Vehicle: promote safety standard in vehicles through inspection and Recall of faulty vehicles	Road Safety
	Setting up dedicated Road Safety Fund at state level	Financing and Governance
	Creation of National Road Safety Board	Financing and Governance
	P2	Preparation of Comprehensive Mobility Plan (CMP)
Integrated Land Use and Transport Planning		Urban Transport Planning and Policy
Integrate Transit-oriented development (TOD) planning		Urban Transport Planning and Policy
Establishing Service level benchmarks (SLBs)		Urban Transport Planning and Policy
Providing first and last mile connectivity		Urban Transport Planning and Policy
Providing road network and associated facilities		Infrastructure
Ensuring Universal accessibility for differently abled and senior citizens		Infrastructure
Providing parking facilities and infrastructure		Infrastructure
Ensure safer road infrastructure by incorporating ‘zero black	Infrastructure	

	spots' policy and issuing safety design guidelines	
	Providing city bus service	Public Transport
	Providing Mass-transit System (MTS)	Public Transport
	Conducting Alternate Analysis of Mass Transit Systems	Public Transport
	Organized Intermittent public transport (IPT) as feeder to main transport system	Public Transport
	Establish integrated waterways transportation	Public Transport
	Providing NMT Infrastructure - footpaths, cycling tracks etc	Non-motorised Transport (NMT)
	Ensuring safety of pedestrians and NMT	Non-motorised Transport (NMT)
	Adoption and implementation of policy for Urban Street Vendors	Non-motorised Transport (NMT)
	Encourage initiatives like Rahagiri (no motor vehicle) days, bike sharing schemes and EV mobility	Non-motorised Transport (NMT)
	Transportation Demand Management (TDM) through measures like car limited zones, congestion pricing zones, no-emission zones, high parking charges etc.	Traffic Management
	Integrate Intelligent Transport Management System (ITMS)	Traffic Management
	Electronic monitoring and enforcement of road safety	Road Safety
	Establishing a state-wide Road Accident Database Management System	Road Safety
	Road Safety knowledge and awareness through education, training and publicity campaigns	Road Safety
	Safer Vehicle: promote safety standard in vehicles through inspection and Recall of faulty vehicles	Road Safety
	Establishing Unified Metropolitan Transport Authority (UMTA)	Financing and Governance
	Establishing Urban Transport Fund (UTF)	Financing and Governance
	Providing financial and fiscal measures to support development and promotion of biofuels	Financing and Governance
	Conduct capacity building & skills development activities	Financing and Governance
	Deployment of hybrid/electric vehicles (Evs) through Demand side incentives	Technology and Innovation
P3	Integrate Transit-oriented development (TOD) planning	Urban Transport Planning and Policy
	Providing first and last mile connectivity	Urban Transport Planning and Policy
	Providing road network and associated facilities	Infrastructure
	Providing Mass-transit System (MTS)	Public Transport
	Providing multi-modal integration	Public Transport
	Providing NMT Infrastructure - footpaths, cycling tracks etc	Non-motorised Transport (NMT)
	Adoption and implementation of policy for Urban Street Vendors	Non-motorised Transport (NMT)
P4	Integrate Transit-oriented development (TOD) planning	Urban Transport Planning and Policy
	Providing first and last mile connectivity	Urban Transport Planning and Policy
	Providing Mass-transit System (MTS)	Public Transport
	Conducting Alternate Analysis of Mass Transit Systems	Public Transport
	Establishing Unified Metropolitan Transport Authority (UMTA)	Financing and Governance
P5	Implementation of Bharat Stage (BS) emission norms	Private Transport
P6	Implementation of Fuel Economy Standards for passenger cars,	Private Transport

	HDVs & LCVs	
P7	Providing financial and fiscal measures to support development and promotion of biofuels	Financing and Governance
	An indicative target of 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel is proposed by 2030	Private Transport
	Development of Second Generation (2G) ethanol technologies, advance biofuels and its commercialization	Private Transport
	Promoting R&D in clean vehicle technology; Setting up incubator facilities	Technology and Innovation
P8	Providing first and last mile connectivity	Urban Transport Planning and Policy
	Providing parking facilities and infrastructure	Infrastructure
	Guidelines related to grant of taxi permits, regulation of taxi aggregators, taxi operations, pricing, defining taxi categories etc.	Public Transport
	Deployment of hybrid/electric vehicles (Evs) through Demand side incentives	Technology and Innovation
P9	Providing charging infrastructure for e-vehicles	Infrastructure
	Encouraging retro-fitment of on-road vehicles with hybrid kit	Road Safety
	Supply side incentives for manufactures of EV & components	Technology and Innovation
	Deployment of hybrid/electric vehicles (Evs) through Demand side incentives	Technology and Innovation
	Promoting R&D in clean vehicle technology; Setting up incubator facilities	Technology and Innovation
P10	State govts. to frame their own EV policy	Urban Transport Planning and Policy
	Providing charging infrastructure for e-vehicles	Infrastructure
	Supply side incentives for manufactures of EV & components	Technology and Innovation
	Encourage interlinking of renewable energy sources with charging infrastructure	Technology and Innovation
	Deployment of hybrid/electric vehicles (Evs) through Demand side incentives	Technology and Innovation
	An Electric Vehicle (EV) research and manufacturing zone shall be established	Technology and Innovation
	Promoting R&D in clean vehicle technology; Setting up incubator facilities	Technology and Innovation
P11	Providing charging infrastructure for e-vehicles	Infrastructure
P12	Developing Dedicated freight corridors (DFCs) and energy efficient freight transport	Urban Transport Planning and Policy
	Providing Mass-transit System (MTS)	Public Transport
	Establish integrated waterways transportation	Public Transport
	Solar powered toll plazas have been envisaged	Technology and Innovation
P13	Developing 'End of life' policy for vehicle scrapping	Urban Transport Planning and Policy
	Safer Vehicle: promote safety standard in vehicles through inspection and Recall of faulty vehicles	Road Safety
	Conduct capacity building & skills development activities	Financing and Governance
	Fiscal & taxation measures to increase automotive production	Financing and Governance
	Implementation of Bharat Stage (BS) emission norms	Private Transport
P14	Integrated Land Use and Transport Planning	Urban Transport Planning and Policy
	Integrate Transit-oriented development (TOD) planning	Urban Transport Planning and Policy
	Establishing Service level benchmarks (SLBs)	Urban Transport Planning and Policy

	Conducting Transport Impact Assessment	Urban Transport Planning and Policy
	Providing road network and associated facilities	Infrastructure
	Providing Mass-transit System (MTS)	Public Transport
	Providing NMT Infrastructure - footpaths, cycling tracks etc	Non-motorised Transport (NMT)
	Adoption and implementation of policy for Urban Street Vendors	Non-motorised Transport (NMT)
	Transportation Demand Management (TDM) through measures like car limited zones, congestion pricing zones, no-emission zones, high parking charges etc.	Traffic Management
	Planning for Freight Traffic : regulation of heavy motor vehicles (HMTVs) such as trucks, buses and lorries	Traffic Management
	Establishing Urban Transport Fund (UTF)	Financing and Governance
	Conduct capacity building & skills development activities	Financing and Governance
	Implementation of Bharat Stage (BS) emission norms	Private Transport
	Implementation of Fuel Economy Standards for passenger cars, HDVs & LCVs	Private Transport
	Integrated Land Use and Transport Planning	Urban Transport Planning and Policy
	Providing first and last mile connectivity	Urban Transport Planning and Policy
P15	Providing parking facilities and infrastructure	Infrastructure
	Providing city bus service	Public Transport
	Providing Mass-transit System (MTS)	Public Transport
	Providing multi-modal integration	Public Transport
	Establish integrated waterways transportation	Public Transport
	Providing NMT Infrastructure - footpaths, cycling tracks etc	Non-motorised Transport (NMT)
	Adoption and implementation of policy for Urban Street Vendors	Non-motorised Transport (NMT)
P16	Preparation of Comprehensive Mobility Plan (CMP)	Urban Transport Planning and Policy
	Integrated Land Use and Transport Planning	Urban Transport Planning and Policy
	Integrate Transit-oriented development (TOD) planning	Urban Transport Planning and Policy
	Providing first and last mile connectivity	Urban Transport Planning and Policy
	Providing parking facilities and infrastructure	Infrastructure
	Providing city bus service	Public Transport
	Providing Mass-transit System (MTS)	Public Transport
	Providing multi-modal integration	Public Transport
	Establish integrated waterways transportation	Public Transport
	Providing NMT Infrastructure - footpaths, cycling tracks etc	Non-motorised Transport (NMT)
	Ensuring safety of pedestrians and NMT	Non-motorised Transport (NMT)
	Adoption and implementation of policy for Urban Street Vendors	Non-motorised Transport (NMT)
	Integrate Intelligent Transport Management System (ITMS)	Traffic Management
	Electronic monitoring and enforcement of road safety	Road Safety
P17	Preparation of Comprehensive Mobility Plan (CMP)	Urban Transport Planning and Policy
	Integrate Transit-oriented development (TOD) planning	Urban Transport Planning and

	Policy
Developing Dedicated freight corridors (DFCs) and energy efficient freight transport	Urban Transport Planning and Policy
Providing first and last mile connectivity	Urban Transport Planning and Policy
Ensuring Universal accessibility for differently abled and senior citizens	Infrastructure
Providing city bus service	Public Transport
Providing Mass-transit System (MTS)	Public Transport
Providing NMT Infrastructure - footpaths, cycling tracks etc	Non-motorised Transport (NMT)
Ensuring safety of pedestrians and NMT	Non-motorised Transport (NMT)
Adoption and implementation of policy for Urban Street Vendors	Non-motorised Transport (NMT)
Encourage initiatives like Rahagiri (no motor vehicle) days, bike sharing schemes and EV mobility	Non-motorised Transport (NMT)
Transportation Demand Management (TDM) through measures like car limited zones, congestion pricing zones, no-emission zones, high parking charges etc.	Traffic Management
Integrate Intelligent Transport Management System (ITMS)	Traffic Management
Planning for Freight Traffic: regulation of heavy motor vehicles (HMTVs) such as trucks, buses and lorries	Traffic Management
Establishing Unified Metropolitan Transport Authority (UMTA)	Financing and Governance
Establishing Urban Transport Fund (UTF)	Financing and Governance
Providing financial and fiscal measures to support development and promotion of biofuels	Financing and Governance
Deployment of hybrid/electric vehicles (EVs) through Demand side incentives	Technology and Innovation

Appendix B

Interventions by Transport Categories and Policy Bundles

Policy Bundles	Transport Intervention
Intervention Category: Urban Transport Planning	
P.2; P.16; P.17	Preparation of Comprehensive Mobility Plan (CMP)
P.2; P.14; P.15; P.16	Integrated Land Use and Transport Planning
P.2; P.3; P.4; P.14; P.16; P.17	Integrate Transit-oriented development (TOD) planning
P.12; P.17	Developing Dedicated freight corridors (DFCs) and energy efficient freight transport
P.2; P.14	Establishing Service level benchmarks (SLBs)
P.14	Conducting Transport Impact Assessment
P.2; P.3; P.4; P.8; P.15; P.16; P.17	Providing first and last-mile connectivity
P.1	Developing a National Transportation Policy
P.10	State governments to frame their own EV policy
P.13	Developing 'End of life' policy for vehicle scrapping
Intervention Category: Infrastructure	

P.2; P.3; P.14	Providing road network and associated facilities
P.2; P.14; P.17	Ensuring Universal accessibility for differently abled and senior citizens
P.2; P.8; P.15; P.16	Providing parking facilities and infrastructure
P.9; P.10; P.11	Providing charging infrastructure for e-vehicles
P.1; P.2	Ensure safer road infrastructure by incorporating 'zero black spots' policy and issuing safety design guidelines
Intervention Category: Public Transport (PT)	
P.2; P.15; P.16; P.17	Providing city bus service
P.2; P.3; P.4; P.12; P.14; P.15; P.16; P.17	Providing Mass-transit System (MTS)
P.2; P.4	Conducting Alternate Analysis of Mass Transit Systems
P.3; P.15; P.16	Providing multi-modal integration
P.2	Organized Intermittent public transport (IPT) as feeder to main transport system
P.2; P.12; P.15; P.16	Establish integrated waterways transportation
P.1; P.8	Guidelines related to grant of taxi permits, regulation of taxi aggregators, taxi operations, pricing, defining taxi categories etc.
Intervention Category: Non-motorised Transport (NMT)	
P.2; P.3; P.14; P.15; P.16; P.17	Providing NMT Infrastructure - footpaths, cycling tracks etc
P.1; P.2; P.16; P.17	Ensuring safety of pedestrians and NMT
P.2; P.3; P.14; P.15; P.16; P.17	Adoption and implementation of policy for Urban Street Vendors
P.2; P.17	Encourage initiatives like Rahagiri (no motor vehicle) days, bike sharing schemes and EV mobility
Intervention Category: Traffic Management	
P.2; P.14; P.17	Transportation Demand Management (TDM) through measures like car limited zones, congestion pricing zones, no-emission zones, high parking charges etc.
P.2; P.16; P.17	Integrate Intelligent Transport Management System (ITMS)
P.1; P.14; P.17; P.2	Planning for Freight Traffic: regulation of heavy motor vehicles (HMTVs) such as trucks, buses and lorries
Intervention Category: Road Safety	
P.1	Stringent punishment for faulty road design, engineering and maintenance, drunk-driving, over-speeding, violation of helmet and seat-belt laws etc.
P.1	Compensation for road accident victims
P.1; P.2; P.16	Electronic monitoring and enforcement of road safety
P1	Improving Quality of Driver by strengthening efficient and effective driver training and testing infrastructure
P.2	Establishing a state-wide Road Accident Database Management System
P.1; P.2;	Road Safety knowledge and awareness through education, training and publicity campaigns
P.9	Encouraging retro-fitment of on-road vehicles with hybrid kit
P.1	Protection of Good Samaritans in case of accidents
P.1; P.2; P.13	Safer Vehicle: promote safety standard in vehicles through inspection and Recall of faulty vehicles
Intervention Category: Financing and Governance	

P.2; P.4; P.14; P.17	Establishing Unified Metropolitan Transport Authority (UMTA)
P.2; P.14; P.17	Establishing Urban Transport Fund (UTF)
P.2; P.7; P.17	Providing financial and fiscal measures to support development and promotion of biofuels
P.2; P.13; P.14	Conduct capacity building & skills development activities
P.1	Setting up dedicated Road Safety Fund at state level
P.13	Fiscal & taxation measures to increase automotive production
P.1	Creation of National Road Safety Board
Intervention Category: Private Transport	
P.5; P.13; P.14	Implementation of Bharat Stage (BS) emission norms
P.6; P.14	Implementation of Fuel Economy Standards for passenger cars, HDVs & LCVs
Intervention Category: Technology and Innovation	
P.7	An indicative target of 20% blending of ethanol in petrol and 5% blending of biodiesel in diesel is proposed by 2030
P.7	Development of Second Generation (2G) ethanol technologies, advance biofuels and its commercialization
P.9; P.10	Supply side incentives for manufactures of EV & components
P.10	Encourage interlinking of renewable energy sources with charging infrastructure
P.12	Solar powered toll plazas have been envisaged
P.2; P.8; P.9; P.10; P.17	Deployment of hybrid/electric vehicles (Evs) through Demand side incentives
P.9; P.10	An Electric Vehicle (EV) research and manufacturing zone shall be established
P.7; P.9; P.10	Promoting R&D in clean vehicle technology; Setting up incubator facilities

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