

National Transport Policy and Cities: Key policy interventions to drive compact and connected urban growth

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Executive summary

Thriving cities – where people can easily connect with one another and with jobs, services, and amenities – are essential to economic prosperity. With the world's urban population expected to double by 2050, cities need to be built and run in ways that maximise access to opportunities without increasing carbon emissions, pollution, and congestion. Smart transport policy has a key part to play in laying the foundations for better urban structures, boosting public transport use, making it safe and easy to walk or cycle, and discouraging private car use.

This paper explores the wealth of options available to national transport policy-makers who wish to support more compact and connected urban development, and provides clear inputs on how to prioritise, broadening the focus from facilitating movement, to achieving true accessibility. It outlines different types of transport policy instruments and governance reforms, and examines 21 widely discussed interventions – including five that global experts identified as particularly effective for making cities more accessible. It ends with guiding principles for choosing and implementing the options best suited to each national context.

Transport policy is typically administered by dedicated transport ministries. Although it is usually separate from spatial planning, it directly affects urban development by determining the cost of travel between places and the quality of local environments. Policy-makers recognise these impacts, but transport departments' narrow remit – to facilitate movement – may lead them to make choices that increase urban sprawl and worsen congestion, making cities less accessible.



Photo credit: Visty Banaji

About this working paper

This working paper was prepared by LSE Cities at the London School of Economics, with research supported by the Overseas Development Institute (ODI) and funding from the UK Department for International Development (DFID). It was developed in partnership with the Coalition for Urban Transitions, which is a major international initiative to support decision-makers to meet the objective of unlocking the power of cities for enhanced national economic, social, and environmental performance, including reducing the risk of climate change. The research presented here was conducted in support of the Coalition's National Policy Levers workstream. The opinions expressed and arguments employed are those of the authors.

Citation

Rode, P., Heeckt, C., da Cruz, N.F. 2019. *National Transport Policy and Cities: Key policy interventions to drive compact and connected urban growth*. Coalition for Urban Transitions. London and Washington, DC. Available at: <http://newclimateeconomy.net/content/cities-working-papers>.



This material has been funded by UK aid from the UK government; however, the views expressed do not necessarily reflect the UK government's official policies.

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National road design standards, budget allocation choices and fiscal incentives can also make urban areas more car-centric and discourage public transport use, cycling, or walking.

Transport policies that prioritise movement and high speeds have many negative effects, from road accidents to increased air pollution to carbon emissions; transport already accounts for 23% of global CO₂ emissions, and is predicted to almost double by 2050 in a business-as-usual scenario. Experts have thus, for years, advocated for refocusing transport policy on accessibility, in close coordination with other sectors. This, in turn, requires recognising that spatial development, urban form and city design are dynamic, able to both respond to and shape transport interventions.

Our analysis focuses on policy instruments typically associated with the sectoral powers of transport ministries, but recognises that other sectors, especially urban planning and social policy, also have crucial roles to play in improving urban accessibility. We explore both specific policy instruments and the governance reforms that may be needed to support their implementation.

TAKING STOCK OF TRANSPORT POLICY OPTIONS

One way to think about national transport policy interventions is how much force the government wishes to apply. It can: impose regulations, requiring compliance (e.g. national fuel standards); create economic incentives (e.g. road pricing, or national budget support for public transport projects); or use information to encourage behaviour change (e.g. public awareness campaigns, or guidance for local transport planners that promotes accessibility-focused approaches). In addition, governance reforms may be needed to facilitate change, such as bringing municipalities together to plan and manage transport across a metropolitan area.

Policy interventions also vary in their scope: do they target a specific city, directly impact on all urban areas, or indirectly affect cities through national-scale change (e.g. fuel economy standards)? They may differ in the types of transition activities they foster or support: strategic, tactical, operational, or reflexive. They can vary enormously in their fiscal implications. And they may focus on different aspects of the sustainable transport hierarchy: avoid (reduce travel needs), shift (get more people to walk, cycle, or take public transport instead of driving), or improve (make travel cleaner and more energy-efficient).

From an inventory of 189 policy instruments and governance reforms, we developed a shortlist of 21, focusing on options that are widely discussed and clearly relevant to national transport policy-makers – from parking standards and awareness campaigns, to infrastructure budget reallocation and metropolitan strategic transport governance.

A survey of transport experts was then used to identify the five interventions deemed most important, on a global scale, for promoting compact and connected urban development. The top five chosen were:

Infrastructure budget allocation: Reforms to national transport budgets and infrastructure spending priorities can shift spending from roads and infrastructure that primarily benefits private car use to public transport, walking, and cycling. Two-thirds of experts cited this as a priority.

Integrated national urban and transport plans: New approaches to urban planning are emerging to align urban development strategy with transport planning and facilitate sustainable mobility at the city level. Bringing experts and planners together across domains (e.g. from different ministries) makes it easier to develop more coherent, complementary policies and plans.

Road pricing: Charging drivers to use a road – based on distance travelled, within a specific zone, or during peak hours – can help to reduce congestion, distribute the social costs of driving more fairly, and improve air quality. In addition, these charges can generate revenue to make alternative modes of travel more affordable, efficient, and pleasant.

Metropolitan strategic transport: Recognising that many people who work in cities commute from a wider metropolitan region, many governments have bundled key transport governance powers – fiscal, decision-making, infrastructure delivery and operations – at the metropolitan or “functional urban area” level.

Land-based finance/Land value capture: Public infrastructure projects can boost real estate values and create major new business opportunities. Governments are seizing on this to generate revenue for those projects by taxing value increases or negotiating contributions from property owners (“land value capture”). Related approaches include selling or leasing land for development around transport infrastructure (e.g. air rights or parcels next to a new metro station) and developing land jointly.

Notably, when asked about the top five policy instruments and reforms they saw as priorities for reducing carbon emissions, transport experts chose four of the five options listed above again. Only road pricing was displaced in the top five, with experts instead elevating parking standards reform. This demonstrates that actions that promote compact and connected cities also tend to be beneficial for low-carbon urban development.

KEY TAKEAWAYS FOR NATIONAL TRANSPORT POLICY-MAKERS

National policy-makers have a significant role to play in shaping urban development. Urban leaders are taking bold action to make cities more accessible, but the choices that national governments make can accelerate progress, or hinder it. This paper can serve as a first step in exploring the best options for each country. For policy-makers embarking on that journey, we recommend:

Carefully consider the national context, especially institutional arrangements.

Factors such as the political economy, level of decentralisation and wealth can make an option more or less viable. Institutional arrangements are particularly important. Find windows of opportunity to adopt particularly tough reforms when they are likelier to be accepted by the public.

Budgets matter – it is not about spending more, but spending better.

National budget allocations can make a major difference in efforts to make cities more compact and connected. This need not require increases in total spending, rather a shift from investments that primarily benefit road-building and maintenance towards public transport and infrastructure for walking and cycling. Consider financing as a critical enabler, especially of large-scale infrastructure.

Identify and eliminate harmful policy interventions that perpetuate the status quo.

Eliminating or reforming harmful policies, such as fuel subsidies, tax breaks on cars, minimum parking requirements, and road-building standards that prioritise speed, is as important as introducing beneficial ones. It is also important to address institutional structures that hinder progress, such as single-purpose road transport agencies.

Consider the wide menu of options to identify priority reforms.

Take stock of the policy interventions already in place and identify opportunities to adopt further actions that have already proven successful elsewhere. Appreciate that the same objective can often be addressed through regulatory, economic, or information-based pathways; which is best will depend on the local context and available resources.

Make new technology work for urban mobility (not the other way around).

Take the lead on steering the application of new technologies. Disruptive innovations – from smart mobility to autonomous vehicles – can transform urban mobility, but they require proactive policy intervention from the start. Embrace road pricing (including for electric vehicles) as a central instrument for managing traffic, and rethink the regulation of different modes of transport.

Bundle complementary policy interventions to enhance their impact.

Bundle and appropriately sequence policy interventions, as this will more effectively scale their impact and acceptability. Certain policy instruments and governance reforms may complement or reinforce others, so it is important to take a comprehensive approach to transport planning. Start with easier-to-implement measures while building up institutional capacity for more difficult ones.

Find common ground with other related sectors, especially urban planning.

Prioritise urban accessibility as a top-level outcome. Although this paper focuses on transport policy, complementary action is also needed in spatial planning (land use), social policy and other areas. To be truly effective, national governments need to foster strong cross-sector collaboration and governance reforms to support more joined-up urban planning and policy-making.

This paper provides a foundation for national transport policy-makers to begin pragmatic but ambitious conversations about actions they can take to make cities more accessible – either by leapfrogging car-centric development pathways, or by transitioning towards a more compact and connected future. There are multiple options to suit every national context – many with broad economic, social, and environmental benefits. By seizing these opportunities, countries at all levels of development can reshape urban life for the better for decades to come.

1. Introduction

Developing thriving cities is essential to achieving economic prosperity. Every country in the world today that has transitioned to middle-income status has significantly increased urbanisation levels.¹ As a result, more than 80% of global economic output is now produced by urban areas.² But urbanisation is about far more than economic growth. It involves profound shifts that affect cultural norms, social equity, health, and well-being – with both positive and negative results to date. Urbanisation also has major ecological consequences: from large-scale land conversion and loss of biodiversity, to greenhouse gas (GHG) emissions, air pollution, and environmental degradation. Urban development has thus become a critical component of the Anthropocene – a new era defined by humans' impact on the planet.

Policy-makers increasingly recognise that cities can and must do better. A key first step is to acknowledge that the physical shape of each city is not coincidental, but rather the outcome of specific choices. To develop more prosperous and sustainable cities, proactive policies need to be adopted at all levels of government to support those goals. This can be a tall order for national governments, which often operate in a highly departmentalised way, with little space to consider the aggregate effects of their policies on land use and urban development. In an increasingly urban world, however, national governments can't afford not to take on this challenge.

This paper focuses on one sector in particular – transport – and presents key options for national policy-makers to promote more sustainable urbanisation. It provides a systematic overview of potential policy interventions, as well as guidance to help decision-makers choose the most effective tools for their specific context. It is important to note that we start from the premise that urban development is most effective when it results in compact and connected cities. After a brief review of why these are desirable goals, we focus on how to align national transport policy with this agenda.

Transport and land use are closely interconnected, and this analysis should be considered together with related analyses of housing and urban development policies published by the Coalition for Urban Transitions. However, this paper recognises that most national transport policy-makers are focused mainly on facilitating movement, and engages them at that level. The goal is to build a pragmatic bridge between the global sustainable urban transport agenda and specific local conditions. We present an overview of different types of transport policy instruments and governance reforms, examine 21 widely discussed interventions, and end with key principles to help guide decision-makers.

1.1 THE CASE FOR COMPACT AND CONNECTED URBAN GROWTH

The great wave of urbanisation that is sweeping through Asia and Sub-Saharan Africa, along with continued urban growth and change around the world, presents unique opportunities but also great challenges for addressing environmental degradation, social equity, and economic prosperity.³ Poorly managed urban growth not only has severe negative consequences, but it can also create “lock-in”, limiting options for the foreseeable future. One major concern is that the average density of urban areas – a key proxy for efficient and accessible urban development as well as agglomeration advantages that enhance economic productivity and innovation – is projected to decrease by 40% globally between 2000 and 2030.⁴ This, in turn, can translate into productivity losses, congestion, long travel times, social segregation, high housing costs, air pollution and carbon emissions, and ecosystem service losses.⁵ In the US alone, the cost of those negative impacts has been estimated at more than US\$1 trillion per year.⁶

More and more cities are choosing a different approach. Innovators including Singapore, Bogotá, Stockholm, Vienna, Hong Kong, and San Francisco are showing how cities can create jobs, support economic development, and deliver a high quality of life with smaller carbon footprints. At the heart of these transitions is a vision for more compact and connected urban growth.^{4,7} By increasing liveable density, creating more mixed-use urban districts where people can live, work, study, shop, and have fun without excessive travel, and combining this with citywide, high-capacity public transport, cities can benefit from agglomeration effects, using resources more efficiently and achieving greater prosperity and social inclusion at lower costs.⁸

Such foundations of good urbanism are inherent to many successful interventions in cities around the world. They are part of Medellín’s social urbanism, with its focus on linking new transport with social infrastructures, as well as Seoul’s efforts to activate public space within the urban core. London’s transit-oriented urban intensification strategy, informed by its spatial development plan, has facilitated more successful, sustainable growth not unlike that of more land-constrained Tokyo. Similarly, and at lower income levels, diverse cities like Ahmedabad, Addis Ababa, and Dar es Salaam have found ways to translate more compact and transit-oriented growth effectively into their particular contexts.

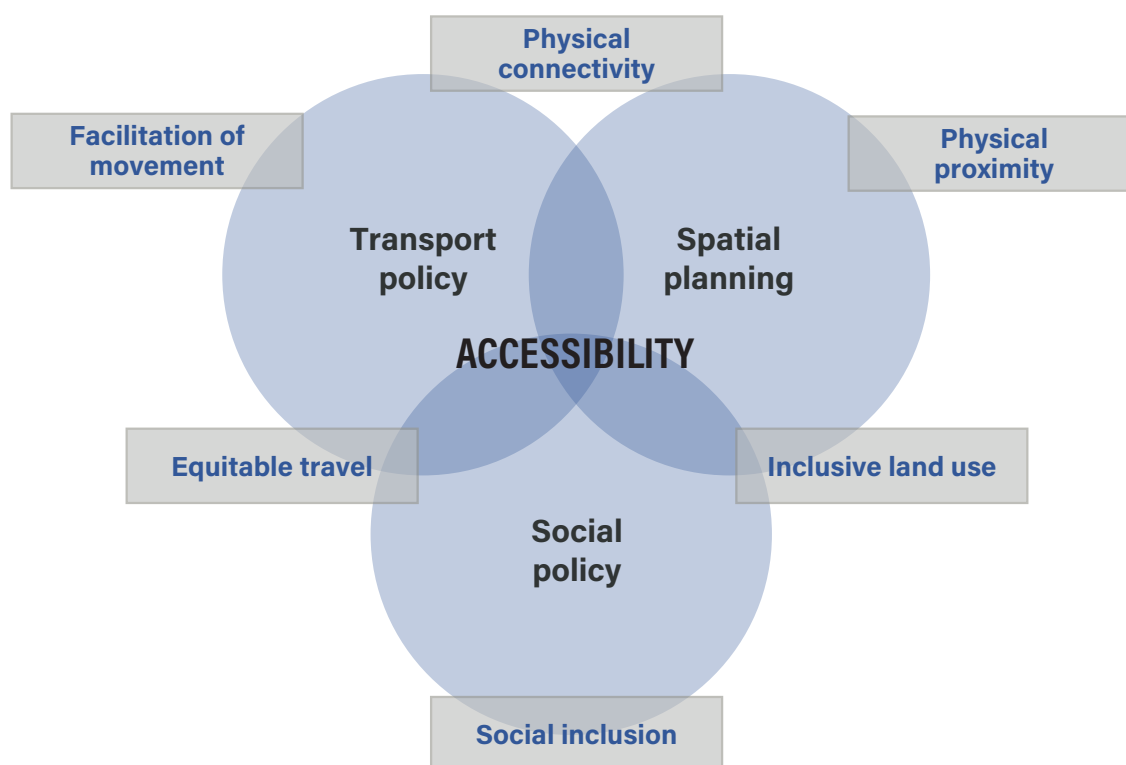
Still, reversing business-as-usual urbanisation trends will require more ambitious and coherent action than seen to date. It will require joined-up interventions from the national to the local level, recognising that urban development is shaped by policies at multiple levels. For national governments, it is also crucial not only to advance tailored national urban policies, but also to shift the focus of urban-impacting policies and their underpinning priorities.

Arguably one of the most important new priorities is enhancing urban accessibility – the ease with which people can reach destinations and connect with one another. Accessibility depends on land use – how different resources are situated within the city and relative to one another – as well as transport options, the availability of opportunities at different times, and people’s individual needs and abilities.⁹ Improving accessibility may require trade-offs between these factors and consideration of social norms, vested interests, technical capacity, appropriate technology, and many other issues.

Urban accessibility requires actions in at least three policy domains: spatial planning (land use), transport policy, and social policy (Figure 1.1), with strong cross-sector collaboration and governance reforms to support joint efforts. However, each sector’s role is fairly well defined and differentiated, and those sector-specific remits are robustly embedded into the institutional frameworks of most countries. Thus, even as governments work to integrate key institutions and policies, they can begin to work on sector-specific actions to advance urban accessibility. That is the context in which we present our analysis of national transport policy options. The transport sector alone cannot deliver good urban access, but it has a crucial role to play.

^a As set out in the NCE report *Better Growth, Better Climate*, compact urban growth refers to managed expansion which encourages higher-density, contiguous development, with functionally and socially mixed neighbourhoods, and walkable, human-scale local urban environments. Connected urban growth refers to investment in innovative urban infrastructure and technology, with a focus on smarter transport systems to connect and capture the economic benefits of more compact urban forms.

Figure 1.1
The urban accessibility nexus



Source: Authors

1.2 THE CRITICAL ROLE OF NATIONAL TRANSPORT POLICY

National transport policy typically focuses on distributing national funds to support infrastructure and services, controlling transport-related taxation and other pricing mechanisms, and establishing the legal and regulatory basis for transport systems. However, countries vary significantly in their approaches; in some, the national government is involved in the delivery of transport services at the local level, for example, while in others it plays mainly an oversight role, as most functions are performed by regional or local governments or by the private sector.¹⁰

Transport policy is typically administered by dedicated national transport ministries. Although it is usually separate from spatial planning, it directly affects urban development by determining the cost of travel between places and the quality of local environments. A district that is connected to other parts of the city by either highway or rail connections will develop in distinctively different ways. Policy-makers recognise these impacts, but transport departments' narrow remit – often labelled as “predict and provide”, simply to anticipate and address demand – often prevents them from considering the broader implications of their actions. Thus, in their efforts to facilitate movement, transport departments may unwittingly make choices that reduce accessibility.

For example, the urban highway programmes of countries as diverse as the US, China, and Kuwait have been shown to lead to urban sprawl, resulting in greater physical distances between destinations, longer travel times, and increased traffic congestion. Beijing is a good case study for this; in 2010, congestion costs were estimated at 4.2% of GDP following decades of investments in the city's six-highway ring roads as part of China's National Trunk Road Network.¹¹

Meanwhile, national road design standards aimed at moving vehicles faster and more continuously have reduced accessibility at the local scale, with roads and intersections acting as major barriers to pedestrian connectivity. This is the case with federally funded roads in the US, for example; the result has been overly wide streets that are hard to navigate and cross for pedestrians and cyclists.¹²

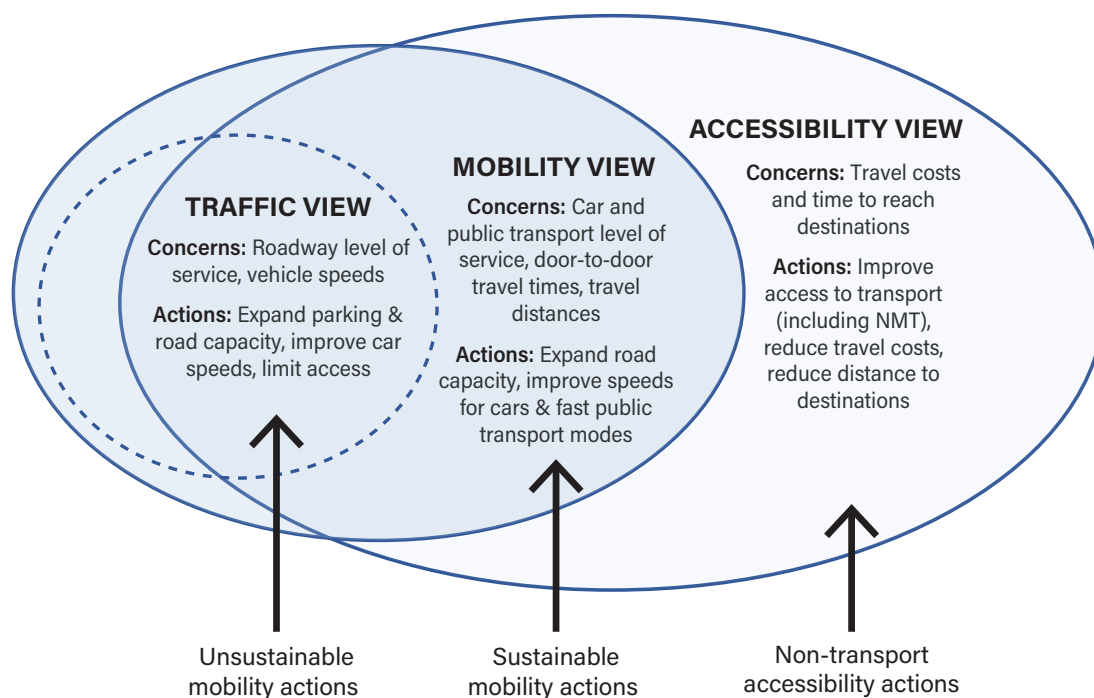
The promotion of mass motorisation, including through fiscal incentives ranging from fuel subsidies to vehicle purchase support, can ultimately lead to significantly higher transport expenditures as a proportion of income.¹³ Given the excessive demand of space required for automobile movement and parking, such policies also subsidise the least spatially efficient form of transport, exacerbating the conflict between place and mobility functions of urban spaces.

In addition to these accessibility shortcomings, transport policy that focuses narrowly on movement and speed has resulted in numerous negative externalities, above all road accidents, transport inequalities, air pollution, and unsustainable resource use.¹⁴ Most worryingly, perhaps, transport is the fastest-growing carbon emissions sector globally, already accounting for 23% of global CO₂ emissions, and predicted to increase by 70% by 2050 under a business-as-usual scenario.¹⁵ In addition, life cycle analysis suggests that carbon emissions embedded in transport infrastructure (i.e. those linked to their construction) are substantial, typically adding another 63% of embodied emissions for road transport in addition to emissions from vehicle operations.¹⁶

Experts have thus, for years, advocated for refocusing transport policy on accessibility, in close coordination with other sectors.¹⁷ Instead of only considering traffic or even mobility,¹⁸ transport policy needs to get better at judging the aggregate impact of supporting different types of movements and speeds. Above all, this requires policy makers to recognise that spatial development, urban form, and city design are themselves dynamic, able to both respond to and shape transport interventions.

As shown in Figure 1.2, a transport policy progression from traffic to mobility and accessibility creates a broadening of concerns and actions across modal shares, urban design and morphology, economic efficiency, and quality-of-life parameters. It also requires new cross-sectoral metrics, analysis, and appraisal methods. These will have to acknowledge the difference between transport-related terminologies that are often used interchangeably: traffic (focus on level of service of roads and vehicle speeds), mobility (focus on multi-modal, door-to-door movement), connectivity (focus on ease of exchange between fixed locations), and accessibility (focus on travel costs and time to reach destinations).¹⁹ By contrast, many transport performance indicators, such as roadway level of service and average traffic speeds, continue to measure mobility rather than accessibility, and are biased simplistically in favour of ease of movement.²⁰

Figure 1.2

The transport policy progression towards accessibility

Source: Venter based on Litman, 2017²¹

An accessibility focus for transport policy implies a balancing between how people and goods move, the efficiency of that movement, macro- and micro-level connectivity (e.g. citywide and neighbourhood level), and the direct and indirect costs (e.g. is it affordable, does it mitigate social, environmental, and economic externalities?). Accessibility is necessarily focused on the range of transport options, not just a few priority modes, as well as minimising travel costs and distances, and even reducing the actual need for travel (e.g. considering mobility substitutes such as urban density and mixed use but also telecommunication).²² For urban conditions, advancing accessibility usually requires transport policy to accept that car-based journeys are the least optimal.

Over the last decades, several countries have reformed their transport policies to better facilitate urban accessibility. In the US, the 1991 Intermodal Surface Transportation Efficiency Act enabled better coordination between land use and transport planning by providing more flexibility to allocate “highway” funds to public transport.²³ The UK’s 1997 New Deal for Transport introduced opportunities for advancing urban accessibility and, besides a shift of transport budgets from roads to public transport, walking, and cycling, allowed cities to generate their own revenues based on road pricing, which London successfully adopted.²⁴ National transport policy reform in Colombia also led to a considerable improvement in urban accessibility. Within a decade from the early 2000s, a combination of devolving transport governance and assisting with national government grants has introduced more than 190 km of new high-capacity bus systems serving 2.5 million passengers per day, increased the number of cities with mass transit systems from two to eight, and enhanced transport and land use coordination. In 2003, Colombia also adopted a dedicated national policy for urban mobility and transport.²⁵

Looking ahead, social and technological changes are likely to transform urban transport even faster than in the previous decade, adding to the urgency for national transport policy reforms. There will be new mobility services, smart logistics, novel personal mobility devices, and increasingly autonomous vehicles. The medium- to long-term impacts of these innovations are difficult to predict, especially as lifestyles and the nature of work are also changing rapidly. Overall travel needs may be drastically altered as more people connect, work, shop, and play remotely.²⁶

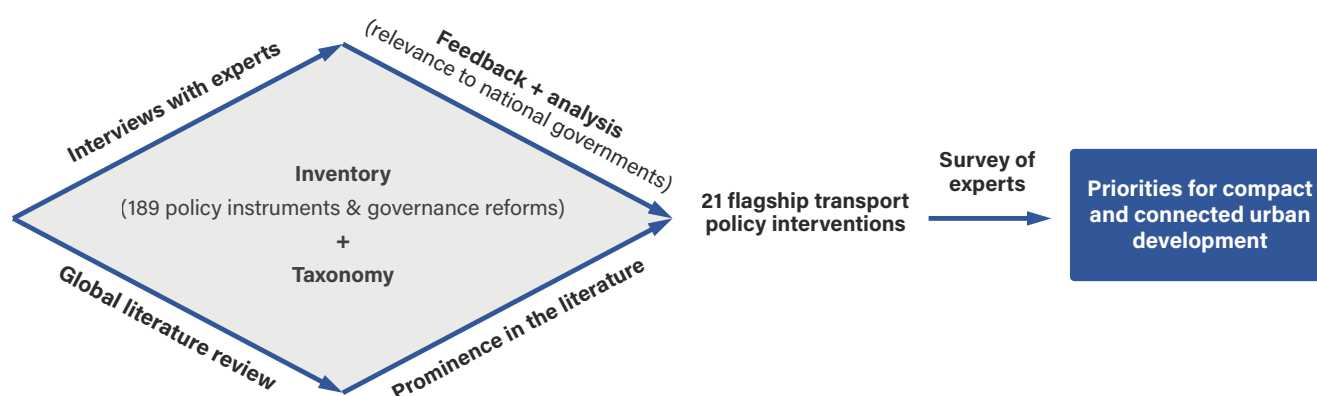
To summarise, transport policy has a great impact on the quality of life, economic dynamism, and environmental sustainability of cities, and can play a central role in enabling compact and connected urban growth. At its best, transport policy focuses on increasing urban accessibility in conjunction with spatial planning and social policy. This approach recognises that the provision of equitable and efficient access to people, goods, and services is a primary function of cities, even though many urban areas are struggling with this fundamental requirement. In the medium and long term, a shift towards accessibility planning and the facilitation of compact and connected urban growth will necessitate governance reforms and enhanced capacities for policy integration.²⁷ In the short term, the accessibility paradigm will have to provide key pointers for existing transport policy frameworks and instruments around which these can be recalibrated.

1.3 RESEARCH APPROACH AND REPORT STRUCTURE

The research for this paper included both desktop-based work and primary research using interviews and expert surveys. Following initial scoping calls with transport experts, an extensive global literature review informed the creation of an inventory of 189 transport policy instruments and governance reforms (Figure 1.3). Policy interventions in this inventory were organised against more than 20 characteristics that helped to structure, analyse, and compare them. This led to the creation of a taxonomy based on instrument type, followed by a more in-depth discussion of how these instruments and reforms could be grouped (section 2). A final set of 21 interventions was chosen based on: (i) feedback from experts; (ii) the prominence of these instruments and reforms in the literature; and (iii) relevance to national governments. In total, 77 experts from 26 countries were consulted to further prioritise this selection in the context of compact and connected urban growth, with the top five policy interventions explored in more detail (section 3).

Figure 1.3

The transport policy progression towards accessibility



Source: Authors

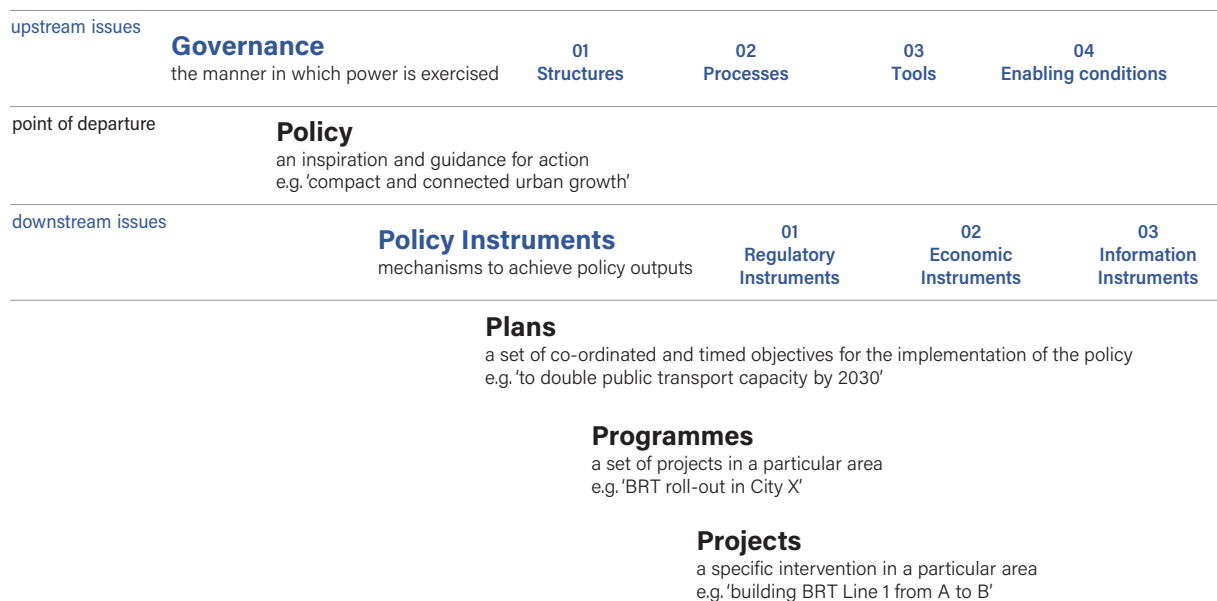
Experts also provided detailed input about the flagship policy interventions in relation to contextual factors, country characteristics, and key barriers that will have to be considered (section 4). Based on the inventory and priority flagship policy interventions, section 5 presents a set of key takeaways for national policy-makers. More detailed methodological information can be found in Appendix A, while Appendix B contains the full policy inventory.

2. Mapping the landscape of national transport policy interventions

This paper starts from the premise that compact and connected urban development is a highly desirable policy objective, and that national governments can and should play a role in supporting cities' efforts to achieve it. Transport is a mature policy sector, focused broadly on facilitating the movement of people and goods. Thus, we focus on policy instruments typically associated with the sectoral powers of transport ministries, even while recognising that other sectors, most notably urban planning and social policy, have key roles to play as well. In addition, we identify governance reforms that could also advance this objective. Thus, in this paper national transport policy intervention is understood as the combined focus on policy instruments and governance reforms.

This dual focus is based on the recognition that policy instruments are often technocratic and fairly un-ideological, but the context in which they are implemented is inherently political. Thus, examining the role of national transport policies in making cities more compact and connected requires looking both *downstream* – what practical options are available, such as regulating traffic speeds, public transport budget allocations, or road design codes – and *upstream*, to consider whether decision-making power and resources are allocated in ways that support implementation of those options. Questions of governance are inherently more political than policy instruments, but often they can be addressed more easily once there is agreement on policy priorities, as the questions can then be framed as administrative and technical coordination issues.

Figure 2.1
Policy, instruments, plans, programmes, and projects



Source: Authors, based on Wood and Dejeddour, 1992²⁸

National transport policy-makers who wish to proactively support compact and connected urban development don't need to start from zero. Many countries have already undertaken efforts that offer valuable lessons and examples, and urban leaders and experts have identified a wide range of relevant policy instruments and governance reforms. This section aims to help policy-makers make sense of the options, first by introducing a simple taxonomy based on instrument types and then showing how they may differ in scope, focus, and fiscal implications.

Based on an in-depth literature review and interviews with experts, we identified 189 policy interventions (126 national transport policy instruments and 63 governance reforms) that may facilitate more compact and connected urban development. These include proactive measures to achieve more sustainable urban transport configurations, as well as the elimination or reform of harmful existing measures (such as fiscal support for inner-city motorways, misguided road-building manuals or minimum parking requirements). The list also comprises instruments and reforms that may be devolved to regional or local governments in most countries, as well as measures that were unsuccessful when implemented in specific contexts but have the potential to be effective. In addition and for comparative purposes, other transport policy instruments and reforms specifically targeting low-carbon urban development were also considered. Excluded are air travel and shipping policies, which are a major concern for sustainable transport but were deemed less relevant to compact and connected urban growth.

Policy-makers can use the inventory both to identify ways to achieve specific transport objectives, and to assess the mix of policy instruments that they are currently using, considering the full range of options available to national governments. The focus on concrete policy instruments can help to keep conversations more pragmatic and un-ideological than a discussion of broad policy agendas might be – though at some point, questions about the respective roles of national vs. subnational (and specifically, municipal) governments are inevitable. As an entry point to these conversations, the next section introduces a basic taxonomy that outlines key types of policy instruments and reforms, including options that are more likely to be initiated by local governments, but still require national-level action and support.

2.1 TOWARDS A TAXONOMY OF POLICY INTERVENTIONS

One way to think of how government effects change is to consider how much force it applies. From this perspective, policy instruments fall into three categories: regulatory (the most forceful type, in which compliance is mandatory); economic (incentives and disincentives); and information-based (non-coercive measures).²⁹ In addition, there are “upstream” organisational strategies and institutional arrangements that can act as enablers or barriers to change, which are covered under governance reforms. Table 2.1 summarises these four categories.

Table 2.1
Policy instruments and governance reforms

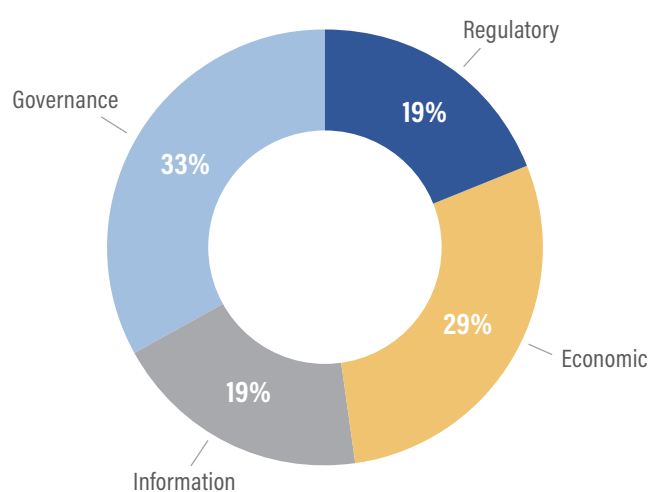
Regulatory	Economic	Information	Governance
Regulatory policy instruments are measures undertaken by governments to influence people by means of formulated rules and directives which mandate that they should behave in a specific way.	Economic policy instruments involve either the handing out or the taking away of material resources, be they in cash or in kind. Economic instruments make it cheaper or more expensive in terms of money, time, effort, and other valuables to pursue certain actions.	Information-based policy instruments cover attempts at influencing people through the transfer of knowledge, the communication of reasoned argument, and persuasion. The only things offered are data, facts, knowledge, arguments, and moral appeals.	Governance reforms change the institutional frameworks within which governments, the private sector, and other stakeholders operate. They directly address the rules that these agents have to follow, their related powers and institutional capacities.
Controlled persons or groups are obligated to act in the way stated by the controllers.	Leaves a certain leeway within which to choose by themselves whether to take action or not.	No government obligation or coercion is involved. Individuals are nudged towards changed behaviour.	Creates the enabling environment that determines the availability and effectiveness of policy instruments.

Source: Authors, based on Vedung, 2017³⁰

Any of the policy instrument types above can be used to address a given challenge. For instance, if policy-makers want to reduce car use in certain areas, they can: prohibit driving in those areas (regulatory); introduce road pricing to disincentivise driving (economic); or use information campaigns to encourage motorists to find alternatives (e.g. by telling them how much faster they might be arriving using public transport). In most cases, a combination of all three instrument types, supported by governance reforms, will be most effective at ensuring that urban accessibility objectives are met. Figure 2.2 highlights how the inventory can be broken down based on the four categories, with economic instruments and governance reforms each making up about a third of the total, and regulatory and information-based instruments accounting for the remainder.

Figure 2.2

Share of policy instruments/governance reforms according to the instrument type



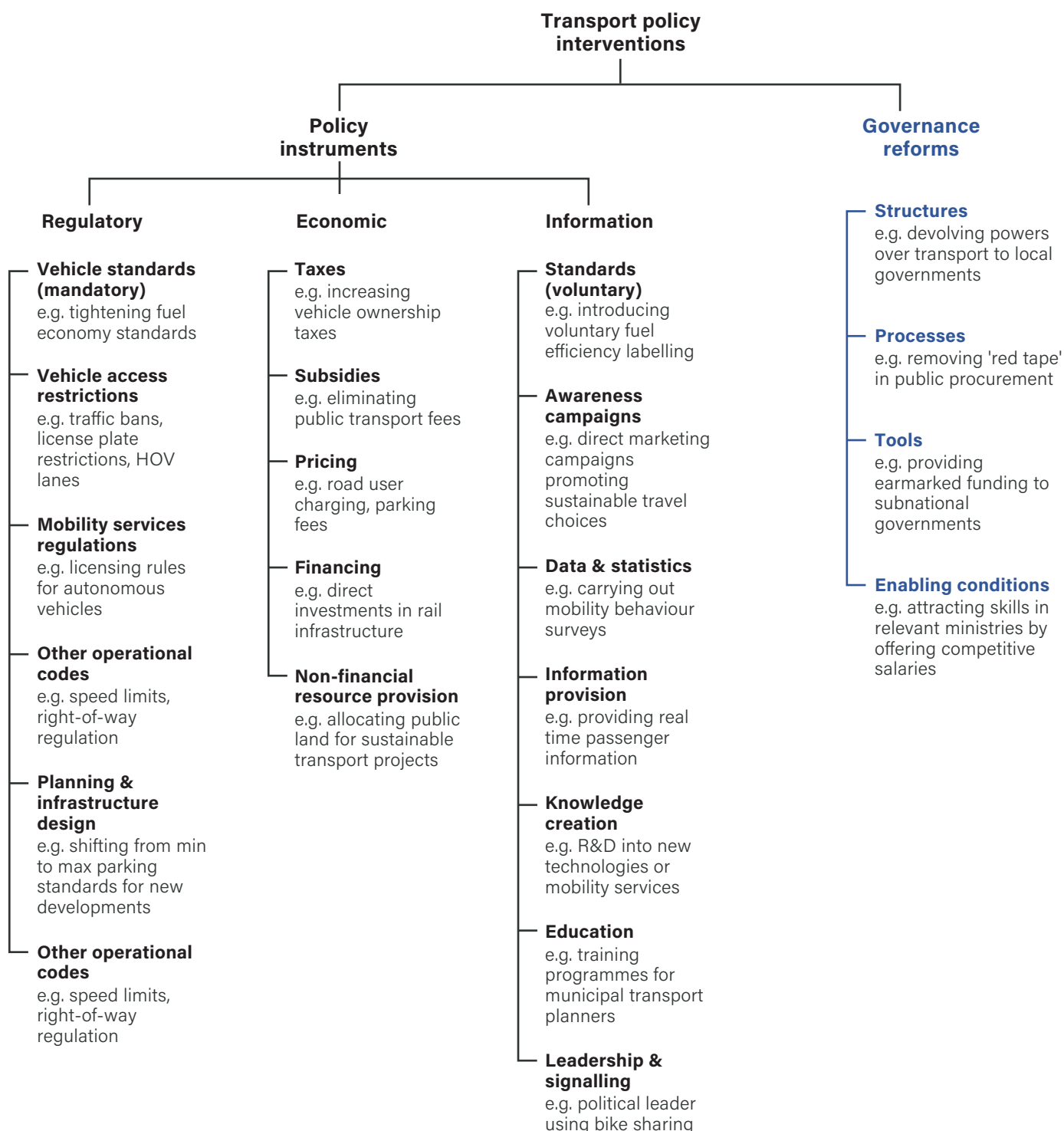
Source: Authors

It is important to note that some policy instruments overlap across categories. A good example of this is road pricing, which may at first glance appear to be an obvious economic instrument but actually requires governance and regulatory changes to enable local governments to charge road users and also has significant information-based elements. A similar overlap of areas of influence can be observed in relation to strategic transport and urban development plans, which may start out as guidance documents and thus be classified as information provision but may later become legally binding in which case they would be classified as regulation. To account for these ambiguities the inventory identifies the main category based on the primary/most common mechanism used to influence actors.

In addition to the four high-level categories presented in Figure 2.2, we have broken the inventory down into additional sub-categories that together form the taxonomy presented in Figure 2.3.

Figure 2.3

Taxonomy of transport policy instruments and governance reforms



Source: Authors

Regulatory policy instruments

Applying the above categorisation to the global inventory reveals that 19% of the policy instruments we reviewed can be considered regulatory instruments. Historically, regulatory “command-and-control” type policy instruments are the most widely used and well-established tools available to policy-makers. Generally speaking, the implementation cost to governments from these instruments is small and they tend to be fairly effective at achieving a particular objective as long as enforcement is closely monitored. Examples include fuel standards in Europe, vehicle access and parking restrictions in Singapore, and reformed urban planning policy in Brazil.

Even in countries where many aspects of urban transport planning and management have been devolved to the local level, regulatory instruments can still provide a framework to support compact and connected urban development. For example, laws to reduce speed limits in urban areas not only make roads safer, but also reduce congestion, noise, and air pollution.³¹ Globally, only 29% of countries have urban speed limits of 50 km/h or below and/or allow local authorities to reduce them further but this is increasingly being recognised as an area where national governments should introduce stricter laws.³² In December 2018, Spain announced that it was developing a plan to reduce urban speed limits to 30 km/h, following requests by several cities; similar measures are being discussed in other European countries.³³

Economic policy instruments

Economic instruments make up 29% of the inventory. For the purposes of this taxonomy, this category also includes direct funding and financing of transport infrastructure and operations by national governments. Since the 1980s, there has been a considerable expansion of transport policies that rely on economic (or “market-based”) instruments to achieve their objectives. This emerged out of a consensus that, in certain contexts, regulatory instruments fail to achieve the most efficient outcome due to the rigidity of their “one-size-fits-all” approach and lack of incentives for actors to change their behaviour beyond what is legally mandated.³⁴ Although economic instruments can be more efficient, determining the appropriate level of taxes and subsidies requires a high degree of administrative capacity and institutional maturity, exacerbated by information asymmetries between policy-makers and individuals and firms.

Examples of instruments in this category include: vehicle registration; ownership, fuel, emissions, and usage taxes; and parking and congestion fees aimed at bridging the gap between the private and social costs of transport. On the other side of the spectrum, subsidies for electric/low-carbon vehicles and public transport fees can provide positive incentives to transition towards compact and connected growth. Different economic instruments can balance each other out, and effective transport demand management often requires a combination of disincentives for driving and incentives for walking, cycling, and public transport. Some studies estimate that in the US, only about 5% of commuters pay for parking, meaning that even when public transport is available (and it often isn’t) making the switch might simply not make economic sense for individuals.³⁵

Increased funding for major transport infrastructure projects that cities may not be able to pay for on their own is another significant area where national governments can shape urban transport outcomes through economic policy. In countries such as Colombia, Mexico, China, and Indonesia, national governments have played an important role in ensuring that cities have the financing and technical assistance they need to meet their growing mobility challenges, resulting in large increases in the provision of urban mass transit in these countries over the past 15 years.³⁶

Information-based policy instruments

Most economic and regulatory policies rely on what is known as a “carrot and stick” approach – in which individuals are generally assumed to have a set of fixed preferences and valuations – but ignore the fact that public policy needs to be about changing attitudes. This is where information-based or “soft” policy tools have the potential to make a real difference, through a variety of mechanisms to nudge, raise awareness, and change behaviour and attitudes over time.³⁷ These instruments make up 19% of the inventory and include: voluntary labelling and certification schemes;

awareness campaigns about the costs of driving and the benefits of alternative travel choices; reforming data collection and statistical services to align with accessibility goals; R&D to support new mobility services; and education for local transport planners.

In addition to direct awareness-raising and communication with the public, national governments can also use softer policy measures that impact on local transport planning. Examples include the US Federal Highway Administration's endorsement of the NACTO Urban Street Design Guide that aims to reimagine urban streets as safe, sustainable public spaces for people walking, driving, biking, and using public transport,³⁸ and New Zealand's adoption of national guidelines for integrated transport assessment that use accessibility-based appraisal methods to account for the local environmental and social impacts of new transport projects.³⁹

Governance reforms

The final third of interventions reviewed can be categorised as governance reforms (63 out of 189). These legislative or institutional changes can consist of: (i) new *structures* that set the responsibilities, powers, and jurisdictions of different actors; (ii) new *processes* that guide the procedural activities and planning efforts while determining the level of involvement of actors at different stages; (iii) new *tools* that cover strategic plans, assessment methods, information gathering, and metrics; and (iv) new *enabling conditions* that address leadership, institutional cultures, and capacities. It should be noted that some of these reforms are not necessarily transport-specific. Furthermore, most do not foster or curtail urban accessibility by themselves. Depending on the context, the same governance reform can have a positive impact in one jurisdiction and a neutral or negative impact in another (in terms of the institutional environment that determines the effectiveness of accessibility policies).

The decentralisation efforts in Colombia that started in 1986 and were strengthened by the 1991 Constitution are representative of a successful governance reform that allowed cities to develop innovative solutions to improve accessibility.⁴⁰ Following in the footsteps of the pioneering example of Curitiba in Brazil, these reforms enabled Bogotá to roll out more kilometres of the bus rapid transit (BRT) system per resident than most other countries and at a comparatively lower cost.⁴¹ Slightly different from devolution, recent years have seen attempts to re-municipalise transport-related responsibilities. For example, in France, a new law was passed in 2010 that enables two or more municipalities to create a “local public company” (SPL) that can carry out public services without the need to invite tenders from private companies.⁴² Since the law was introduced, more than 350 SPLs have been created, replacing mixed public–private and private operators, especially in public transport.⁴³ The city of Saumur in Western France created an SPL for its public transport services, leading to annual savings of between €400,000 and €800,000.⁴⁴

While re-municipalisation certainly has the potential to improve the quality of service and/or reduce costs, such an outcome cannot be guaranteed. Such reforms require careful consideration. In Addis Ababa, for instance, strategic transport powers were re-centralised, putting the federal government in charge (through the Ethiopian Railways Corporation) in order to deliver the Addis Ababa Light Rail Transit system.⁴⁵ The city government was deemed to lack the skills and financing capacity to deliver such a complex and costly project. This is why governance reforms have to consider existing incentives and institutional capacities, and be carefully monitored to ensure that they produce the desired outcomes.

2.2 CRITICAL CHARACTERISTICS BEYOND THE TAXONOMY

The inventory of policy instruments was not just reviewed using the high-level taxonomy of instrument type presented above but also based on a set of key characteristics that can help to further differentiate the policy interventions and act as important entry points for discussions about relevant policy instruments and governance reforms.

These characteristics help to segment and compare the interventions, think through their impact, and consider key contextual factors and implementation barriers. Given that policy interventions were assessed in general terms (rather than within a specific country context), this approach is necessarily a simplification of the actual complexities of policy-making but it provides a framework for specific conversations related to this wide range of transport policy tools. This

section briefly describes four of these characteristics that were deemed particularly interesting and describes how they could be used to evaluate policy options:

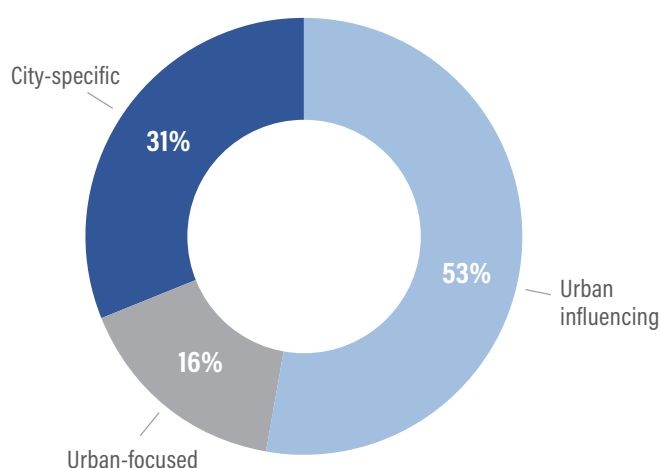
1. What is their scope? Do national policies (indirectly) influence all cities, (directly) focus on all urban areas, or target a specific city?
2. What types of transition activities do they foster or support: strategic, tactical, operational, or reflexive?
3. How great are the policies' fiscal implications?
4. Which piece of the sustainable transport hierarchy do they support: avoid, shift, or improve?^b

Urban scope

National transport policies vary dramatically in how narrowly they target cities: they can be general policies that significantly influence urban areas, targeted policies focused on urban areas, or specific to a single city or urban area.⁴⁶ This important perspective builds on the United Nations' New Urban Agenda and its advocacy for the establishment of comprehensive and coherent national urban policy.⁴⁷ As shown in Figure 2.4, more than half the policy instruments that we considered (53%) fall into the first category; for example, vehicle tax reforms, fuel subsidies, and emissions standards. Although they do not specifically target cities, they can strongly influence the relative cost of different transport modes, which in turn can affect incentives for urban growth and sprawl. Only 16% are urban-focused (e.g. developing sustainable urban mobility plans, changing planning policy, subsidies for urban infrastructure). More common (31%) are policy instruments targeting specific cities or urban areas (e.g. financing a metro system or other transport infrastructure). This category also includes many policy instruments that are typically implemented at the city level (road user charging, parking policy), but where the national government can play an important enabling role.

Figure 2.4

Share of policy instruments according to the urban scope



Source: Authors

^b The pie charts in this section only show data from the 126 policy instruments and exclude the 83 governance reforms since they are often not directly comparable. Corresponding results for governance reforms are discussed at the end of each section where applicable. For a full list of all characteristics for which data were collected, see Appendix A.

Among the governance reform options we reviewed, the vast majority (84%) are urban-influencing. This is not surprising, but the fact that such large shares of both policy instruments and governance reforms are only urban-influencing may help to explain why national transport policies have not made a significant positive impact on cities to date: they are not directly addressing the targeted problems.

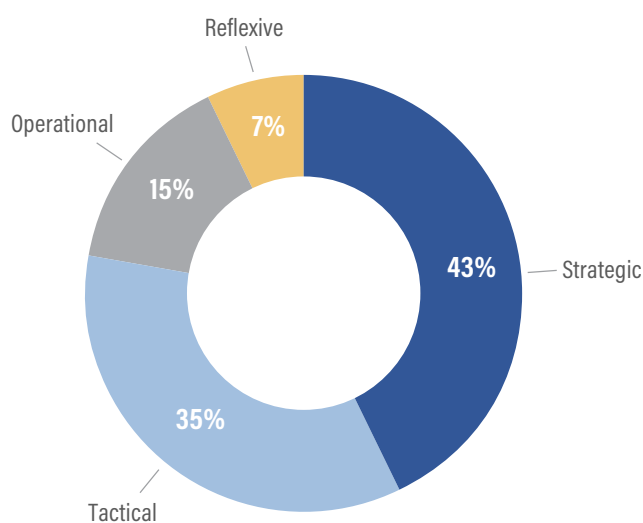
Transition activity

Over the last decade, government action in the context of achieving more sustainable development has been increasingly framed as transition management.⁴⁸ From this perspective, policy instruments can be categorised by where they fit into the transition process: from the establishment of a vision (strategic), to implementation (tactical and operational), and finally to the evaluation of outcomes and processes (reflexive).

As shown in Figure 2.5, the vast majority of the policy instruments we assessed can be classified as either “strategic” (43%) or “tactical” (35%). This is partly due to the high number of regulatory instruments included in the inventory as well as the long-term impact of major infrastructure decisions we considered. The very small number of policy instruments that support the reflexive stage is a concern, as evaluation and learning are critical for managing better transitions in the future. For example, in a recent analysis of 30 transport mega-projects across 10 OECD countries, more than half did not include any form of post-project evaluation.⁴⁹ When it comes to the governance reforms in the inventory, a full 83% were classified as strategic.

Figure 2.5

Share of policy instruments according to the type of transition activity

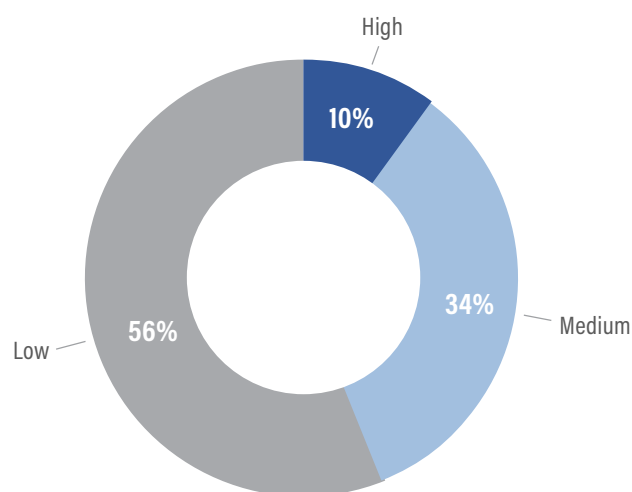


Source: Authors

Fiscal implications

A universally important consideration for policy-makers relates to the impact that specific policy instruments have on the budget. Recent policy debates on sustainable development have highlighted that the traditional, simplistic lens of assessing policy options by “how much does it cost the taxpayer?” needs to give way to the far more appropriate consideration of sustainable management of public funds, considerations of environmental and social externalities (shadow pricing), and a government’s capacity to identify and execute policies while maintaining control of their fiscal implications.⁵⁰

Figure 2.6

Share of policy instruments according to their fiscal implications

Source: Authors

Figure 2.6 presents a simple three-level differentiation of fiscal implications of national transport policy instruments. Perhaps somewhat surprisingly, only 10% of policy instruments reviewed were judged as having high/considerable fiscal implications. These are mostly policies that include significant infrastructure or operational investments or a reallocation of public budgets (e.g. building new railway infrastructure). Another 34% were judged to have medium/some fiscal implications. These mostly include economic policy instruments implying transport-related changes to taxation and/or fees. It should be noted that this category doesn't differentiate instruments that are revenue generators – it merely highlights whether there is a considerable impact (positive or negative) on government budgets. The majority (56%) of policy instruments actually have low/negligible fiscal implications. These are mainly regulatory and information-based instruments. They do not require major coordination with finance ministries or treasuries and can thus be rolled out more rapidly and focus explicitly on accessibility and sustainability concerns. High or medium fiscal impact does not mean those policy instruments are less relevant, however; they are just likely to require a higher level of coordination and governance complexity.

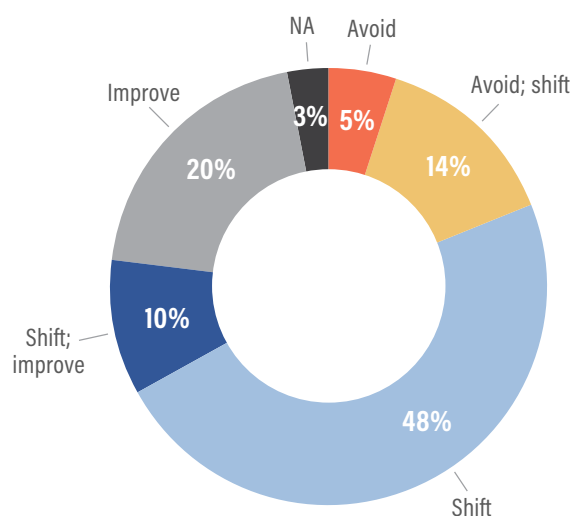
Of the governance reforms reviewed, 65% have low fiscal implications. Many of these institutional and organisational arrangements don't require large budgets, but do require administrative capacity, institutional coordination, and political willpower.

Sustainable transport hierarchy

A final way of segmenting the policy instruments is the three-tiered transport policy hierarchy known as Avoid-Shift-Improve (ASI) (Figure 2.7). In many countries around the world, policy responses to increased transport demand continue to focus on building and expanding road infrastructure even though there is mounting evidence that such a supply-side oriented approach actually leads to induced traffic, which in turn exacerbates congestion, urban sprawl, air pollution, greenhouse gas emissions, and other negative externalities.⁵¹ By contrast, ASI policy instruments focus on demand-side responses for more sustainable transport solutions. Depending on the specific implementation context, individual policies can promote one or two or all three of the below approaches at the same time (others are higher-level, focused on the enabling environment, and thus don't fit into one of the three categories).

Figure 2.7

Share of policy instruments according to the sustainable transport hierarchy



Source: Authors

Avoid (reduce) includes any policies that improve the efficiency of the transport–urban form system as a whole and thereby avoid the need to travel or reduce the overall trip length. Integrated transport and land use planning that improves accessibility and transport demand management policies, such as video conferencing and remote working, fall into this category. Very few national policy instruments (5%) fall exclusively into this category. This finding highlights that transport policy only has a limited ability to reduce the need to travel, which is an area that wider urban and land use planning and social and economic policy are better placed to address.

Shift (maintain) policies aim to improve the efficiency of individual trips by encouraging people to travel less in private cars and instead use public transport, walk, or cycle. Examples include support for public transport systems to enable fare reductions, investments in cycling infrastructure, and road pricing. An emerging idea on the “maintain” front is to impose fees on ride-sharing services such as Uber to keep them from drawing passengers away from public transport. The largest number of policies reviewed (48%) fall into this category.

Improve refers to increasing the efficiency of transport infrastructure, vehicles, and fuels to make them more energy-efficient and less polluting. Examples include investments to electrify bus services, stricter emissions standards, and eco-driving campaigns; 20% of policies fall into this category.

Collectively, the four approaches to analysing the inventory discussed above offer a way to better understand the nature of different policy interventions and governance reforms. No categorisation is inherently superior to the others, but some characteristics may resonate more with specific stakeholders or in specific contexts.

3. Flagship transport policy interventions

Few policy-makers have the time or resources to seriously consider 189 transport policy interventions in detail. Thus, we asked transport policy experts which ones they deemed most critical or effective for promoting compact and connected urban development. We also reviewed the literature to determine which policy instruments and governance reforms were featured most prominently, and then filtered the inventory to highlight the most relevant ones for national governments (Table 3.1). This process resulted in a list of 21 “flagship” policy interventions (eight regulatory, eight economic, two information-based, and three governance reforms), which we shared with 77 transport experts from 26 countries in a detailed survey.^c The survey asked experts to prioritise these interventions and to identify barriers to implementation, complementary policies, and country characteristics that might influence the relevance of each option.

It is important to stress that the policy instruments and governance reforms were assessed on a global scale, which is inherently different from how policy-makers might consider their options in a specific national context. Potentially relevant contextual factors are discussed in section 4. Still, the resulting shortlist represents a set of highly relevant interventions applicable in many contexts – a useful starting point for discussions that can then be tailored to local circumstances.

Table 3.1

Overview of flagship policy instruments and priority governance reforms

Type	Intervention focus	Description	Benefits for cities
Regulatory	Parking standards	Many jurisdictions have minimum parking requirements for new developments; eliminate such minimums and instead set maximum amounts of parking allowed for new developments	Frees up space for other uses as parking takes up a great deal of space; limiting parking also encourages walking, cycling, and public transport use instead of driving
	Smart regulation of mobility-as-a-service	National regulation that enables multi-modality and integrated ticketing, avoiding new mobility service monopolies and securing transitions towards autonomous shared vehicles	Ensures that new transport technologies are adapted to meet urban development objectives instead of the other way around
	Licence plate-based restrictions	Bar vehicles with certain licence plate numbers (e.g. odd- or even-numbered, or commercial registrations) from accessing the city centre on certain days or at certain times	Reduces congestion by limiting the number of vehicles operating on city streets
	Freight management	National guidelines that regulate the movement of trucks in inner cities and require that logistics centres be situated on the outskirts of cities	Reduces congestion and improves road safety and air quality
	Speed limits	Reduce national speed limits, e.g. to 30 km/h on all urban roads and 80 km/h on all urban highways	Improves road safety, air quality, public space, and liveability
	Fuel economy and emission standards	Raise standards to considerably more ambitious levels	Reduces air pollution and GHG emissions from vehicles

^c See Appendix A for a breakdown of results by professional background and country of origin.

Table 3.1

Overview of flagship policy instruments and priority governance reforms (Cont.)

Type	Intervention focus	Description	Benefits for cities
Economic	Enforcement regimes	Strengthen enforcement of speed limits, driving restrictions, and parking regulation (through better technology, human resources, and appropriate fines)	Ensures that existing laws are effectively implemented and can thus fulfil their purpose
	Highway codes and road standards	Reform existing national highway codes and road standards to enable more flexible urban street design (e.g. reducing road width and speed requirements)	Ensures that roads in urban areas can be designed to meet local needs, including safety and accessibility for pedestrians and cyclists
	Infrastructure budget reallocation	Adjust national transport infrastructure budgets to increase the share of funds going to public transport and infrastructure for non-motorised transport	Boosts funding for much-needed public transport projects, bike paths, pedestrian areas, etc.
	Road pricing	Charge for the use of inter- and intra-city roads through different forms of user fees	Fees incentivise modal shift and generate revenue for better urban transport services and infrastructure
	Land value capture	Enable governments to raise revenue from increases in property values and/or business income due to public investment (e.g. a metro line expansion), and use it to finance public transport infrastructure	Increases available funding for public transport projects
	Fuel subsidies	Eliminate national subsidies for all non-renewable transport fuels (including diesel)	Makes alternative means of transport more cost-competitive and reduces air pollution and GHG emissions
	Operational budget reallocation	Adjust national transport budgets to increase spending on the maintenance and operation of public and active transport services	Ensures that public and active transport operations are well funded
	Tax breaks for automobiles	Eliminate any national tax breaks that incentivise the purchase of new personal or company vehicles or subsidise the cost of driving	Makes car ownership less attractive
	New vehicle registration	Limit the registration of new vehicles, either through a fixed ceiling with lottery or via licence plate auctioning	Limits the number of cars added to roadways to match infrastructure capacity
	Automobile import tariffs	Maintain automobile import tariffs at the highest levels applied over the last decades	Makes car ownership less attractive
Information	Statistical services	Ensure that national statistical services gather data on all modes of travel, measures of accessibility, and information on the social costs of different transport modes	Provides crucial data to help policy-makers align transport with urban development objectives
	Awareness campaigns	Launch national campaigns to raise public awareness of the consequences of different transport choices and the benefits of taking public transport, cycling, and walking	Helps shift public perceptions to favour public transport and active options

Table 3.1

Overview of flagship policy instruments and priority governance reforms (Cont.)

Type	Intervention focus	Description	Benefits for cities
Governance	Integrated national urban and transport plans	Establish national frameworks that align strategic urban development with transport planning and facilitate sustainable urban mobility plans at the city level	Ensures that transport planning is aligned with urban development and accessibility objectives
	Metropolitan strategic transport governance	Bundle key transport governance powers (fiscal, decision-making, infrastructure delivery, and operations) at the metropolitan level	Helps to ensure a coherent approach to multi-modal transport for connected urban development
	Appraisal methods	Reform appraisal methods for transport infrastructure projects to enable a shift away from "predict and provide" and travel time savings to a focus on accessibility-oriented metrics	Ensures that the viability of transport projects is gauged by metrics that align with compact and connected urban growth

The instruments and reforms outlined above have been widely discussed and implemented – but not always successfully or without controversy. Licence plate restrictions, for example, have been widely implemented in Latin American cities, from São Paulo and Santiago (Chile) to Mexico City, Quito, and Bogotá.⁵² Such restrictions are also increasingly common in China, where they appear to enjoy greater public acceptance than economic policies such as road pricing. However, these schemes have had mixed results, with wealthier households simply buying an extra car, or people ignoring the restrictions due to a lack of alternative travel options. Policies that only restrict access to roads during peak hours, and not the whole day, appear to be more successful in achieving the desired goals.⁵³

Similarly, maintaining high automobile import tariffs can be effective in slowing motorisation rates in rapidly urbanising countries, but can also hinder much-needed upgrades to vehicle fleets and keep highly polluting and/or unsafe vehicles on the road, as has occurred in Ethiopia, Kenya, Nigeria, and other African countries, for example.⁵⁴ To address this challenge, tariffs can be kept high for gasoline and diesel cars but be relaxed for buses, taxis, and electric vehicles, which can help to improve the environmental performance of local vehicle fleets.⁵⁵

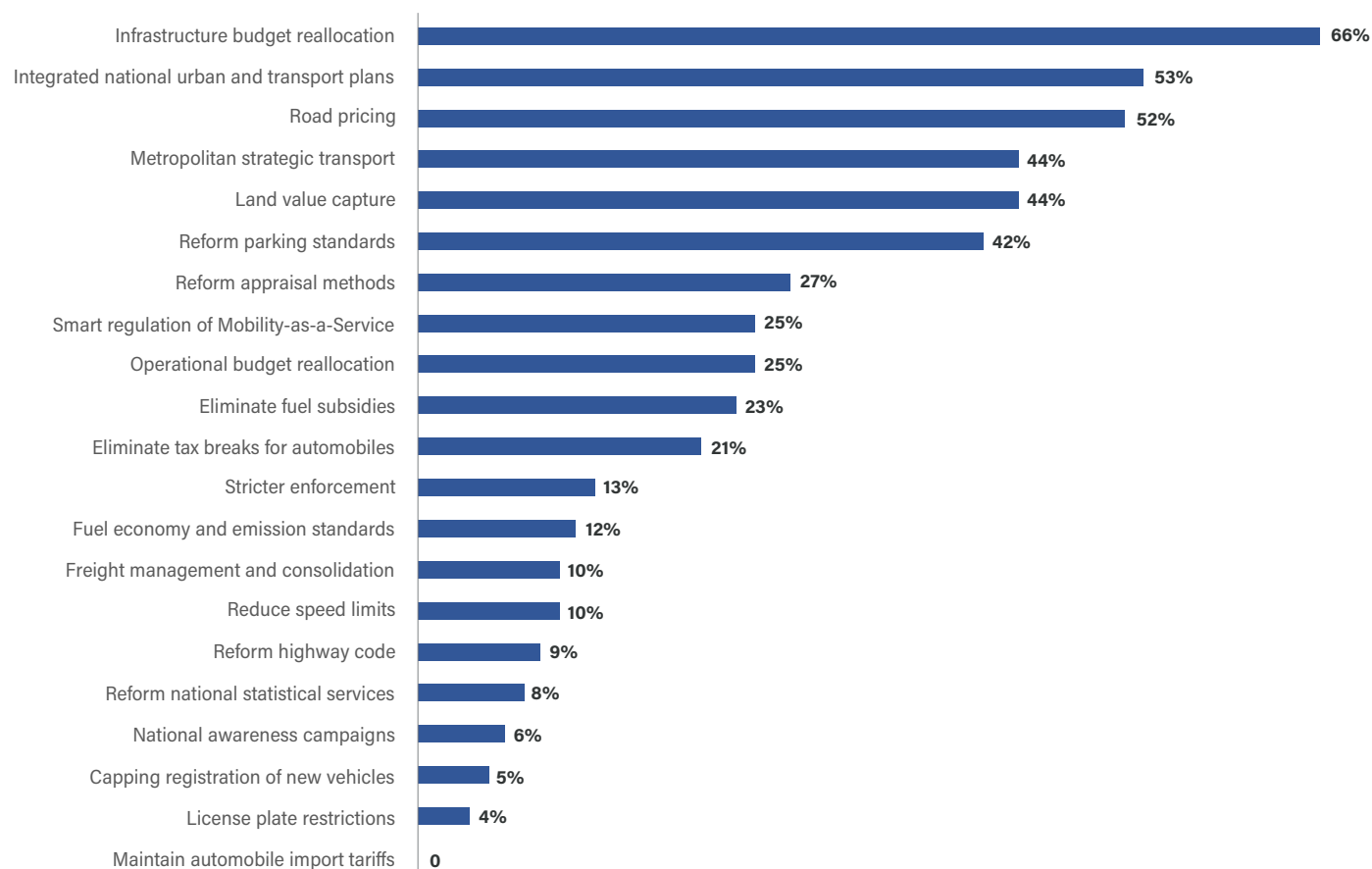
These examples highlight that policy interventions need to be carefully designed to ensure that they respond to the particularities of the local context, and that both ex-ante and ex-post evaluations are carried out rigorously to ensure that the policy instrument or governance reform is working as intended and doesn't create perverse incentives or other unintended consequences that undermine their effectiveness in promoting compact and connected cities.

3.1 PRIORITIES FOR COMPACT AND CONNECTED URBAN DEVELOPMENT

From the 21 flagship policy instruments and governance reforms, survey respondents were asked to select the five they deem most important for promoting compact and connected urban development. They were asked to take a global perspective, without concern about differences between individual countries. They were also asked to disregard the fact that in some countries, several of these policies might be likelier to be implemented at the subnational level. Their responses are summarised in Figure 3.1.

Figure 3.1

“Which are the five most important national transport policy instruments and reforms for promoting compact and connected urban growth?”^d



Two-thirds of the experts included infrastructure budget reallocation among their five priority policy interventions, highlighting the importance of rethinking investments in infrastructure delivery and maintenance. Also in the top five were integrated national urban transport plans, road pricing, metropolitan strategic transport, and land value capture. Three types of policies that are widely discussed and have been implemented in several countries – licence plate restrictions, capping the registration of new vehicles, and automobile import tariffs – were cited as priorities by very few, if any, experts. This may be because these are considered beyond the remit of national transport ministries, or because they have a mixed track record in reducing car use while disproportionately affecting lower-income households.

Notably, when the experts were asked to identify the top five policy instruments and reforms that they saw as priorities for reducing global GHG emissions, four of the top five policies rated as best for promoting compact and connected cities were chosen again. Only road pricing was displaced in the top five, with experts instead elevating parking standards reform. This suggests that experts see most of the top instruments or reforms as equally important for achieving both objectives. Hence, by pursuing some of the top policies designed to promote compact and connected development, countries can also take advantage of important policy synergies to have an impact on carbon emissions.

^d Sensitivity analysis: The results depicted in were also recalculated according to the professional background and the geographical context of the respondents (see Appendix A). Despite some changes in the order of policy priorities, the top five policies remained the same. This validates the consistency and robustness of the findings and corroborates the general suitability of implementing these policies or reforms across the globe.

This finding was mirrored across the entire inventory of 189 policy interventions. More than two-thirds of instruments and reforms that were assessed as good for promoting compact and connected growth were also deemed to reduce carbon emissions. While such co-benefits will make it easier for policy-makers to push for transformative action, it is also important to highlight that some policy instruments don't improve outcomes across both dimensions. For example, subsidies for low-emission and electric vehicles can reduce emissions and improve air quality, but they don't reduce private car use and might even perpetuate car-dependent urban development patterns.

Box 3.1

Evaluating national transport policy instruments and governance reforms in Ethiopia

Policy-makers looking for the most effective ways to support compact, connected urban development cannot rely only on a global analysis; they need to consider the national context as well. In December 2018, as part of a workshop with the Ethiopian Federal Transport Ministry, we reviewed the 21 policy interventions to see how local priorities might differ from the global analysis. After an initial discussion of existing policy agendas and transport policy challenges, workshop participants worked in groups to review the inventory and identify policy interventions already in place or planned in Ethiopia. They were then asked to select their top five policy interventions in the context of local reform efforts.

Although they had not been told upfront which policies had been chosen by global experts, four of their top five choices were the same. The only difference was that instead of road pricing, they chose freight management, which was identified as the most important national transport policy instrument for Ethiopia. This reflects current concerns in Ethiopia about the way goods are transported. Road pricing, meanwhile, may not be appropriate or relevant for countries in earlier stages of urbanisation. The workshop served as a pilot to test how the inventory and taxonomy could be used to identify national transport policy instruments and governance reforms in particular country contexts. The workshop methodology will be refined before repeating similar engagements in China and Mexico in 2019.

3.2 A CLOSER LOOK AT THE TOP FIVE POLICY INSTRUMENTS AND GOVERNANCE REFORMS

The top five policy options chosen by experts in the global survey have been discussed for many years and have been tested in several countries. Below we examine each in more detail, highlighting how they contribute to compact, connected, and low-carbon growth, and providing examples of countries and cities that have successfully implemented them.

Infrastructure budget reallocation

Among the most fundamental policy instruments available to national governments are budgetary allocations. In the context of transport policy, they have particularly long-term and strategic effects as part of deciding on public infrastructure expenditure. The assumptions that underpin these effects are that transport infrastructure will enable or undermine particular modes of travel, as well as have an impact on urban form and the level of development intensity. Reforms to national transport budgets and infrastructure spending priorities can shift spending from roads and infrastructure that primarily benefits private car use to public transport, walking, and cycling.⁵⁶ Related debates highlight that it may be beneficial to ensure that the combined urban transport infrastructure spending for public transport and active transport (walking or cycling) matches at least their combined share of trips in urban areas.

Within cities, it has been suggested that infrastructure budget reallocation could shift 5–10% of motorised vehicle transport to non-motorised transport, and 10–35% of local trips could be shifted from private vehicles to public transport, walking, and cycling.⁵⁷ Specific effects of related national budgetary reallocation in supporting public and active travel were, for example, observed following reforms in the 1990s in the US, Germany, and the UK. More recently, budgetary reallocation in Colombia, China, and Ethiopia has enabled compact growth in fast-growing cities. Budgetary reallocation of transport infrastructure investments at the city level (which is often enabled by reallocation at state and national level) has often led the way in shifting towards more sustainable urban transport. Some of the most dramatic examples include: Copenhagen, which has built extensive cycling infrastructure;⁵⁸ Bogotá, which built a highly successful BRT system;⁵⁹ and Addis Ababa, which has a new light rail system.⁶⁰

Integrated national urban transport plans

Urban mobility is a complex issue, and it is now widely recognised that we need more integrated planning processes that break down policy silos. Indeed, the Sustainable Development Goals note the need for “adopting and implementing integrated policies and plans” across transport, land use, and environmental policy.⁶¹ New approaches to urban planning are emerging to align urban development strategy with transport planning and facilitate sustainable mobility at the city level. Bringing experts and planners together across domains (e.g. from different ministries) makes it easier to develop more coherent, complementary policies and plans, and to take advantage of cross-sectoral synergies.⁶² Featuring transport as a priority within broader national urban policies also supports a shift to an accessibility paradigm that promotes compact and connected urban development.⁶³ This sort of policy integration can thus create the enabling conditions for reducing carbon emissions and non-renewable resource use and produce more socially equitable and economically efficient outcomes.⁶⁴

Many national governments have already started to change how urban transport is planned and implemented. In Brazil, France, and India, for instance, the development of Urban Mobility Plans is now a requirement for receiving national government funds for urban transport projects. In the European Union, guidelines for the development of Sustainable Urban Mobility Plans have led to hundreds of cities rethinking their transport planning.⁶⁵ California’s Sustainable Communities and Climate Protection Act of 2008 requires all metropolitan regional planning areas to develop integrated land use and transportation plans which prove that they can meet state greenhouse gas emissions reduction targets.⁶⁶ South Africa’s National Land Transport Strategic Framework provides local governments with an overarching framework to implement their Integrated Transport Plans.⁶⁷ India’s National Urban Transport Policy of 2006 embraces integrated transport and land use planning as its number one priority, with half the cost of preparing such plans for Indian cities covered by the central government. For the past 25 years, Brazil’s national urban transport policy has supported planning for sustainable transport and urban growth.⁶⁸

Road pricing

Road pricing (also known as congestion charging) involves charging private motorised vehicle users for the use of roads. These charges can apply to a certain area, to specific roads, and/or to times of use. The vehicle category, weight, and environmental impact can also be used to determine the level of fees. There are two main types of road charges: charges based on distance travelled, and one-off charges for entering a specific zone within a specified period (e.g. driving within the city centre per day). The goal is to reduce the number of vehicles in the street, reduce congestion, control peak period traffic levels (for time-specific charging), and improve the environmental quality (e.g. reduce air pollution, NO_x, CO₂ and noise pollution) within urban areas.⁶⁹ Along with creating an economic disincentive to drive, these charges can generate revenue that can be used to make alternative modes of travel more affordable, efficient, and pleasant.

For city-level road pricing, Singapore is the pioneer, having first introduced a manual payment scheme in 1975 and updating it to an electronic system as more advanced technology became available. Several European cities also introduced road pricing as a means to curb traffic congestion and improve air quality and noise pollution. Cities such as London, Rome, Stockholm, Oslo, and Milan have sought to charge private vehicle users to access inner-city zones

during the work week (in some cities, road pricing charges vary depending on income).⁷⁰ To increase the effectiveness of road pricing and similar economic instruments, many cities have chosen to earmark the revenue for investments in public transport (e.g. extending bus routes, introducing Park and Ride schemes) that make it easier for individuals to leave their car at home, effectively creating a “double dividend”.⁷¹

Metropolitan strategic transport governance

The idea behind establishing metropolitan transport authorities or similar strategic entities is to bundle key transport governance powers – fiscal, decision-making, infrastructure delivery and operations – at the metropolitan or “functional area” level.⁷² Many people who work in cities commute from the suburbs, so efforts to address transport issues will work best if they include officials from both the cities and their wider commuter belt. Metropolitan transport authorities usually oversee many (sometimes all) transport modes in their jurisdictions.⁷³ This means that they are well positioned to develop comprehensive strategies to manage transport demand across the region, support more compact and connected development, and reduce carbon emissions.⁷⁴

This type of metropolitan transport governance reform has been adopted in many major cities in the last decade, particularly in Europe.⁷⁵ London’s integrated transport authority – Transport for London (TfL) – is a good example.⁷⁶ Since its creation in 2000, this citywide agency has increasingly taken over management of more of the region’s transport services. TfL manages almost all public transport in London: the Underground, bus routes, cycle hire, street design for major roads, taxi regulation, the coach station and overseeing the operation of light rail and trams. The one exception is commuter rail, which is nationally managed, but since 2007, TfL has been taking over some of the commuter rail lines, and it continues to seek to manage more rail routes.⁷⁷ Increasingly, the importance of such reforms is also being recognised in rapidly urbanising countries of the Global South. As part of its National Urban Transport Policy the Indian government is encouraging all cities over 1 million inhabitants to work towards the creation of unified metropolitan transport authorities. To date, only Hyderabad has established such a new governing body, with Bangalore, Kochin and other cities working towards such reforms.⁷⁸

Land-based finance/Land value capture

Land value capture (LVC) is a term used to describe a range of instruments and mechanisms for funding large public infrastructure projects that allows governments to capture some of the increases in real estate values associated with these projects (e.g. when a new metro line enables landlords to command higher rents). LVC theoretically ensures that the costs of infrastructure investment are substantially borne by those who benefit from it. In practice, there are a number of institutional preconditions that need to be in place to ensure LVC fulfils its potential and does not have unintended consequences. LVC is not a single instrument, but a wide range of disparate land-based financing instruments. These tools are increasingly used to fund urban transport infrastructure projects and have the potential to generate more compact development through better connectivity, more intensive use of land and rising land values.⁷⁹

Governments can generate revenue through land value taxation, land sales, negotiated developer contributions, tax increment financing, special assessments, joint development, betterment levies, transportation utility fees, impact fees, and air rights. Which land-based financing tool is most appropriate depends on the policy objective: Impact fees can help offset the impact of development on greenfield sites, for example. Betterment levies might be more appropriate for urban regeneration projects, while development rights can help increase density around transport hubs (e.g. around a new commuter rail or metro station).⁸⁰

Land-based financing tools all depend on efficient management of public assets, enabling regulatory frameworks and robust land and property markets. The use of LVC is far more common in higher-income countries, generally due to factors such as local government capacity and the maturity of land/property markets; most developing countries have yet to make the most of this approach, even though they arguably have the greatest opportunities for LVC as they build new transport infrastructure and grow their cities.⁸¹

Several developing countries, including India, Colombia, Brazil and China, have started experimenting with LVC. For instance, the Hyderabad metro in India was developed through a public-private partnership based on land value capture. The state government and the municipality provided the contractor with the right-of-way for metro construction and land for property development close to the metro stations. The contractor is financing the metro construction costs with a combination of fare and development receipts.⁸² In Hong Kong, income from property atop metro stations controlled by the state entity has been used to finance the capital and operating costs of the metro. A similar model is in place in Japan.⁸³ However, there are risks of these instruments having unintended consequences if they are not enforced in the context of careful urban planning and strict land management. LVC has been linked to increased urban sprawl, exclusive city development in the United States and inducing rent-seeking behaviour and land-grabbing.⁸⁴

4. From concept to practice: Adapting to national contexts and overcoming barriers

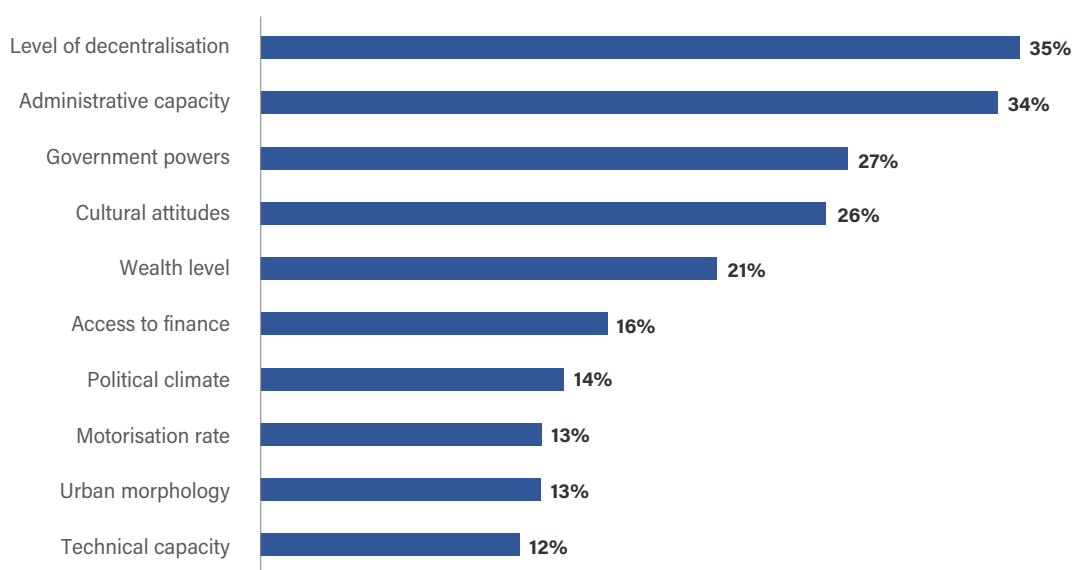
The discussion in the preceding sections focuses on the core concepts behind widely recommended national transport policies and governance reforms, but adopting any of these options requires careful consideration of the national context. Indeed, the national context may determine why a specific policy succeeds in one place, but fails in another.

4.1 KEY FACTORS TO CONSIDER IN CHOOSING POLICY INTERVENTIONS FOR A SPECIFIC NATIONAL CONTEXT

Experts interviewed for this analysis identified several economic, social, governance, physical and environmental features that need to be taken into account. To capture these concerns in a more systematic way, our survey asked respondents to list up to five contextual factors that determine the appropriateness and effectiveness of national transport policy instruments and governance reforms for particular countries. Figure 4.1 provides an overview of the top 10 contextual factors and how often they were cited by respondents.

Figure 4.1

Top 10 contextual factors that determine the appropriateness and effectiveness of policy interventions



The results show that governance structures (decentralisation, powers) and government resources (administrative and technical capacity, access to finance) are significant contextual factors in policy-making around the world. These broad categories were closely followed by socio-economic and political factors such as local cultural attitudes, wealth levels, and the political climate. These findings suggest that addressing institutional and financial barriers will require particular attention for successful policy implementation. Surprising in the survey results is the relatively low importance given to the urban form and environment context, given the interrelationship between mobility, urban form, economic geography, and infrastructure that can lock in unsustainable patterns. Yet it highlights once again that successful policy-making has to respond first and foremost to the existing institutional context.

Certain country profiles may bring some of these factors into sharper relief. Using basic regional and/or country archetypes through which context can be considered, the survey respondents were asked to select the country contexts where they felt their top five policy interventions would be most appropriate or have the most impact. The five categories devised were offered as a proxy for relative levels of wealth, urbanisation, and motorisation, as well as likely administrative capacity. The categories are: Low-Income Asian & African Countries (e.g. Ethiopia, India, Tanzania, Bangladesh); Medium-Income Asian & African Countries (e.g. China, Malaysia, Vietnam, Indonesia, Nigeria); Medium-Income Latin American Countries (e.g. Brazil, Mexico, Colombia, Chile); High-Income European & Asian Countries (e.g. UK, Germany, France, Japan, South Korea, Singapore); and High-Income North American & Oceanian Countries (US, Canada, Australia, New Zealand). These regional groupings comprise large numbers of diverse countries, so this is a very simplified categorisation. Still the survey responses offer some indications of the types of policy instruments and governance reforms that may be most appropriate for particular country contexts.

Some policy instruments and reforms were deemed to be medium or high priorities irrespective of country/region, such as *introducing metropolitan strategic transport*, *eliminating fuel subsidies*, and *reforming appraisal methods*. *Road pricing* and *smart regulation of mobility-as-a-service* were considered more relevant for the two categories of high-income countries, while *integrated national urban and transport plans* and *infrastructure budget reallocation* were identified as most relevant for low- and medium-income countries – probably because they are already widespread in developed countries.

4.2 BARRIERS TO SUCCESSFUL IMPLEMENTATION

Policy-makers seeking to implement national transport policies and governance reforms also need to beware of common barriers to success. We define four main types of barriers relevant to sustainable transport policies and investment: political (leadership and government commitment, public acceptance); financial (budget restrictions, high upfront costs); institutional and human capacity (knowledge and skills, legal regimes, uncoordinated responsibilities across agencies); and technological (need to import, insufficient R&D). The expert survey was used to generate more granular insight into the barriers likely to be faced by decision-makers for the shortlisted policy instruments and governance reforms. The list of barriers is shown in Table 4.1.

Table 4.1

Barriers to implementation of transport policy interventions

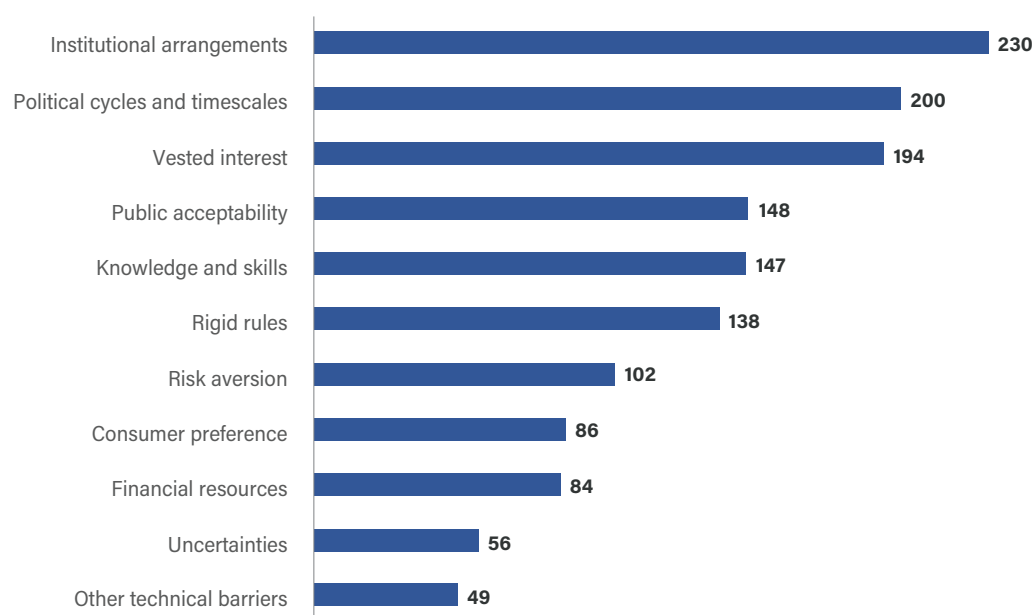
Barriers	Transport policy example
Political	Political cycles and timescales: Short-term gains misaligned with long-term goals, e.g. dependence on urban periphery land sales to raise revenue works against long-term land holding and strategic compact growth / development restrictions Public acceptability: Negative response to introducing user charges to “free” goods (not reflecting real social and environmental costs), e.g. street parking charges Vested interests: Powerful lobbies that inhibit change, e.g. car industry lobbying against sustainable transport regulation or motorist groups blocking allocation of road space for cycling lanes Consumer preferences: The extent that attitudes influence transport policy and funding options, e.g. user perceptions of mass transport as opposed to personal car use Risk aversion: Reluctance to change the status quo (worried about backlash) leads to a narrowing of policy considerations, e.g. removing licence plate or registration caps/auctions/restrictions from consideration as a supply management measure Rigid rules: Lack of flexibility to address local context, e.g. minimum parking space standards prevent land owners and developers from limiting the parking they provide in walkable, transport-rich areas
Financial	Financial resources: Policy option restricted due to insufficient capital budgets, e.g. debt instruments for new mass transport infrastructure
Institutional and human capacity	Knowledge and skills: Insufficient experience or training in new approaches to urban design or service provision, e.g. unable to introduce flexible performance-based standards for road widths and layouts in place of conventional design engineering standards Institutional arrangements: Levels of centralised or decentralised decision-making and authority that affect policy choices, e.g. cities unable to implement central city congestion charging due to restrictions on local revenue-raising from national governments
Technical	Uncertainties: Lack of clarity on technology evolution and risk from picking early winners, e.g. reluctance of government to invest in alternative fuel refilling facilities such as for hydrogen vehicles (potentially slowing market transformation) Other technical barriers: Key technologies, e.g. cameras/scanners and collection systems for road pricing, are prohibitively expensive for lower-income countries

The survey respondents were asked to identify all of the barriers they deemed relevant for their five shortlisted policy interventions. The results are shown in Figure 4.2 below, with each horizontal bar displaying the total number of times each barrier was selected. The top barriers – institutional arrangements, political cycles and timescales, vested interests, public acceptability, and knowledge and skills – show a degree of overlap/influence between them. For example, the ways in which agencies are organised between and within governments (institutional arrangements) may work against the building up and sharing of technical skills and knowledge for collecting and accessing data and developing evidence bases; or the influence of vested interests and public acceptability may entrench short-termism in decision-making (political cycles) maintaining the status quo.

Other related barriers such as rigid rules and risk aversion are also significant in terms of the number of times selected. In fact, most barriers seem to be “governance-related”. It is interesting to note that the respondents perceive financial resources and uncertainties as being less problematic. These findings should provide a good basis for specific analysis and discussion on the ground.

Figure 4.2

Barriers identified for flagship transport policy instruments and governance reforms



This overview of general country-specific considerations will be critical for translating the input provided in this paper to individual countries. It already includes a complex list of contextual factors and barriers that can act as a starting point for discussions with policy-makers about the specific constraints and opportunities they face. Governance-related factors stand out as particularly important. These factors also tend to be the ones that are generally less well understood by transport policy-makers, who may not always have the expertise or professional remit to fully consider how governance and political arrangements might affect policy implementation.

5. Key takeaways for national transport policy-makers

Our analysis shows that national transport policy instruments and governance reforms can make a real positive impact on urban development while also tackling climate change – many countries are already proving how. Urban leaders are taking bold action to make cities more accessible, but the choices that national governments make can accelerate progress, or hinder it. Sections 1–3 provided a global perspective on the most effective strategies and options available to policy-makers; section 4 highlighted the importance of tailoring interventions to the national context and identified common barriers to implementation.

Below we distil the insights from our analysis into recommendations for national transport policy-makers as they look to build a policy toolkit to promote compact and connected urban development:

Carefully consider the national context, especially institutional arrangements.

- Recognise that factors such as a country's political economy, level of decentralisation, and wealth can make specific policy interventions more or less viable.
- Consider institutional arrangements in particular, as they are seen as the most important contextual factor and barrier for implementing specific policy instruments. Adopting policy instruments just because they worked somewhere else doesn't make sense if the local context is different.
- Find windows of opportunity to adopt particularly tough reforms when they are likelier to be accepted by the public. Some policy instruments may be more appealing when proposed as part of wider national debates, while others may be more successful if implemented as pragmatic measures that don't get wrapped up in political debates.

Budgets matter – it is not about spending more, but spending better.

- Allocate budgets wisely. National budget allocations can make a major difference in efforts to make cities more compact and connected. This need not require increases in total spending, rather a shift from investments that primarily benefit road-building and maintenance towards public transport and infrastructure for walking and cycling.
- Remember that policy instruments based on economic incentives, such as road pricing, vehicle taxes, licence plate auctions, and parking charges, are also sources of revenue that can be reinvested in transport infrastructure.
- Consider financing as a critical enabler, especially of large-scale infrastructure, which underpins many of the policy instruments reviewed. Previous work by the Coalition has identified several avenues through which national governments can support urban infrastructure projects,⁸⁵ but important questions remain about how best to mobilise resources to fund sustainable urban transport infrastructure at scale.
- Recognise taxation as a central pillar for creating public value in the transport sector. This requires moving beyond “creative finance” and towards sustainable tax reform, and strengthening the institutional links between national transport and finance ministries as well as municipalities.

Identify and eliminate harmful policy interventions that perpetuate the status quo.

- Eliminate or reform harmful policies, such as fuel subsidies, tax breaks on cars, minimum parking requirements, and road-building standards that prioritise speed. This is as important as introducing beneficial ones.
- Address governance arrangements and institutional structures at the national level that hinder progress; for example, single-purpose road transport agencies that do not have a remit beyond road-building, or speed-based metrics to assess transport projects.
- Understand that there are trade-offs between competing policy objectives, and prioritise measures that will provide a long-term benefit. For instance, road expansions might lead to short-term increases in productivity or reductions in travel times, but in the long term, they create path dependencies and carbon lock-in.

Consider the wide menu of options to identify priority reforms.

- Recognise the transport sector as a relatively mature and well-established policy sector with a good balance of economic, regulatory, information-based, and governance interventions. This means that any one goal can likely be advanced by multiple means.
- Take stock of the policy interventions already in place and identify opportunities to adopt further actions that have already proven successful elsewhere. The inventory and taxonomy developed in this paper can be a helpful entry point for policy-makers wanting to identify an appropriate balance of regulatory and economic instruments, physical and soft measures, and technological innovations.
- Appreciate that the same transport objective can often be addressed through regulatory, economic, or information-based pathways; which is best will depend on the local context and available resources.
- Think about the characteristics of instrument types and governance reforms to identify the most appropriate for a particular challenge: how directly they influence urban development; what role they want to play in change processes; how much public spending they require; and which aspect of the Avoid-Shift-Improve paradigm they focus on.

Make new technology work for urban mobility (not the other way around).

- Take the lead on steering the application of new technologies. Disruptive innovations – from smart mobility to autonomous vehicles – can transform urban mobility, but they require proactive policy intervention from the start.
- Embrace road pricing (including for electric vehicles) as a central instrument for managing traffic, and rethink the regulation of different modes of surface transport. Prioritise the movement of people over vehicles by increasing the efficiency of the use of space and regulating for autonomous shared vehicles.
- Create an agile regulatory environment that can respond quickly to changes in the transport sector while ensuring alignment with compact and connected development objectives.
- Take public leadership with regard to open data and interoperability of transport service data.

Bundle complementary policy interventions to enhance their impact.

- Bundle and appropriately sequence policy interventions, as it will more effectively scale their impact and acceptability. Certain policy instruments and governance reforms may complement or reinforce others, so it is important to take a comprehensive approach to transport planning.
- Maximise the impact of major policy interventions by adopting supporting measures at the same time. For example, if the national infrastructure budget is being reallocated, the way that individual projects are appraised should also be revamped, and operational budgets should be adjusted accordingly. Governance reforms to create a metropolitan transport authority might also be timely, to allow for the development of a transport strategy that meets the needs of all affected jurisdictions.
- Start with easier-to-implement measures while building up institutional capacity for more difficult ones. For example, a national guidance document can evolve over time into mandatory national standards. An informational campaign can pave the way for road user charges. Sequencing can be particularly useful to increase the acceptance of regulatory interventions.
- Balance push and pull mechanisms, incentives and disincentives. For example, new employee subsidies for public transport use are likelier to make an impact if other policies that support car use, such as free parking, are phased out at the same time.

Find common ground with other related sectors, especially urban planning.

- Prioritise urban accessibility as a top-level outcome. Although this paper focuses on transport policy, complementary action is also needed in spatial planning (land use), social policy, and other areas. To be truly effective, national governments need to foster strong cross-sector collaboration and governance reforms to support more joined-up urban planning and policy-making.
- Think about potential co-benefits of cross-sector interventions, and explicitly identify them as desired outcomes. This is likely to require dialogue with environment, health, energy, and industrial policy-makers to understand their perspectives and jointly shape strategies and plans.
- Acknowledge established sector boundaries. There are fairly well-defined areas that transport ministries are best placed to deal with, and those sector-specific remits are robustly embedded into the institutional frameworks of most countries. Thus, even as governments advance towards more integrated institutions and policy-making, they can begin to work on sector-specific actions to advance urban accessibility.

6. Conclusions

With the world's urban population projected to double between now and 2050, it is crucial to ensure that cities are built and run in a way that maximises access to opportunities without increasing carbon emissions, pollution, and congestion. This means private car use needs to be reduced and investments in walking and cycling infrastructure and mass transit systems need to be scaled up. At the same time, more integrated policy-making linking transport to other critical urban sectors, such as land use, social policy, energy and industrial policy, is essential to ensure greater urban accessibility. In all of this, national governments will continue to play a crucial role in providing the enabling policy environment that will determine if their cities exacerbate the problems or provide the solutions that will lead to a more climate-resilient, healthy, economically vibrant, and equitable urban future.

This paper mapped out the landscape of transport policy instruments and governance reforms that national governments can use to promote compact and connected urban development, and provided global experts' perspectives on the most effective tools on a global scale. Encouragingly, many of the policy interventions identified to support better urban development also help to accelerate climate action.

The overview and recommendations presented here are intended to provide a foundation for national transport policy-makers to begin pragmatic, but ambitious conversations about actions they can take to make cities more accessible – either by leapfrogging car-centric development pathways, or by transitioning towards a more compact and connected future. There are multiple options to suit different national contexts – many with broad economic, social, and environmental benefits.

There are also trade-offs which this paper did not address: highly successful and beneficial policy interventions for better cities and urban accessibility may still have negative impacts on some groups. Conventional car manufacturers who have an interest in accelerating motorisation and keeping people driving their own private vehicles will have to revise their business models. Taxi and ride-hailing services will have to embrace greater operational efficiencies and greener vehicles, and online retailers may have to price-in the costs of road use and congestion in cities for their deliveries. Thus, mitigating measures for potentially negative impacts on jobs and livelihoods will have to be centrally considered alongside the policy interventions discussed above. This is one of the key reasons why it is crucial to integrate policies across sectors.

National policy-makers who take on the urban accessibility agenda need to recognise upfront that the journey they are embarking on is ambitious. But by seizing the opportunities explored in this paper, countries at all levels of development can reshape urban life for the better for decades to come.

APPENDICES

APPENDIX A – METHODOLOGICAL APPROACH

The research for this paper was based on a mixed-method approach that included desktop research, empirical analysis, and primary research using semi-structured interviews and expert surveys to inform and contextualise the desktop-based work. Below is a more detailed overview of the methodologies used for different components of this paper.

Scoping interviews: The goal of this research is to create a meaningful resource for policy-makers in diverse contexts to identify priority transport policy reforms, including in lower- and middle-income countries. To ensure that this research aligns with that objective, the team conducted scoping interviews with 20 international experts at the very outset. These interviews were structured to confirm that: (i) the research approach is robust; (ii) the work is building on rather than repeating efforts already undertaken by other projects; (iii) crucial aspects that could make this work have more impact are not neglected; and (iv) outputs are easy to understand and use by different actors. The diverse expert inputs received played an important role in shaping the direction of the research and confirmed that there is a clear knowledge gap when it comes to context-specific identification of transport policy instruments.

Organisational affiliation of experts involved in scoping interviews:

Campaign for Better Transport, CEPT University, EMBARQ, GIZ, Institute for Transportation & Development Policy, International Transport Forum, Organisation for Economic Co-operation and Development, Overseas Development Institute, McKinsey Center for Business and Environment, Municipality of Bogotá, University of Oxford, University College London, University of Leeds, Victoria Transport Policy Institute, World Resources Institute, 100 Resilient Cities

Literature review: A wide range of literature, including academic research and policy reports suggested by the 20 experts, formed the starting point for an extensive review of the transport policy literature. This also covered sources that perhaps would not have come up in a conventional search of academic titles or covered different regional contexts. This literature review was used to start building the inventory of transport policy instruments and reforms.

Inventory of policy interventions: The inventory cuts across relevant transport policy interventions which have been referred to in the context of either compact and connected urban development or low carbon transition. Each transport policy instrument and governance reform was reviewed and assessed against more than 20 separate characteristics. These characteristics both helped to segment and compare the instruments, and to establish key contextual factors and implementation barriers. Where possible, policy interventions were rated using a “traffic light” system (high, medium, low or positive, neutral, negative) to allow for comparability between instruments. Given that policy instruments were assessed in general terms (rather than within a specific country context), this approach is necessarily a simplification of the actual complexities of policy-making and some of the categorisations may appear slightly artificial or do not always apply to all instruments reviewed.

Table A.2
Inventory characteristics

Inventory characteristics	Description
Policy Sub-Category	Break-down to specify sub-categories beyond regulatory, economic, information, and governance reform
Policy Intervention Type	Overarching intervention type – what tools/methods could be used by national government to pursue desired outcome?
Specific Policy Instrument	Name the specific policy instrument – define what the policy is
Policy Action	Should this intervention be eliminated, introduced, reformed, or maintained to achieve 2C objectives?
Description	Short description of the policy instrument or governance reform and its intended use [50 words max]
Primary Transport Objective	List the overarching transport objective of the specific policy intervention
Demand/Supply	Does it target demand or supply? Supply – Government led, providing public services / goods Demand – Driven by public demand (end users)
Case Study (Successful)	Examples of countries that have successfully: • Phased out (or suspended) • Reformed (refined; developed improvements) • Introduced (brought a new policy measure into use or operation for the first time)
Case Study (Unsuccessful)	Examples of countries that have unsuccessfully: • Phased out (or suspended) • Reformed (refined; developed improvements) • Introduced (brought a new policy measure into use or operation for the first time)
ASI Category	Avoid – Reduce or avoid the need to travel (requires improved efficiency of the transport system) Shift – Shift or maintain share of more environmentally friendly modes (improve trip efficiency such as PT and NMT) Improve – Improve the energy efficiency of transport modes and vehicle technology (vehicle and fuel efficiency as well as the optimisation of transport infrastructure) <i>Note: some policy interventions are in between, depending on context</i>
GHG Reduction Impact	Impact of policy intervention on achieving a GHG emissions reduction: Negative – contributes to GHG emissions Neutral – has no direct impact on GHG emissions Positive – reduces GHG emissions
Impact on Connected Growth	Impact of policy intervention on “connected” growth, where level of access for passengers between transport (rail, bus, cycle paths) and services (sanitation, water) has increased
Impact on Compact Growth	Impact of policy intervention on “compact” growth, where the urban development is characterised by built environments with higher density and mixed use urban form
Impact on Compact and Connected Growth	Impact of policy intervention on compact and connected growth Policy intervention can be positive on one aspect, and negative on another, and therefore neutral for both categories combined

Table A.2
Inventory characteristics (Cont.)

Inventory characteristics	Description
National Level Relevance	Relevance of the policy intervention for national government (e.g. is the specific policy instrument type implemented at a national level or devolved to regional and local authorities) • Low: Unlikely to be implemented at national level • Medium: It is <i>possible</i> that it could be implemented at national level • High: <i>Frequently</i> implemented at a national level
Fiscal Considerations	Impact of policy intervention on government budgets (positive or negative) • Low: Has no or negligible impact • Medium: Has some impact • High: Has a considerable impact
Policy Scope	Policy scope used to identify who might be affected by a policy: • Urban-influencing measures (nationwide policy intervention) • Urban-focused measures (policy intervention for urban areas only) • City-specific measures (relating to specific city or metropolitan area)
Policy Target Group (Winners)	List the direct and indirect beneficiaries (e.g. winners) of the policy intervention
Policy Target Group (Losers)	List the direct and indirect beneficiaries (e.g. losers) of the policy intervention
Gender Considerations	Likelihood that this policy intervention will improve/facilitate the mobility and travel experience of women and girls by addressing their particular needs and priorities
Impact on Vulnerable Groups	Likelihood that this policy intervention will improve/facilitate the mobility and travel experience of vulnerable user groups by addressing their particular needs and priorities Vulnerable user groups include people living with disabilities, people from low-income backgrounds, and people frequently discriminated against based on their religion, ethnicity, caste, sexual orientation, political beliefs, etc.
Administrative Capacity	Administrative capacity required to effectively implement policy intervention – the capacity of national government to implement specific policy instruments and governance reforms (e.g. human resources, skills, know-how, monitoring and evaluation)
Unintended Consequences	What risks could be associated with the policy intervention? • Could there be any unintended consequences? Both positive and negative? • Has there been any backlash against the policy instrument? • Could there be any risks associated with policy instrument?
Public Acceptability	Popularity of the policy intervention with the general public. Could consider: • Is there likely to be a single user group that are disproportionately disadvantaged? • How is the policy intervention frequently talked about (e.g. favourably or not)?
Vested Interests	How much would the policy intervention be lobbied against?
Socio-Political Barriers to Successful Implementation	Barriers to implementation (other than administrative capacity), such as cultural norms, corrupt practices, political inertia from left/right

Development of policy taxonomies: To reflect the importance of considering contextual factors in a more appropriate way, the development of a policy intervention taxonomy in this report does not present one final schema but instead provides multiple entry points to a classification of instruments. Ultimately, these entry points and classifications serve the purpose of familiarising governments with policy options while preparing the ground for a more appropriate selection, prioritisation, and bundling of instruments and reforms. The five chosen entry points of the classification in this report include instrument types (regulatory, economic, information, governance), urban scope, transition activity, fiscal implications, and transport approach (ASI).

Identification of flagship policy interventions: Based on a review of the inventory, 21 flagship policy interventions were identified for further examination. Criteria that influenced the selection included whether they were of particularly high relevance to national government and deemed to have a positive influence on both GHG emission reductions and compact and connected growth. The initial judgement of this relevance was based on the extent to which these interventions are discussed in relevant policy publications and how often they came up during the expert interviews. In addition, a further literature review was conducted for these 21 flagship policy interventions to gather information on the empirical evidence surrounding their effectiveness. In several instances, similar policy instruments were grouped together into a single flagship policy intervention in order to broaden the relevance of these selected tools.

Expert survey to prioritise flagship policy interventions: Once the 21 flagship policy interventions had been identified, a questionnaire was created to gather expert feedback. The survey asked experts to identify the five national transport policy instruments and governance reforms they consider most important for compact and connected growth, and provide reflections on implementation barriers, policy complementarities, and country contexts.

Organisational affiliation of experts that responded to the survey:

Asian Development Bank, Brookings Institution, Business Innovation Brokers, Campaign for Better Transport, CEPT University, Climate Mitigation Works Ltd, Cox architecture, Curtin University, Despacio, Durham University, Factual, GIZ, Hewlett Foundation, HJA Associates, IDOM Ingeniería, InfraStrategies, Institute for Transport Studies, University of Leeds, Inter-American development Bank, International Transport Forum at the OECD, Institute for Transportation and Development Policy, JUMP bikes, Kineo Mobility Analytics, LA CoMotion, McKinsey Center for Business and Environment, Median srl, Mobility CarSharing Switzerland, Mobility in Chain, Momentum Transport Consultancy, New York City Department of Transportation, New York University Rudin Center for Transportation, University of Oxford, Partnership for Road Safety, Pegasys group, Ramboll, Roads and Transport Authority, Dubai, Rocky Mountain Institute, Siemens, Smart Cities India Foundation, Smart Freight Centre, Studio Karonga, Technical University of Lisbon, The World Bank, International Bank for Reconstruction and Development (IBRD), TransLink, Transport for London, UC Berkeley, University College London, UN Environment, UN-Habitat, University of Bremerhaven, Urban Management Centre, Urban Transport Group, Victoria Transport Policy Institute, Volkswagen Group, Volterra, World Bank, World Resources Institute, 8 80 Cities.

Sensitivity analysis of survey results: This set includes experts from around the globe working in academia, the private and public sectors, think tanks and the third sector. illustrates the prominence of each of these professional backgrounds in the set of respondents. illustrates the prominence of the global regions where the experts are based.

Figure A.1
Representativeness of different sectors in the set of survey respondents

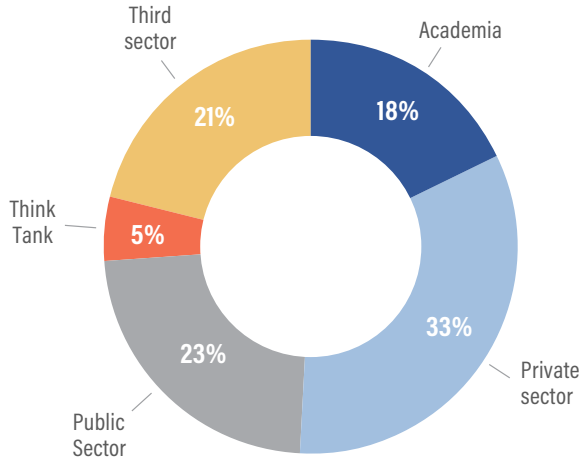
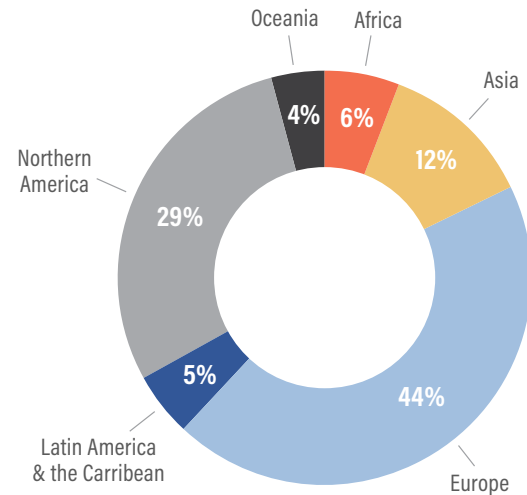
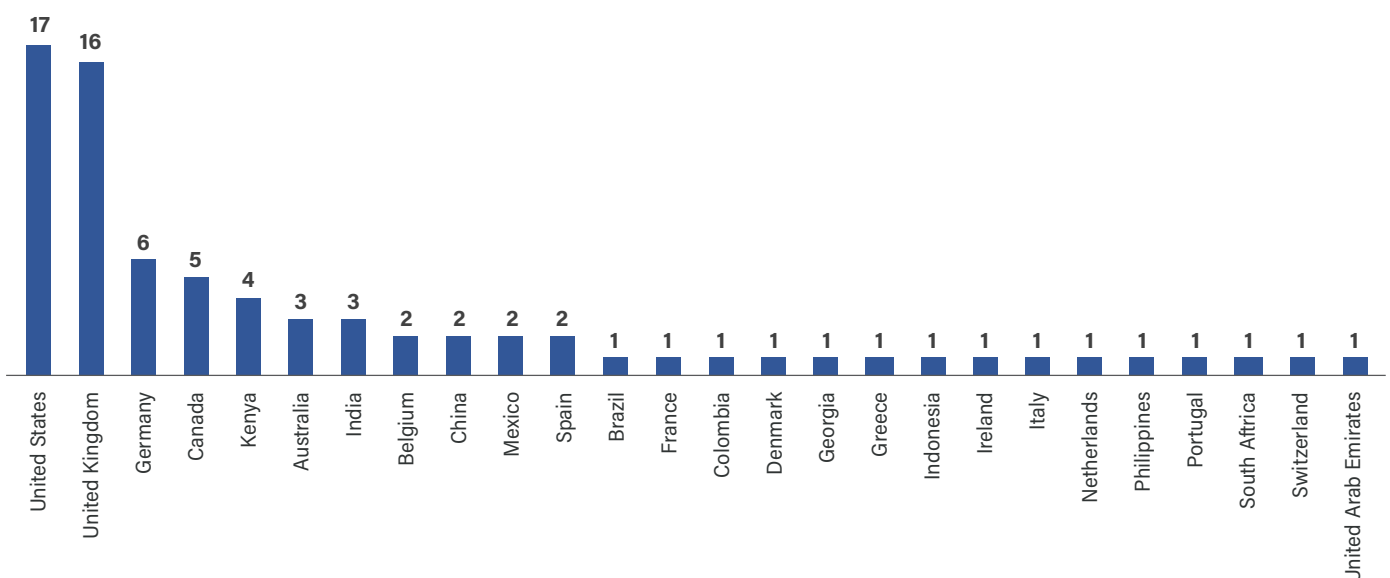


Figure A.2
Representativeness of different global regions in the set of survey respondents



Despite the good mix of professional backgrounds/sectors, there is a clear dominance of experts based in Europe and Northern America (which is to be expected). This is due to the fact that many of the key organisations working on these issues have their headquarters in the US or the UK. Still, our survey gathers the perceptions of experts working in 26 different countries.

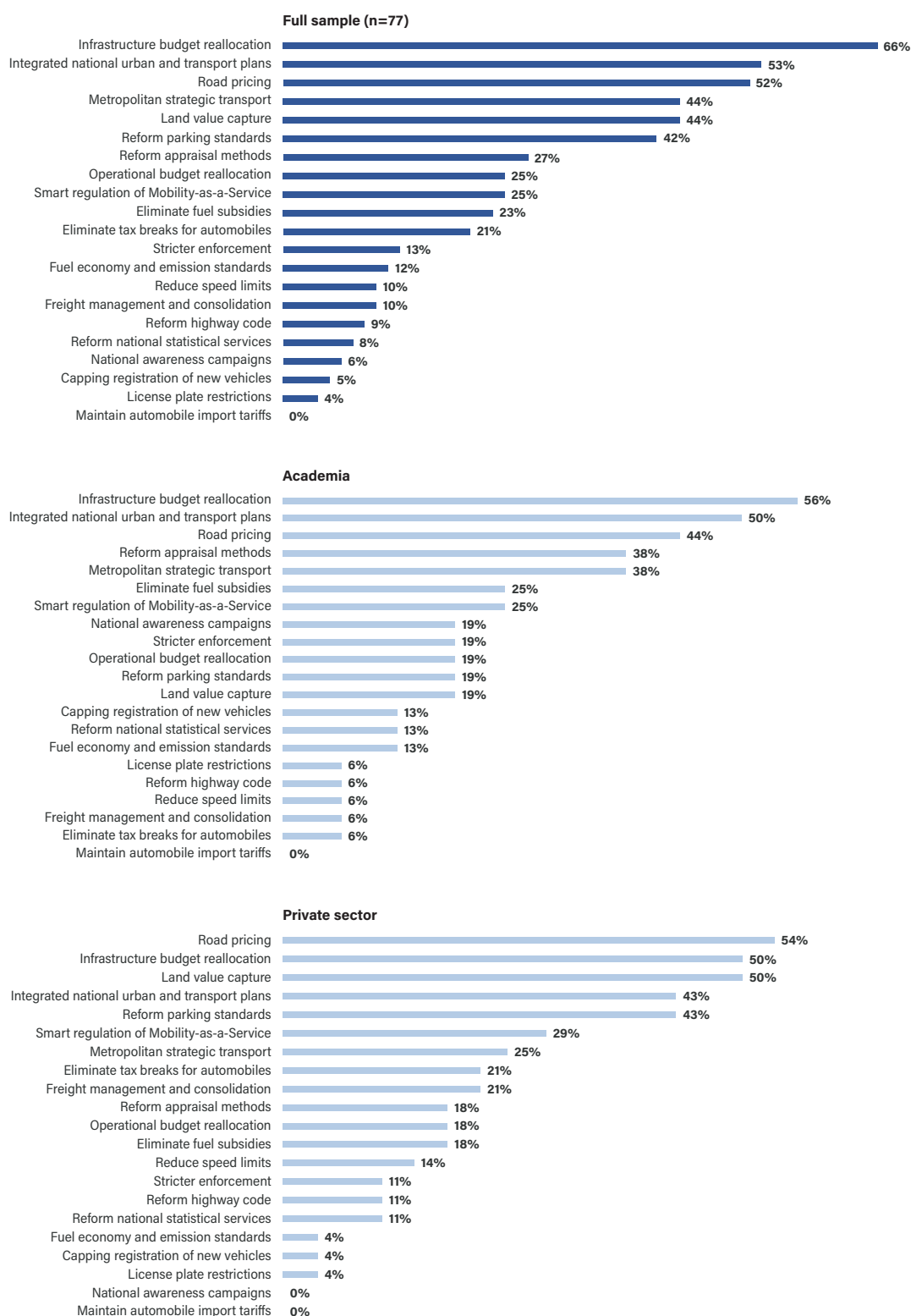
Figure A.3
Number of survey respondents per country included in the sample



The following tables compare the survey responses received from the full sample with results broken down by professional background and country of origin, to try and see if there are certain patterns or clusters that might provide more nuance to the overall survey results.

Figure A.4

Priorities for compact and connected urban growth according to professional background



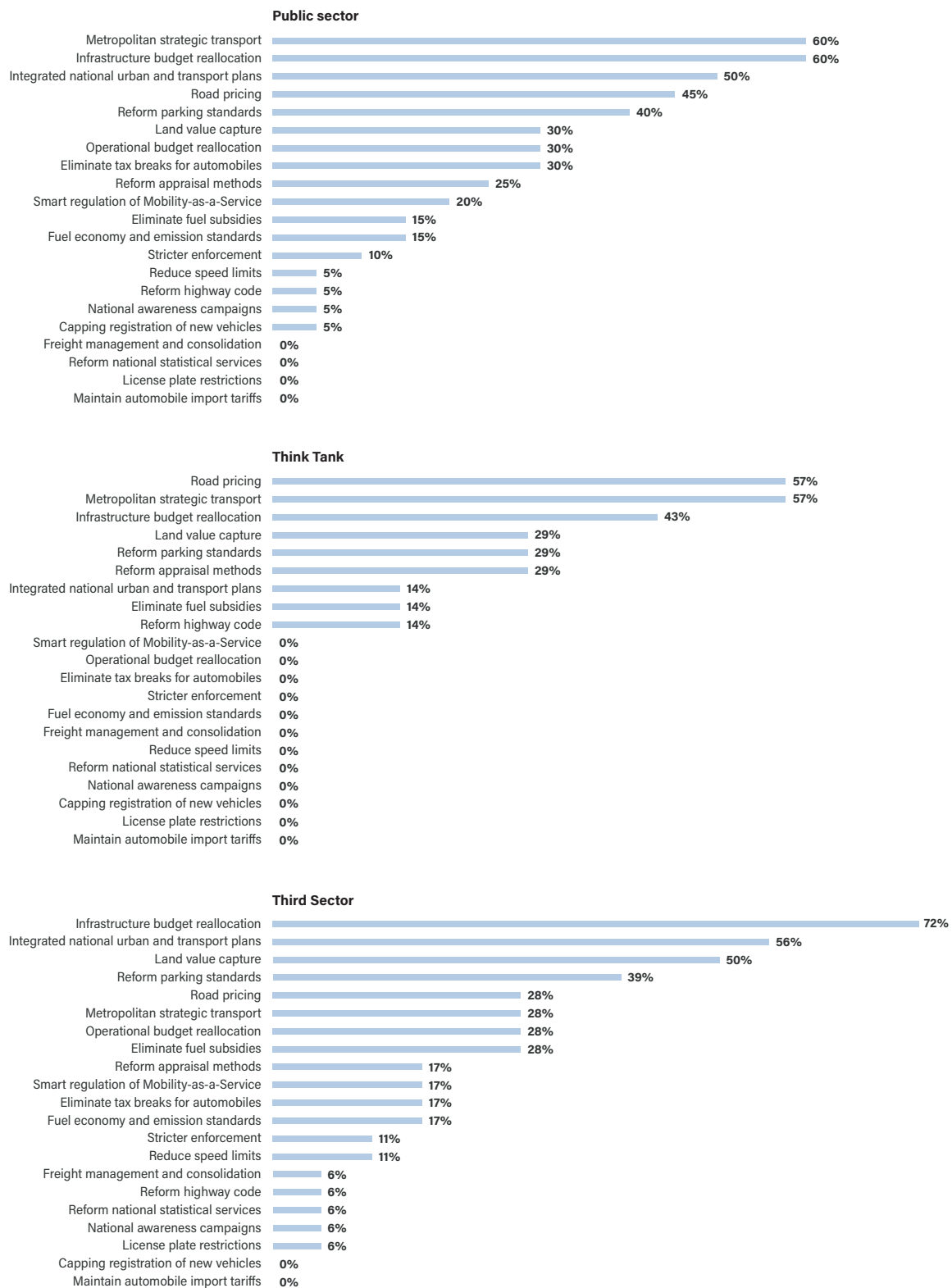
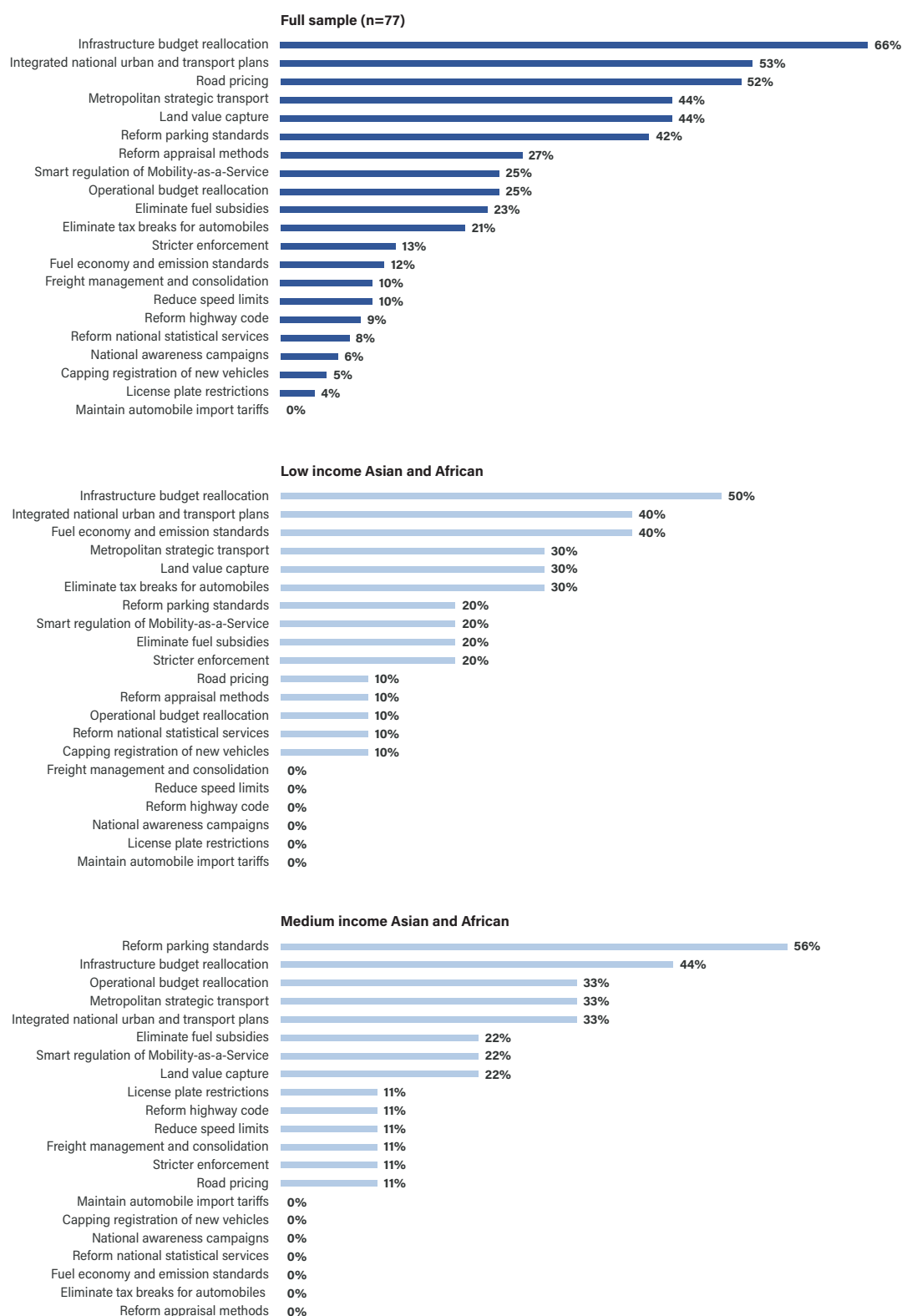
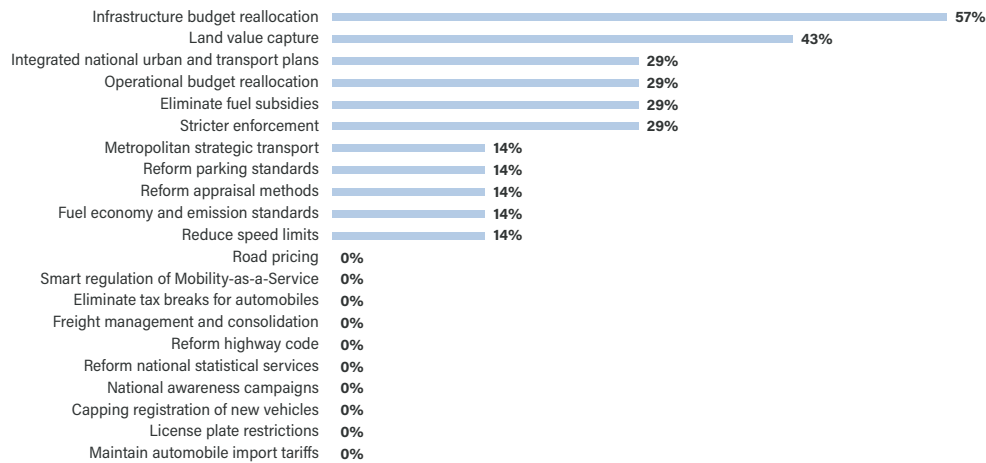


Figure A.5

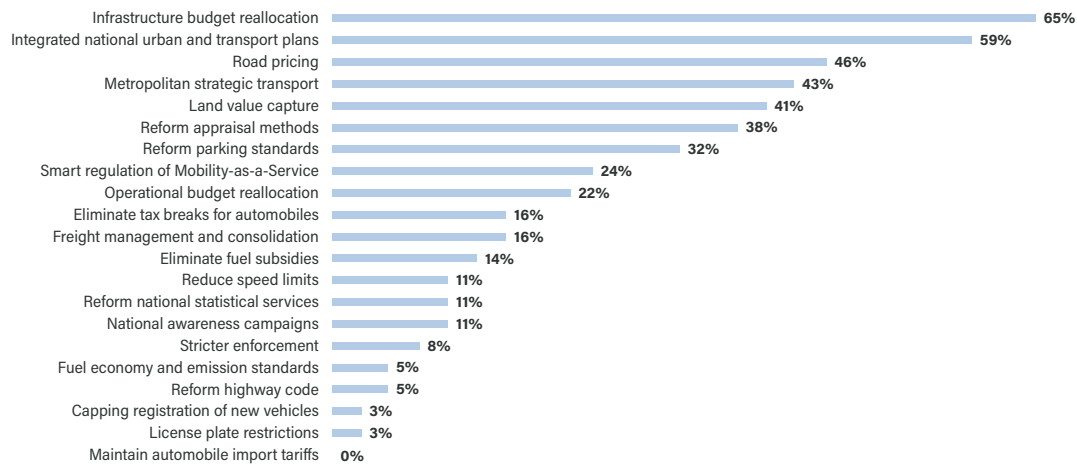
Priorities for compact and connected urban growth according to global context of the respondents



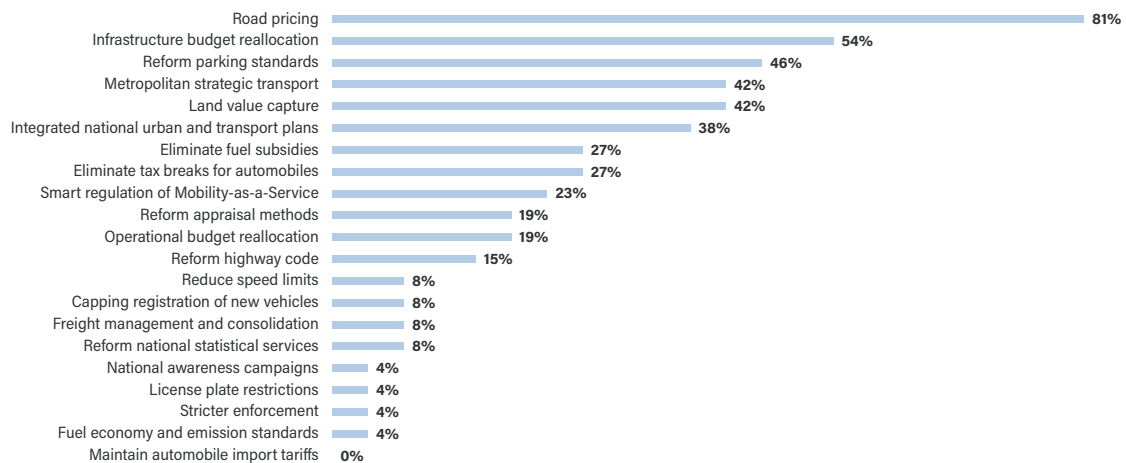
Medium income Latin American



High-income European & Asian



High income North American & Oceanian



APPENDIX B – POLICY INTERVENTION INVENTORY

Below is an overview of some of the most relevant categories from the policy inventory of 189 interventions. Due to space constraints it was not possible to depict the full inventory in a legible format as part of this paper.

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Regulatory	Vehicle standards (mandatory)	Banning/ phasing out of lead, sulphur etc. from fuels	Urban-influencing	Strategic	Low	Improve	+	=	3	2	2	3
Regulatory	Vehicle standards (mandatory)	Introducing periodic vehicle inspection and maintenance systems	Urban-influencing	Operational	Low	Improve	+	=	3	2	2	2
Regulatory	Vehicle standards (mandatory)	Tightening standards for the level of tailpipe emissions from motorised vehicles	Urban-influencing	Strategic	Low	Improve	+	=	3	2	2	3
Regulatory	Vehicle standards (mandatory)	Tightening fuel economy (consumption per km of travel) standards for motorised vehicles	Urban-influencing	Strategic	Low	Improve	+	=	3	2	2	3
Regulatory	Vehicle access restrictions	Establishing car free zones	City-specific	Strategic	Low	Shift	+	+	1	1	2	3
Regulatory	Vehicle access restrictions	Establishing high-occupancy vehicle (HOV) lanes	City-specific	Tactical	Low	Shift	+	+	2	2	2	1
Regulatory	Vehicle access restrictions	Establishing partial traffic bans	City-specific	Strategic	Low	Shift	+	+	1	2	2	2
Regulatory	Vehicle access restrictions	Establishing traffic route restrictions	City-specific	Tactical	Low	Improve	+	=	1	1	1	2
Regulatory	Vehicle access restrictions	Installing physical restrictions (e.g. Bollards) to improve pedestrian environment/restrict parking in unauthorised areas	City-specific	Operational	Low	Shift	=	+	1	1	2	1
Regulatory	Vehicle access restrictions	Introducing license plate restrictions	City-specific	Operational	Low	Shift	+	+	2	2	1	2
Regulatory	Vehicle access restrictions	Introducing lorry routing systems	Urban-focused	Operational	Low	Shift	+	=	1	2	3	2
Regulatory	Vehicle access restrictions	Introducing Low emission zones (LEZs) in urban areas	City-specific	Tactical	Low	Improve	+	=	2	2	2	3
Regulatory	Mobility services regulation	Allow spaces for experimentation of new mobility technologies and PMDs (Personal Mobility Devices)	Urban-focused	Strategic	Low	Shift	=	+	3	1	3	1
Regulatory	Mobility services regulation	Introduce data sharing requirement for all private operators	Urban-influencing	Reflexive	Low	Shift	=	+	3	1	3	2
Regulatory	Mobility services regulation	Introduce Dynamic Speed Regulation	Urban-influencing	Strategic	Low	Shift; improve	=	+	3	2	2	2
Regulatory	Mobility services regulation	Introduce ICT Security Standards	Urban-influencing	Strategic	Low	Shift; improve	=	+	3	1	3	1
Regulatory	Mobility services regulation	Introduce licensing for Autonomous vehicles that are urban compatible (light weight, low speed)	City-specific	Strategic	Low	Shift; improve	=	+	3	2	3	2
Regulatory	Mobility services regulation	Introduce maximum market shares of MaaS providers	Urban-influencing	Strategic	Low	Shift	=	+	3	3	3	2

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Regulatory	Mobility services regulation	Regulate for exclusive public/shared ownership of autonomous vehicles	Urban-influencing	Strategic	Low	Shift	=	+	3	2	2	3
Regulatory	Mobility services regulation	Regulate for slow-speed autonomy with light vehicles	Urban-influencing	Strategic	Low	Shift; improve	=	+	3	2	1	2
Regulatory	Mobility services regulation	Regulate pick-up and pick-off location (MaaS Station management)	Urban-focused	Strategic	Low	Shift; improve	=	+	2	2	3	2
Regulatory	Mobility services regulation	Regulate separate service provision from data, management and information provision	Urban-influencing	Strategic	Low	Shift; improve	=	+	3	3	3	1
Regulatory	Other operational codes	Reduce speed limits to 30 km/h on all urban roads and 80 km/h on all highways	Urban-influencing	Tactical	Low	Improve	+	+	3	1	2	1
Regulatory	Other operational codes	Reform highway and street codes to enable more flexible urban street design	Urban-influencing	Strategic	Low	Shift	+	+	3	1	3	1
Regulatory	Planning & infrastructure design	Establish national freight management plans to optimise movement of goods and support development of urban logistics centres at the urban periphery	City-specific	Strategic	Low	Avoid	+	+	3	2	3	2
Regulatory	Planning & infrastructure design	Establishing sustainable urban mobility plans/policies	City-specific	Strategic	Low	Avoid; Shift	+	+	3	2	3	1
Regulatory	Planning & infrastructure design	Reallocating parking space to other non-motorised uses	City-specific	Strategic	Low	Shift	+	+	1	1	2	1
Regulatory	Planning & infrastructure design	Reallocating road space to cycling infrastructure	City-specific	Strategic	Low	Shift	+	+	1	2	3	1
Regulatory	Planning & infrastructure design	Reallocating road space to pedestrian infrastructure	City-specific	Strategic	Low	Shift	+	+	1	2	3	1
Regulatory	Planning & infrastructure design	Reallocating road space to public transport	City-specific	Strategic	Low	Shift	+	+	2	2	3	1
Regulatory	Planning & infrastructure design	Reducing the number of off-street and on-street parking spaces	Urban-focused	Tactical	Low	Shift	+	+	1	1	2	1
Regulatory	Planning & infrastructure design	Regulate for a special facility (multi-storey/underground) or area (surface) for off-street parking	City-specific	Tactical	Low	Shift	+	+	1	1	2	2
Regulatory	Planning & infrastructure design	Shift from minimum to maximum parking requirements for new developments (residential or commercial)	Urban-influencing	Strategic	Low	Shift	+	+	3	1	2	2
Regulatory	Enforcement	Stricter enforcement of speed restrictions, driving restrictions and parking regulations	City-specific	Strategic	Medium	Shift; improve	+	+	2	1	2	1
Economic	Taxes	Eliminating tax breaks for the purchase of new vehicles	Urban-influencing	Strategic	Medium	Avoid; Shift	=	=	3	1	2	1

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Economic	Taxes	Eliminating tax breaks for large vehicles	Urban-influencing	Strategic	Medium	Avoid; Shift	+	=	3	1	2	1
Economic	Taxes	Eliminating tax breaks for use of company vehicles by employees	Urban-influencing	Tactical	Medium	Avoid; Shift	+	=	3	1	2	1
Economic	Taxes	Increase/Maintain automobile import tariffs at highest level applied over the past decade	Urban-influencing	Strategic	Medium	Shift; improve	+	+	3	1	1	2
Economic	Taxes	Introducing developer levies for transport infrastructure	Urban-influencing	Strategic	Medium	Shift	+	+	3	2	3	2
Economic	Taxes	Introducing land value capture via increase of business rates or any other tax to support transit oriented development	Urban-influencing	Strategic	Medium	Avoid; Shift	+	+	3	3	2	2
Economic	Taxes	Introducing land value capture via property sales tax, property tax, or land tax to support transit oriented development	Urban-influencing	Strategic	Medium	Avoid; Shift	+	+	3	3	3	2
Economic	Taxes	Introducing taxes on fossil fuels used in transport	Urban-influencing	Strategic	Medium	Improve	+	+	3	2	1	3
Economic	Taxes	Introducing vehicle emissions taxes that are time-based, location-based or distance-based	Urban-influencing	Strategic	Medium	Avoid; Shift	+	+	3	3	2	1
Economic	Taxes	Introducing vehicle ownership taxes	Urban-influencing	Strategic	Medium	Avoid; Shift	+	+	3	2	1	2
Economic	Taxes	Reform tariffs to reduce cost of importing bicycles and e-bikes	Urban-influencing	Strategic	Medium	Shift	+	+	3	1	3	1
Economic	Taxes	Removing of tax breaks for use of fossil fuels in transport	Urban-influencing	Strategic	Medium	Shift; improve	+	=	3	2	1	3
Economic	Subsidies	Introduce exemptions for clean vehicles from road user charging	City-specific	Tactical	Medium	Improve	+	=	2	2	3	1
Economic	Subsidy	Introducing mandatory employer contributions towards public transport fares	Urban-influencing	Tactical	Low	Shift	+	+	2	2	2	1
Economic	Subsidies	Introducing rebates on electric vehicle purchases	Urban-influencing	Tactical	Medium	Improve	+	=	3	2	3	2
Economic	Subsidies	Introducing tax breaks for clean vehicles	Urban-influencing	Strategic	Medium	Improve	+	=	3	1	2	2
Economic	Subsidies	Introducing tax breaks for companies working on dynamic trip-planning and ticketing services	Urban-influencing	Tactical	Medium	Avoid; Shift	+	+	3	1	3	1
Economic	Subsidies	Introducing tax breaks for ride sharing companies (bicycles, E-bikes, E-scooters, etc.)	Urban-influencing	Tactical	Medium	Shift; improve	+	+	3	1	3	1
Economic	Subsidies	Introducing tax breaks for ride sharing companies (cars, taxis, other motor vehicles)	Urban-influencing	Tactical	Medium	Shift	=	=	3	1	3	1
Economic	Subsidies	Introducing tax breaks for teleworking services (VC, etc.) for businesses	Urban-influencing	Tactical	Medium	Avoid	+	=	3	1	3	1

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Economic	Subsidies	Introducing tax breaks for use of biofuels in transport	Urban-influencing	Strategic	Medium	Improve	+	=	3	2	3	2
Economic	Pricing	Eliminating free parking	City-specific	Tactical	Medium	Shift	+	+	1	2	1	2
Economic	Pricing	Increasing parking charges	City-specific	Tactical	Medium	Avoid; Shift	+	+	1	2	2	1
Economic	Pricing	Introduce MaaS Road Charging	Urban-influencing	Strategic	Medium	Shift	=	+	3	3	2	2
Economic	Pricing	Introduce road user charging via a cordon system	City-specific	Operational	Medium	Avoid; Shift	+	+	1	3	1	2
Economic	Pricing	Introducing differentiated toll charges for different types of vehicles	Urban-influencing	Operational	Medium	Avoid; Shift	+	+	2	2	2	1
Economic	Pricing	Introducing differentiated tolls based on level of congestion	Urban-influencing	Operational	Medium	Avoid; Shift	+	+	2	2	2	1
Economic	Pricing	Introducing differentiated tolls based on mileage	Urban-influencing	Operational	Medium	Avoid; Shift	+	+	2	2	2	1
Economic	Pricing	Introducing discounted bulk transit passes	City-specific	Tactical	Medium	Shift	+	+	2	1	3	1
Economic	Pricing	Introducing distance-based vehicle registration, insurance and emission fees	Urban-influencing	Tactical	Medium	Avoid; Shift	+	+	3	3	2	1
Economic	Pricing	Introducing toll charges for urban motorways	Urban-focused	Operational	Medium	Shift	+	+	2	3	2	1
Economic	Pricing	Introducing vehicle registration auctions	City-specific	Operational	Medium	Shift	+	+	1	1	2	2
Economic	Pricing	Introducing vehicle registration lotteries	City-specific	Operational	Low	Shift	+	+	1	1	2	2
Economic	Pricing	Introduction of differentiated fare structures	City-specific	Tactical	Medium	Shift	+	+	1	2	3	1
Economic	Pricing	Lowering (or total removal) of public transport fares	City-specific	Tactical	High	Shift	+	+	1	2	3	1
Economic	Pricing	Replace fuel tax with road users charge to account for increasing electrification of vehicle fleets	Urban-influencing	Strategic	Medium	Shift; improve	=	+	3	3	2	2
Economic	Financing	Developing terminals or interchanges for public transit services	City-specific	Strategic	Low	Shift	+	+	2	3	3	2
Economic	Financing	Establishing Park and Ride Schemes	City-specific	Strategic	Low	Shift	+	+	1	1	2	2
Economic	Financing	Increasing financing for BRT infrastructure	Urban-focused	Strategic	High	Shift	+	+	3	2	3	1
Economic	Financing	Increasing financing for bus infrastructure	Urban-focused	Strategic	High	Shift	+	+	3	2	3	1
Economic	Financing	Increasing financing for light rail infrastructure	Urban-focused	Strategic	High	Shift	+	+	3	2	3	1

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Economic	Financing	Increasing financing for cycling infrastructure (bike paths, storage, signalling, etc.)	Urban-focused	Strategic	High	Shift	+	+	3	2	3	1
Economic	Financing	Increasing financing for electric vehicle infrastructure	Urban-focused	Strategic	High	Shift	+	=	3	2	3	2
Economic	Financing	Increasing financing for pedestrian infrastructure	Urban-focused	Strategic	High	Shift	+	+	3	2	3	1
Economic	Financing	Increasing financing for R&D for clean transport technology development	Urban-influencing	Strategic	Medium	Shift; improve	+	+	3	1	3	3
Economic	Financing	Increasing financing for rail transport infrastructure	Urban-influencing	Strategic	High	Shift	+	+	3	3	3	1
Economic	Financing	Increasing the frequency of bus services (increase in bus fleet numbers thus reducing journey times)	Urban-focused	Tactical	Medium	Shift	+	+	1	1	3	3
Economic	Financing	Increasing the frequency of rail services	Urban-focused	Tactical	Medium	Shift	+	+	3	2	3	1
Economic	Financing	Installing urban traffic management and control (UTMC) systems (e.g., fixed time systems, plan generation systems, traffic responsive centralised systems).	City-specific	Strategic	Medium	Improve	+	=	1	3	2	1
Economic	Financing	Introducing/expanding programmes of road maintenance inspection and repair	Urban-focused	Operational	High	Improve	=	=	1	1	3	1
Economic	Financing	Operational budget reallocation to support operations related to active transport	Urban-influencing	Strategic	High	Shift	+	+	3	2	3	1
Economic	Financing	Providing financing for integrated ticketing services	City-specific	Strategic	Medium	Shift	+	+	3	3	3	1
Economic	Financing	Providing financing for public transport operations	City-specific	Operational	High	Shift	+	+	3	1	3	1
Economic	Financing	Purchasing of equipment and/or vehicles supporting low-carbon modes of transport (e.g. vehicles with clean fuels, trains, etc)	Urban-influencing	Tactical	High	Improve	+	=	3	1	3	3
Economic	Non-financial resource	Allocating land and providing incentives for sustainable modes of transport and eliminating the free allocation of land for road building.	Urban-focused	Strategic	Low	Shift	+	+	2	1	2	2
Information	Standards (voluntary)	Introducing voluntary CO ₂ emissions labeling	Urban-influencing	Tactical	Low	Improve	+	=	3	1	3	2
Information	Standards (voluntary)	Introducing voluntary fuel economy labeling	Urban-influencing	Tactical	Low	Improve	+	=	3	1	3	2
Information	Awareness Campaigns	Encouraging flexible working hours	Urban-influencing	Operational	Low	Avoid	+	=	2	1	3	1
Information	Awareness Campaigns	Encouraging telecommuting/teleworking	Urban-influencing	Tactical	Low	Avoid	+	=	2	1	3	1

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Information	Awareness Campaigns	Encouraging teleconferencing	Urban-influencing	Tactical	Low	Avoid	+	=	2	1	3	1
Information	Awareness Campaigns	Introducing campaigns to promote eco-driving	Urban-influencing	Tactical	Low	Improve	+	=	3	1	3	1
Information	Awareness Campaigns	Introducing campaigns to promote low carbon vehicles	Urban-influencing	Tactical	Low	Improve	+	=	3	1	3	1
Information	Awareness Campaigns	Introducing campaigns to promote road safety	Urban-influencing	Tactical	Low	Shift; improve	+	+	3	1	3	1
Information	Awareness Campaigns	Introducing direct marketing campaigns to promote sustainable and active travel	Urban-focused	Tactical	Low	Shift	+	+	2	1	3	1
Information	Awareness Campaigns	Introducing general marketing campaigns to promote sustainable and active travel	Urban-focused	Tactical	Low	Shift	+	+	3	1	3	1
Information	Awareness Campaigns	Promoting deadline for phase-out of diesel and petrol vehicles	Urban-influencing	Tactical	Low	Improve	+	=	3	1	2	1
Information	Awareness Campaigns	Supporting bike sharing programmes	Urban-focused	Tactical	Low	Shift	+	+	1	1	3	1
Information	Awareness Campaigns	Supporting car clubs/car sharing	City-specific	Tactical	Low	Avoid; Shift	+	=	1	1	3	1
Information	Awareness Campaigns	Supporting company travel plans	Urban-influencing	Tactical	Low	Shift	+	+	2	1	3	1
Information	Awareness Campaigns	Supporting ride sharing programmes	City-specific	Tactical	Low	Avoid	+	=	1	1	3	1
Information	Awareness Campaigns	Supporting school travel plans	Urban-influencing	Tactical	Low	Shift	+	+	2	1	3	1
Information	Data & Statistics	Carrying out mobility behaviour surveys	Urban-influencing	Reflexive	Low	Improve	=	=	3	2	3	1
Information	Data & Statistics	Collecting, analysing and disseminating data on national transport trends	Urban-influencing	Reflexive	Low	Shift	=	=	3	2	3	1
Information	Data & Statistics	Establishing open data systems for transport	City-specific	Strategic	Low	Shift	+	+	2	1	3	1
Information	Data & Statistics	Reform appraisal methods for transport infrastructure projects to enable shift away from 'predict and provide' and travel time savings focus to accessibility-oriented metrics	Urban-influencing	Strategic	Low	Avoid; Shift	+	+	3	3	3	1
Information	Data & Statistics	Reform national statistical services to incorporate all modes of travel, measures for accessibility and fuller information on social costs of different transport modes	Urban-influencing	Reflexive	Low	Shift	+	+	3	3	3	1
Information	Information provision	Establishing initiatives for personalised travel planning	Urban-focused	Tactical	Low	Shift	+	+	1	1	3	1
Information	Information provision	Installing conventional signs & markings	Urban-influencing	Operational	Low	Improve	=	=	1	1	3	1

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Information	Information provision	Installing parking guidance systems	Urban-influencing	Operational	Low	Improve	=	=	1	1	3	1
Information	Information provision	Installing variable message signs	Urban-influencing	Operational	Low	Improve	=	=	1	2	3	1
Information	Information provision	Introducing barrier-free mobility	City-specific	Operational	Medium	Shift	+	+	1	1	3	1
Information	Information provision	Introducing crowd sourcing to be generate data for trip-planning applications and other statistical uses.	City-specific	Tactical	Low	Shift	+	+	1	1	2	1
Information	Information provision	Introducing road freight fleet management systems	City-specific	Reflexive	Medium	Improve	+	=	1	2	3	1
Information	Information provision	Providing conventional timetable & service information	City-specific	Operational	Low	Shift	+	+	2	1	3	1
Information	Information provision	Providing real time passenger information	City-specific	Tactical	Low	Shift	+	+	2	2	3	1
Information	Information provision	Providing trip planning systems	City-specific	Tactical	Low	Shift	+	+	1	2	3	1
Information	Knowledge creation	Carrying out research into sustainable mobility (including policy research and tech development)	Urban-influencing	Reflexive	Low	n/a	+	=	3	2	3	1
Information	Knowledge creation	Conducting research and studies into sustainable mobility (including policy research and tech development)	Urban-influencing	Reflexive	Medium	n/a	+	=	3	1	3	1
Information	Education	Facilitating knowledge exchange between urban policy-makers, researchers and private sector	Urban-influencing	Reflexive	Low	n/a	=	=	3	1	3	1
Information	Education	Funding training and skills development for transport planners and other public officials	Urban-influencing	Reflexive	Medium	n/a	=	=	3	1	3	1
Information	Leadership & signalling	Encouraging uptake of sustainable modes/change in behaviour through high-profile public figures modelling this behaviour	Urban-influencing	Tactical	Low	Shift	+	=	3	1	3	1
Information	Leadership & signalling	Encouraging uptake of sustainable modes/change in behaviour through public procurement and other forms of signalling	Urban-focused	Tactical	Low	Shift	+	=	2	1	3	1
Governance	Structures	(Re)nationalise transport infrastructure	Urban-influencing	Strategic	High	n/a	=	=	3	3	2	3
Governance	Structures	(Re)nationalise transport operations	Urban-influencing	Strategic	High	n/a	=	=	3	3	2	3
Governance	Structures	Amalgamate municipalities within the metropolitan (functional) area	City-specific	Strategic	Low	Avoid; Shift	=	=	3	3	1	3
Governance	Structures	Create formal platform where actors with influence over (or affected by) decisions (transport sector) can jointly learn, negotiate, coordinate and decide	Urban-influencing	Strategic	Low	Shift	=	=	3	2	3	1

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Governance	Structures	Create independent transport regulator with sanctionary and enforcement powers (all transport modes)	Urban-influencing	Strategic	Low	n/a	=	=	3	3	2	2
Governance	Structures	Create inter-municipal or regional bodies/advisory groups (composed of adjacent authorities) for transport and mobility	Urban-influencing	Strategic	Low	Avoid; Shift	=	=	3	2	2	1
Governance	Structures	Create metropolitan transport authority (with jurisdiction over all transport modes)	City-specific	Strategic	Low	Avoid; Shift	=	=	3	3	2	2
Governance	Structures	Create multi-scalar bodies/advisory groups (composed of authorities with responsibilities over transport and mobility in a given territory at different levels of government)	Urban-influencing	Strategic	Low	Avoid; Shift	=	=	3	2	3	1
Governance	Structures	Create new ministry for 3C development	Urban-influencing	Strategic	Low	Avoid; Shift	+	+	3	2	2	1
Governance	Structures	Create state-owned company to manage transport infrastructure	Urban-influencing	Strategic	High	n/a	=	=	3	2	2	1
Governance	Structures	Create state-owned company to manage transport operations	Urban-influencing	Strategic	High	n/a	=	=	3	2	2	3
Governance	Structures	Delegate decision-making (transport sector) to a technical public or quasi-public body	Urban-influencing	Strategic	Low	n/a	=	=	3	2	2	3
Governance	Structures	Demerge transport into its own ministry	Urban-influencing	Strategic	Low	n/a	=	=	3	1	2	1
Governance	Structures	De-regulate transport sector (e.g. dissolution of sector regulator, remove regulations on licensing, exclusive rights, ownership, quality standards, safety standards)	Urban-influencing	Strategic	Low	n/a	=	=	3	1	2	2
Governance	Structures	Devolve decision-making powers over transport to municipal governments	City-specific	Strategic	Low	n/a	=	=	3	2	2	1
Governance	Structures	Devolve decision-making powers over transport to regional/metropolitan governments/authorities	Urban-focused	Strategic	Low	Avoid; Shift	=	=	3	2	2	2
Governance	Structures	Devolve fiscal, investment and decision-making powers over transport to municipal governments	City-specific	Strategic	High	n/a	=	=	3	3	2	1
Governance	Structures	Devolve fiscal, investment and decision-making powers over transport to regional/metropolitan governments/authorities	Urban-focused	Strategic	High	Avoid; Shift	=	=	3	3	2	2
Governance	Structures	Legislate to allow cooperatives (and/or other forms of civic or co-production) to manage transport infrastructure	Urban-influencing	Strategic	Low	n/a	=	=	3	1	3	2
Governance	Structures	Legislate to allow cooperatives (and/or other forms of civic or co-production) to manage transport operations	Urban-influencing	Strategic	Low	n/a	=	=	3	1	3	2

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Governance	Structures	Make it mandatory that all (including sub-national) transport-related policies/ projects need to be approved by a national agency	Urban-influencing	Strategic	Low	n/a	=	=	3	2	2	3
Governance	Structures	Merge ministries of transport and land use and planning	Urban-influencing	Strategic	Low	Avoid	=	=	3	1	2	1
Governance	Structures	Privatise transport infrastructure	Urban-influencing	Strategic	High	n/a	=	=	3	1	1	2
Governance	Structures	Privatise transport operations	Urban-influencing	Strategic	High	n/a	=	=	3	1	1	2
Governance	Structures	Sub-department level mergers of land use/planning (or transport) functions into transport (or land use/planning) ministry	Urban-influencing	Strategic	Low	Avoid	=	=	3	1	2	1
Governance	Structures	Transfer control over transport to a single national authority	Urban-influencing	Strategic	Low	n/a	=	=	3	1	2	3
Governance	Processes	Aligning other national spending with sustainable transport objectives	Urban-influencing	Strategic	High	Avoid; Shift	+	+	3	2	3	2
Governance	Processes	Approve strong commitments in national parliament (e.g. pluri-annual budget, investment programmes) covering several future mandates	Urban-influencing	Strategic	Low	n/a	=	=	3	2	3	2
Governance	Processes	Decrease length of political mandates	Urban-influencing	Strategic	Low	n/a	=	=	3	1	2	2
Governance	Processes	Enhance transport planning beyond 'predict and provide' by focusing on accessibility (instead of movement)	Urban-influencing	Strategic	Low	Avoid	+	+	3	2	2	1
Governance	Processes	Increase length of political mandates	Urban-influencing	Strategic	Low	n/a	=	=	3	1	1	3
Governance	Processes	Integrating transport into strategic urban and land-use planning	City-specific	Strategic	Low	Avoid; Shift	+	+	3	3	3	1
Governance	Processes	Introduce term limits (e.g. maximum two consecutive terms)	Urban-influencing	Strategic	Low	n/a	=	=	3	1	3	2
Governance	Processes	Introducing competitive bidding for specific transit routes	Urban-influencing	Reflexive	Medium	Shift	=	+	2	2	3	2
Governance	Processes	Make stakeholder involvement, consultation and participatory processes in the transport sector mandatory by law	Urban-influencing	Strategic	Low	Shift	=	=	3	3	3	1
Governance	Processes	Pass legislation that formally promotes consensus-based, cross-party, decision-making in the transport sector (e.g. signing specific commitments to transport policy)	Urban-influencing	Strategic	Low	n/a	=	=	3	2	3	2
Governance	Processes	Regulate to avoid competition with existing bus and public transport services	Urban-focused	Strategic	Low	Shift	=	+	3	2	3	1

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Governance	Processes	Remove 'red tape' in public procurement procedures	Urban-influencing	Strategic	Low	n/a	=	=	3	1	2	1
Governance	Processes	Remove term limits (e.g. no restrictions to re-election)	Urban-influencing	Strategic	Low	n/a	=	=	3	1	1	3
Governance	Processes	Set a well-calibrated plan-making hierarchy to support strategic planning logic (top-level plans with lower resolution and more strategic, lower-level plans considering specific local conditions)	Urban-influencing	Strategic	Low	n/a	=	=	3	3	2	1
Governance	Processes	Streamline land acquisition and expropriation processes for transport-related projects	Urban-influencing	Strategic	Low	n/a	=	=	3	3	1	3
Governance	Tools	Assess problems as well as past and future interventions integrating knowledge from several domains (e.g. multidisciplinary teams from different ministries)	Urban-influencing	Strategic	Low	Avoid	=	=	3	2	2	1
Governance	Tools	Develop and implement costing models for transport-related policy that consider at least 10-year horizons and factor in direct and indirect impacts on the public purse	Urban-influencing	Strategic	High	n/a	=	=	3	3	2	1
Governance	Tools	Develop and implement measures of accessibility (which take account of access through connectivity and physical proximity)	Urban-influencing	Reflexive	Low	Avoid	+	+	3	2	2	1
Governance	Tools	Developing centralised information and communications technology hubs for transport	City-specific	Reflexive	Medium	Improve	+	=	2	3	3	1
Governance	Tools	Enhance data collection efforts and support data availability across sectoral boundaries	Urban-influencing	Reflexive	Low	Shift	=	=	3	3	3	1
Governance	Tools	Equip transport authorities to deal with mobility aggregation	City-specific	Strategic	Low	Shift; improve	=	+	2	3	3	1
Governance	Tools	Evaluate specific reforms, regulations and/or policy interventions	Urban-influencing	Reflexive	Low	n/a	=	=	3	2	2	1
Governance	Tools	Increase legally required time horizons for (cities') transport strategies and plans	Urban-influencing	Strategic	Low	n/a	=	=	3	1	2	1
Governance	Tools	Introduce debt ceilings	Urban-influencing	Strategic	High	n/a	=	=	3	1	3	3
Governance	Tools	Introduce new rules for financing transport infrastructure that recover some or all of the value generated for private landowners (e.g. land value capture laws)	Urban-influencing	Strategic	High	n/a	=	=	3	3	2	3
Governance	Tools	Introduce new rules/limits for financing transport projects/ infrastructure (i.e. % user fees, % taxes, % debt)	Urban-influencing	Strategic	High	n/a	=	=	3	3	2	2

Main Taxonomy	Taxonomy Sub-Category	Specific Policy Intervention	Urban Scope	Transition Activity	Fiscal Implications	ASI Category	Impact on GHG Emissions	Impact On Compact + Connected Growth	National Level Relevance	Administrative Capacity	Public Acceptability	Vested Interests
Governance	Tools	Introduce requirement that feasibility studies of each transport-related policy/ project need to demonstrate positive contribution to 3C development (mandatory by law)	Urban-influencing	Reflexive	Low	Avoid; Shift	+	+	3	2	2	2
Governance	Tools	Provide earmarked funding to subnational governments (through categorical grants for specific transport purposes, rather than block grants)	Urban-influencing	Strategic	High	n/a	=	=	3	3	2	2
Governance	Tools	Remove/change debt ceilings	Urban-influencing	Strategic	High	n/a	=	=	3	1	1	2
Governance	Enabling conditions	Assist far-reaching collaboration through multidisciplinary and multisectoral project groups (spanning across jurisdictions, departments and other institutional boundaries)	Urban-influencing	Reflexive	Low	Avoid	=	=	3	2	2	1
Governance	Enabling conditions	Attract and retain skills in relevant ministries by offering competitive salaries	Urban-influencing	Reflexive	Medium	n/a	=	=	3	2	1	2
Governance	Enabling conditions	Develop a training programme that local authorities can access to develop their knowledge and skills in transport and 3C development	Urban-influencing	Reflexive	Medium	Avoid; Shift	=	+	3	1	2	1
Governance	Enabling conditions	Develop and implement codes of conduct targeting the relationship between government and all actors identified under the category "vested interests" (in other types of policy instruments)	Urban-influencing	Strategic	Low	n/a	=	=	3	3	3	2
Governance	Enabling conditions	Develop and implement transparency laws targeting the relationship between government and all actors identified under the category "vested interests"	Urban-influencing	Strategic	Low	n/a	=	=	3	3	3	2
Governance	Enabling conditions	Develop knowledge and skills in relevant ministries by delivering appropriate training on 3C development	Urban-influencing	Reflexive	Medium	Avoid; Shift	=	+	3	2	2	1
Governance	Enabling conditions	Empower local authorities to attract and retain transport and 3C development-related skills by allowing them to offer more competitive salaries	Urban-influencing	Reflexive	Medium	Avoid; Shift	=	+	3	2	1	2
Governance	Enabling conditions	Increase budget of relevant ministries (e.g. transport, land use/planning)	Urban-influencing	Strategic	High	n/a	=	=	3	2	2	3

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ABOUT THE COALITION FOR URBAN TRANSITIONS

The Coalition for Urban Transitions - launched in 2016 at the Climate Leaders' Summit in New York - is a major new international initiative to support decision makers to unlock the power of cities for enhanced national economic, social, and environmental performance, including reducing the risk of climate change. The Coalition provides an independent, evidence based approach for thinking about 'well managed' urban transitions to ensure that the growth of urban areas, and the accompanying process of economic, social, and environmental transformation, maximises benefits for people and the planet.

The initiative is jointly managed by the **C40 Cities Climate Leadership Group (C40)** and **World Resources Institute (WRI) Ross Center for Sustainable Cities**. Members include over 20 major institutions spanning five continents, including research institutions, city networks, international organizations, infrastructure providers, and strategic advisory companies. The initiative will be overseen by a Global Urban Leadership Group to steer and champion the work.

STEERING GROUP

This work was guided by a Steering Group comprising representatives from the Brookings Institution, the C40 Cities Climate Leadership Group, the Climate Bonds Initiative, the Climate Policy Initiative, Deutsche Bank, the Lincoln Land Institute, the UK Department for International Development, the UN Environment Finance Initiative, and the World Bank.

ABOUT LSE CITIES

The London School of Economics and Political Science (LSE) is one of the foremost social science universities in the world. LSE Cities is an international centre at the LSE that carries out research, graduate and executive education and outreach activities in London and abroad. Its mission is to study how people and cities interact in a rapidly urbanising world, focusing on how the physical form and design of cities impacts on society, culture and the environment. This research was commissioned via LSE Enterprise.

Acknowledgements

This paper was made possible through the generous support of the UK Department for International Development. The authors would like to thank Ipek Gençsü and Shelagh Whitley from the Overseas Development Institute for their excellent insights and research that shaped the direction of this paper early on. We would also like to thank Matt Ulterino for his invaluable editorial input, Katherine Maxwell for her diligent research assistance and Nick Godfrey and Sarah Colenbrander for their constructive feedback from the inception of this work to its publication. The paper also benefitted greatly from the thorough reviews of Tony May, Flavio Coppola and Holger Dalkmann. We would also like to acknowledge the input of a number of global experts who took time to speak to us for the scoping interviews and to respond to our survey. Finally, we are indebted to our wonderful editor Marion Davis, without whom this paper would simply not exist in its current form. Any errors, omissions, or other deficits are solely the fault of the authors and should not be attributed to any of the aforementioned individuals or organisations.