

POLICY BRIEF

URBAN TRANSPORT & SDG 11: SUSTAINABLE CITIES & COMMUNITIES

This document is a part of series of six policy breifs that identify interactions of the urban transport with six UN Sustainable Development Goals (SDGs); SDG1: No Poverty, SDG3: Good Health & Well-being, SDG5: Gender Equtiy, SDG8: Economic Growth, SDG11: Sustainable Cities & Communities, and SDG13: Climate Action.

SUSTAINABLE G ALS

About

This policy breif is part of the OPTIMISM (Opportunities for Climate Mitigation and Sustainable Development) project. OPTIMISM is an international multi-stakeholder partnership and research network funded by the UK Natural Environment Research Council as part of the research council's "Towards a Sustainable Earth" program. The international team consists of four partners: (i) Imperial College London, UK, (ii) Lund University, Sweden, (iii) Waseda University, Japan; and (iv) Ahmedabad University, India. Dr. Darshini Mahadevia (Principal Investigator-India) and Dr. Minal Pathak (Co-Principal Investigator) lead the project team placed in India that is supported and funded by the Department of Biotechnology (DBT), Government of India. The project team in India consisted of Dr. Chandrima Mukhopadhyay, Saumya Lathia, Amitkumar Dubey, Kanika Gounder, Bandish Patel, and Saleem Yatoo.

Adopting a whole-systems perspective, the OPTIMISM project uses the United Nations Sustainable Development Goals framework to analyze (i) the change in human development and the environment amidst rapid and extensive climate action and (ii) the role of insights from sectoral-SDG interaction in creating policies and practices that enable a transformational change. This document is a part of series of six policy breifs that identify interactions of the urban transport with six UN Sustainable Development Goals (SDGs); SDG1 - No Poverty, SDG3- Good Health & Well-being, SDG5 - Gender Equtiy, SDG8 - Economic Growth, SDG11- Sustainable Cities & Communities, and SDG13 - Climate Action. The document stems from a literature review of over 250 publications.

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SDG 11: Sustainable Cities & Communities

What's the Goal & Why Does It Matter?

The Goal: Make cities inclusive, safe, resilient, and sustainable

Today, more than half the world's population lives in cities, and by 2050, about two-thirds of the global population is estimated to inhabit cities, especially in the Global South[i]. India alone will add about 400 million new urban dwellers, doubling its urban population by 2050. Cities have never been more instrumental in shaping the future of the planet than today. Cities cover about 1[ii]-3%[iii] of global land area, house about 50% of the global population, and contribute to 80% of global GDP (UN, 2023[iv]). It accounts for 60-80% of energy consumption [v], 70% of resource consumption [vi], and contributes to about 75% of global greenhouse gas emissions [vii].

Rapid and haphazard urbanization has led to several challenges; a guarter of the global urban population about 1 billion people live in informal housing or slums, about 3.5 billion people lack access to basic services such as water or sanitation, and 99% of the world's urban population breaths polluted air [viii]. About 37% of the world's 1510 cities of urban areas are served by public transport systems, and only half of the world's population has access to public transportation. In central and South-Asian cities, only about 24% of municipal waste is collected, and only 45% of the urban population has access to open and public spaces within walking distance. Evidence shows that cities are more vulnerable to climate change owing to the concentration of people and activity intensity [ix]. Yet, cities hold the potential to forward sustainable development and resilience as 75% of the urban infrastructure used in 2050 is yet to be built [x]. The COVID-19 pandemic and other crises have shown the need for sustainable urban development, as they have revealed deep inequalities. To effectively respond

to future crises, it is vital to enhance the resilience of cities. Urban growth can be sustainable and promote prosperity for all.

What is its relationship with Transportation?

Among all SDGs, urban transport has the strongest linkages with SDG11. Urban transport enables access to employment opportunities, education, healthcare, basic services, public spaces, and civic opportunities. Rapid personal motorization combined with the poor state of transport service provision in the cities presents unique sustainability challenges. SDG11 provides a backdrop for cities to pursue opportunities for creating inclusive, safe, resilient, sustainable, and low-emission communities [xi] [xii].

Accessibility and Inclusivity

Transport plays a crucial role of enabling access and inclusion in two ways: first, by enabling access to affordable housing and basic services, especially for the urban poor residing in peripheral low-income housing (SDG11.1) [xiii][xiv], and second, through universal design and inclusive planning, urban transport systems improve accessibility, mobility and in turn quality of life for all, especially vulnerable socio-economic groups, women, elderly, children and the differently-abled (SDG11.2) [xiii][xiv][xvii]. Transport systems form important public assets, and hence inclusive planning & design can improve economic outcomes and social cohesion in communities. However, in cities of the global South, expanding or building new transport infrastructure often leads to large-scale evictions/ displacement of the urban poor, loss of land and livelihoods, deepened poverty, and contributes to peripheralization of low-income housing [xviii]. For example, the urban poor evicted due to urban renewal projects in Indian cities were relocated under the Basic Services for Urban Poor (BSUP) scheme to city peripheries with no access to public transport, forcing them to spend more time and resources on travel [xix].

Clean, safe, affordable urban transport is the key to poverty reduction and sustainable urban economic growth [xx]. Yet unaffordability of high-quality transit like Metrorail and Bus Rapid Transit (BRT) poses a concern for transport inclusivity of the urban poor and other vulnerable groups in the global South [xxi]; as a result, the majority of users from low-income and vulnerable groups are forced to commute to work via walking and cycling. Private ownership of mass transit systems under the Public-Private Partnership (PPP) projects often affects the inclusivity of the urban poor [xxii]. Moreover, poor coverage of public transit, poor location of bus shelters, lack of first & last-mile connectivity, inconvenient bus design (high-steps, poor seating capacity), low frequency, and unreliable schedules translate to unreliable and uncomfortable travel conditions and result in lower public transit ridership [xxiii][xxiv]. For example, the lack of safe cycle tracks and the absence of supporting cycling infrastructure near public transit stops/ stations in Indian cities deters the use of cycling as a reliable first & last mile connectivity mode to the near bus stop [xxv]. Since most sustainable transport users (walking, cycling, and public transport) in these cities are captive users/ "no-choice" users, they are more likely to shift to motorized transport with an increase in income levels [xxvi].

Urban Resilience & Greenhouse Gas Emissions

Integration of land-use and transport planning determines an urban form and hence, its sustainability. The lack of effective integration of land-use and transport leads to urban sprawl and increases a city's carbon footprint [xxvii][xxviii]. For example, South Asia's growing urban sprawl combined with inadequate public transport systems and high dependence on private vehicles in cities is leading to both increased GHG emissions and local air pollution [xxix]. Rapid motorization and a multi-fold increase in passenger transport demand result in longer trip lengths, more frequent and more severe traffic congestions, longer travel time, higher fuel costs, increased emissions, and air pollution [xxx][xxxi][xxxii]. In the global South, rapid motorization also often leads to social exclusion through environmental degradation, adverse public health impacts (cardiovascular diseases, obesity, etc.) [xxxiv], declining public transport usage, changes in land-use and community severance [xxxiv][xxxv].

The current motorization and emissions level also negatively affect agricultural produce and other ecosystem services (SDG11.6, SDG11.A, and SDG11.B); land transport is a major emitter of ground-level ozone, which has damaging effects on vegetation. Exposure to even relatively low levels of ozone causes significant damage to crops and natural systems. This is subsequently detrimental to agricultural output and food security, as well as ecosystem services [xxxvi]. This damage is enhanced in developing countries with high mixed land-use, where agricultural activities are undertaken in close proximity to urban areas. Similarly, high levels of PM 2.5 are also observed to interfere with precipitation and lead to unpredictable rainfall patterns, which is critical for monsoon-dependent and drought-prone regions [xxxvi]. Transport infrastructure and networks are crucial for pre- and post-disasters resilience (SDG11.B); with the exponential increase in extreme weather events (due to climate change), there is increasing emphasis on creating resilient urban transportation systems [xxi]. This is especially important in the global South, where heavy monsoons cause periodic flooding and damage transport infrastructure (roads, rail tracks, airports, etc.) every year (SDG11.5).

Road-space Distribution

Equitable distribution of street space among a variety of heterogeneous road users in Asian cities is a challenge, leading to contested streets. In most cities of the Global South, Right of Way (ROW) is often limited, and an overwhelming majority of it is allocated for motorized traffic functions (like automobiles, parking, and freight vehicles). While 4-wheelers cater to a small portion of the population in Asian cities, they occupy the most space, creating unequal road-space Meanwhile, distribution [xxxvi]. non-motorized transport that caters to about 50% of the total trips in cities is marginalized and under-prioritized; most cities lack more than 30% coverage of footpaths and cycle

tracks. The lack of resource allocation (in terms of road space, infrastructure, and funding) for non-motorized transport curtails the modal share of public transport, as footpaths and cycle tracks are vital first-last mile connectivity modes [xxxviii]. For example, in Jakarta, lack of prioritization and continued degradation of NMT infrastructure resulted in curbed mobility and spatial mismatch [1] for the urban poor and other vulnerable groups in the city [xxxix]. Hence, equitable road-space distribution is key for increasing sustainable mode shares like walking, cycling, and public transport, as well, and it is crucial to ensure the safety and dignity of vulnerable socio-economic groups that predominantly depend on these modes.

A car-centric approach to road design also translates into a lack of safe urban transport and magnifies the adverse impacts of road safety for pedestrians and cyclists (11.2, 11.3, 11.5, and 11.7). When road networks are designed to prioritize vehicular traffic, it exponentially increases exposure and risk of road crashes and deaths/ serious injuries in crashes, often borne by the most vulnerable [xxiv]. The externalities of private car travel, including accidents, noise, air pollution, climate change, nature, and urban effects, are estimated to range between \leq 45 and \leq 86 per 1000 passenger kilometers, compared to \leq 20 to \leq 24 per passenger kilometer for rail [xl].

Natural, Cultural & Built Heritage

When transport planning- especially the expansion of road infrastructure or public transport routing- is not context-sensitive, it leads to the loss of natural, cultural, or built heritage (SDG11.3 & SDG11.4). Large-scale highway projects routed through/ in-proximity to eco-sensitive zones continue to cause loss of biodiversity cover and ecological services in several regions of the global South [xli]. Expansion or construction of transport infrastructure in dense, historic cores of cities often results in the loss of built and cultural heritage. But if designed sensitively, it has the potential for improving economic outcomes for the community; Penang's multimodal public transport system with a BRT, LRT, and MRT improved access to its cultural heritage and increased revenue from tourism and retail [xlii]; introduction of the water taxis in Xochimilco, Mexico improved access to the coastlines & water bodies, and in turn improved economic outcomes for some of the most vulnerable communities that relied on water-tourism [xliii].

Urban & Peri-urban Dependencies

Intra-city and inter-regional transport planning and management link urban areas to their surroundings. This provides the hinterland/ rural areas with better access to economic (markets, jobs, etc.), and social, and institutional facilities (healthcare, legislative, education, etc.) while providing the urban areas with regular local farms and other produce. Developing a robust and affordable metropolitan public transport system has created a symbiotic relationship between urban and peri-urban areas in numerous cities across the globe. Hence, low-carbon intra-city and inter-regional transportation planning is vital for the positive links to thrive (SDG11.A) [xliv] [xlv] [xlvi]

How can transport enable Sustainable Communities and Cities?

The transportation systems in cities have a crucial and multi-faceted role in cities to advance and scale the reach of SDG11 [xlvii][xlviii][xlix][l]. Improving urban transport networks is linked with several co-benefits; promoting active transportation such as biking and walking reduces air pollution and increases physical activities, leading to improved health, and well-being; low-emission and sustainable encouraging transportation modes like public transportation improves mobility for all (especially vulnerable groups like elderly, women, children, urban poor and differently-abled), leading to improved socio-economic outcomes for communities; encouraging a shift away from private vehicles through various mechanism like car-free zones, congestion pricing, paid-parking and park-and-ride systems promotes a more equitable road space distribution and reduces carbon emissions. Studies discuss numerous possibilities ; vehicle-grid integration in urban, semi-urban, and rural areas provides an opportunity to integrate buildings and transport to the power sector [li][xl], enabling MaaS can decarbonize transport by increasing the share of trips via Electric Vehicles and by reducing the need for private car ownership [lii]; policies around cleaner engines and fuels presents the potential to mitigate emissions from private motorized demand [liii][liv][lv].

What can states do?

Although the implementation of sustainable transport planning and design is anchored by cities, the state has a vital role to play:

- Invest in public transportation infrastructure and systems to increase accessibility, reliability, and affordability, especially for marginalized groups.
- Promote active transportation modes like biking and walking through a dedicated infrastructure, such as bike lanes and pedestrian-friendly sidewalks, through various programs and schemes.
- Encourage the use of low-emission and sustainable modes of transportation, such as electric or hybrid vehicles, and offer incentives for their adoption through demand and supply-side incentives through programs and schemes.
- Develop integrated land-use and transport plans to encourage compact, connected, and coordinated cities that reduce sprawl and promote sustainability. For example, by amending the urban planning acts & regulations of the state.
- Ensure inclusive, accessible, and universal transport systems for people with disabilities, older persons, and low-income populations by amending acts and regulations that mandate cities to incorporate the same.
- Utilize early warning systems and scientific information for building disaster-resilient transportation infrastructure and systems to better prepare for and respond to natural disasters and other crises.
- Support research and innovation in the field of sustainable transport and share best practices among state governments and departments.expanded to include direct benefit

transfers to the urban poor while using public transport.

• Promote low-carbon fuels through the Auto Fuel Policy of the State.

What can cities do?

Sustainable transport planning at the city level can effectively mitigate the negative externalities discussed above:

- Increase investments in Public Transport, Intermediate Public Transport, and Non-Motorized Transport.
- Large-scale behavioral change campaigns for encouraging car-free zones and reducing personal car usage through congestion charging, parking management, and expanding park-and-ride systems.
- The city can create safe active, and public transport links to public spaces to create more livable, inclusive, and healthier communities. (11.7)
- Provide of essential elements like NMT crossings, traffic signals, and lights, raised medians, and road signages are essential (for all users) and contribute to a safe street environment.
- Develop low-emission zones and incentivizing the use of clean vehicles and clean fuels.
- Encourage sustainable and innovative transportation solutions, such as electric bikes and ride-sharing services. For example, Copenhagen's Sustainable Urban Mobility Plan (SUMP) discusses the importance of its bicycle network in increasing accessibility within its urban form [lvi].
- Monitor and report transportation-related emissions to track progress toward sustainability goals.
- Encourage active transportation, such as cycling and walking, through infrastructure development and promotion. Especially by improving first-last mile connectivity through the provision of footpaths & bicycle stations.
- Allow cycles on public transport such as buses or metro, or rail to improve first-last mile connectivity.
- Utilize smart cards for integrated payment systems

for ride-sharing, taxis, buses, metro, rail, etc., to increase modal ridership.metro, or rail to improve first-last mile connectivity.

 Provide smart and state-of-the-art charging infrastructure to advance the adoption of electric vehicles in the city.

What can Communities and Individuals do?

Communities and individuals can fast-track the achievement of SDG11 by:

- Choose non-motorized transport (walking and cycling) for shorter distances.
- Advocate for investment in non-motorized transport infrastructure in neighborhoods.
- Choose public transport for longer distances, and for first-last mile connectivity, choose intermediate public transport (IPT) (auto-rickshaws, E-rickshaws, or shared rickshaws, etc.)
- Avoid using personal vehicles and give preference to carpooling.
- Select Mobility-as-a-Service or Ridesharing for the intercity commute (Preference could be given to lesser-emitting modes like rickshaws and 2-wheelers over cars).
- Actively engage in organizing car-free street movements to reclaim streets for group activities and recreation.
- Provide feedback to urban local bodies about the challenges & barriers of using public transport and non-motorized transport in your neighborhoods.
- Work with urban local bodies and non-government organizations in enabling a behavioral shift towards sustainable transport such as walking, cycling, public transport, and IPT.

Footnotes

[1] Spatial mismatch refers to the incongruity between the locations of low-income households and available jobs that are suitable for them [lvii].

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Appendix SDG 11 Targets

11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.

11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage.

11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.

11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other

waste management.

11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.

11.A Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning.

11.B By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels.

11.C Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials



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