4.3 Mobility and Air Quality

Indicator 1: Clean Technologies Shared Vehicles

Rationale: Conventional fuel burning vehicles release an enormous amount of toxicants to atmosphere, cities must put efforts to introduce a cleaner fuel based shared vehicles.

Description: The indicator assesses the percentage of shared vehicles that operate on clean fuels like CNG, LPG, biofuels or are hybrid or electric vehicles.

Methodology: The city has to calculate the ratio of annual number of clean technologies shared vehicles to total shared vehicles.

Formula:

$$\frac{\text{Total number of shared vehicles on clean technologies}}{\text{Total number of shared vehicles in the city}} \times 100$$

*Note: *Clean technology shared vehicles consists of vehicles that operate on clean fuels like CNG, LPG, biofuels or are hybrid or electric vehicles*

Unit: %

Maximum Score: Total score for the indicator is 100. Cities will be marked in 5 levels with score ranging from 0 to 100.

Performance Evaluation Levels:
Table 4.12: Clean Technologies Shared Vehicles

	1	2	3	4	5
Progression Levels	No clean technology shared vehicles available	Clean technology shared vehicles <5%	Clean technology shared vehicles 5% to <15%	Clean technology shared vehicles 15% to <25%	Clean technology shared vehicles >25%
Evidence/ Data sources	• Registration data from regional transport office by type of fuel				
Responsible Department/ Agency	State/ Municipal Corporation, SPV's – Public Transport companies, City Development Authority, Smart City SPV's, Regional Transport offices				
Reference Document	Open Government Data Platform https://tinyurl.com/vn7fsg6 Moving Forward Together Enabling Shared Mobility in India (NITI Aayog; 2018) https://niti.gov.in/writereaddata/files/document_publication/Shared-mobility.pdf				
Score	0	25	50	75	100

Indicator 2: Availability of Public Transport

Rationale: Under Smart City initiatives, most of the cities are planning for organized public transport system. Increase in extent of supply availability of public transport can be a key factor to evaluate the modal shift from private transport to public transport. In turn helps tremendously to reduce emissions by the transport sector.

Description: The population growth had put forth a tremendous demand for infrastructure and mismatch between demand and supply of transport infrastructure resulted in delays, fuel loss, air and noise pollution, accidents and loss of productive time and energy. Extent of supply availability of public transport is one of the service level performance benchmarks.

Methodology: The city has to calculate the Public Transport Unit (PTU) of total available public transport (which includes fleet size of bus, Metro coach, suburban rail coach and ferries) per 1000 population. Estimated existing population of the city should be considered. Data could either be taken through previous studies, secondary sources or captured through specific primary surveys. Data collected from the primary and secondary sources need to be collated and analyzed.

Formula:

$$\frac{\text{Fleet size of PT (bus+metro coach+suburban rail coach+ferries)} \times 1000}{\text{Estimated existing population of the city}}$$

Where, 1 metro coach or train coach or ferry = 3 Public Transport Unit (PTU),

Note: Since the capacity of non-bus systems may vary from city to city. Please note the following conversion unit:

- *1 Public Transport Unit (PTU)= 1 standard size bus having capacity 65 passengers*
- *Midi bus (capacity-45)= 0.7 PTU*
- *Mini bus (capacity-35)=0.55 PTU*

Unit: Availability of Public Transport Unit (PTU) per 1000 population

Maximum Score: Total score for the indicator is 100. Cities will be marked in 5 levels with score ranging from 0 to 100.

Performance Evaluation Levels:
Table 4.13: Availability of Public Transport

	1	2	3	4	5
Progression Levels	Public Transport is not available	Availability of Public Transport (<0.2)*	Availability of Public Transport (0.2-0.4)*	Availability of Public Transport (0.4-0.6)*	Availability of Public Transport (≥0.6)*
Evidence/ Data sources	• Annual data from public transport Authorities companies • Census of India population figures indexed with average annual growth rate for the year 2019 as per SCP				
Responsible Department/ Agency	State/ Municipal Corporation, SPV's – Public Transport companies, City Development Authority, Smart City SPV's, Regional Transport offices				
Reference Document	Service Level Benchmarks for Urban Transport (MoHUA, 2010) https://smartnet.niua.org/csc/assets/pdf/key-documents/phase-2/Mobility-Air/Service-Level-Benchmarks-for-Urban-Transport-MoHUA-2010.pdf				
Score	0	25	50	75	100

*Note: *the decimal figure represents, Public Transport Unit (PTU) per 1000 population*

Indicator 3: Percentage of coverage of Non-Motorized Transport network (pedestrian and bicycle) in the city

Rationale: Developing the Non-Motorized Transport (NMT) network in a city addresses the problems related to the high consumption of non-renewable energies. Thus addressing air pollution and GHG emission production. Furthermore, it promotes aspects like health, user safety, traffic congestion and equal mobility-options for all income brackets.

Description: This indicator assesses the network length for dedicated cycle lanes/ tracks and footpath in the city on major road network (all arterial, sub-arterial roads and public transport corridors).

Methodology: The city has to calculate the total length of footpath and cycle lanes/tracks. Footpath minimum width and cycle lane/track minimum width should be as per the street design guidelines of MoHUA. In case of narrow roads, width of cycle track and footpath can be combined.

Formula:

$$\frac{\text{Total length of NMT (length of footpath + length of cycle lane/track network)}}{\text{Total road network length}} \times 100$$

Unit: %

Maximum Score: Total score for the indicator is 100. Cities will be marked in 5 levels with score ranging from 0 to 100

Performance Evaluation Levels:
Table 4.14: Percentage of coverage of Non-Motorized Transport network (pedestrian and bicycle) in the city

	1	2	3	4	5
Progression Levels	NMT Coverage: Less than 15%	NMT Coverage: 15% to <25%	NMT Coverage: 25% to < 35%	NMT Coverage: 35% to < 50%	NMT Coverage: ≥ 50%
Evidence/ Data sources	• NMT Network plan of city • Annual completed list of NMT and Pedestrian projects of Public Works department and Municipal Corporations • Bicycle lanes constructed in the city • Map of NMT network in the city as a .kml file (line geometry with optional attribute: width of lanes) • Map of bicycle lanes constructed in the city as a .kml file (line geometry with optional attribute: width of lanes)				
Responsible Department/ Agency	State/ Municipal Corporation, SPV's – Public Transport companies, City Development Authority, Smart City SPV's, Regional Transport offices				
Reference Document	Promoting Non-Motorized Transport in Asian Cities: Policymakers' Toolbox (UN-Habitat and Shakti Sustainable Energy Foundation; 2013) https://tinyurl.com/wbjd5b3 Urban cycling design guidelines (UCDG) https://pmc.gov.in/sites/default/files/urban-cycling-design-guidelines.pdf				
Score	0	25	50	75	100

Indicator 4: Level of Air Pollution

Rationale: Climate and air pollutants including CO2 emissions have a common origin- the current energy model. Both are worsened by the burning of fuel and increase the CO2 emissions. Sound urban planning and clean technologies are now recognised as solutions to air pollution. The smart cities present a unique opportunity to adapt to advanced air-quality-monitoring technologies. Cities are encouraged to adopt affordable technologies by introducing low-cost air-quality sensors and linking the latter to the Integrated Command and Control Centres. This approach can complement the Pollution Control Board's existing monitoring system to provide further data on localised areas, hot spots and help generate real-time information for cities to take corrective action as well as gauge improvements. Air pollution data will not only help the government in framing policies and measures but allow citizens to make informed decisions that can improve the quality of their lives.

Description: A city level air-quality monitoring grid is important to generate holistic data, helps to assess the risks, implements control measures and assesses other climate smart strategies adopted by the city. The city is encouraged to assess to what extent it has achieved National Ambient Air Quality Standards (NAAQS),2009. The National Clean Air Programme sets a target of 20 -30 percent reduction of air pollution levels with 2017 as the base year. A city level air-quality monitoring grid is important to generate holistic data, helps to assess the risks, implements control measures and assesses other climate smart strategies adopted by the city.

Methodology: The indicator assesses the existing city-level air quality monitoring mechanism, its strengthening requirements and availability of air quality data on public domain. City will be assessed on its additional pollutants monitoring, its reduction strategies, its implementation and compliance to the National Standards.

Formula:

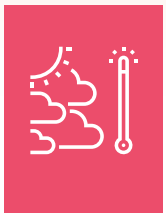
Nil

Unit: According to National Ambient Air Quality Standard by CPCB

Maximum Score: Total score for the indicator is 100. Cities will be marked in 5 levels with score ranging from 0 to 100.

Performance Evaluation Levels:
Table 4.15: Level of Air Pollution

	1	2	3	4	5
Progression Levels	No Consideration	Basic Monitoring	Availability of Data in Public Domain	Air Pollution Reduction Trend	Achievement of National Air Quality Standards
Evidence/ Data sources		• Capture levels of - PM10 PM2.5, NO x, SO x (as per Central Pollution Control Board Guidelines) • Additional pollutants monitored (like CO, NH3, Pb and O3 etc. as per NAAQS)	• Daily AQI levels are published and available to public through display boards/ SAFAR/ Sameer App/ any other app	• Reduction Air Pollution level based on previous year reading if available • Reduction trend / incremental improvement in compliance to National Clean Air Programme, • NCAP target (base year 2017)	• National ambient air quality standard for PM10, PM2.5, NOx and SOx has been met.
Responsible Department/ Agency	CPCB, SPCB				
Reference Document	National Ambient Air Quality Standards (NAAQS) (CPCB; 2009) https://cpcb.nic.in/uploads/National_Ambient_Air_Quality_Standards.pdf Central Control Room for Air Quality Management, Delhi NCR https://app.cpcbccr.com/ccr/#/caaqm-dashboard-all/caaqm-landing				
Score	0	25	50	75	100



Indicator 5: Clean Air Action Plan (Planning and Implementation)

Rationale: Unsustainable urban planning, lack of proper waste management, poor technology in industries and increased urban transport have all led to rise in air pollution in cities in India. According to the Health Organisation (WHO), seven million people die prematurely from health risks every year owing to air pollution. The Smart city Mission sets out to bring in its fold the urban policy design of public transit oriented urban mobility, smart parking, intelligent traffic management and integrated multi-modal transport, prioritising non-motorised transport, digitalisation of public services, and waste management e.g. reduction of C&D (construction and demolition) waste, all of which are good practices for better air quality. These are also actions that need to be emulated in the entire city.

Description: Cities should take onus for providing healthy air quality to the citizens. Clean Air Action Plans mandated by the National Clean Air Programme (2019) of Government of India integrate the cumulative city level actions for better air quality. For a city to be climate smart it should be able to address the issues of reducing air and climate pollutants since both air and climate pollutants arise from similar sources and addressing one has a direct co benefit to the other. Clean Air is integral for achieving climate smartness by a city.

Methodology: Indicator assesses to what extent the city has made efforts to improve the air quality, through clean air action planning and proper air quality management strategy in cities. To generate data and identify sources through scientific methods and subsequently to develop and implement sectoral strategies and projects that are components of the clean air action plan. This has to be done in close co-ordination with the State Level monitoring authorities and other stakeholder departments. The clean air action plan needs to be reviewed and monitored to assess improvements in air quality.

Formula:

Nil

Unit: Nil

Maximum Score: Total score for the indicator is 100. Cities will be marked in 5 levels with score ranging from 0 to 100.

Performance Evaluation Levels:
Table 4.16: Clean Air Action Plan (Planning and Implementation)

	1	2	3	4	5
Progression Levels	No Air Pollutant Monitoring Clean Air Action Plan in the city	Air Pollutant Monitoring	Clean Air Action Plan and Pollutants Source Identification	Implementation of Clean Air Action Plan	Assessing impacts of Clean Air Action Plan implementation
Evidence/ Data sources		• Monitoring Stations for measuring Ambient Air Quality (please indicate number of stations, differentiate between manual stations /continuous ambient air quality monitoring stations (CAAQMS) / continuous emission monitoring system (CEMS) / • Air Quality Monitoring mechanism linked with ICCC/ Sensors based monitoring systems • Map of monitoring stations in the city as .kml files (point or polygon geometry) • Map of air pollution sensors in the city as .kml files (point geometry)	• Clean Air Action Plan prepared by SPCB based on CPCB guidelines as per National Clean Air Programme, (NCAP) developed • Any other Clean Air Action Plan developed by Municipal Authority / Smart City Mission in case of other cities • Scientific study based on CPCB / SPCB led Source Apportionment Studies and Emissions Inventories • Any other available government validated studies for identifying source/EIs	• Implementation of at least 2 measures under the domain of the ULB as specified in Clean Air Action Plan	• Impact assessment for implementation of Clean Air Action Plan measures with evidence of improvements in air quality
Responsible Department/ Agency	CPCB, SPCB				
Reference Document	National Clean Air Programme (MoEF & CC; 2019) http://moef.gov.in/wp-content/uploads/2019/05/NCAP_Report.pdf				
Score	0	25	50	75	100