4.3 Mobility and Air Quality

**Indicator 1: Low Carbon Mobility**

**Rationale:** The Low Carbon Mobility Plan (LCMP) provides a long-term vision for sustainable mobility for people, and the movement of goods in cities. The LCMPs advocates an integrated approach – e.g. looking at land use and transport planning, social inclusion, and the integration of safety, environment and CO2 mitigation.

**Description:** To what extent does the city show preparedness towards low carbon mobility during various stages i.e. strategy development, planning, funding and implementation.

**Methodology:** In order to reduce its emission and control the pollution levels connected to mobility, the city must plan, initiate and implement low carbon mobility actions based on a City Mobility Plan (CMP)/ Low Carbon Mobility Plan (LCMP)/ Comprehensive Traffic and Transportation Studies (CTTS) based on the MoHUA toolkit on ‘Comprehensive Mobility Plan 2014 or latest update.’

**Formula:**

\[ \text{Percentage share of cleaner fuel shared vehicles} = \left( \frac{\text{Total number of shared vehicles on clean fuel}}{\text{Total no. of shared vehicles in the city}} \right) \times 100 \]

**Unit:**

- NA

**Maximum Score:**

- 100
### Table 4.13: Low Carbon Mobility

<table>
<thead>
<tr>
<th>Progression Levels</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consideration of Low Carbon Mobility</td>
<td>Citywide assessment/plan for mobility</td>
<td>Plan with specific focus on low carbon mobility</td>
<td>Allocation of budget and monitoring framework</td>
<td>Implementation of measures</td>
<td></td>
</tr>
</tbody>
</table>

#### Evidence/ Data sources

<table>
<thead>
<tr>
<th>Evidence/Data sources</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>• City Development Plan (CDP)</td>
<td>• City-wide document with mobility status assessment (CDP, SCP, Masterplans) or any other assessment of transport network in the city (relevant section to be highlighted and uploaded) or Metro Assessment report/metro DPR prepared after year 2005</td>
<td>• CMP/LCMP/CTTS as per the latest toolkit of MoHUA</td>
<td>• Allocation of State Level/Smart City budget as per the plan highlighting transport sector funds/investment</td>
<td>• 50% of projects implemented as planned under CMP/LCMP/CTTS.</td>
<td></td>
</tr>
<tr>
<td>• Smart City Plan (SCP)</td>
<td>• Masterplan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Masterplan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Reference Document

Preparing a Comprehensive Mobility Plan (CMP)—A Toolkit (MoHUA, 2014)

https://smartnet.niua.org/content/4152272f-2bbf-41bb-a11f-e9d8865f4271

#### Responsible Agency/Department

Municipal Corporation, City Development Authority, Smart City SPV’s, UMTA

#### Score

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>25</td>
<td>50</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>
Indicator 2: Low Carbon Shared Vehicles

**Rationale:** Since conventional fuel burning vehicles release an enormous amount of intoxicants to atmosphere, cities must put efforts to introduce a cleaner fuel based shared vehicles.

**Description:** Percentage of low carbon buses/ Taxies/ app-based cabs/ app based two wheelers/Autos/ e-Rickshaw/ Private Buses/ Ferries (based on CNG, LPG, Hybrid, Biofuels, Electric) of the total shared vehicles.

**Methodology:** Annual number of low carbon shared vehicles and shared vehicles in total can be obtained from the State/ Municipal Corporation, the SPV’s - Public Transport companies, the City Development Authority, and the Smart City SPV’s. Data has to be collected by type of fuel. In case the data on fuel type is not available with RTO in such cases information needs to be collected on sample basis through primary surveys to arrive at an estimated fuel base of shared vehicles.

### Formula:

\[
\text{Percentage share of cleaner fuel shared vehicles} = \left( \frac{\text{Total number of shared vehicles on clean fuel}}{\text{Total no. of shared vehicle in the city}} \right) \times 100
\]

**Unit:** %

**Maximum Score:** 100

**Performance Evaluation Levels:**

<table>
<thead>
<tr>
<th>Progression Levels</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No low carbon shared vehicles available</td>
<td>Low carbon shared vehicles &lt;25%</td>
<td>Low carbon shared vehicles &gt;25%</td>
<td>Low carbon shared vehicles &gt;50%</td>
<td>Low carbon shared vehicles &gt;75%</td>
<td></td>
</tr>
</tbody>
</table>

**Evidence/ Data sources:** Registration data from regional transport office by type of fuel

**References Documents**

- Open Government Data Platform
  - [https://tinyurl.com/vn7fsg6](https://tinyurl.com/vn7fsg6)
- Moving Forward Together, Enabling Shared Mobility in India (NITI Aayog; 2018)

**Responsible Agency/ Department**

- State/ Municipal Corporation, SPV’s – Public Transport companies, City Development Authority, Smart City SPV’s

**Score**

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>25</th>
<th>50</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
</table>
**Indicator 3: Availability of Public Transport**

**Rationale:** Under Smart City initiatives most of the selected 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, which in turn helps tremendously to reduce emissions from 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 and 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 data could either be taken through previous studies, secondary sources or captured through specific primary surveys. This data would be the basis for the establishing the base year benchmarks of various parameters. The data collected from the primary and secondary sources need to be collated and analysed.

**Formula:**

\[
\text{Percentage share of cleaner fuel shared vehicles} = \left( \frac{\text{Total number of shared vehicles on clean fuel}}{\text{Total no. of shared vehicle in the city}} \right) \times 100
\]

**Unit:** \%

**Maximum Score:** 100

**Formula:**

\[
\text{Availability of Public Transport (Metro, Tram, Buses, Ferries) per 1,000 population} = \left( \frac{\text{Fleet size of PT (bus + metro coach + suburban rail coach + Ferries)}}{\text{Estimated existing population of the city}} \right) \times 1000
\]

Where, 1 metro or train coach or Ferry = 3 Buses

**Unit:** Availability of Public Transport (Metro, Tram, Buses, Ferries) per 1,000 population

**Maximum Score:** 100

**Performance Evaluation Levels:**

<table>
<thead>
<tr>
<th>Progression Levels</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of Public Transport (Nil)</td>
<td>Availability of Public Transport (&lt;0.2)</td>
<td>Availability of Public Transport (0.2-0.4)</td>
<td>Availability of Public Transport (0.4-0.6)</td>
<td>Availability of Public Transport (≥0.6)</td>
<td></td>
</tr>
</tbody>
</table>

**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

**Reference Document**

Service Level Benchmarks for Urban Transport (MoHUA, 2010)
http://mohua.gov.in/upload/uploadfiles/files/Service_level.pdf

**Responsible Agency/Department**

SPV’s, Public Transport companies, Smart City SPV’s and PMC’s

| Score | 0 | 25 | 50 | 75 | 100 |
**Indicator 4 - 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, traffic safety, traffic congestion and equal mobility-options for all income brackets.

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

**Methodology:** Calculate the length of the major road. Calculate the total length of footpath and bicycle lanes. Footpath minimum width: 1.5m; Cycle lane minimum width: 2.5m, both designed as per the street design guidelines of MoHUA.

\[
\text{Percentage of NMT} = \frac{\text{Total length of NMT (length in city + length of cycle track) network}}{\text{Total road network length}} \times 100
\]

**Unit:** %  
**Maximum Score:** 100

**Performance Evaluation Levels:**  
**Table 4.16: Non-Motorised Transit Network**

<table>
<thead>
<tr>
<th>Progression Levels</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMT Coverage</td>
<td>Less than 15%</td>
<td>15% to &lt;25%</td>
<td>25% to &lt; 35%</td>
<td>35% to &lt; 50%</td>
<td>≥ 50%</td>
</tr>
</tbody>
</table>

**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)

**Reference Documents**
- Promoting Non-Motorized Transport in Asian Cities: Policymakers’ Toolbox (UN-Habitat and Shakti Sustainable Energy Foundation; 2013)  
  [https://tinyurl.com/wbjd5b3](https://tinyurl.com/wbjd5b3)

**Responsible Agency/ Department**
- ULB, Public Works Department, City Development Authority, Transport Authority, Smart City SPV’s and PMC’s

<table>
<thead>
<tr>
<th>Score</th>
<th>0</th>
<th>25</th>
<th>50</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
</table>
**Indicator 5: Clean Air Action Plan (Pollutants Monitoring, Planning and Implementation)**

**Rationale:** Unsustainable urban planning, lack of proper waste management, obsolete technology in industries and urban transport have all led to an increase in air pollution in cities in India. According to the World 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:** This indicator assesses to what extent the city has made efforts to improve the air quality, to generate/collate data on the key pollutants through enhanced monitoring mechanisms, to 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:**

\[
\text{Percentage of NMT} = \left( \frac{\text{Total length of NMT (footpath length in city + length of cycle track)}}{\text{Total road network length}} \right) \times 100
\]

**Unit:** NA

**Maximum Score:** 100
### Performance Evaluation Levels:

**Table 4.17: Clean Air Action Plan**

<table>
<thead>
<tr>
<th>Progression Levels</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>

**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)/Sensors based monitoring systems
- Air Quality Monitoring mechanism linked with ICC
- 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 based on scientific data captured in case of Non-attainment city.
- Clean Air Action Plan developed by Municipal Authority in case of other cities
- Scientific based on CPCB/SPCB led Source Apportionment Studies and Emissions Inventories
- Implementation of at least 2 measures under the domain of the ULB as specified in Clean Air Action Plan
- Impact assessment study for implementation of Clean Air Action Plan measures with evidence of improvements in air quality
- Air quality database management and dissemination to the stakeholders

**Reference Documents**


**Responsible Agency/ Department**

- CPCB, SPCB, ULB, Transport Dept, Smart city SPV, Environment Dept, ICC

**Score**

<table>
<thead>
<tr>
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<th>1</th>
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<tr>
<td></td>
<td>0</td>
<td>25</td>
<td>50</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>
Indicator 6: 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: 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 city-level air quality monitoring mechanism, its strengthening requirements and availability of air quality data on public domain. The city will be further assessed on its additional pollutants monitoring, its reduction strategies, its implementation and compliance to the National Standards.

Formula: NA

Unit: according to National Ambient Air Quality Standards by CPCB

Maximum Score: 100

Performance Evaluation Levels:

Table 4.18: Air pollution

<table>
<thead>
<tr>
<th>Progression Levels</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence/ Data sources</td>
<td>No Consideration</td>
<td>Basic Monitoring and Publishing of Data</td>
<td>Advanced Monitoring</td>
<td>Compliance to NCAP Targets</td>
<td>Compliance with National Ambient Air Quality Standards</td>
</tr>
<tr>
<td>Evidence/ Data sources</td>
<td>• Capture present levels of PM10, PM2.5, NOx, SOx (as per Central Pollution Control Board Guidelines) and data availability in public domain (Daily records of last 3 months)</td>
<td>• Additional pollutants monitored (like CO, VOC and O3 etc as per NAAQS)</td>
<td>• Reduction trend / incremental improvement in compliance to National Clean Air Programme, NCAP target (base year 2017) in case of non-attainment cities/ other cities</td>
<td>• Relevant document from SPCB/CPCB on achieving National Ambient Air Quality Standards for last 12 months.</td>
<td></td>
</tr>
</tbody>
</table>

Reference Documents
- 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

Responsible Agency/ Department
- CPCB, ULB, SPCB, SPV

Score
- 0
- 25
- 50
- 75
- 100