CLEAN DEVELOPMENT MECHANISM

CDM-MP72-A14

Information note

Methodological Framework: Development of new top-down methodology for 2-3 wheeled personal transportation, including infra-structure for bicycles, e-bikes and tricycles

Version 01.0

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. The CDM Executive Board (hereinafter CDM EB), at its 89th meeting, considered a concept note prepared jointly by Methodologies Panel (MP) at its 69th meeting (MP 69) and by the Small-Scale Working Group (SSCWG) at its fiftieth meeting (SSCWG 50) and agreed to initiate work in the following areas:

   (a) Development of a new top-down methodology for lightweight, two- or three-wheeled personal transportation infrastructure, including technologies/measures for bicycles, electric bicycles and tricycles, to shift from or reduce the use of fossil fuel in transportation; and

   (b) Development of a new top-down methodology for the improved operation of public transportation (e.g. improved transit logistics, smart traffic systems).

2. The MP and the SSC WG (at MP 72 and SSC WG 53) considered an information note prepared by the secretariat on the draft framework for a new methodology for lightweight, two- or three-wheeled personal transportation infrastructure, identifying which are the elements that can be applied to identify the baseline, assess additionality, calculate emission reductions and develop the monitoring plan.

2. Purpose

3. The purpose of this call for public inputs is to invite stakeholders to provide their inputs on this draft framework consisting of methodological elements covering project types discussed under para 1 (a) above. The scope of the public input includes but is not limited to the issues highlighted in the sections below.

4. The public inputs will be taken into account when preparing the draft revised methodology to be recommended to the Board at a future meeting.

3. Key issues and proposed solutions

5. N/A

4. Impacts

6. N/A

5. Subsequent work and timelines

7. The comments received at of the call for public inputs will be taken into account for the development of a draft new methodology for lightweight, two- or three-wheeled personal transportation infrastructure, which will broaden the applicability of the CDM.

8. The secretariat will present the draft new methodology for lightweight, two- or three-wheeled personal transportation infrastructure to the MP and to the SSC WG.

6. Budget and costs [Delete if not relevant]

9. N/A

7. Recommendations to the Board

10. Not applicable (call for public input).

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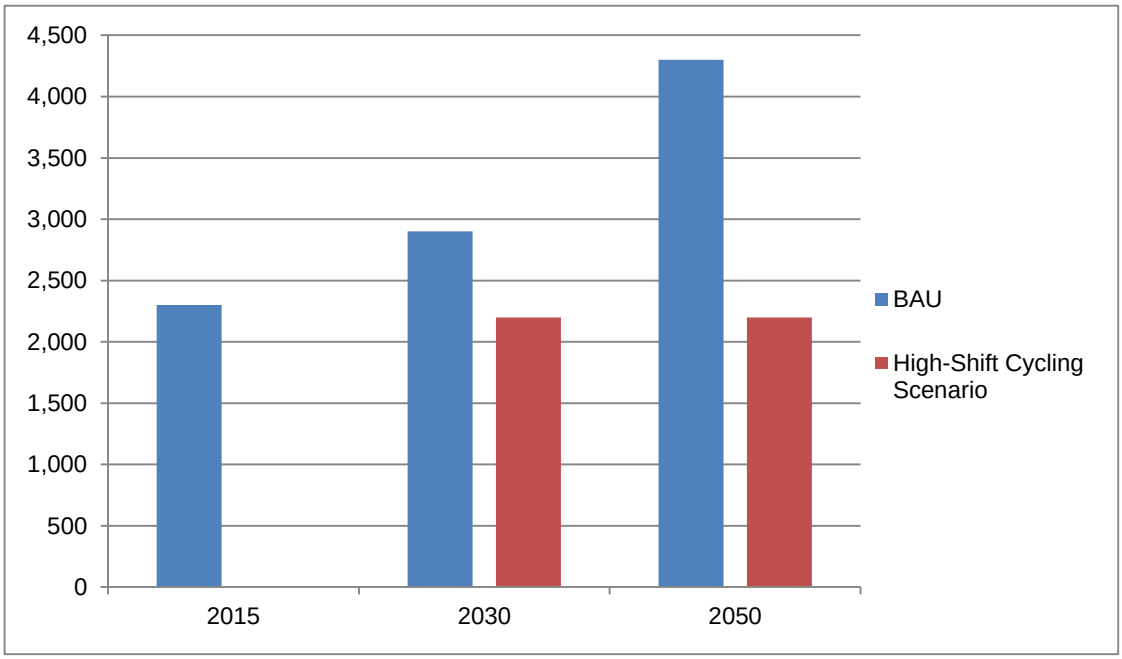
1. Introduction

1. Cycling plays a major role in personal mobility around the world, but it could play a much bigger role, given the potential to provide a far greater proportion of urban passenger transportation and to reduce CO_2 emissions associated with the convenience, health benefits, and affordability of bicycles. Figures from an ITDP[1] publication indicate that the use of bicycles represents 25 per cent of the total trips in Denmark, 13 per cent in Germany and 10 per cent in China, and an increase in the world mode share of cycling/e-biking around the world could represent a reduction of CO_2 emissions of about 7 per cent by 2030 and around 11 per cent by 2050, compared with a BAU scenario determined based on the current trends of bike/e-bike mode share – in numeric terms, it represents a reduction of 2 gigatonnes of CO_2 by 2050, as indicated in the graphic below where the y-axis is CO_2e emissions in megatonnes.

Figure 1. BAU and High-Shift Cycling scenarios trends



Source: ITDP, 2015

2. Given the importance that the use of bicycles/tricycles/e-bikes represents when planning sustainable urban transportation systems of cities, thirteen[2] Parties have indicated in their

[1] **ITDP –** Institute **for Transportation & Development Policy**; A Global High Shift Cycling Scenario: The Potential for Dramatically Increasing Bicycle and E-bike Use in Cities Around the World, with Estimated Energy, CO_2, and Cost Impacts; 12 November 2015; available at <https://www.itdp.org/wp-content/uploads/2015/11/A-Global-High-Shift-Cycling-Scenario_Nov-2015.pdf>; accessed on 01/07/2016.

[2] This represents only the INDCs that make direct reference to Non-motorized transport (NMT). The construction of cycling infrastructure is also included indirectly in other measures, such as TODs (Transit Oriented Development) and urban passenger modal shift.

INDCs (Intended Nationally Determined Contributions) the intention to adopt such measures to mitigate CO_2 emissions.

3. A concept note[3] was jointly prepared by the Meth Panel (MP 69), the Small-Scale Working Group (SSCWG 50) and the UNFCCC Secretariat with recommendation to the CDM Executive Board (CDM-EB) to develop top-down methodologies for the transport sector, including the development of a Non-motorized transport (NMT) methodology given the potential mitigation impact and the demand for CDM projects.

4. The Board at its eighty-ninth meeting while considering the concept note agreed to initiate work in the following areas:

   (a) Development of a new top-down methodology for lightweight, two- or three-wheeled personal transportation infrastructure, including technologies/measures for bicycles, electric bicycles and tricycles, to shift from or reduce the use of fossil fuel in transportation; and

   (b) Development of a new top-down methodology for the improved operation of public transportation (e.g. improved transit logistics, smart traffic systems).

2. Purpose and Scope

5. The document aims to provide a draft initial framework to facilitate the MP/SSCWG for the development of a new methodology covering 2-3 wheeled personal transportation, including infra-structure for bicycles, e-bikes and tricycles, and build-on the existing work and input from institutions mentioned above. The mandate to develop of a new top-down methodology for the improved operation of public transportation (e.g. improved transit logistics, smart traffic systems) this will be carried out at the subsequent stage.

6. The document provides the following:

   (a) Analytical Steps;

   (b) Assessment of approved CDM methodologies relevant to passenger modal shift transportation, such as requirements to identify the baseline, determine the additionality, calculate emission reductions and the monitoring plan;

   (c) A review of 2-3 wheeled transport initiatives and key elements relevant to GHG accounting, from sources such as GEF, Transport NAMA Database (t-NAMA Database), GCF;

   (d) Initial proposal in terms of key methodological elements (e.g. scope, applicability, baseline, additionality, monitoring).

[3] Concept note: Proposal on top-down methodological work for the transport sector", available at <https://cdm.unfccc.int/UserManagement/FileStorage/M8NIJ3RPBCOZ9DWV0F4YU15K6S7TQ2>.

3. Analytical Steps

7. The analytical steps to deliver the product are as follows:

   (a) Analyze the existing approved CDM methodologies on transport, with focus on urban passenger modal shifting, and the methodological tool "Baseline emissions for modal shift measures in urban passenger transport" to determine:

      (i) The steps and requirements to identify the baseline in each of the methodologies and the methodological tool;

      (ii) How additionality is demonstrated, the approaches and inputs;

      (iii) the main parameters used to determine emission reductions, how they are determined and which are the data sources;

      (iv) the parameters needed to monitor such projects, how they are to be monitored and the QA/QC procedures;

   (b) Analyze methodologies/standards approved under other GHG accounting initiatives, such as the VCS, Gold Standard, GEF, GCF, etc. and explain the differences between the approved standards and the CDM methodologies – including an assessment of strengths and weaknesses of the latter;

   (c) Determine if existing methodologies/standards have been able to cover a combination of methods to promote 2-3 wheeled personal transportation (e.g. new lanes, public bicycle-sharing system, and economic incentives for e-bike purchase);

   (d) Determine which are the main elements required to develop a new methodology for personal 2-3 wheeled transportation modes and whether a methodology can cover a variety of measures to increase use of this transport mode.

4. Assessment of existing approved CDM methodologies

8. The aim of creating enabling conditions for 2-3 wheeled personal transportation development (infrastructure, accessibility of vehicles) is to incentivize the use of bicycle, e-bikes and tricycles for personal transportation, avoiding the use of personal cars or the public transportation system – in other words, to shift the modal transport of people in the cities. Therefore, the measures involved are a mix of energy efficiency and fuel switching – displacement of more-GHG intensive transport modes by less-GHG-intensive ones.

9. The CDM has approved 18 baseline and monitoring methodologies in the transport sector, including large-scale, small-scale and consolidated methodologies and methodological tools. Of these, the following are related to modal shifting or urban passenger transportation:

   (a) AM0031: Bus rapid transit projects;

   (b) AM0101: High speed passenger rail systems;

   (c) AMS-III.U: Cable Cars for Mass Rapid Transit System (MRTS);

   (d) ACM0016: Mass Rapid Transit Projects;

(e) Methodological tool “Baseline emissions for modal shift measures in urban passenger transport”.

10. The matrix in the Appendix provides a comparison among the different methodologies and the tool. From the tables contained in the Appendix, the common elements are:

(a) Baseline: if the project activity is deemed to be additional, then the baseline scenario is assumed to be the continuation of the use of current modes of transport;

(b) Additionality: with the exception of the small-scale methodology, the additionality is demonstrated through a common approach, based on the common practice at the location of the project at the national and local levels, and an analysis at the system level (investment analysis or performance analysis);

(c) Baseline emissions: determined by identifying the CO_2 emission factor per passenger kilometre of the different baseline transportation modes and via survey to identify the modal split in the baseline. The methodologies and the tool describe the survey design and the survey requirements;

(d) Project emissions: project emissions are mainly due to the use of fuel and electricity by the project transport mode (direct emissions) due to travels between the entry and the exit station, and secondarily due to indirect emissions from travel between the origin and the final destination and the project transport mode stations;

(e) Leakage: leakage is mainly due to changes in the occupancy rate of different transport modes in the project as compared to the baseline (reduced occupancy), induced traffic and upstream emissions from use of gaseous fuels in the project activity;

(f) Monitored parameters: since the methodologies are related to the shifting of the transport mode, the monitored parameters are similar – number of passengers using the project transport mode, amount of fuel and electricity consumed by the project transport mode, average distance travelled by the passengers, total distance driven by the project transport mode. Some parameters have to be determined via survey and other parameters can be measured directly.

5. Assessment of methodologies/approaches from other sources

5.1. GEF – Global Environmental Facility

11. Most of the GEF projects in the transport sector apply studies and simulation models to determine the future trend of the baseline and the project scenarios. For example, for the Metro Manila Urban Transport Integration Project – Marikina Bikeways Project (MBP) Component, the baseline was determined using a transport simulation model based on traffic data from recent studies that defined a trend of the evolution of the transport system with and without the MBP. The inputs were sourced from a feasibility study, conducted by the University of Philippines National Centre for Transportation Studies Foundation. The baseline emissions were calculated following the ASIF (activity, share, intensity, fuel type). The daily emissions of the baseline and of the three different scenarios were calculated as the product of the number of trips per day (per type of vehicle, type of fuel used and

type of engine), times the average emission factor (per type of vehicle, type of fuel used and type of engine) and times the average distance driven.

5.2. t-NAMA Database

12. To the date, the t-NAMA Database has recorded more than 50 NAMAS in different stages of development (under conceptualization, under development, under implementation, implemented, etc.). 10 NAMAs in the transport sector have been implemented, in Azerbaijan, Chile, Colombia (2), Ethiopia, Indonesia, Kazakhstan, Kenya, Mexico and South Africa. From these, the only NAMA that has clear actions and references to non-motorized transportation is the Santiago Transportation Green Zone (STGZ), in Chile. According to the results of a pilot of this NAMA, three actions were implemented in a 2 km^2 area (a new 6.8 km bicycle lane, 19 new bicycle sharing stations and 386 new bicycle parking spots), and the modal shift from private car to bicycle was observed to be between 6.8 to 9 per cent per cent resulting in 138 to 183 tCO_2e/year.

5.3. Green Climate Fund – GCF

13. No project in this area has been approved by the GCF Board until now.

5.4. Conclusions

14. From the assessment of the methodologies/approaches from other sources, two main elements are identified to be relevant to the proposed new CDM top-down methodology:

    (a) The use of simulation modelling to determine the baseline. However, it may be necessary to provide some guidelines on the required input data and modelling assumptions;

    (b) The use of benchmarks.

[Stakeholders are invited to comment including suggestions on approaches to or benchmark values (such as tCO_2e/passenger-kilometer) including related justifications where relevant]

6. Elements of a proposed new methodology for 2-3 wheeled personal transportation

6.1. Types of projects

15. The methodology is being developed to incentivize people to use bicycle, e-bikes and tricycles for personal transportation, avoiding the use of personal cars or public transportation vehicles – in other words, to shift the modal transport of people in the cities. The following types of projects are envisaged:

    (a) Type 1: Construction of new bicycle lanes in urban areas;

    (b) Type 2: Expansion of the existing bicycle lanes in urban areas;

    (c) Type 3: Implementation of new bicycle sharing program in urban areas;

    (d) Type 4: Expansion and upgrading of the existing bicycle sharing program in urban areas, including the installation of new bicycle sharing capacity;

(e) Type 5: Construction of new bicycle parking areas that can be connected to the public transport (subway, buses, light-rail trains) or activity hubs (office towers, shopping centers, markets, venues);

(f) Type 6: Expansion of the existing bicycle parking areas that can be connected to the public transport (subway, buses, light-rail trains) or activity hubs (office towers, shopping centres, markets, venues);

(g) Type 7: Program to incentivize the use of bicycles, e-bikes or tricycles through financial subsidy or tax exemption;

(h) Type 8: implementation of a new or expansion of an existing passenger transportation service based on tricycles.

6.2. Applicability

16. Requirement 1: this proposed new methodology would be applicable for initiatives that will promote the use of bicycles, e-bikes and tricycles in urban areas. Such initiatives involve:

(a) Type 1: Construction of new bicycle lanes;[4]

[Stakeholders are invited to propose additional or alternative definitions of bicycle lanes]

(b) Type 2: Expansion of the existing bicycle lanes;

Rationale: constructing or expanding the bicycle lanes is expected to encourage the shift to the transportation mode to bicycles, e-bikes and tricycles between the origin and destination points;

(c) Type 3: Implementation of new bicycle sharing program stations;

(d) Type 4: Expansion of the existing bicycle sharing program stations;

Rationale: bicycle sharing program will allow users to rent bicycles for travel for a certain period of time. The bicycles can be returned to the same sharing station or to a different sharing station or other location. This is expected to encourage the shift to the low-emissions transportation mode;

(e) Type 5: Construction of new bicycle parking areas. These parking areas can be connected to the public transport (subway stations, bus stops, light trains stations) or activity hubs (office towers, shopping centers, markets, venues);

(f) Type 6: Expansion of the existing bicycle parking areas. These parking areas can be connected to the public transport (subway stations, bus stops, light trains stations) or activity hubs (office towers, shopping centers, markets, venues);

Rationale: bicycle parking areas next to the public transport stations/stops and activity hubs are expected to encourage the use of bicycles, e-bikes and tricycles by passengers that have used the public transport for travel – the bicycles, e-bikes

[4] Bicycle lanes are defined as dedicated lanes for mobility using bicycles, e-bikes or tricycles. These lanes could be located on-road, on sidewalks or could be dedicated lanes in other areas (such as in a park, in the margin of rivers, etc.). These lanes shall be clearly identifiable and signaled.

or tricycles would be used for displacement between the origin and the public transport system's entry station/stop. Or replace private vehicles or public transport for travel from origin to destination, in the case of activity hubs;

(g) Type 7: Program to incentivize the use of bicycles, e-bikes or tricycles through financial subsidy / tax incentives / etc.;

Rationale: private companies or governments may provide financial subsidies to encourage employees or citizens to use bicycles, e-bikes and tricycles. This type of project is independent of the existence of the infra-structure (such as bicycles lanes), although it is expected that the infra-structure in place to be an encouraging factor;

(h) Type 8: Implementation of a new or expansion of an existing passenger transportation service based on tricycles;

(i) Different combinations of the cases referred in paragraph 16(a) to 16(h).

17. Requirement 2: this proposed new methodology is applicable for urban or suburban trips. It is not applicable for inter-urban transport.

Rationale: the boundary of the project is limited to the urban area where the bike infra-structure is implemented or extended. Additionally, promoting the use of bikes, e-bikes or tricycles for trips of more than 10 kilometres does not seem advisable since the trip may take more than 30 minutes.[5]

6.3. Baseline

18. Requirement 1: If the project activity is deemed to be additional, then the baseline scenario is assumed to be the continuation of the use of existing modes of transport.

Rationale: this requirement is in line with the methodologies AM0031, AM0101, ACM0016 and AMS-III.U (hereinafter "MRTS methodologies").

6.4. Additionality

6.4.1. Actions that are free of charge

19. Projects/programs free of charge are defined as those that do not realize any type of financial revenue.

20. The following project/programs types, referred in paragraph 16 above, alone or in combination, are programs/projects with free of charge:

(a) Type 1;

(b) Type 2;

(c) Type 3, provided that the value paid when renting the bicycle is fully refundable upon return to the sharing station;

[5] ECF – European Cyclist Federation; FACTSHEET – Marrying Cycling and Public Transport; available at <https://ecf.com/sites/ecf.com/files/Factsheet-ITF2012-PT.pdf>.

(d) Type 4, provided that the value paid when renting the bicycle is fully refundable upon return to the sharing station;

(e) Type 5, provided that no charges are applied to park the bicycles;

(f) Type 6, provided that no charges are applied to park the bicycles;

(g) Type 7.

21. For the specific cases referred in paragraph 20 above, additionality is deemed automatic.

Rationale: for the MRTS methodologies, it is possible to determine the financial return of a project because passengers will have to pay to board the public transport system and the system will be operated by an entity (public or private). For implementation of new bicycle lanes, free of charge bicycle parking areas or fully refundable bicycle sharing program stations, on the other hand, the action will be a net cost to the project proponent (unless if tolls are installed in certain parts of the urban area). Therefore, it is reasonable to assume that projects types involved in paragraph 20 above are automatically additional.

6.4.2. Other types of actions

22. Other types of programs/projects are defined as those falling under:

(a) Type 3, provided that the value paid when renting the bicycle is not refundable;

(b) Type 4, provided that the value paid when renting the bicycle is not refundable;

(c) Type 5, provided that it is necessary to pay to park the bicycles;

(d) Type 6, provided that it is necessary to pay to park the bicycles;

(e) Type 8.

23. For the situations referred in paragraph 22 above, additionality could be determined as follows:

(a) Programs/projects developed in LDCs: additionality is automatic;

(b) FoiK programs/projects: additionality is automatic (except for cases referred in paragraphs 22(b) and 22(d));

(c) Other programs/projects: investment analysis through benchmark analysis or barrier analysis[6];

Rationale: these requirements follow part of the requirements from MRTS methodologies. For projects that fall under bullet (c) and involve the construction of new paid bicycle parking areas or the construction of new bicycle sharing program stations, the investment analysis should be undertaken from the perspective of the operator/investor of the bike parking areas, reflecting the costs and revenues from the perspective of the operator/investor (meaning the revenues from the parking fees and the costs associated with the rent and maintenance of the parking area, security and personnel and the land

[6] Benchmark analysis or barrier anallysis shall be conducted following the relevant steps from the latest version of the “Tool for demonstration and assessment of additionality”.

cost and/or opportunity cost of land and/or fair value of the land shall be considered when conducting the investment analysis).

6.5. Emission reductions

6.5.1. Baseline Emissions

24. Requirement 1: baseline emissions factor can be determined:

(a) On a per-bike-trip basis, following the "Baseline emissions for modal shift measures in urban passenger transport" – through survey, to determine the baseline transport mode for the same trip used by the user of the bike, e-bike or tricycle, the average distance travelled and the emissions factor per passenger-km of the baseline;

(b) Based on the emission factor on the average share of the main modes (excepted bicycles) in the city, or the distance classes which can be covered by bicycles, e-bikes and tricycles and/or area of the city covered by the project;

(c) By using a reliable city transport simulation model, including bicycle trips;[7]

(d) By using a baseline from a similar city/urban area;

[Stakeholders are invited to provide inputs to the definition of "similar city/urban area"]

(e) assuming a conservative benchmark, for example in tCO_2e/passenger-kilometre, provided proper justifications.

Rationale: the ideal approach is to conduct a survey (similar to the MRTS methodologies) to have a clear picture of the baseline. However, since conducting surveys is intensive in cost, time and data, the second proposal would be to use a model developed by a reliable source (such as universities or transport authorities). In absence of these possibilities, one could adopt the baseline of a similar city (in terms of number of inhabitants, length of the streets available for travelling, average distance travelled using public transportation, number of cars, among others). Another alternative approach would be to use a conservative benchmark.

6.5.2. Project Emissions

25. Requirement 1: direct project emissions are calculated based on the electricity required to recharge the batteries of e-bikes.

Rationale: This parameter is determined by multiplying the electricity consumed to recharge the bicycle by the emission factor of the grid that is supplying the electricity[8]. Electricity charge or specific electricity consumption could be defined ex-ante based on manufacturer information where the models of e-bikes are known, or ex-post based on a survey of models, combined with manufacturer information, where users may choose their own e-bike models.

[7] The simulation model can also be used to calculate emission reductions.

[8] If it can be demonstrated that the source of the electricity is renewable, project emissions do not need to be taken into account.

6.5.3. Leakage

26. Requirement 1: leakage is to be accounted in case bicycle lanes are implemented in car lanes.

Rationale: since the construction of bicycle lanes are not expected to have an impact on a relevant number of passengers shifting from the baseline mode[9], emissions due to the re-bound effect, upstream emissions due to the use of gaseous fuels and change in the occupancy rate of vehicles can be neglected. However, implementing a bicycle lane in a car lane may have impact on traffic congestion since the area available for cars to drive will be lower.

[Stakeholders are invited to provide inputs on the effects of leakage and its magnitude due to the implementation of a bicycle lane in an existing car lane]

6.5.4. Fixed parameters

27. Requirement 1: the fixed parameters will depend on the approach used to determine the baseline.

Rationale 1: If survey is applied, then all relevant parameters from the "Baseline emissions for modal shift measures in urban passenger transport" methodological tool have to be included.

Rationale 2: if a simulation modelling is applied, then the emission factor per passenger-kilometre per type of transport mode has to remain fixed – defined prior to the registration.

Rationale 3: if the baseline from another similar city is applied, it has to be properly justified that both cities have similar characteristics in terms of transport – such as the kilometres of street per area, the kilometres of public transport modes per area, the number of inhabitants, topography, fuel cost (including taxation regime), among others.

6.5.5. Monitored parameters

28. Requirement 1: the monitored parameters will depend on the approach used to determine the baseline.

Rationale 1: If survey is applied, the relevant parameters from the methodological tool "Baseline emissions for modal shift measures in urban passenger transport" have to be included. Additional parameters may also need to be included such as the origin and final destination of the user, partial use of public transport between the origin and final destination, among others.

[Stakeholders are invited to provide inputs on additional parameters that need to be monitored if the monitoring is made via survey]

[9] According to the ITDP high shift cycling scenario study, the share of transport worldwide using bicycles and e-bikes may reach 16 percent by 2030 in an optimistic scenario, which also includes the implementation of a certain level of policies. This number incorporates cities from Europe, USA and Japan, where the infra-structure already exists, and where the cycling culture is spread. The actual share of trips using bicycles and e-bikes in developing countries is less than 3 per cent, therefore it is plausible to estimate that the share of trips in developing countries is expected to remain below 15 per cent in Annex I Parties.

Rationale 2: for the other approaches, only the number of trips of bicycles, e-bikes and tricycles are required to be monitored, since the emission factor per passenger-kilometre has already been fixed. This could be done, for example, by using apps from mobile phones to track the number of trips and to apply a default for the distance travelled by the users of the bicycle, e-bike and tricycle of 5 km. Another approach could be to monitor the number of trips and also the distance travelled. However, this may be not feasible in low-income cities since the users will be required to have a good mobile phone network and a smartphone. For bicycle sharing programs, only the number of trips have to be monitored.

[Stakeholders are invited to provide inputs on the use of indicators such as the stock or the annual sales of bicycles in the city as an activity parameter]

6.5.6. Use of survey to identify the baseline

29. The approved methodologies have a dedicated section to describe the survey required to identify and quantify the baseline scenario. However, some parameters of the survey design (such as the main strata and sub-strata and the sample frame) have to be adjusted to a proposed new methodology for bikes, e-bikes and tricycles, since among others:

    (a) Bike ways don't have stations to measure the flow of bikes, e-bikes and tricycles and to stop them to make interviews;

    (b) The questionnaire has to be slightly modified, to accommodate the specific characteristics of the usage of bicycles, e-bikes and tricycles. For example, questions should be elaborated to identify if the user of the bicycle, e-bike or tricycle utilizes the public transport to travel long distances and which are the entry and exit stations.

Appendix. Comparison between the elements of the approved CDM methodologies and the methodological tool

Table 1. Applicability Conditions

AM0031	AM0101	ACM0016	AMS-III.U	Methodological Tool
Establishment of new or extension of an existing BRT system	Establishment of a new or extension of an existing high-speed rail service	Establishment of a new or extension of a ail-based or bus-based mass rapid transit systems (MRTS) in urban districts of a city	Cable cars substituting traditional road-based transport trips (construction and operation of new cable cars for passenger transport)	Estimate baseline emissions of projects the implement urban passenger transport modal shift

Table 2. Baseline

AM0031	AM0101	ACM0016	AMS-III.U	Methodological Tool
Baseline depends on the result of the additionality	Baseline depends on the result of the additionality	Baseline depends on the result of the additionality	Assessing alternatives to public transport in the project region	N/A

Table 3. Additionality

AM0031	AM0101	ACM0016	AMS-III.U	Methodological Tool
▪ LDCs: automatic additional ▪ FoK: automatic additional ▪ Other projects: assessment on the country level, city level and system level (investment analysis or performance analysis): • Country level: identify whether BRT is common in the country; • City level: identify the share of trips of the proposed CDM project in the baseline; • Investment analysis: apply the benchmark analysis; • Performance analysis: forecasted emissions are below 50 gCO_2/pkm.	▪ LDCs: automatic additional ▪ FoK: automatic additional ▪ Other projects: assessment on the country level, city level and system level (investment analysis or performance analysis): • Country level: identify whether HRS is common in the country; • Investment analysis: apply the benchmark analysis; • Performance analysis: forecasted electricity consumption below 0.08 kWh/pkm.	▪ LDCs: automatic additional ▪ FoK: automatic additional ▪ Other projects: assessment on the country level, city level and system level (or performance analysis): • Country level: identify whether MRTS is common in the country; • Investment analysis: apply the benchmark analysis; • Performance analysis: forecasted electricity consumption below 0.1 kWh/pkm (rails) or forecasted emissions are below 50 gCO_2/pkm.	Not clearly indicated.	N/A

Table 4. Emission Reductions

AM0031	AM0101	ACM0016	AMS-III.U	Methodological Tool
▪ Baseline emissions: determined using the tool; ▪ Project emissions: through fuel consumption data or specific fuel consumption and distance data; ▪ Leakage: change in load factor of the baseline transport system, reduced congestion in remaining roads, upstream emissions of gaseous fuels (if gaseous fuels used in the project are more than in the baseline).	▪ Baseline emissions: determined by the passenger-kilometer and by the mode of transport – existing rail, vehicles (bus, cars, motorcycles) and flight; ▪ Project emissions: through electricity consumed by the HSR, electric grid emission factor, passenger-kilometer using non-project rail system; ▪ Leakage: no leakage needs to be taken into account.	▪ Baseline emissions: determined via survey, using the tool (individual passenger surveyed, multiplied by the individual expansion factor and by the emission factor per passenger-kilometer); ▪ Project emissions: amount of fossil fuel and electricity consumed (DIRECT EMISISONS) and based on the trips between the origin and entry and between the exit andfuel final destination, following the same approach from the baseline section (INDIRECT EMISSIONS) ▪ Leakage: changes in the load factor of taxis and buses, changes in vehicle speeds and due to rebound effects and upstream use of gaseous fuels.	▪ Baseline emissions: determined by multiplying the emission factor per kilometer by the total passenger-kilometer in the baseline; ▪ Project emissions: amount of fossil fuel and electricity consumed (DIRECT EMISISONS) and based on the trips between the origin and entry and between the exit and final destination, following the same approach from the baseline section (INDIRECT EMISSIONS); ▪ Leakage: changes in the load factor in the vehicles in the baseline, emissions due induced traffic.	▪ Baseline emissions: determined through the total passengers transported in the project, the average trip distance travelled by the passenger surveyed, the baseline emission factor and the share of passengers who shifted from the baseline to the project mode.

Table 5. Fixed parameters

AM0031	AM0101	ACM0016	AMS-III.U	Methodological Tool
▪ Distance driven by buses (S/M/L), taxis and passenger cars in the baseline; ▪ Number of buses of size S/M/L in the baseline; ▪ Share of road space used by public transport in the baseline; ▪ Total road space available in the baseline; ▪ Average speed of different vehicles types in the baseline; ▪ Average distance driven by taxi in the baseline.	▪ Average trip distance using the existing rail system; ▪ Total passengers transported by the existing rail system; ▪ Fossil fuel types consumed by the existing rail system; ▪ Average occupancy rate of buses/cars/motorcycles; ▪ Passengers transported by buses, average distance travelled and distance driven; ▪ Number of vehicles in different categories; ▪ Amount of fuel consumed by the different vehicles; ▪ Specific fuel consumption of the different vehicle categories using different fuels.	▪ Passengers transported by the baseline buses; ▪ Average distance travelled by the baseline passengers using the baseline buses; ▪ Distance drive by baseline buses (large, medium small), taxis and cars; ▪ Average distance driven by the baseline buses and baseline taxis; ▪ Number of baseline buses; ▪ Road space available in the baseline and in the project scenarios; ▪ Number of vehicles using the affected roads in the baseline; ▪ Average speed of cars/taxis in the affected roads in the baseline.	▪ Specific fuel consumption of different vehicles ▪ Number of different vehicle categories in the baseline ▪ Fuel used (quantity, NCV and EF_CO2); ▪ Occupancy rate of the different vehicles; ▪ Distance driven by buses; ▪ Electricity consumed by the baseline system; ▪ Emission factor of the electric grid; ▪ Passengers transported by the electric transport system in the baseline; ▪ Average distance driven by electricity transport systems.	▪ Specific fuel consumed; ▪ Specific electricity consumed; ▪ Number of vehicle; ▪ Type of fuel used; ▪ Average occupancy rate of different vehicles; ▪ Total passengers transported by electricity vehicles; ▪ Average trip distance.

Table 6. Monitored parameters

AM0031	AM0101	ACM0016	AMS-III.U	Methodological Tool
▪ Total fuel consumed; ▪ Specific fuel consumed; ▪ Total distance driven by buses; ▪ Average distance driven by taxis, passenger cars and motorcycles; ▪ Total passengers transported per type of transport system; ▪ Average occupancy rate of different vehicles; ▪ Passengers capacity of different vehicles; ▪ Number of buses and different vehicles; ▪ Average trip distance by different vehicles; ▪ Average speed of different vehicles.	▪ Passengers transported by the HSR; ▪ Electricity consumed by the project HSR; ▪ Share of passengers that would have used other means of transportation in the absence of the project (existing rail, flight, vehicles); ▪ Distance between entry and exit airports; ▪ Distance between entry and exit existing train stations; ▪ Distance between origin and destination of passengers using vehicles.	▪ Fuel consumed; ▪ Passengers transported; ▪ Electricity consumed; ▪ Grid emission factor; ▪ Specific fuel consumption of each type of vehicle; ▪ Distance driven by project vehicles; ▪ Occupancy rate of buses and taxis in the project scenario; ▪ Average distance driven by taxis and cars on affected roads; ▪ Number and types of vehicles using the affected; ▪ Share of passengers using the MRTS that would use other mode in the baseline; ▪ Number of buses and taxis circulating in the urban area; ▪ Average speed of cars/taxis in the affected roads.	▪ Fuel consumed; ▪ Passengers transported; ▪ Share of passengers who would have used other mean of transport in the baseline; ▪ Share of passenger using different transport modes from trip origin to the project entry station and from project exit station to their final destination ▪ Distance of the trip in the baseline for different passengers and different modes; ▪ Distance of the trip in the project (from trip origin to the project entry station and from project exit station to their final destination) for different passengers and different modes; ▪ Electricity consumed ▪ Grid emission factor; ▪ Occupancy rate of vehicles in the project scenario.	▪ Average distance travelled by the passenger; ▪ Passengers transported; ▪ Share of passengers that shifted from the baseline to the project mode.

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