

# EcoLogistics

Low carbon freight for sustainable cities

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## EcoLogistics Low Carbon Action Plan for Urban Freight (LCAP-UF)

*A guide to developing an LCAP-UF*



This document is a deliverable of the “EcoLogistics: Low carbon freight for sustainable cities” project.

## About the EcoLogistics project

Supported by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) through the International Climate Initiative (IKI), ICLEI’s EcoLogistics project (2017 - 2021) aims to increase the capacity of governmental and non-governmental actors to build strategies and policies to promote low carbon and sustainable urban freight in Argentina, Colombia and India, involving nine cities and regions:

- Argentina: Córdoba, Rosario, Santa Fe de la Vera Cruz (Santa Fe)
- Colombia: Capital District of Bogotá, Metropolitan Area of the Aburrá Valley (AMVA), Manizales
- India: Kochi, Shimla, Panaji

For more information, please visit: [sustainablemobility.iclei.org/ecologistics](https://sustainablemobility.iclei.org/ecologistics)

## About ICLEI - Local Governments for Sustainability

ICLEI – Local Governments for Sustainability is a global network of more than 2500 local and regional governments committed to sustainable urban development. Active in 125+ countries, we influence sustainability policy and drive local action for low emission, nature-based, equitable, resilient and circular development. Our Members and team of experts work together through peer exchange, partnerships and capacity building to create systemic change for urban sustainability.

## Acknowledgement

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## Disclaimer

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# Executive Summary

## *A guide to developing an LCAP-UF*

### Why is this guidebook needed?

Low Carbon Action Plans for Urban Freight (LCAP-UF) are not a new concept and a few exemplary cities have developed such plans in the last decade. However, the total number of cities with these plans remains quite small and most existing LCAP-UFs are primarily from developed or Global North countries. Additionally, as global freight demand grows in the coming years, so will its negative externalities, such as traffic congestion, Greenhouse gas (GHG) emissions, air pollution, noise pollution, traffic accidents, safety concerns, and land-use severance. For this reason, more local and regional governments should include freight as a critical component in their climate action plans.

EcoLogistics: Low carbon freight for sustainable cities, a project led by ICLEI - Local Governments for Sustainability, is playing a critical role in helping develop road maps for efficient and sustainable freight transport. This LCAP-UF guidebook was created to provide local governments with a roadmap in enhancing the freight movement and operations with a low carbon approach aiming to reduce GHG emissions. It facilitates a safe, socially inclusive, accessible, reliable, affordable, fuel-efficient, environmentally friendly, low-carbon, and resilient freight movement in the city.

### Phases of development

This guidebook covers eight vital steps in the process of developing an LCAP-UF. The first phase is analyzing the current scenario, which this guidebook refers to as 'Baseline Information'. The following steps include: identification of stakeholders engagement; defining low carbon target scenarios, defining vision, city goals and project goals; defining actions and demonstration projects; defining key performance indicators (KPIs); implementation and stakeholder roles. The final phase included in this guidebook is the adoption of the LCAP-UF.

Because developing an LCAP-UF is an iterative process involving various steps, this guidebook provides a series of checklists and outputs for cities to use as a framework. The main objective of this guidebook is to help cities develop realistic and usable localized action plans that moves away from the usual "one size fits all" model.

# Introduction

Efficient freight movement has become a need for a habitable city. Today, 55 percent of the world's population lives in cities ([UNDESA, 2018](#)), and it is projected to be 68 percent by 2050. What does this mean for urban freight?

Growing urbanization will generate a higher demand for services and lead to an increase in movement of goods and result in higher energy consumption. This will put further pressure on the existing infrastructure. The need for a resilient freight movement becomes evident during the COVID-19 pandemic, when the entire supply chain is disrupted due to imposed lockdown measures. Countries will need to invest in a reliable, resilient and efficient supply chain to distribute essential goods and curb the negative impacts.

The transport sector is one of the major sources of greenhouse gas (GHG) emissions. Globally, it accounts for nearly a quarter of energy based emissions. An estimate suggests that international trade-related freight transport currently accounts for around 40 percent of all transport related carbon dioxide (CO<sub>2</sub>) emissions from fossil fuel combustion, and more than 8 percent of global emissions ([IPCC 2018](#), [ITF 2019](#)). Transport emissions and freight in particular are still increasing compared to most other sectors. According to the [International Transport Forum \(ITF\) 2021 report](#), the global freight demand is estimated to grow more than double by 2050, and associated carbon emissions will be 22 percent higher than 2015.

A strong collaboration at multiple levels - national, regional and local as well as with private companies - will be a crucial step in turning promises into actions. Currently, only 21 percent of the Nationally Determined Contributions (NDCs) have communicated targets, policies or measures addressing the transport sector ([SLOCAT, PPMC 2015, ClimateWatch 2019](#)). Over a thousand companies have already committed to supporting zero carbon transition by setting emission reduction targets, with 177 pledging to go carbon neutral by 2050 ([SBT 2021, IISD 2019](#)). Many national and local governments have started including freight as an important component in their [climate action plans](#), but many have yet to start.

## Current trends in urban freight transport (UFT)

Economic activity and development of any urban area strongly depend on efficient and sustainable freight movement. UFT has been an overlooked topic in the discussion of sustainable transport, and urban and transport planners often miss out on the aspect of moving goods efficiently to, from, within or through the city. Even ambitious city development plans, climate action plans, land use plans or mobility plans often do not consider or take into account freight movement. Most road infrastructure related design and planning is performed based on passenger transport data (e.g. modal share, origin - destination, peak hour demand, etc.). Inefficient freight movement causes various environmental externalities, in addition to issues related to traffic congestion, road safety and the use of curb spaces. Due to the number of stakeholders involved, urban freight is complex to understand and design for.

In recent years, many cities have recognized the importance of more efficient and sustainable urban freight movement and operations to improve energy efficiency by implementing a mix of interventions from policies, infrastructure, technology to behaviour. Urban consolidation centers, off-hour deliveries, shifting to alternate modes of transport, optimizing delivery routes, use of clean vehicles and low emission technologies, fleet renewal schemes, loading/unloading zones, integration of freight into mobility and overall development plans, are a few of a range of measures implemented.

The growth of urban freight has been unprecedented in the last decade, and it will continue to grow in the future. The recent boom in e-commerce has further exacerbated the load on existing infrastructure. During the COVID-19 pandemic, many people shifted to online shopping, giving a further boost to e-commerce.

It is expected that to satisfy customers' ever-rising desire to buy products online, without any intervention, the number of delivery vehicles in the top 100 cities globally will increase by 36 percent until 2030. Consequently, emissions from delivery traffic will increase by 32 percent and congestion will rise by over 21 percent, equaling an additional 11 minutes of commute time for each passenger every day ([WEF, 2020](#)). Thus, a strong set of measures are required to curb the emission growth from the freight sector. Against this backdrop, this guidebook is developed for cities planning to start their journey to make freight sustainable involving various steps.

# What is a Low Carbon Action Plan for Urban Freight (LCAP-UF)?

Thorough planning, in conjunction with other development plans, is a prerequisite in order to minimize the negative externalities and to create efficient and sustainable freight flows in a city.

For the EcoLogistics project, we define an LCAP-UF as:

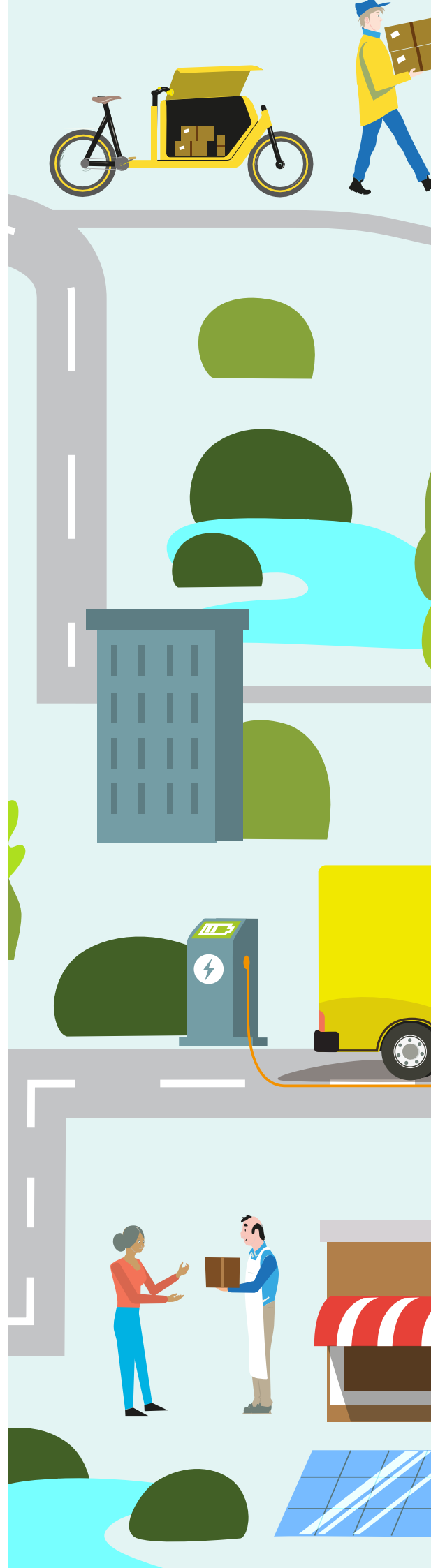
Explicit long-term freight goals for an efficient and optimized urban freight movement with a strong focus on emission reduction, while addressing local specific issues like air quality, road safety, traffic congestion, economy. It is an iterative plan with short, medium, and long term targets and associated set of measures. It is also flexible to adapt to political change and local priorities.

The development of the plan is made possible through an iterative and consultative process involving multiple stakeholders:

- public authorities from the city
- city technical teams
- urban planners
- transport/ traffic planners
- regional and national level authorities
- private companies
- academia
- local NGOs
- other international organizations

The main objective of an LCAP-UF is to develop realistic and viable localized action plans that moves away from the usual “one size fits all” model. Each LCAP-UF is developed through an intensive consultation process, including different stakeholders and synthesizing current information on urban freight as baseline information.

“The purpose of the Freight Plan is to take a holistic approach to the City’s goods-related work and point the way forward. By means of this plan, the City wishes to communicate its perspective on the development of freight transport clearly and create the right expectations amongst key industry stakeholders.” (Stockholm Freight Plan 2018)



**A few frontrunner cities have developed such plans in the last decade and have defined it as follows:**

An “urban freight plan” has explicit long-term freight goals and a clear set of measures to address urban freight. As such, any plan is not just focused on one issue, but instead focuses on developing a safe, efficient and environmentally sustainable urban freight system. The development of a plan also enables an alignment of stakeholder views and actions towards a common goal (Urban Freight Plans, [Sustainable Urban Logistics Plans](#)).

One example is the city of London, which launched its first Freight Plan in 2007 as “[London Freight Plan](#)”, to bring about: “The safe, reliable and efficient movement of freight and servicing trips to, from, within and, where appropriate, through London to support London’s economy, in balance with the needs of other transport users, London’s environment and Londoners’ quality of life’. A revised plan was launched in 2019 as “[Freight and servicing action plan](#)”.

**A selected list of Freight Action Plans by front runner cities is as follows:**

City or Region	Freight Plan/Document name	Time/ Timeframe
Berlin	Berlin’s Strategy for an Integrated Urban Freight Transport System	2006
Brussel	Brussels Strategic Plan for Urban Freight	2013-2016
California	California Freight Mobility Plan	2016
London	London Freight Plan, Freight and Servicing Action Plan (updated)	2007, <a href="#">2019</a>
Paris	Paris Sustainable City Logistics Charter	2013
Seattle	City of Seattle Freight Master Plan	2016
Stockholm	The Stockholm Freight Plan	2014-2017, <a href="#">2018-2022</a>
Washington State	Washington State Freight Mobility Plan	2014
9 EU Cities	Sustainable Urban Logistics Plans (As part of <a href="#">ENCLOSE project</a> ) (Cities: Alba Iulia, Almada, Balchik, Burgos, Dundee, ‘s-Hertogenbosch, Lucca, Serres, Trondheim)	<a href="#">2015</a>



## Why develop an LCAP-UF?

“No urban area could exist without a reliable freight transport system”, said K W Ogden in the book “Urban Goods Movement: a Guide to Policy and Planning” published in 1992. This is probably the first recognized study on urban freight.

A Freight Action Plan aims to minimize the impact from negative externalities caused by freight movement: including traffic congestion, GHG emissions, air pollution, noise pollution, traffic accidents and associated safety concerns, and land-use severance. Similarly, LCAP-UF will provide a roadmap to authorities in enhancing the freight movement and operations with a low carbon approach aiming to reduce GHG emissions. It facilitates a safe, socially inclusive, accessible, reliable, affordable, fuel-efficient, environmentally friendly, low-carbon, and resilient freight movement in the city.

The action plan, if developed through a consultative process, is a useful tool to support local decision-makers and participating stakeholders in implementing new policies and taking actions for sustainable freight movement in the city. The plan consists of a clearly defined vision and set goals, and to achieve those goals, a set of actions and implementable measures. The plan also offers a target to measure and track the progress to achieve certain objectives. Such measures can be adopted with a collaborative approach amongst stakeholders for reaching a common vision of a “sustainable city”.

**In summary, the following are the benefits of developing an LCAP-UF:**



Creating a vision of sustainable freight in a liveable city



Opportunities to engage with multiple stakeholders



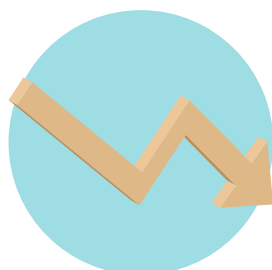
Improving the understanding of the issues around freight transport



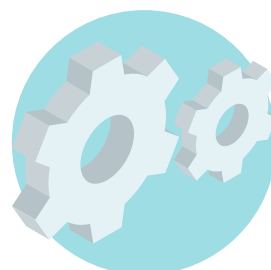
Contributing to the longer term process of addressing the sector needs



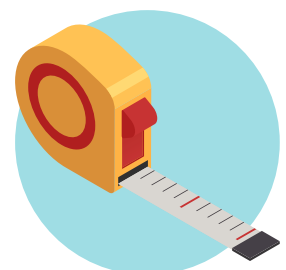
Accommodate the increasing demand of the freight sector whilst maintaining operational efficiency



Reducing the negative environmental and socio-economic impacts caused by urban freight



Opportunities to integrate freight planning into urban planning and land use planning



Measure freight efficiency and track the progress towards cities' goals/targets

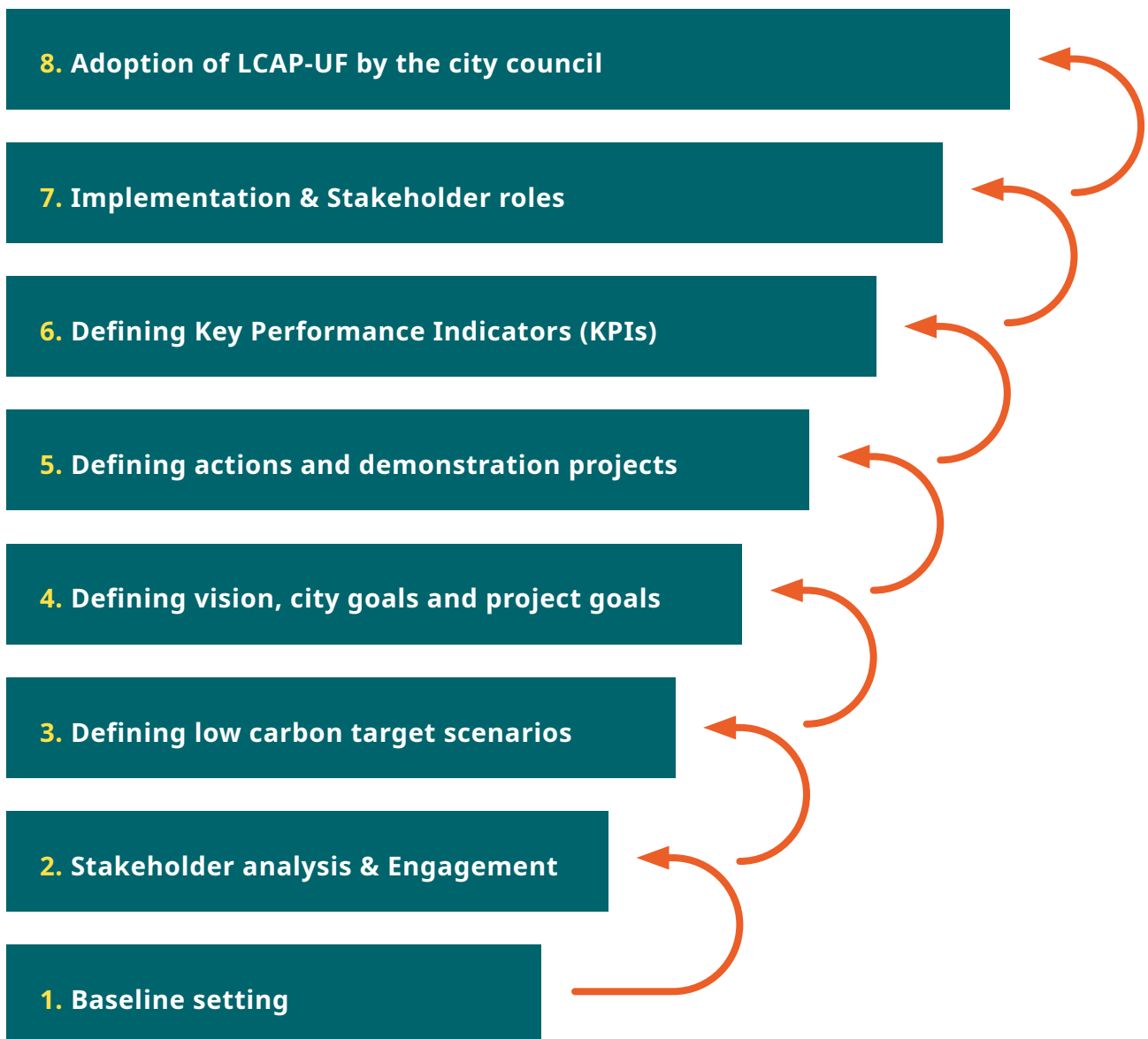


# How to develop an LCAP-UF

Developing an LCAP-UF is an iterative process involving various steps. It includes analysis of the current scenario, identification and engagement strategies with stakeholders, setting vision, specific goals, etc. It allows revision of goals based on outcomes of implemented actions.

**Figure 1** shows each step of the LCAP-UF process separately, many of these steps may overlap or happen concurrently. Developing an LCAP-UF can take anywhere from six to twelve months based on city size, availability of data and information, and level of engagement between public and private stakeholders.

**Figure 1: Steps of an LCAP-UF Development Process**



## Baseline Information: Where Are We Now?

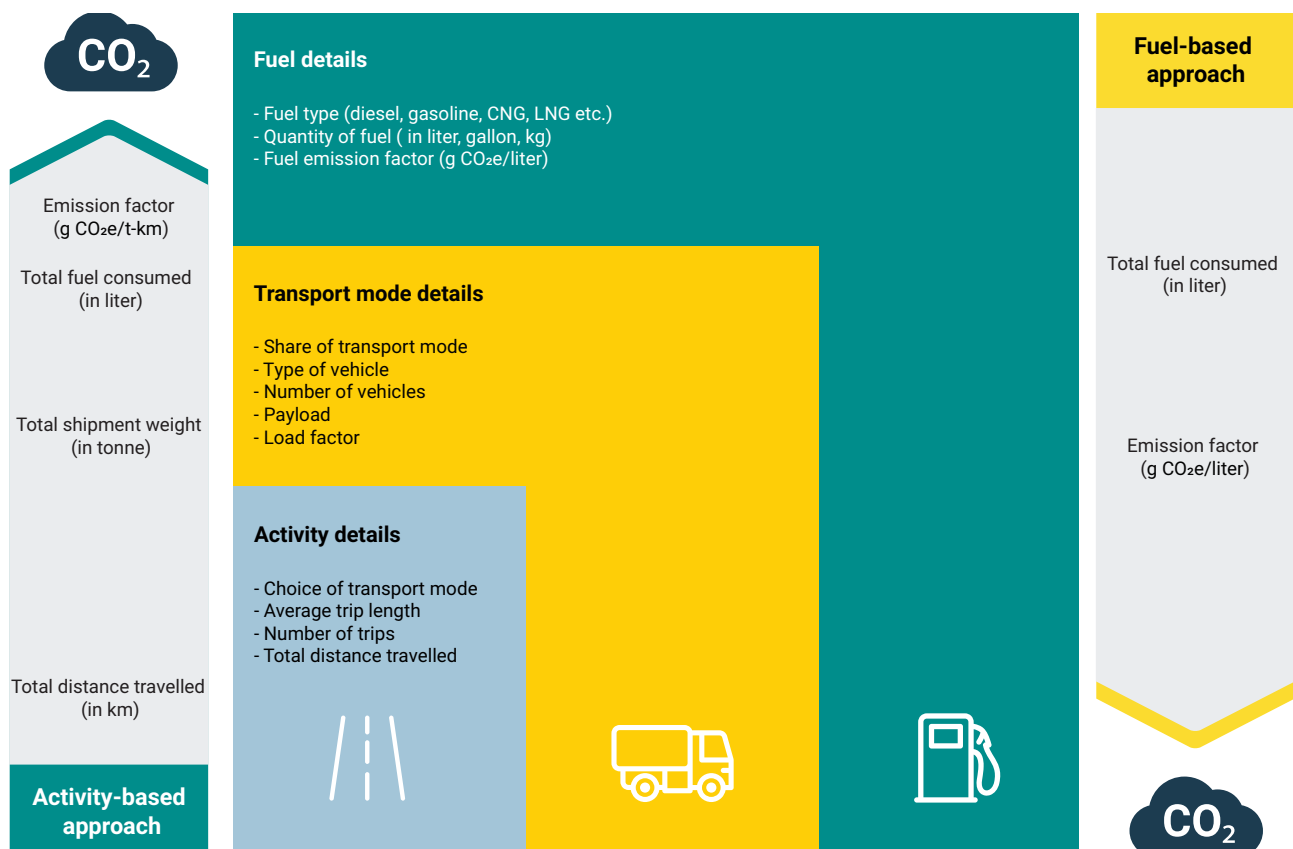
The first step is to understand the current situation by identifying a study area boundary (administrative boundary, or geographic boundary) and establishing a Urban freight transport (UFT) baseline of this area. Baseline information refers to the overall city-wide situation and specifics concerning freight and a baseline report could include the following:

- City boundaries and infrastructures, including the main transport infrastructures, such as road, rail, air, port and navigable waterways, as well as a map of the area.
- Urban freight transport characterization, including quantity of freight moved, number of deliveries per day, vehicle size, type, and age, average trip length, etc.
- Urban freight policies, including time restrictions, vehicle size/load restriction, loading/unloading zones, low/zero emission zones, etc.
- Baseline emissions, including GHG emissions from different modes of transport.

The baseline report should highlight challenges and issues associated with UFT, as well as any opportunities. A list of challenges is highlighted in **Table 2**.

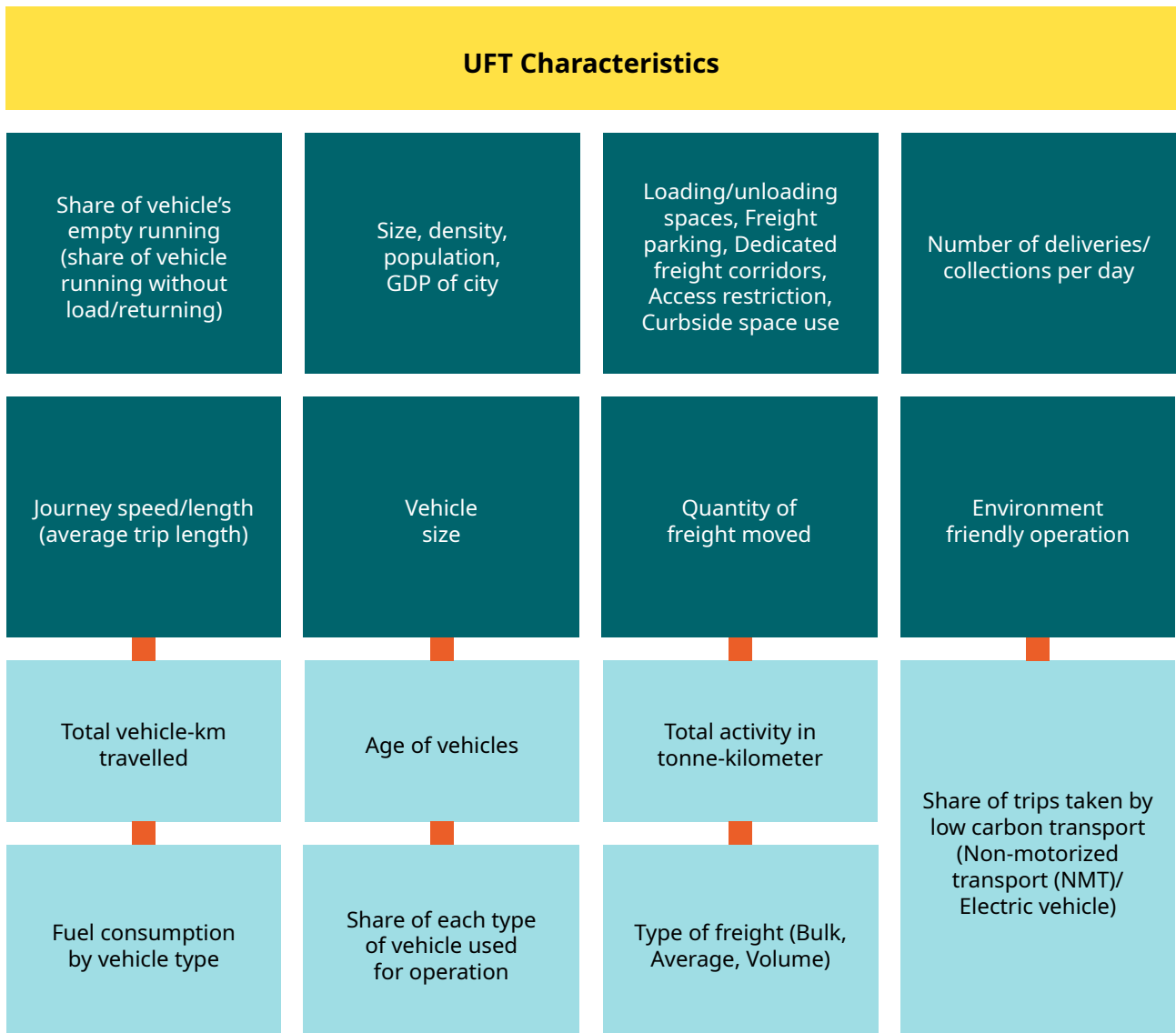
The EcoLogistics project has focused extensively on the GHG emissions from the UFT to establish baseline emissions in project cities. A detailed report on the baseline emission calculation and methodology by ICLEI was published earlier in 2020 "[EcoLogistics Self-Monitoring Tool User Guide](#)". Generally, two approaches are used to calculate transport related emissions: fuel-based and activity-based approach. Cities should decide which approach to use based on the availability and quality of data. For instance, the fuel-based approach can be more accurate to show the emissions from the freight transport sector, while the activity-based approach can give detailed information on transport activities and help prioritize actions.

**Figure 2: The Calculation approach for freight transport emissions. Source: EcoLogistics Report 2021**



The next step is to gather information required for generating a baseline study. The city should have a clear understanding of freight flows, challenges and opportunities, empirical values on numbers and transport volumes, etc. If such information does not exist in existing documents, there will be a need to do primary surveys focused on freight movement in the sample area of concentrated economic activities, e.g. industrial area and main markets. The most comprehensive data available often lies with the private sector, but there are rarely agreements in place for the data sharing amongst key stakeholders. As such, a multi-layer, multi-actor approach is required to capture freight patterns and characteristics in the cities. Statistical sources, existing policy documents and plans, previous technical studies are used, and primary surveys can be carried out among the local stakeholders in sample areas (drivers, establishments, logistics companies, freight experts etc.).

**Figure 3: UFT Characteristics. Source: EcoLogistics 2021, NOVELOG 2018**



Detailed information on data collection methodologies, their limitations and comprehensive analysis are provided in the [EcoLogistics - Creating sustainable cities through low-carbon freight - EcoLogistics in Argentina, Colombia and India \(EcoLogistics Report 2021\)](#). While data collection and analysis could be quite exhaustive, the [NOVELOG project](#) has identified a minimum set of data required to describe UFT characteristics.

**Figure 4: Minimum set of data. Source: NOVELOG project**

Journey length		<b>High</b>
Journey speed		
Environment-friendly distribution		
Loading/unloading activities		
No. of vehicle & vehicle size/type		<b>Average</b>
Type & quantity of goods delivered/collected		
Time to carry out deliveries/collections		
Empty running		<b>Low</b>
Time of day of delivery/pick up		
Number of deliveries/collections		

The baseline study should take into account existing development plans, municipal annual budgets and development plans (e.g. socio-economic statistics, environment strategy, transport strategy etc). It should also comply with existing urban mobility plans (if any), parking management plans, climate action plans, etc. Any ongoing schemes, policies which may affect freight movement should be identified (e.g. vehicle renewal scheme, electric mobility subsidies, etc).



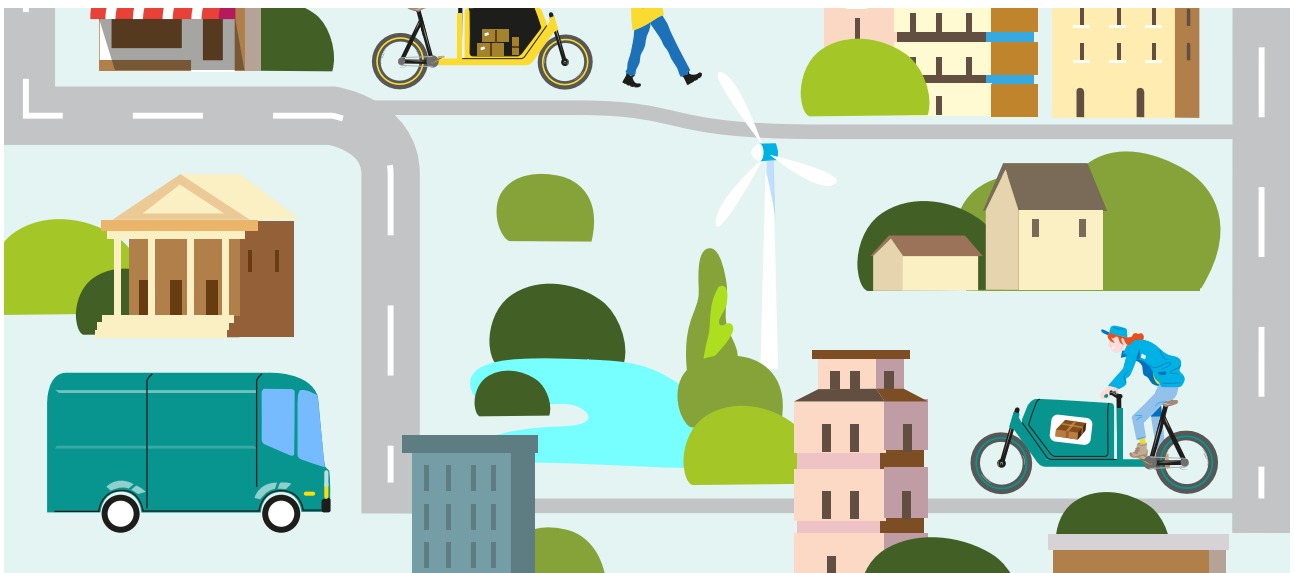
### Checklist for cities

- Analyse available data, action plans, studies, surveys, etc.
- Collect and consolidated UFT data (primary surveys)
- Use data to establish UFT baseline



### Output

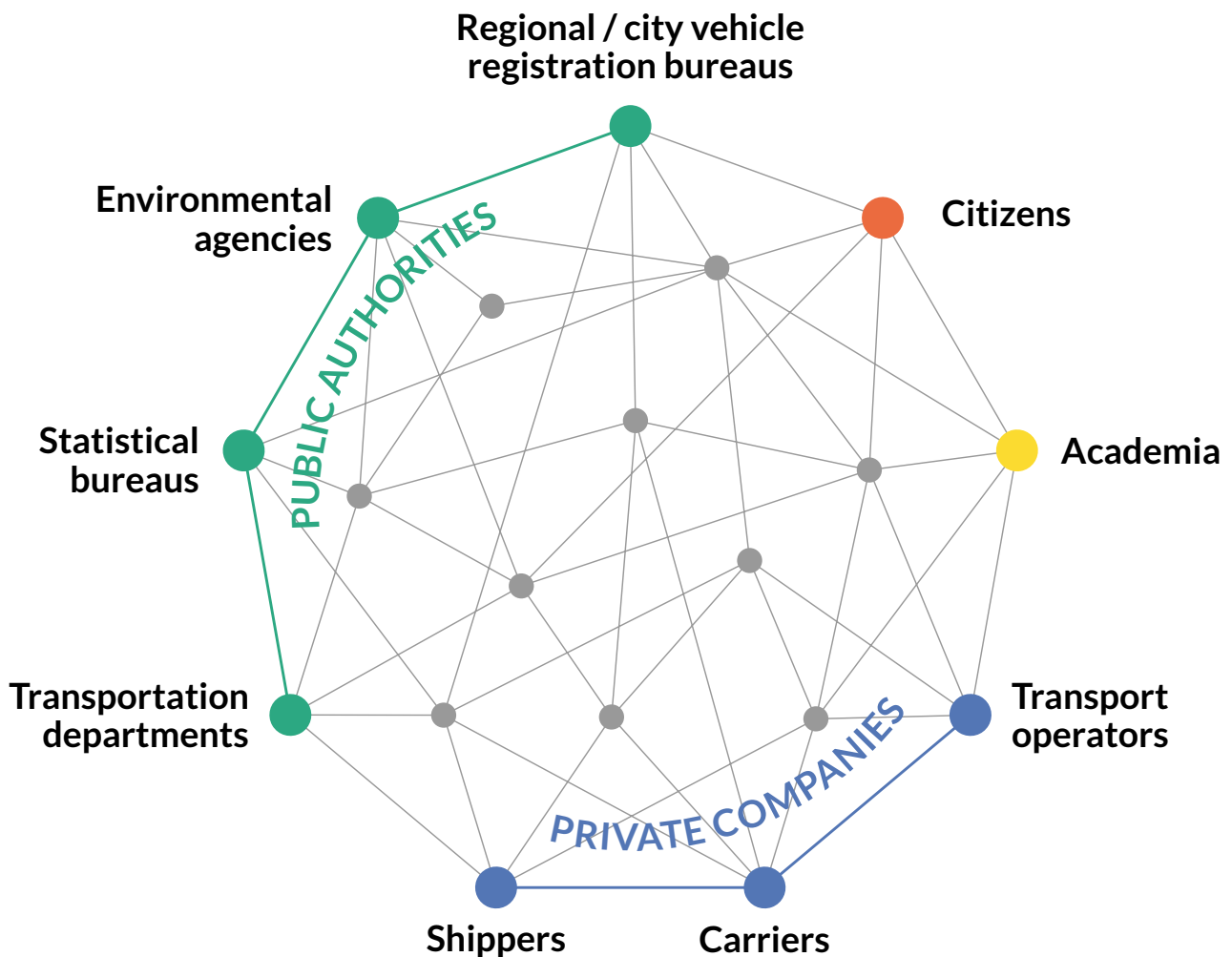
- Baseline report
- Analysis of existing supply chain
- Freight vehicle profile
- GHG emissions from urban freight



## Stakeholder Analysis and Engagement

Urban freight involves a range of stakeholders: receivers, transporters, retailers, public authorities, pedestrians, cyclists, third party logistics providers, researchers etc. It is important for a successful action plan to map all stakeholders, and identify the key ones to further engage with them throughout the process of development of the plan, implementation of measures, and so on. It is recommended to establish a “**stakeholder working group**” for a continuous dialogue exchange between public and private stakeholders. There may even be existing stakeholder working groups that can be further strengthened. Engagement needs to be administered and moderated by a neutral party (e.g. NGO, public university, or a group of experts), with continuous discussion and negotiations among relevant key stakeholders.

Figure 5: Key stakeholders related to urban freight transport. Source: EcoLogistics Report 2021



### Checklist for cities

- Identify relevant stakeholders (see [annex 1](#) for list of stakeholders)
- Categorize them as primary and secondary stakeholders
- Engage with them regularly to understand respective challenges



### Output

- Stakeholder working group (institutionalize in city administration if possible)
- Stakeholder challenges analysis
- Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis

## Defining Low Carbon Target Scenarios

A “scenario” describes a hypothetical future and the path leading to that scenarios. These futures are storylines created to: identify hidden risks and opportunities, test the impact of potential outcomes, and develop strategies that build resiliency and frame decision-making. Although it is not possible to predict when and to what extent GHGs will be emitted in the future, scenarios provide us with insight into how emission reductions could be achieved under a variety of socio-economic and political conditions (SBT, 2019).

In order for the local governments to understand the progress made towards low carbon direction, the LCAP-UF proposes future performance of the city’s UFT by developing target scenarios. Business as usual (BAU) scenarios will be developed based on baseline information, when there is no new action taken in future to reduce GHG emissions. A low carbon scenario should be developed together with a stakeholder working group by identifying planned infrastructure developments, policies, technological advancements and private stakeholder’s individual plan.

If a city already has defined a low carbon scenario(s) as part of a city climate action plan or other development plans, the low carbon scenario should incorporate UFT in local successes in the longer term.



### Checklist for cities

- Development of BAU scenario
- Analysis of ongoing and proposed projects on urban freight.
- Development of different low carbon scenarios



### Output

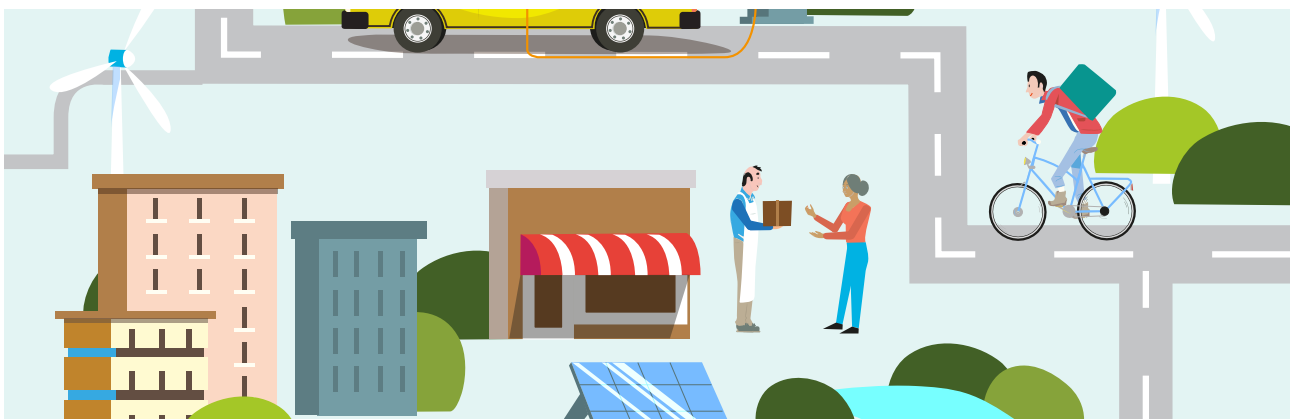
- BAU scenario
- Low carbon target scenario

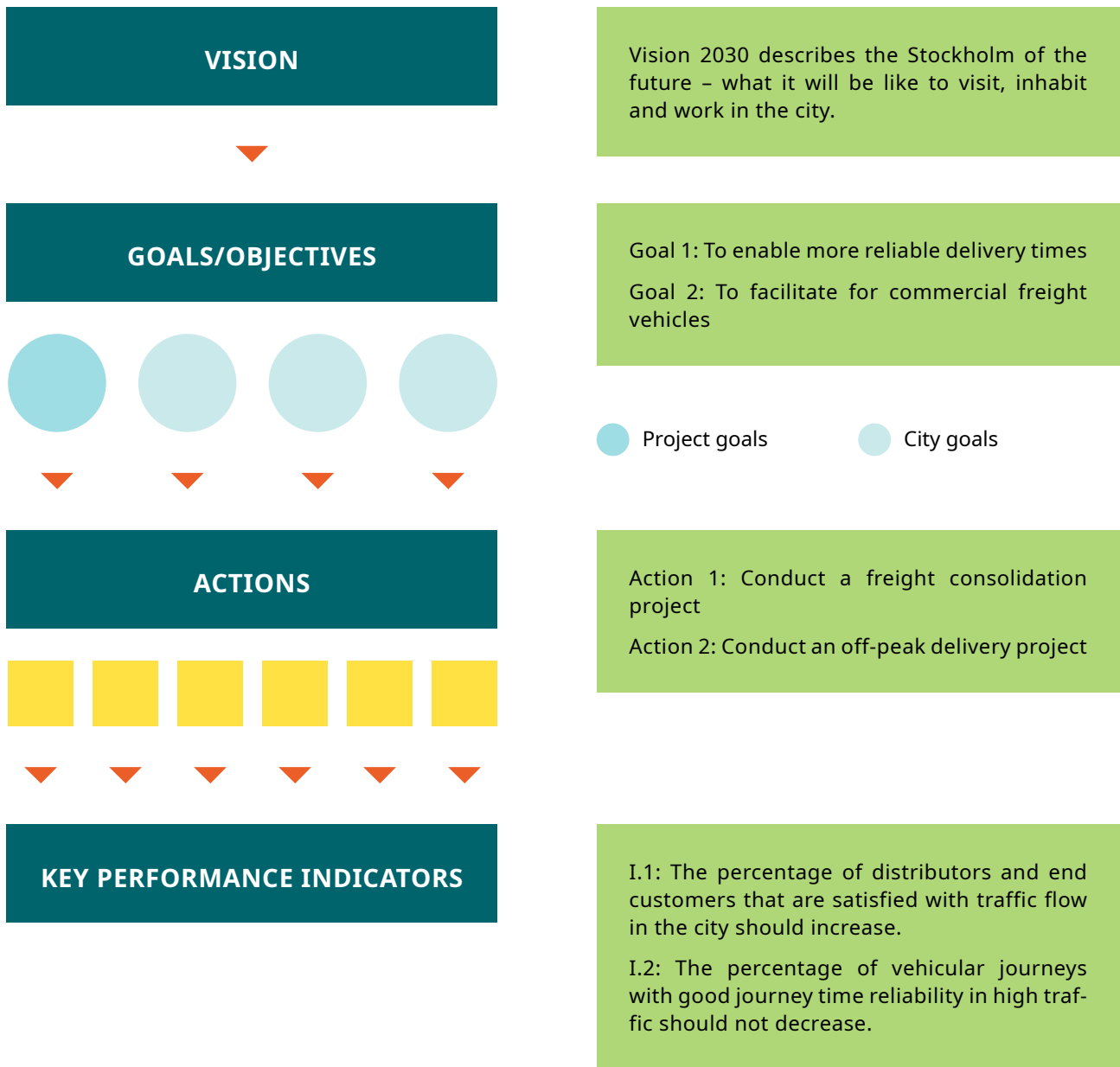
## Defining Vision, City Goals and Project Goals

Local governments may have set a vision for the future. A “vision” defines the desired future state of what a city wants to achieve over time and provides guidance. Common characteristics include improving economic vitality and social quality of life, while limiting the negative impacts on the environment. Consultations should be conducted with stakeholder groups. To turn a vision into an effective plan, stakeholders stakeholders should set SMART goals, i.e. specific, measurable, achievable, realistic and time-bound goals to address the challenges.

ICLEI’s EcoLogistics Framework outlines four policy goals that balance the interests of different stakeholders while achieving the city’s overarching goal in sustainability:

- **Environmental sustainability** refers to reduced air and noise pollution, GHG emissions, energy consumption from freight operations
- **Social equity** ensures safety, public participation in city policies, and overall quality of life of the local communities to minimize disturbances to the communities resulting from logistics operations
- **Economic sustainability** maintains the economic competitiveness of the city and addresses energy efficiency and overall freight sector efficiency and affordability
- **Operational efficiency** is a coefficient of delivery productivity (e.g. average payload), utilization (e.g. fleet), and reliability (e.g. timeliness).





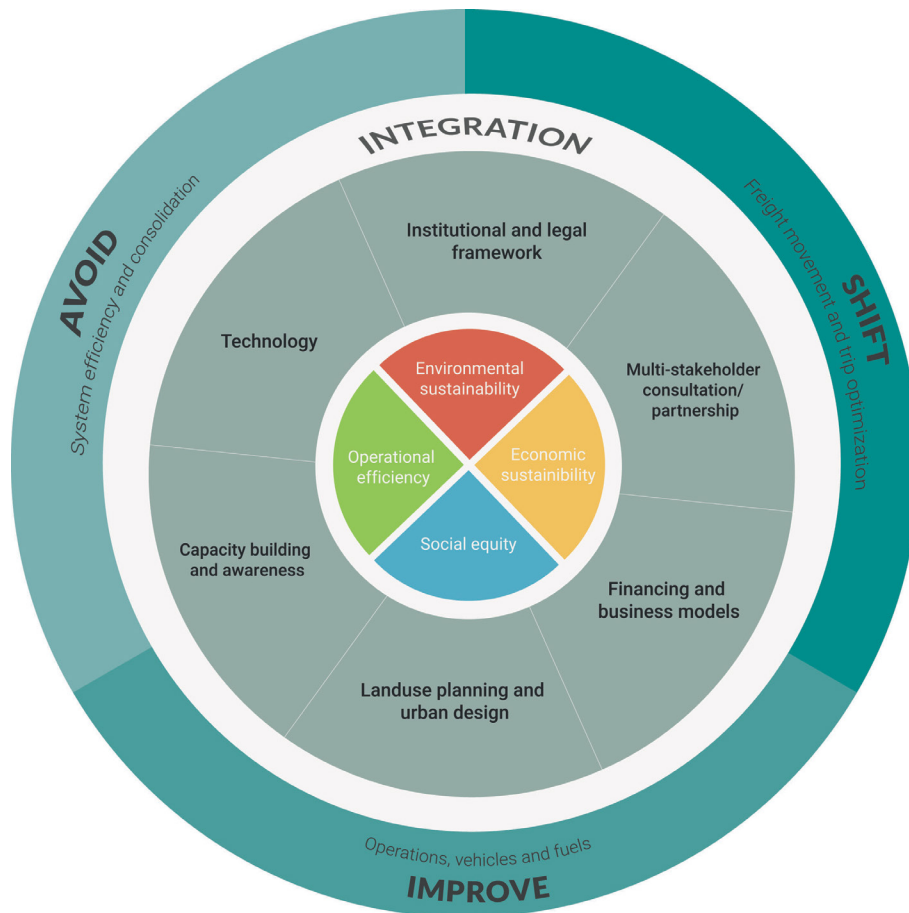
There is a need to also define “EcoLogistics project goals”. Based on the Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis by a stakeholder working group, a consensus needs to be reached defining project goals or focus. The defined goal for LCAP-UF could be aligned to the city’s overall sustainable development vision or climate action vision.

These goals should reflect the **Avoid-Shift-Improve (ASI)** approach:

- Reduce the road freight required to carry the same volume of goods (avoid)
- Ensure freight arrives at a time and place that reduces CO2 (shift)
- Increase the use of alternative fuels/transport modes – cleaner, safer and quieter vehicles (improve)

In addition to the ASI approach, integration is vital to enable the sustainable urban logistics system’s useful and practical transformation. Therefore, ICLEI adopts the **ASII (Avoid-Shift-Improve-Integration)** strategies in categorizing strategies and intervention measures, as there are cross-cutting strategies in nature, and pivotal in framing the institutional and innovation conditions.

Figure 6: ASII strategy (Source: EcoLogistics in East Asia - The frontier for sustainable urban mobility)



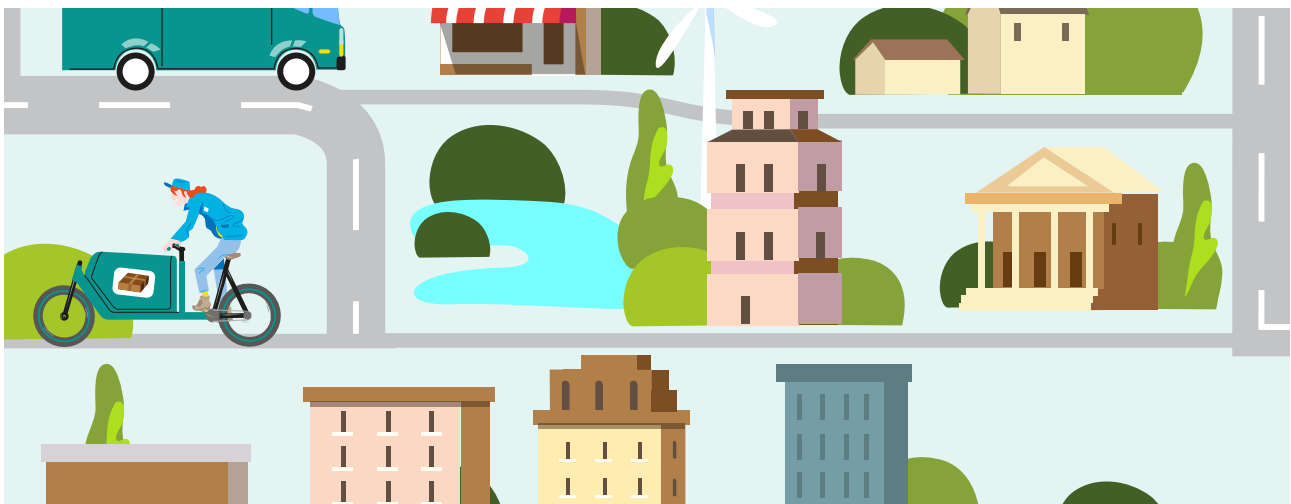
### Checklist for cities

- Define vision for the city (or align with existing one)
- Prioritize goals by city/project
- Discuss with stakeholder working group



### Output

- A vision statement, goals, and objectives for attaining sustainable freight in the city



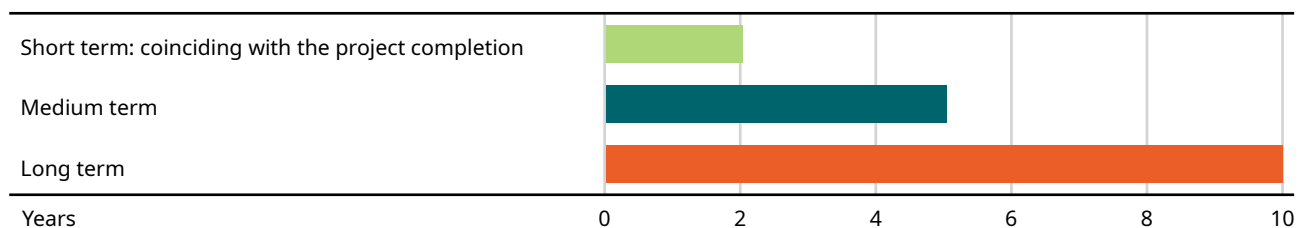


## Defining Actions and Demonstration Projects

Actions are defined activities and interventions with a specific objective, budget, timeframe and output. Collectively, actions are designed to support the achievement of the planned goals (SFC, 2016). There exist hundreds of actions (or interventions) a city could implement from available good practices. It is important to decide which goals should be prioritized based on local context and needs and then to identify the corresponding actions. References and learnings from the previous experiences of the city and of those who have replicated or transferred good practices will be valuable.

Most of the front-runner cities focused on small-scale demonstration projects or pilot projects (so-called low-hanging fruit) to showcase some immediate results. This approach builds trust among different stakeholders, and private stakeholders see local governments as problem solvers, not just regulators. Local governments should focus on delivering some actions in the short-term through formalized discussion, formation of a stakeholder working group, and creating a data platform to enable data sharing. **A list of goals and corresponding actions developed by different cities are listed in the [Annex 2](#).**

Cities usually have an overall time frame for action plans that they are working towards. This is often part of a broader city-wide approach to planning timeframes (e.g. in line with land use planning time horizons). In the EcoLogistics project three time periods are suggested:



The project will only monitor and reflect the short-term actions as they meet the EcoLogistics time framework available.

To help a city prioritize its actions, a set of ranking criteria is also developed as part of the project. Criteria will be based on the potential amount of GHG emissions reduced, costs, project implementation time, availability of external resources for the implementation, potential social and economic benefits. The primary criteria should identify any 'showstoppers', which are likely to prevent a project progress. The secondary criteria should help to eliminate projects if they do not meet project objectives; do not fit with local programmes and strategies, and are unacceptable to stakeholders, politicians and (indirectly) the public. The list of criteria is provided in the [Annex 3](#).



### Checklist for cities

- Discuss identified challenge with stakeholder group
- Define actions to achieve set goals
- Recommend to follow ICLEI's ASII approach
- Prioritize the demonstration project(s)



### Output

- A set of actions for one or more defined actions based on the ASII approach
- An achievable time horizon for proposed actions
- Defined targets for each action (qualitative or quantitative depending on the nature of action)
- A list of demonstration project based on criteria ranking

## Defining Key Performance Indicators (KPIs)

LCAP-UF is a strategic document, providing a framework for low carbon urban freight movement. However, it does not specify in detail how a suggested or selected measure will be implemented. Project implementation processes also need to follow a robust framework to achieve the corresponding targets, and require monitoring systems. A robust monitoring and evaluation system to measure impacts using Key Performance Indicators (KPIs) needs to be developed. To ensure a successful implementation of defined actions, it is important to set a baseline value before and apply selected monitoring tools or KPIs to check how much progress has been made towards achieving the targets. The monitoring results need to feed back into the process to optimize further implementation. **Table 5** shows a list of most commonly used indicators to assess and analyze city-level freight performance.

**Table 6: EcoLogistics Key Performance Indicators (Source: adapted Smart Freight Center, 2017)**

Category	Indicators
Economic	<ul style="list-style-type: none"> <li>GDP/total CO<sub>2</sub> emissions</li> <li>GDP/tonne-km</li> </ul>
Urban Form	<ul style="list-style-type: none"> <li>City size (km<sup>2</sup>)</li> <li>Population density (people/km<sup>2</sup>)</li> </ul>
Operational	<ul style="list-style-type: none"> <li>Average loading factor per type of vehicle (percentage)</li> <li>Average trip length within the urban area per type of vehicle (km)</li> <li>Freight lifted (tons/capita)</li> <li>Freight motorization index per type of vehicle (vehicles/1000 inhabitants)</li> <li>Urban freight share of vehicle kilometer travelled (VKT)</li> </ul>
Social	<ul style="list-style-type: none"> <li>Freight employment</li> <li>Freight accidents involving freight vehicles</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Freight emission intensity: CO<sub>2</sub> e/tonne-km</li> <li>Urban freight share of CO<sub>2</sub> emissions (percentage)</li> <li>Urban freight share of PM, NOx concentration (percentage)</li> </ul>



### Checklist for cities

- Discussion on KPIs for monitoring
- Monitoring and evaluation arrangements for all indicators developed (including its definitions, reporting format, how data is measured, how the indicator value is calculated from the data, and how often it will be measured)
- Establish baseline values for indicators, as well as target values of desired changes
- Agree on responsibilities and a budget for monitoring and evaluation



### Output

- Finalized KPIs for monitoring
- Report of progress and impact

## Implementation and Stakeholder Roles

To implement the LCAP-UF, it is necessary to understand roles and responsibilities of involved stakeholders, and the source of funding. This requires close collaboration and coordination amongst the involved parties from the public and private sector. It is important to identify the level of involvement of respective stakeholders in the development of the LCAP-UF.

As aforementioned, it is necessary to understand the source of funding and more importantly to secure the resources for effective implementation and results. For funding opportunities, allocation of available municipal budgets, local, subnational or national financial mechanisms (financial support, tax levies, subsidies), support by financial institutions (development banks) and Public Private Partnerships (PPPs) should be explored. The implementation phase of the selected measure will be monitored by the defined KPIs, it should be flexible to adapt to new or changed situations.

Stakeholders may include: City authorities, transport companies, logistics service providers, business owners, private companies, citizens associations, NGOs, etc.

**DISCLAIMER:** It is vital to identify any concern or doubts or conflict of opinions upfront. The plan is not the place to have the argument, but if city priorities are different or a small number of stakeholders disagree, recognizing this now enables a clear route map to be defined.

It may be possible to identify any dissent as project risks, and to periodically check if the issue still exists. This will demonstrate to those in doubt that the city is committed to making change and that concerns are addressed.



### Checklist for cities

- Define roles and responsibilities of relevant stakeholders
- Identify and resolve any concern or conflict raised by stakeholders



### Output

- Stakeholder engagement strategy
- Secured funding and allocation plan

## Adoption of the LCAP-UF

Adoption of the LCAP-UF as part of a mobility strategy or overall sustainability vision is key for long term implementation of actions. The municipal council or similar authority shall pass a resolution (law or decree) to integrate LCAP-UF. It also helps to revise plans at a regular time interval and continue focusing on making freight efficient.



### Checklist for cities

- Apply to the relevant authorities for passing resolution
- Revise LCAP-UF at regular time intervals (recommended every 2-3 years)



### Output

- Securing resolution on LCAP-UF by relevant authorities (municipality or similar authority)

## POLICY MAKERS

Ministries, agencies and authorities which oversee environmental, energy, and transportation policy making in their countries are invited to engage in further development and implementation of the Action Plan. These stakeholders will be able to learn best practices and acquire lessons learned in developing and implementing green freight programs. They can also gain new insights on how these programs can complement or supplement efforts to improve the infrastructure, logistics sector, and regulatory programs in their countries. The collective results of these efforts should foster more sustainable economic development, energy security, and improved public health in their countries.

## PRIVATE SECTOR

Businesses that ship, carry, or manage goods movement are invited to engage in supporting the implementation of green freight programs through this Action Plan. Shippers, carriers, and logistics firms in key economic sectors such as manufacturing, retail, food and beverage, and other industries that move the most tonne-miles of freight globally will have opportunities to shape green freight programs to help advance their needs and address their challenges. Associations, technology suppliers, vehicle manufacturers, and service providers can work with the shippers, carriers, and logistics firms as well. Private sector support is pivotal to the success of green freight programs, and they have much to gain, including cost savings, enhanced competitiveness, corporate leadership, and policy influence.

## CIVIL SOCIETY

Organizations with missions that aim to address common challenges around climate change, environmental protection, economic development and other related global concerns are invited to lend their support and influence to implement the Action Plan. Freight movement links developed and developing economies creating broad impacts but also opportunities for collaboration and engagement across a wide range of organizations: NGOs, research/academic institutes, development agencies, foundations, financing institutes, and others.

## Conclusion

A LCAP-UF is an integrated, futuristic and systematic preparation and execution of decision-making processes for an efficient, resilient and sustainable movement of freight. Its purpose is to influence policymakers in a city according to a defined vision, specific goals using measures and policies in the following areas:

- Infrastructure management,
- Parking/Loading areas management
- Vehicle-related strategies,
- Traffic management,
- Pricing, incentives, and taxation,
- Logistical management,
- Freight demand/Land use management and
- Stakeholder engagement.



This guidebook provides a holistic approach towards creating an action plan and setting out a long term vision. It outlines the key actions a city would need to take in the short, medium and long term. In today's context, collective actions are necessary to overcome the barriers to a low carbon, safe, resilient and efficient freight. The major focus is given on decarbonizing the freight sector (low carbon) and aligning cities to national climate commitments, e.g. NDCs.

It is a starting point for cities to start thinking about freight transportation and embed it as part of city development plans, mobility plans, clean air action plans and climate action plans etc. It is intended to be a catalyst and should be flexible to include any important aspect related to freight movement. The following characteristics are important for the success of the developed LCAP-UF:

- Involve all stakeholders in the development phase
- Clearly define goals and target scenarios
- Be a continuous process, it should be revised at a fixed time period, e.g. 2-3 years.
- The results of implemented actions, along with goal achievement of measures, must be reviewed and evaluated constantly, and achievements should be shared to gain traction from the stakeholders
- Freight transport related data has to be continually or periodically collected and updated.
- Should be flexible

Looking forward, new challenges (e.g. rise in E-commerce) and innovations (e.g. drone deliveries) may disrupt the freight industry and an action plan should provide space to include them at a certain stage.

## Summary of steps

Step	 Checklist for cities	 Output
Baseline Information	Analyse available data, action plans, studies, surveys etc.	Baseline report
	Collect and consolidate UFT data (primary surveys)	Analysis of existing supply chain
	Use data to establish UFT baseline	Freight vehicle profile
		GHG emissions from urban freight
Stakeholder analysis and engagement	Identify relevant stakeholders (see <a href="#">annex 1</a> for list of stakeholders)	Stakeholder working group (institutionalize in city administration if possible)
	Categorize them as primary and secondary stakeholders	Stakeholder challenges analysis
	Engage with them regularly to understand respective challenges	Strength, Weakness, Opportunities, Threats (SWOT) analysis
Defining Low Carbon Target Scenarios	Development of baseline scenario	BAU scenario
	Analysis of ongoing and proposed projects on urban freight	Low carbon target scenario
	Development of different low carbon scenarios	
Defining vision, city goals and project goals	Define vision for the city (or align with existing one)	
	Prioritize goals by city/project	A vision statement, goals, and objectives for attaining sustainable freight in the city
	Discuss with stakeholder working group	
Defining actions and demonstration projects	Discuss identified challenges with stakeholder group	A set of actions for one or more defined actions based on the ASII approach
	Define actions to achieve set goals	An achievable time horizon for proposed actions
	Recommend to follow ICLEI's ASII approach	Defined targets for each action (qualitative or quantitative depending on the nature of action)
	Prioritize the demonstration project(s)	A list of demonstration projects based on the criteria ranking
Defining Key Performance Indicators	Discussion on KPIs for monitoring	Finalized KPIs for monitoring
	Monitoring and evaluation arrangements for all indicators developed	Report of progress and impact
	Establish baseline values for indicators, as well as target values of desired change	
	Agree on responsibilities and a budget for monitoring and evaluation	
Implementation and stakeholder roles	Define roles and responsibilities of relevant stakeholder	Stakeholder engagement strategy
	Identify and resolve any concern or conflict raised by stakeholders	Secured funding and allocation plan
Adoption of LCAP-UF	Apply to relevant authorities for passing resolution	Securing resolution on LCAP-UF by relevant authorities (municipality or similar authority)
	Revise LCAP-UF at regular time intervals (every 2-3 years)	

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# Annex

## A.1 Stakeholders category

Stakeholders are individuals, groups of individuals or organizations that affect and/or could be affected by an organization's activities, products or services and associated performance with regard to the issues to be addressed by the engagement ([AA1000 Stakeholder Engagement Standard AA1000SES - 2015](#)). Stakeholders can include government agencies, local NGOs, community groups, university partners and private sector organizations. The table below compiled key stakeholders identified for urban freight transport.

Stakeholder Category	Considerations and suggestions
Regulators	National government department(s) responsible for transport operations, transport planning, vehicle regulations and driver standards National government department(s) responsible for environment, safety, land-use planning, climate change Regional and local government departments for the same areas Regulators of freight vehicle licencing and operations.
Operators	Relevant sectors for each city, ideally a range of sizes of companies, but likely to be multinationals or larger domestic operators as they have the resources to engage Cash In Transit / Secure movements Construction operators Hazardous goods (e.g. fuel, chemicals) Health and Pharmaceutical deliveries Home Delivery Services Waste Collection High Street Deliveries Food: retail/wholesale (including wholesale markets) HoReCa (Hotels, Restaurants and Catering) Courier and Express Mail Services Service sector (e.g. repairs and maintenance for offices, through to local plumbers or electricians)
Businesses and organisations	A range of businesses (and representatives - see below) relevant for each city. Ideally a range of sizes of companies (large to SME) Retail Financial services (e.g. banks, solicitors, etc.) Large origins and destinations of freight (e.g. port or rail-freight terminal operators) Representatives of municipal, universities, schools and hospitals (as receivers of goods and services) Construction clients (e.g. property developers, land agents, etc.) Business Improvement Districts, Chambers of Commerce, etc. 'One Off' Sites (e.g. sports stadia, concert venues, etc.)

Stakeholder Category	Considerations and suggestions
Trade Associations	<p>National freight association(s)</p> <p>Regional freight associations / officers</p> <p>Local freight associations / officers</p> <p>Business groups (representing both large groups and SMEs)</p>
Residents (and representative associations)	<p>As appropriate: associations representing specific sectors, depending on local requirements and projects/proposals developed (see sheet 2)</p> <p>Local residents associations</p> <p>Local tenant groups (e.g. from a wholesale or retail market)</p> <p>Proxy groups (e.g. in the UK the Noise Abatement Society)</p>
City Authorities	<p>Other local transport authorities (e.g. in New York the subway and bridges are managed by a different authority from the road network)</p> <p>Local boroughs, districts or wards within the city</p> <p>Neighbouring local authorities</p> <p>Other transport operators( e.g. public bus operators, tourist bus operators, taxi companies, etc.)</p> <p>Any organisation managing or developing infrastructure (e.g. bridge authorities or even private developers)</p>
Enforcement	<p>Any national or local government department(s) , that have dedicated enforcement teams (from parking control to vehicle inspectors)</p> <p>City police</p> <p>Customs / Border force if appropriate</p>
Academics	<p>Local universities (academic input and potentially students for any data surveys)</p> <p>National and international universities (academic input and international best practice)</p> <p>Covers a range of issues, including modal (rail, water, air and bike lobby groups), environmental, etc.</p>
Special interest and lobby groups	<p><b>International</b> - e.g. Green Freight Asia</p> <p><b>National</b> - e.g. Royal Society for the Prevention of Accidents (UK)</p> <p><b>Local</b> - Variable</p>



## A.2 List of strategies/actions in Asian cities

ASII	Strategies	Taoyuan City	Seoul Metropolitan	Suzhou City
Integrated strategies	Institutional and legal framework	EcoLogistics Community office establishment	National logistics laws and Master-plans (e.g. Sustainable Logistics Act Local Plan for Sustainable Transport Logistics Development 2012-2021)	Work Plan for Building Suzhou into a Green Logistics Model; Measures on Recognition and Assessment of Model Enterprises of Urban Green Logistics in Suzhou
	Multi-stakeholder partnerships and consultations	Taiwan Logistics Alliance	Public-private partnerships, the collaboration between Seoul Metro and CJ Logistics and the Ministry of Land, Infrastructure and Transport	Suzhou Leading Group for Urban Green Logistics
	Financing and business models	Subsidies to replace diesel vehicles under the Air Pollution Fund	Subsidies to replace diesel vehicles by SMG Private investments fund to promote sustainable packaging and responsible distribution chain	Award and subsidies for new energy logistics vehicles
	Landuse planning and urban design	Landuse planning Loading/unloading zone evaluation	Low emission zones in Seoul and Green Transportation Zones in the inner city of Seoul City Wall	Logistics demonstration zones: priority for new energy freight vehicles in the right-of-way
	Capacity building and awareness	Multi-stakeholder partnership	Invest Seoul Centre to attract start-ups to incubate sustainable and innovative businesses	
	Digitalization and smart technology	Dynamic routing Automated technology	ICT system to limited polluting diesel vehicles from entering the LEZ Development of hydrogen fueling and EV charging stations	Intelligent public information service platform to map freight hotspots for better route planning
Avoid	Avoidance or reducing the need for goods delivery by improving system efficiency	Demarcation of silent and low emission zone Consolidation center E-commerce pick-up point network	Establishment of logistic hubs by using train depots Self-pick-up lockers in subway stations	Diversified logistics models (e.g. unified, centralized, and joint distributions)
Shift	Changing the freight activity to be more efficient modes and optimizing trips	Use of electric scooters for delivery	Multimodal freight transport (e.g. metro for freight delivery)	Big data analysis and logistics heat map to optimize parking, loading and distribution points, charging demand
Improve	Enhancing the energy efficiency of the vehicles and fuels and upgrading operations throughout the supply chain network	Emission labeling Electric vehicles Fuel inspection and maintenance Time access restrictions Energy-efficient warehouses	Promotion of electric and hydrogen vehicles Time access restrictions Eco-packaging to reduce unnecessary wastage of plastics waste	Promotion of new energy vehicles: enclosed micro-trucks; enclosed midsize trucks; light vans; and refrigerated trucks

### A.3 Multi-criteria analysis for project selection (EcoLogistics project 2020, Ian Wainwright, Smart Freight Center)

#### Primary criteria (i.e. yes/no decisions)

Criteria	Description	Comments	Decision
Project timescale	Are the project timescales within the limit of the ICLEI project?	Either the project can be delivered in total before project end, or the pilot and any revised approach to scaling up the project can be published, so that all results can be attributable to ICLEI input.	Yes/ no
Cost /funding	Are the project costs within the limit of ICLEI funding?	Self-explanatory	Yes / no
Potential results	Does this project address the most important area(s) to tackle to address carbon emissions?	This should be an assessment of the outputs and potential outcomes and could be identified by the numbers coming out of the model. Assessment may have to be more subjective but should still be based on clear deliverables rather than a vague improvement suggested.  It's highly likely that the solution may do more to address air quality emissions (as that's often the local driver for action), but the potential to reduce carbon is critical to meet project criteria.	Yes / no

#### Secondary criteria (i.e. scorable criteria)

Criteria	Description	Comments	Decision
Data and measurement	Availability and quality of data to define the issue, scale potential impact and measure change	We want to be able to measure the change resulting from this project and model the likely impact of a wider uptake of the project. Ideally, measurement is required for changes in CO2, NOx, SOx, road safety, operator costs (labour, fuel, vehicle, other) and other stakeholder costs (e.g. retailer staff costs and stock losses for out of hours delivery). Limited measurement will limit how detailed the project outputs can be. With less information, others will be less inclined to consider change, and the likelihood of wider take up will be reduced. Measurement could be supported by modelling, including the ICLEI baseline model [IW1], but assessment of input data accuracy must be considered.	1 - 5
Stakeholder support	Active stakeholder involvement in project proposal and support of wider stakeholder community	There is a balance to be struck between support and involvement of stakeholders important to the individual project success and the support and involvement of those deemed the most important and/or the most influential in the industry/wider community.  An influential stakeholder who is highly critical of the project may counteract any benefits obtained by a successful project outcome.	1 - 5
City policy	Alignment with and/or benefit to wider city policy	There may be requirements through local policy for certain types of interventions (e.g. modal shift, zero-emission vehicles).  Good alignment to transport and/or land use plans is beneficial, while misalignment suggests any benefits obtained by a successful project outcome are unlikely to lead to greater roll out.  (Assumption that city policy aligns with national policy)	1 - 5
Political support	Likelihood of political support for project	Local politics may mean politicians from the area of project implementation are critical of the project or even of city policy. Alternatively, there may be huge local support and therefore pressure to deliver a successful project that will affect the outcomes.  Local politics, and opportunities to claim success or failure, can have a disproportionate impact on how any successful project is perceived, influencing stakeholder involvement throughout the project or uptake afterwards.	1 - 5

Criteria	Description	Comments	Decision
Commitment from city and operators	Active involvement in project proposal development and implementation	Projects are likely to need involvement from several different city officials/departments and many different individuals working for operators. Without clear commitment and involvement from the start, there is a high likelihood for commitment and participation reducing throughout the project, particularly if problems occur.  Dedicated resources are always preferable, but most people will have other commitments that should be considered.	1 - 5
Sustainable operators	Operators and other businesses directly involved in the project are committed to sustainable improvement in all areas: social, economic, and environmental.	Many operators seek publicity for environmentally sustainable activity, but do not always commit to full sustainability ('greenwash'). For example, many cargobike companies use gig workers, which may mean they do not pay a living wage, and retailers may have reputational issues in their production facilities.  There are various recognised industry schemes that would suggest greenwashing is unlikely. International schemes with a greater level of publicity and awareness demonstrate a broader commitment (e.g. the GLEC framework for carbon reduction) but local schemes could be more appropriate if they exist.	1 - 5
Supply chain efficiency	Project will improve service levels and/or reduce operator costs	Wider freight industry support and greater uptake is more likely if the project demonstrates improved service levels and/or reduced operator costs.  If this is not easily demonstrable, a proxy measure could be journey time reliability, as this is likely to impact both cost and service levels.	1 - 5
Deliverability	The likelihood of delivery of project on-time and within-budget	This may be very subjective but is likely to be based on historical success. The involvement of key individuals and a commitment from wider stakeholder support could be taken into account if relevant.	1 - 5
Funding (if appropriate)	Are there any sources of match funding and/or additional local funding included (e.g. operators providing vehicles free of charge)?	Greater funding and/or benefit in kind suggests greater support. This implies the project may have longevity and a greater chance of success, with ICLEI funding effectively speeding-up a local initiative	1 - 5
Scalable (if appropriate)	Is the project scalable/repeatable?	If this is a one-off project that may not discount the impact that could be achieved locally (e.g. a rail/road freight exchange). However, the more scalable a project is, the more potential there is for long term impact.	1 - 5



# EcoLogistics

Low carbon freight for sustainable cities

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and Nuclear Safety

based on a decision of the German Bundestag



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