



Zero Emission City Logistics

QuickScan
Guideline

Zero-Emission City Logistics

Maturity Model

QuickScan Guideline



Breda University of Applied Science

Academy of Built Environment and Logistics

Research and Business Innovation Unit

Zero-Emission Maturity Mode for Companies Conducting City Logistics in the Netherlands

September 2021

Table of Contents

QuickScan Guideline.....	3
1. Introduction.....	4
1.1. What is a QuickScan	4
1.2. Goal of the QuickScan	4
2. QuickScan Execution	4
2.1. Before QuickScan (Preparation)	5
2.2. During QuickScan (Execution)	5
2.3. After QuickScan (Analysis and Reporting)	5
3. Overview of levels	6
3.1. Level 0 Oblivious.....	6
3.2. Level 1 Awareness	6
3.3. Level 2 Interest	7
3.4. Level 3 Managed.....	7
3.5. Level 4 Established	8
3.6. Level 5 Optimized	8
4. Maturity Matrix	9
5. QuickScan Sections	10
5.1. General	10
5.2. Strategy	10
5.3. Infrastructure	10
5.4. Personnel.....	11
5.5. Fleet Management and Operations	11
5.6. Partnerships.....	12
5.7. Finance	12

QuickScan Guideline

Zero-emission has in the past couple of years gained traction as a logistics industry buzz-word, however, there is no clear view of whether this buzz-word has become more than that, particularly in small to medium companies. In the Netherlands a call has come from the national government to reduce greenhouse gas emissions in the city centers (i.e. Dutch climate agreement) which has filtered down to the logistics and mobility industries.

One of the initiatives, called the Implementation Agenda spearheads the progress towards zero emission by calling for cities to create zero emission zones to transition over a period of 5 years between 2025 and 2030 (<https://opwegnaarzes.nl/over-zes/zero-emissiezones> (in Dutch, open in Google and choose translate option for English)), to date almost 30 Dutch municipalities have signed the agreement which states that cities need to declare the size and area of their zero emission zones 4 years before implementation and the vehicle classes. The phasing out of traditionally fuelled vehicles begins on the 1st January 2025 with the exceptions of:

Table 1: Phasing out of commercial vehicles

VEHICLE TYPE	PHASING OUT DATE
EURO 6 TRUCK AND TRAILER COMBI PURCHASED AFTER 2017	1 January 2030
EURO 6 TRUCKS PURCHASED AFTER 2020	1 January 2030
EURO 5 VANS	31 December 2026
EURO 6 VANS	31 December 2027
PLUG IN HYBRID ELECTRICAL TRUCKS	1 January 2030

<https://opwegnaarzes.nl/kamerbrief>

Some larger logistics companies have already started working on a zero-emission logistics strategy to meet the future zero emission zone (ZEZ) requirements, but many companies active in city logistics are not yet familiar with the coming zero emission (ZE) requirements or have not started working on a zero-emission city logistics strategy. To assess how far companies are in their zero-emission city logistics preparation, and what issues they face, in order to develop tools and information to make the transition to a more sustainable city logistics system possible, it is necessary to assess the current level and needs companies (in different city logistics segments and sizes) have.

The lack of insight into how companies are preparing towards zero emission zones has created the need for the maturity of companies in the area of zero-emission city logistics operations to be determined by means of a maturity model which will enable a high-level view of how far companies are in preparing towards zero-emission logistics operations in the city-centres which have indicated their zero emission zones. The maturity of these companies will be determined using a QuickScan and surveys.

This guideline delves into the execution of the QuickScan and it is separated into 5 parts, Introduction, Execution, Overview of levels, Maturity Rubric and lastly QuickScan sections.

1. Introduction

1.1. What is a QuickScan

A QuickScan is a “**participatory modelling tool** that links stakeholder and decision-maker knowledge to assessments for policy-making purposes” (Verweij, et al., 2016). In this instance the main stakeholders in consideration are the SME’s conducting business within the designated city center’s where zero emission zones are to be implemented, the decision makers are the Dutch government including municipalities.

Participatory modelling is a method that uses models in three ways: as a means to generate knowledge, to achieve knowledge integration and to enable societal impact. (Smetschka & Gaube, 2019)

The QuickScan is used to determine the current state of zero-emission initiatives by conducting on site viewings, taking photographic evidence and hosting interviews with the QuickScan questionnaire, the answers to the questionnaire will determine the levels of each area of transformation which will be indicated on the matrix, the matrices from different companies will then be used for benchmarking in order to have a high level view of the cities progress towards zero emission.

1.2. Goal of the QuickScan

Since the purpose of the QuickScan is to provide a view of the status quo of zero-emission city logistics efforts by way of providing content to fill in the maturity matrix (see section 4.), it is important to identify what the goals of the QuickScan are for the different stakeholders, these are listed below:

- **Student:** Get an introduction into the practical aspects of sustainability, innovation and change readiness of logistics service providers and businesses.
- **Research Institutions:** Establish the ZEZ readiness of companies and their needs in terms of support from companies and cities. Inform policy-makers of the progress.
- **Businesses:** Create an awareness and therefore a sense of urgency in preparing for ZEZ in order to avoid supply chain disruptions when changes are implemented. In addition to this, the feedback from the QuickScan will enable companies to establish the next steps they could take in order to level up their organizational readiness
- **Municipalities:** Obtain a clearer view of the readiness of businesses to comply with policy changes as well as establish the need for support from the private sector in terms of infrastructure and general accommodations.

2. QuickScan Execution

In order to get a clear picture of business progress towards zero-emission city logistics operations, it is crucial to prepare beforehand and be armed with knowledge in order to be able to understand the questions you are asking and field any counter questions that may be posed to you. An overview of the current trends and policies related to zero emission logistics on a macro, meso and micro level and how these could affect business operations is crucial. In addition to this, the below tips may be helpful.

QuickScan Process

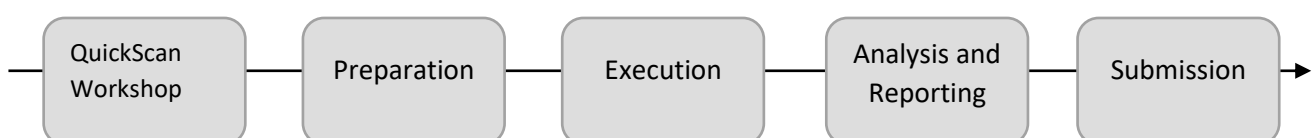


Figure 1. QuickScan Process Flow

2.1. Before QuickScan (Preparation)

- Go through the company website beforehand and develop an understanding of their main products, mission, vision and values.
- Go through the QuickScan and adjust and adapt it to suit the company you are going to by adding questions and making comments based on your research.
- Email the person you will be interviewing and introduce yourself and your goals. It may also be a good idea to outline what a QuickScan is and ask for permission to take pictures of things that may be relevant to the scan.

2.2. During QuickScan (Execution)

- Introduce the process you will be going through during the QuickScan, usually this is an interview ending in a tour of the facility.
- Discuss the factors leading to an exploration into zero emission alternatives and the urgency
- Initiate QuickScan form filling.
- Take pictures.
- Share QuickScan form by clicking on the send button

2.3. After QuickScan (Analysis and Reporting)

- Send email thanking the interviewee
- Compile QuickScan report
- Indicate maturity levels on matrix
- Email report to assignment owner and await comments
- Adjust report and send to company

In the case that you are asked questions that you did not consider, it may be useful to note these and send them to the assignment owner so that resources can be prepared for everyone undertaking the research.

3. Overview of levels

The Zero-Emission Maturity Model has six levels, representing the possible attitudes and actions of a company that is pursuing zero emission city logistics operations, each level is explained below with the possible advice that could be given to the company in order to progress onto the next level.

3.1. Level 0 Oblivious

An organization in the oblivious stage is unaware of its macro environment and the sustainability issues affecting it, this organization is often blind-sided by developments and plans for the future with an internal orientation.

As such, this organization falls under level 0 as they are oblivious to the zero-emission efforts championed by the local municipality in which they operate in. In the instance of the areas of transformation, it is possible that the organization has individuals or departments that are oblivious in their individual capacity therefore each will be attended to separately in the maturity rubric.

Advice

- ✓ Gather information on zero-emission policies which affect them
- ✓ Find out the plans that their local municipalities have regarding zero-emission city logistics.
- ✓ Draw a timeline of the policy implementation
- ✓ Take stock of the departments which may be affected by the changes

3.2. Level 1 Awareness

An aware organization is one which knows about the changes in the industry relating to sustainability and how it relates to their operations, however, they are not making efforts that are aligned to the zero emission policies.

There may be individuals or departments who think that perhaps zero-emission logistics does not fall within their scope of work and thus do not look any further, some may even feel that since the government policies are always changing, they will wait until the last minute to implement operational changes.

Advice

- ✓ Gather information on zero-emission policies which affect them
- ✓ Find out the plans that their local municipalities have regarding zero-emission city logistics.
- ✓ Draw a timeline of the policy implementation
- ✓ Take stock of the departments which may be affected by the changes
- ✓ Detail the impact of maintaining status quo
- ✓ Present business cases of companies in the same industry who have embraced ZECL
- ✓ Explore the possibility of getting interns to conduct a feasibility study
- ✓ Spot quick wins such as load optimization to decrease inner city trips
- ✓ Detail the various options available for inner city logistics
 - City hubs
 - Cargo bike
 - Zero emission vehicles etc.

3.3. Level 2 Interest

Organizations who are well informed may decide to explore their options by encouraging individuals within the company to compile plans on how they can implement zero-emission logistics changes within the company. The interest level is where the company decides to make concrete first steps in the direction of adapting their city logistics operations to become zero-emission.

Research is an important aspect of the interest stage as the company will be making comparisons between products that may be beneficial in their quest for minimizing their carbon footprint.

Some organizations may even decide to host trial implementations to test options and see whether they can roll out the solution on a wider scale. Managers will also be taking account of what skills are required, budgets, the need for external partnerships and alternatives that will enable them to transition seamlessly.

Advice

- ✓ Draw a timeline for the implementation of changes
- ✓ Manage the change within the organization (8-step change programme, Kotter)
- ✓ Take stock of the departments which may be affected by the changes
- ✓ Present business cases of companies in the same industry who have embraced ZECL
- ✓ Delegate research work to interns
- ✓ Note the things that go wrong and right in the trials
- ✓ Explore the risks and develop strategies to mitigate these risks
- ✓ Explore partnerships and industry collaborations.
- ✓ Establish departmental goals

3.4. Level 3 Managed

Once the solutions have been tested, the results need to be noted and the roll out process starts. In the managed stage, what started out as research is being implemented into the day to day operations and the organization is in a state of change and transformation.

At this level, it is critical to drill the goals down into key performance indices which are relevant and measured often to ensure the company is progressing towards the logistics and ZECL goals. The managed stage exposes whether the assumptions made in the trials hold up in large scale operations. At this point, the infrastructure becomes central to planning and operations, zero emission solutions are still being implemented in real life and the extent to which the company can maintain regular operations becomes clear.

Advice

- ✓ Note the operational short-comings of zero emission city logistics
- ✓ Where processes are successfully running, create operational procedures
- ✓ Explore ways in which to institutionalize the new knowledge
- ✓ Source intern to research ways in which to mitigate the risks and shortcomings
- ✓ Monitor KPI dashboards continuously, possibly automating the monitoring
- ✓ Create feedback moments to listen to operational staff and what they have to say about the changes, this will assist in refining the bottlenecks.
- ✓ Document everything

3.5. Level 4 Established

The established level is where the changes have become a norm, the organization is wholly aware of zero emission goals and are working towards achieving their targets daily, this includes the automation of the KPI's that can be automated, freely available trainings, well documented processes such as standard operational procedures and

Advice

- ✓ Create a knowledge management system
- ✓ Identify the complementary processes which support the main ZECL operations
- ✓ Move the documentation processes online and automate
- ✓ Identify bottlenecks and work on improving processes
- ✓ Seek out partnerships to optimize the last mile
- ✓ Encourage employees to communicate
- ✓ Stimulate a culture of innovation
- ✓ Keep an eye out for changes in the industry
- ✓ Share knowledge
- ✓ Document all adaptations to operations
- ✓ Evaluate improvements

3.6. Level 5 Optimized

The optimized level speaks to a culture of continuous improvement within an organization. The hiccups have been ironed out and since the organization has well documented processes, they are able to automate as well as provide transparency to those within their supply chain.

Optimization also pertains to the uptake of innovation and encouraging the development of complementary systems, for example, off the grid electricity solutions to complement the on grid charging ports for electric vehicles.

Advice

- ✓ Innovation uptake is an iterative process that requires one to keep abreast of macro and meso environmental changes and how they affect operations.
- ✓ Embracing network thinking exposes you to what other companies are doing and how you could collaborate.
- ✓ Sharing knowledge is important, document the journey and share it among your collaborators.

4. Maturity Matrix

Before executing the QuickScan, familiarize yourself with this matrix to develop an understanding of the various levels and the indicators related to it. The matrix can then be filled accordingly post analysis to indicate the companies ZE maturity.

Area of Transformation		Personnel	Fleet Management	Operations	Finance	Purchasing	Infrastructure
Level							
0	Oblivious	No knowledge of ZECL or any external environmental changes due to ZE regulations	No knowledge of ZECL or any external environmental changes due to ZE regulations	No knowledge of ZECL or any external environmental changes due to ZE regulations	No knowledge of ZECL or any external environmental changes due to ZE regulations	No knowledge of ZECL or any external environmental changes due to ZE regulations	No knowledge of ZECL or any external environmental changes due to ZE regulations
1	Awareness	HR is aware of ZECL however has not explored the impacts of ZE on employees and their skills	Fleet manager has awareness of ZECL, however they have may have reservations. Fleet may comprise of Euro 5-6 trucks (infrastructure)	Operations manager has awareness of ZECL, however they have may have reservations	Finance manager has awareness of ZECL, however they have may have reservations	Purchasing manager has awareness of ZECL, however they have may have reservations	There is an awareness of the types of alternative fuels and ZE vehicle fuelling solutions
2	Interest	HR has conducted research on ZECL and identified skills gaps, training needs and capacity requirement.	Fleet manager undertakes research on the types of ZE vehicles and may have purchased a few (<10%) zero-emission vehicles to supplement of the fleet. Fleet may also comprise of new Euro 6 trucks	The operations manager has commissioned a research (by intern, employees or consultancy) on the feasibility of ZECL. There is also possibly a trial implementation, capacity gaps are identified.	The financial need for ZE has been forecasted and a TCO calculation has been completed. Funds are availed for purchasing ZECL	Purchasing manager has conducted research on ZE vehicle types and capabilities. There is also an overview of capacity gaps and subcontractors which can be used to fill those gaps.	The company has researched zero emission energy providers, the ZE vehicles may already be utilizing public fuelling/charging stations. The fuelling hub applications are lodged
3	Managed	The training needs of the ZECL employees are catered to and employees are open to discuss their progress and issues with the training with HR	Fleet is composed of a couple of ZE vehicles for city logistics use. In addition to mainly Euro 6 trucks.	The outcomes of the research have resulted in a trial implementation which is integrated into the normal operations. There are defined KPI's	Actual ROI becomes clearer vs forecasts. Investments are made in accordance to TCO figures	Vehicle suppliers, mechanics and subcontractors have been found, partnership agreements are signed, operations are running however they may not be fully integrated	There are ZE fuelling points on the company location, continued use of public solutions
4	Established	There are a set series of trainings on ZECL. Staff is knowledgeable about ZE operations.	Fleet is composed of mostly ZE vehicles for city logistics use. The Euro 6 vehicles are being phased out	There are SOP's on the support systems for ZECL (Loading docks, charging stations, planning) ZE trucks are responsible for 60-80% of city logistics. ZECL is integrated into normal operations.	Funds are availed for upscaling ZECL. The ROI on the initial vehicles is monitored	Subcontractors and suppliers are privy to company data in order to improve their operations, there is a level of integration and transparency. Green logistics policies are enforced on subcontractors.	Company utilizes on grid energy solutions, however, is looking towards more sustainable use of this energy.
5	Optimized	ZES is fully integrated into the corporate culture, the ZES vision is fully part of trainings and corporate culture	The City Logistics fleet is completely Zero emission	KPI monitoring is automated, there is a focus on continuous improvement. 100% of inner city movements are zero emission. There is a focus on network thinking, therefore shared loads and city hubs become a norm.	Inner city fleet is completely turned over to zero emission, the project budget is reviewed and the need for further funding for research is assessed	Suppliers and subcontractors are integrated into the companies ERP system and there is a high level of transparency. The subcontractors work in a network	Company utilises a private smart energy solution which optimises lertical energy use.

Table 2. Zero-Emission Maturity Matrix

5. QuickScan Sections

The QuickScan questionnaire comprises of seven sections which cover the various elements required for a company to reach zero-emission, each section below covers the explanation of the section as well as guidelines for assessing the answers given for some of the questions.

QUICKSCAN QUESTIONNAIRE

5.1. General

- Aim to talk to the fleet manager, operational manager or someone who has knowledge about the last mile and zero emission initiatives.
- Clarify the position of the company in the supply chain:
Shipper: Organization sending the goods
Carrier: Organization conducting the physical transportation of the goods
Receiver: Organization to which the goods are sent

Question Notes

- 1.4. For some organizations all three functions are performed by different departments of the same entity, if this is the case, make a note.

5.2. Strategy

Often, a lot can be established about a company's inclination towards innovation and change from their vision, mission and strategy; hence why this is the springboard for the QuickScan.

- The companies vision, mission and values can be viewed on their website and if they are a publicly listed company, their financial statements can give a wealth of information about who they are.
- In the interview it is crucial to determine how the strategy filters down to tactical (medium term) and operational (day to day) goals. Specifically relating to last mile distribution and city logistics.
- Note whether there are goals for the next 3 years and what they are
- What are the city logistics operations KPI's, how often are they measured and how are they measured?
- Possible KPI's could be traditional city logistics vehicle kilometers compared to zero emission city logistics vehicle kilometers, carbon emissions, truck occupancy and percentage of shared loads

5.3. Infrastructure

If the company opts for the use of electric vehicles, hydrogen vehicles, cargo bikes or barges, they need to consider the infrastructure that is required in order to operate these vehicles. This could be:

- ✓ Charging ports
- ✓ Refuelling stations
- ✓ Loading/unloading docks
- ✓ Cycling paths

Unless if they are on private property, there is a need for applications to be logged with the local municipality and possibly other private service providers. This section deals with the room for these considerations.

Question Notes

3.1. Yes: Infrastructure level 3+

No: Infrastructure level 0-2

3.2. Infrastructure level 2+ (use discretion based on matrix)

3.3. Operations level 3

3.4. Infrastructure level 3-4

Identifying issues means that they have trialed solutions which is level 3, if the company is attempting/has attempted off grid solutions it is level 5

5.4. Personnel

Staffing is important in every organization, their expertise, skills and openness to change and development dictates the direction of the company.

Ofttimes going ZE requires training on how to operate the assets, project management, upskilling of staff and possibly the hiring of people who will carry out the new operations. This requires the organization to be ready for change and have a culture of continuous improvement and learning, the box below indicates the key attributes of such an organization. These 5 elements can be used to assess the level of zero emission readiness.

Organizational Innovation Readiness

1. Innovative organizational culture, structure and climate
2. Leadership and management style in support of innovation
3. Creative human capital
4. Learning orientation
5. Knowledge management

This section seeks to determine whether the company has educated their staff and championed zero emission city logistics.

Question Notes

4.2. Yes: Personnel level 1+

No: Personnel level 0

4.3. Personnel level 3 (If there are a variety of trainings to choose from, possibly level 4)

4.4. Personnel level 3

4.7. Personnel level 4-5

5.5. Fleet Management and Operations

The best indication of a company's receptiveness of innovation and change is investment and where the investments are being made.

This section explores the operational changes undergone by the company to embrace zero emission operations.

Question Notes

5.2. & 5.3. Fleet Management level 2+

5.4. Operational Management level 2+

5.10. Fleet and Operational Management level 2+

5.11. Purchasing level 2+ (Have these alternatives been tested? Yes: OP 3

(Have these alternatives been included in daily operations? OP 3

(Are there SOP's in place for the use of these alternatives? OP4

5.6. Partnerships

It may be necessary for businesses to develop relationships with service providers for the running of their operations, these partnerships may take the form of:

- Suppliers
- Distribution agreements with logistics service providers
- Load sharing
- Outsourcing of parts of the supply chain

In order to establish these partnerships, agreements have to be made between both parties laying out their duties to each other. This section deals with suppliers (electric vehicle OEM's, power companies etc.) and companies who carry out zero emission transportation.

Question Notes

6.2. Purchasing level 3

6.3. Purchasing level 4

6.4. Purchasing level 4

6.6. Operations Management level 2 (Company has identified capacity gaps)

6.7. Purchasing level 2

6.8. Purchasing level 3

5.7. Finance

Capital is required for the purchase and operation of new assets such as those used in zero-emission projects. Funds, subsidies and incentives enable companies to accelerate their progress

Question Notes

7.1. Finance (yes =level 1+, no = level 0)

7.2. Finance level 2+

7.3. Finance level 3+

7.4. Purchasing level 3 and Finance level 3

Breda University of Applied Science

Academy of Built Environment and Logistics

Research and Business Innovation Unit

Zero-Emission Maturity Mode for Companies Conducting City Logistics in the Netherlands

September 2021