

E-Laas

Energy optimal urban Logistics As A Service

Milestone report

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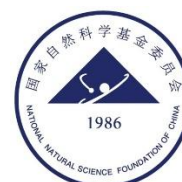
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1. Summary

This report documents the completion of Milestone M0, “Repository of cases characterizing logistic system scenarios”, developed within Work Package WP0 of the E-Laas project (Energy optimal urban Logistics As A Service). Milestone M0 constitutes a practical outcome of the work carried out in WP0, the purpose of which was to prepare the basis for further modelling, scenario analyses and assessment of selected urban logistics systems.

The work carried out in WP0 included an update of the state of knowledge, the development of an attribute structure describing reference cases and scenarios, and the identification of scenarios for the RC1 reference case – the Górnślasko-Zagłbiowska Metropolis (GZM). As a result of these activities, a structured set of input data was prepared, linking the conceptual outcomes of reports D0.1, D0.2 and D0.3 with the needs of further research conducted in the project. The result of the work is the M0 data repository, made available in Zenodo (DOI: 10.5281/zenodo.20512695).

The repository includes data necessary to describe and parameterise selected urban logistics scenarios. It contains, among others, data on the transport network, traffic analysis zones, buildings, demand, transport mode structure, delivery channels, and selected operational, energy-related and emission-related parameters. These data were prepared primarily for scenarios concerning ready-made food deliveries, boxed meal deliveries and parcel deliveries represented as one common demand stream split between the home delivery channel and the parcel locker delivery channel, including drone-based variants where they are included in the scenario structure.

The M0 repository serves as a common reference dataset supporting further analytical, modelling and simulation work in the E-Laas project. It may be used as a source of input data for microsimulation models, spatial analyses, scenario-based studies and assessments concerning energy consumption, emissions and the operational efficiency of urban delivery processes.

The scope of the repository was deliberately limited to the data needed for the structuring and parameterisation of selected scenarios. The dataset does not constitute a full transport model of the GZM Metropolis or a set of simulation results. It also does not include dynamic changes in traffic conditions or detailed variants of charging or refuelling infrastructure development. Its main function is to provide a coherent, documented and citable data basis for the subsequent stages of the project, in particular for work carried out in WP2, WP3 and WP4. The M0 closes the conceptual and structural work carried out in WP0, showing the transition from diagnosis and scenario identification to the preparation of a data repository enabling further modelling and the energy, environmental and operational assessment of selected urban logistics solutions.

2. Introduction

The E-Laas project focuses on developing an approach for analysing and assessing urban logistics systems from the perspective of energy consumption, emissions and the organisation of freight flows in the city. One of the first stages of the project was to define reference cases and research scenarios that could subsequently be used in modelling, simulation and comparative analyses.

Work Package WP0 had a preparatory and structural character. Its purpose was to move from a general diagnosis of urban logistics problems to an organised set of attributes, scenarios and input data. This work was documented in reports D0.1, D0.2 and D0.3, which respectively covered: the update of the state of knowledge, the development of the attribute structure, and the identification of scenarios for the RC1 reference case, the Górnośląsko-Zagłębiowska Metropolis.

The M0 report provides a synthetic closure of this work. Its main purpose is to present the data repository prepared for further project analyses. The repository organises data related to selected urban logistics scenarios and provides a basis for subsequent research stages carried out in the E-Laas project.

3. Purpose and scope of the report

The purpose of this report is to summarise the work carried out in WP0 and to present the M0 data repository prepared as a result of this work. The report shows the relationship between the update of the state of knowledge, the attribute structure, the scenario catalogue and the final dataset made available in Zenodo.

The scope of the report includes a description of the main outcomes of reports D0.1, D0.2 and D0.3, the characteristics of the RC1 and a synthetic description of the contents of the data repository. The repository includes input data for selected urban logistics scenarios, including spatial, network, demand, operational, energy-related and emission-related data.

The report does not include simulation results or a detailed assessment of the scenarios. Its function is to document the scope, structure and intended use of the M0 repository as a basis for further analytical, modelling and simulation work carried out in subsequent work packages of the E-Laas project.

4. WP0 work leading to the M0 repository

WP0 had a preparatory and organising character. Its purpose was to establish the basis for further modelling and assessment of urban logistics systems by moving from a knowledge review, through an attribute structure, to a catalogue of scenarios and input data. The outcomes of reports D0.1, D0.2 and D0.3 form a logical sequence leading to the development of the M0 repository. Table 1 summarises the role of the individual WP0 outputs in preparing the M0 repository.

Table 1. Synthesis of WP0 outputs and their contribution to M0

WP0 output	Main role	Contribution to M0
D0.1	Update of the state of knowledge and review of literature, projects and urban practices	Providing the conceptual basis for selecting urban logistics segments, actors, solutions, research problems and assessment dimensions
D0.2	Development of the attribute structure for reference cases and scenarios	Defining the data structure for the description of cases, scenarios, variants, parameters and KPIs
D0.3	Identification of scenarios for RC1 (GZM Metropolis)	Indicating the base and alternative scenarios that form the basis for dataset parameterisation

M0	Repository of urban logistics cases and scenarios	Making a structured set of input data available in Zenodo to support further modelling, scenario analyses and assessment of urban logistics systems
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Thus, WP0 creates a coherent pathway from problem diagnosis and the identification of key urban logistics areas to the preparation of the data structure and the M0 repository. This repository constitutes a practical outcome of the conceptual and organisational work carried out in WP0 and provides the basis for further work in subsequent work packages of the E-Laas project.

4.1. D0.1 – Knowledge base

Report D0.1 constituted the first stage of work in WP0. Its purpose was to update the state of knowledge based on a review of scientific literature, research projects, reports and urban practices related to urban logistics. The report identified the main problems, categories of solutions, groups of actors, infrastructure elements, transport modes and assessment dimensions relevant to further analyses.

The outcomes of D0.1 had conceptual significance for the subsequent stages of WP0. They made it possible to determine which features of urban logistics systems should be considered when defining reference cases, scenarios, modelling assumptions and data requirements. In particular, D0.1 indicated the need to account for aspects related to energy, emissions, delivery organisation, user behaviour, infrastructure and data limitations.

4.2. D0.2 – Attribute structure

Report D0.2 translated the outcomes of the knowledge review into a structure for describing reference cases and scenarios. The report defined the basic concepts used in the E-Laas repository, such as Reference Case, Virtual Reference Case, Base Scenario, Alternative Scenario, Attribute and KPI.

The most important outcome of D0.2 was the development of a common attribute structure enabling the description of the urban area, transport network, traffic zones, dispatch and collection points, transport modes, demand, operational parameters, energy consumption, emissions, costs, user behaviour and assessment indicators. D0.2 does not constitute the full M0 repository, but it defines the structure that enables its preparation and the organisation of data used in subsequent stages of the project.

4.3. D0.3 – Scenario catalogue for RC1 – GZM Metropolis

Report D0.3 used the structure developed in D0.2 to identify urban logistics scenarios for the RC1 reference case – the Górnośląsko-Zagłębiowska Metropolis. The report had an organising and methodological character, and its purpose was to prepare a catalogue of scenarios that could be used in further project work.

In D0.3, the scenarios for RC1 were organised around three main groups intended for further use in modelling and simulation analyses: ready-made food deliveries, boxed meal deliveries, and parcel deliveries with home delivery and parcel locker delivery channels. For parcel

deliveries, a common demand stream was adopted, which can be split between different service channels. Pharmaceutical deliveries and B2B deliveries were indicated as valuable directions for further research and potential methodological extensions.

5. M0 repository description

5.1. Repository availability and citation

The M0 repository was prepared as a structured set of input data for selected urban logistics scenarios developed within the E-Laas project. The repository is available in Zenodo [1].

DOI: 10.5281/zenodo.20512695

Repository license: Creative Commons Public Domain license — CC0

How to cite repository:

E-Laas WUT Team. (2026). Dataset for E-Laas WP0 - Repository of cases characterizing logistic system scenarios (Milestone M0) (1.0) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.20512695>

5.2. Dataset objective

The purpose of the dataset is to provide structured input data for scenario-based and simulation studies of selected urban logistics systems. The dataset is an outcome of the work carried out in WP0 and represents Milestone M0.

The repository should be understood as a common reference dataset supporting the description, structuring and analysis of reference cases and scenarios. The dataset does not replace the detailed data used in individual models or publications, but provides a coherent input basis for further project analyses.

The dataset includes data for scenarios related to:

- ready-made food deliveries from restaurants to individual recipients,
- boxed meal deliveries to residential buildings and offices,
- parcel deliveries treated as one common demand stream split between home delivery and parcel locker delivery, with the possibility of including drone-based variants.

The scenarios differ primarily in terms of demand level, the structure of transport modes used, and the method of splitting parcel demand between delivery channels.

5.3. Dataset contents

The M0 repository consists of five basic files: one documentation file and four data files in XLSX format (Table 2).

Table 2. Contents of the M0 repository

File	Content and role in the repository
README.txt	Dataset documentation. It describes the dataset objective, data sources, licence, file structure, data scope, adopted assumptions and limitations.
Reference case and scenarios.xlsx	Main scenario file. It contains scenario definitions, transport mode structure variants, demand data, time profiles, modal split rules,

	assumptions concerning parcel delivery channels, package type distributions, vehicle parameters, energy and emission factors, and validation summaries.
Network.xlsx	Transport network data. The file contains nodes and directed road links, including length, number of lanes, capacity, speed and availability flags for selected transport systems and vehicle classes.
TAZ.xlsx	Traffic analysis zone data. The file contains demographic, spatial, transport, functional and travel-motivation characteristics of TAZs, as well as a travel-time matrix between the analysed zones.
Buildings.xlsx	Building data assigned to TAZs. The file contains building coordinates, the general and dominant building function, and the number of storeys.

The main operational file of the repository is *Reference case and scenarios.xlsx*. It contains the data structure directly related to scenario parameterisation. The most important groups of data in this file include:

- definitions of scenarios and their linkage to report D0.3,
- variants of transport mode structure,
- demand data for food deliveries,
- demand data for boxed meal deliveries,
- demand data for parcel deliveries,
- demand time profiles,
- distance-dependent rules for assigning transport modes,
- the split of parcel deliveries between channels: home delivery and parcel locker delivery,
- the distribution of package types by mass, volume and parcel locker eligibility,
- technical and operational parameters of transport modes,
- energy and emission conversion factors,
- source data concerning nodes, network links, parcel lockers, residential buildings, offices and restaurants.

The *Network.xlsx* file provides a simplified representation of the transport network. These data may be used for accessibility analyses, assigning points to network nodes, estimating distances and preparing input data for simulation models.

The *TAZ.xlsx* file describes selected traffic analysis zones. The data included in this file may be used to characterise the study area, compare zones, analyse similarity, aggregate results and interpret the spatial differentiation of demand and transport conditions.

The *Buildings.xlsx* file provides point data at the building level. These data are particularly relevant for demand modelling, recipient location, spatial analyses and assigning objects to TAZs and network nodes.

5.4. Data sources and modelling assumptions

The dataset was developed on the basis of several complementary data sources (Table 3). It uses both data derived from external models and databases, as well as own assumptions adopted to prepare a coherent input structure for the scenarios.

Table 3. Main data sources used in the M0 repository

Source	Role in the dataset
GZM macroscopic transport model	Source of data on the transport network, traffic analysis zones, selected transport indicators, travel times, road-link parameters and traffic-related characteristics.
BDOT10k	Source of topographic and building-related data, including building locations, building functions, number of storeys and land-use characteristics.
OpenStreetMap	Supplementary source of spatial data, used primarily to identify or verify the locations of restaurants, service points, parcel lockers, offices and other objects relevant to the scenarios.
Emission and energy-conversion sources	Methodological sources used to prepare assumptions related to energy and emissions, including EMEP/EEA, IPCC and KOBiZE.
Own modelling assumptions	Assumptions adopted where direct empirical data were unavailable or where it was necessary to harmonise the data structure for scenario and simulation purposes.

The full GZM macroscopic transport model is not part of the repository. The dataset uses selected derived data and input tables prepared on the basis of that model. The model itself remains the property of GZM and is not redistributed as part of the M0 repository. Own assumptions were applied primarily in relation to:

- scenario definitions,
- demand multipliers,
- demand time profiles,
- transport mode structure variants,
- modal shares,
- the split of parcels between delivery channels,
- package type distributions,
- selected technical vehicle parameters,
- selected operational parameters of logistics processes.

These assumptions were introduced to ensure the completeness and coherence of the dataset and to enable its use as input data for further simulation analyses.

5.5. Scope and limitations

The scope of the M0 repository is deliberately limited to the data needed to describe, structure and parameterise selected urban logistics scenarios. The dataset focuses mainly on the demand layer, the structure of transport modes, delivery channels, and basic operational, energy-related and emission-related parameters. The current version of the dataset does not include:

- dynamic changes in traffic conditions,
- detailed changes in charging infrastructure,
- detailed changes in refuelling infrastructure,
- road network development variants,

- the full GZM transport model,
- full operational data from logistics operators,
- simulation results,
- a full energy, emission or cost assessment of the scenarios.

The repository should be interpreted as a set of input data prepared for scenario-based research. Detailed simulation models, algorithms, experiments and analysis results are addressed in subsequent stages of the project and in separate reports.

5.6. Intended use of the dataset

The M0 dataset may be used as input data or as a reference point for further analytical, modelling and simulation work. Its primary purpose is to support research carried out in subsequent work packages of the E-Laas project, in particular in the modelling and assessment of selected urban logistics scenarios. Potential uses of the dataset include:

- preparing input data for microsimulation models, including models developed in the FlexSim environment,
- preparing data for macroscopic and spatial analyses,
- analysing the spatial distribution of demand and recipients,
- analysing the spatial accessibility of selected logistics facilities,
- conducting scenario-based studies concerning changes in demand, transport mode structure and delivery channels,
- assessing the potential impact of scenarios on energy consumption and emissions,
- comparing variants of delivery process organisation,
- supporting work on decision models, system dynamics models or agent-based simulation,
- preparing data for further scientific publications and project reports.

In practice, the dataset serves as a bridge between the conceptual outcomes of WP0 and further modelling. It enables the transition from a general definition of scenarios to their parameterisation in the form of data that can be used in simulation models and quantitative analyses.

6. Conclusions

The implementation of WP0 led to the preparation of a coherent basis for further analytical, modelling and simulation work in the E-Laas project. This work included the update of the state of knowledge, the development of the attribute structure describing reference cases and scenarios, and the identification of scenarios for the RC1 case – the Górnośląsko-Zagłębiowska Metropolis.

Milestone M0 constitutes a practical summary of these activities in the form of a data repository made available in Zenodo. The repository contains structured input data for selected urban logistics scenarios, in particular food deliveries, boxed meal deliveries and parcel deliveries treated as one common demand stream split between the home delivery channel and the parcel locker delivery channel.

The M0 dataset is not a full transport model or a set of simulation results. Its role is to provide a common, documented and citable data structure that enables scenario parameterisation and further use in microsimulation models, spatial analyses, scenario-based studies and energy-emission assessments.

Milestone M0 closes the conceptual and structural stage of WP0 and creates a direct transition to the subsequent stages of the project, in particular the work carried out in WP2, WP3 and WP4.

7. References

- [1] E-Laas WUT Team. (2026). *Dataset for E-Laas WP0 - Repository of cases characterizing logistic system scenarios (Milestone M0) (1.0)* [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.20512695>