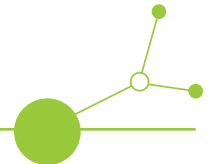


D.2.2.2 - Report from Pilot Implementation



Version 2
07 2026

draft by:	Ádám Bolyós, PP5 WPN	date:	2026.07.31.	version n° 1
revision by:		date:		version n° 2
FINAL VERSION				
approved by:		date:		



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1. Introduction

This document is Deliverable 2.2.2 has been prepared as part of the CE0200590 - Green LaMiS Project being implemented in the frame of the Interreg CENTRAL EUROPE 2021-2027 programme. The material is developed within Activity 2.2 - Pilot Action Implementation in Work Package 2 (WP2) - Ground testing and validation of the joint strategy and Action Plan which is a deliverable prepared in earlier stage of the project (as part of WP1 - Assessment and monitoring of services' environmental impact for a Joint Action Plan.)

The purpose of D.2.2.2 is to provide a consolidated presentation about the pilot process, experiences, results and lessons learned. Deliverable D.2.2.2 provides a consolidated account of the implementation of the Green LaMiS pilot action in the three territories involved: Bergamo in Italy, Klis in Croatia and Szombathely in Hungary. Its primary purpose is to document how the sustainable mobility strategy and action plan developed during WP1 were translated into practical measures within the everyday operation of home-delivered social services. The report describes the principal activities carried out by the municipalities, social service providers and mobility managers during the pilot implementation period. It presents not only the measures introduced, but also the implementation processes, organisational arrangements, monitoring activities and local adaptations that supported their application. Particular attention is given to the introduction and operational integration of greener vehicles, improvements in mobility management and service organisation, and the continuous monitoring of environmental, economic and operational performance. The deliverable also identifies the main results, implementation challenges, lessons learnt and factors influencing the long-term applicability of the tested approaches. In this way, D.2.2.2 provides the evidence base required to assess the practical validity of the Green LaMiS model and to support its further development into a transnational sustainable mobility.

The Green LaMiS project aims to develop a joint transnational solution for greening the last mile of home social service delivery in small and medium-sized cities in Central Europe. The project addresses the environmental and operational impacts generated by the mobility of social service providers, including CO₂ emissions, inefficient travel patterns, traffic-related pressures and weak urban-rural connections. Its approach combines Carbon Footprint assessment with indicators concerning territorial characteristics, mobility conditions and the organisation of the social services concerned. Following the development of a common methodology, strategy and action plan in WP1, the project tests the proposed measures under real operational conditions in Bergamo, Klis and Szombathely. D.2.2.2 contributes directly to this objective by presenting the evidence generated through these local pilot applications and by examining whether the proposed measures can improve the environmental and operational sustainability of home-delivered social services. The deliverable also supports the project output concerning the validation of a sustainable mobility model for home service delivery and provides practical knowledge for the jointly developed solution foreseen under WP3. By comparing three different territorial and organisational contexts, the report further contributes to identifying measures that may be adapted, transferred or replicated in other Central European municipalities and service-provider organisations.

D.2.2.2 is prepared within Work Package 2, entitled Ground testing and validation of the joint strategy and Action Plan, and more specifically within Activity 2.2 - Pilot Action Implementation. WP2 constitutes the operational testing phase of the Green LaMiS project, linking the methodological and strategic work completed in WP1 with the development and uptake of the joint sustainable mobility solution under WP3. The work package begins with the establishment of a common implementation framework, including shared guidelines and evaluation criteria intended to ensure that the pilot actions are carried out in a coordinated and sufficiently comparable manner. These common provisions are subsequently applied and adapted to the specific service structures, mobility conditions and territorial characteristics of the three pilot municipalities. Within this sequence, D.2.2.2 records and assesses the actual implementation of the pilot measures and consolidates the experiences generated at local level. It therefore represents the principal reporting output of the implementation phase and complements the monitoring activities performed through



the Carbon Footprint tool and the pilot-action KPI system. Its conclusions provide an essential link between local experimentation and transnational validation, supporting the formulation of the final joint solution and the capacity-building and policy-related activities carried out in WP3.

The report covers the pilot action implementation undertaken in the municipalities of Bergamo, Klis and Szombathely and the home-delivered social services selected in each territory. Its thematic scope includes the procurement, rental or provision of greener vehicles and their integration into the operational routines of the participating social service providers. It also examines changes and potential improvements in service organisation, route planning, fleet management and other mobility-related components of the management systems. The report documents the role of the local mobility managers, including their contribution to vehicle selection, operational planning, staff training, route optimisation, stakeholder coordination, data collection and awareness-raising activities. A further component concerns monitoring and evaluation, based on repeated Carbon Footprint calculations, pilot-action KPI data collections and qualitative feedback from municipalities, service providers and staff.



2. Methodological and strategic background

The implementation of the pilots was not a stand-alone activity but was built on the results of several previous project outcomes. This included the common assessment tool, the baseline analysis, and the joint strategy and action plan from WP1, furthermore the pilot action guidelines and the pilot action KPIs from WP2. It was a dedicated goal to incorporate these elements into the pilot implementation in some way. The list and role of each previously prepared project outputs is described below.

The following previously prepared project outputs were used for the pilot actions:

- **D.1.2.1 Common Assessment Tool / Carbon Footprint Tool**

The Common Assessment Tool provides a harmonised methodology for estimating the carbon footprint of home-delivered social services in Bergamo, Klis and Szombathely. During the pilot implementation, the tool provided the analytical basis for identifying emission-intensive mobility patterns, supporting vehicle-related decisions and monitoring changes in emissions over time.

- **D.1.2.2 Baseline Analysis**

The Baseline Analysis presents the results of the first application of the Common Assessment Tool to the social services involved in the project. It describes the initial operational, mobility and environmental conditions of each service, including their vehicle use, travelled distances, carbon footprint and territorial characteristics. The analysis established the reference situation against which the effects of the pilot actions could be assessed and helped the municipalities identify the services, vehicles and operational areas with the greatest potential for improvement. During the pilots it was used as a tool for monitoring the impacts of the applied actions.

- **D.1.2.3 Joint Strategy and Action Plan**

The Joint Strategy and Action Plan translates the analytical findings of WP1 into a common strategic framework and location-specific recommendations for greener home-delivered social services. It focuses particularly on appropriate vehicle selection, trip planning and route optimisation, the use of greener energy sources, and the organisational conditions required for implementation. During the pilot actions, this strategy and action plan was tested, as the name of WP2 indicates it (“ground testing and validation of the joint strategy and action plan), so this document was the subject of the whole pilot activity. The recommendations included in the document supported the municipalities in selecting and integrating mobility solutions and in identifying practical measures adapted to the characteristics of their respective services.

- **D.2.1.1 Guidelines for Pilot Actions**

The Guidelines formulates recommendations for implementing the pilot actions in Bergamo, Klis and Szombathely while allowing the municipalities to take account of their local conditions. They covered the principal implementation components, including mobility management, vehicle selection, economic sustainability, communication and investment management. The role of the document was to lay the foundation for the subsequent pilot activity and to help the affected settlements to effectively implement their pilots. Content parts of the guideline were incorporated into the structure of the pilot action implementation.

- **D.2.2.1 Pilot Action KPIs**

The Pilot Action KPIs provide a structured set of indicators for guiding the selection of green mobility solutions and evaluating their implementation and results. The indicators address environmental impact, economic feasibility, operational performance, employee satisfaction, potential areas for improvement, and the scalability and transferability of the tested solutions. Their repeated application during the pilot period enabled the municipalities and service providers to monitor



progress, compare results with the initial situation and assess experiences consistently across the three pilot territories.

In summary, the pilots were not ad-hoc actions, but a planned testing process that used results of WP1 and WP2 for different purposes. The pilots followed a common logic: preliminary analysis, selection of a green mobility solution, integration of vehicles, service organization analysis, KPI measurement, monitoring, and summary of experiences. Details will be described in the later chapters.



3. Overview of pilot territories and services

The following chapter provides an overview of the three pilot territories and the social services involved in the implementation. It highlights the main characteristics of each service, their mobility profiles and key operational challenges.

3.1. Bergamo, Italy

The Bergamo pilot involved 2 social services:

- I Pellicani ODV- Social Transport for People with Disabilities
- C.D.D. - Day Centre for People with Disabilities (Later it was replaced by C.S.E. - Centro Socio Educativo per l'Autismo)

The Pellicani ODV service includes accompanying people with disabilities from their residences to various services within the Municipality of Bergamo. Service during normal working hours, serving approximately 100 persons. Services use 18 vehicles, (some equipped with lifts for wheelchair). Vehicles used for transporting disabled persons have 9 seats each. There are both paid operators and volunteers working in the service. There is both daily and consistent service and on-demand service. The operators use passenger cars for other services and some of those are already electric.

The Day Centre for people with disabilities (C.D.D.) of the City of Bergamo is a service for severely disabled people who need continuous and specific assistance. They provide service from 9 am to 4 pm, from Monday to Friday. Transport service is provided to the users is the daily transport service from 7.45am to 9.00am Home/ C.D.D. and from 4pm to 5.15pm C.D.D./ Home, after the ordinary frequency at the C.D.D. from 9.00 to 4pm. The transport service is used by 33 users (the capacity of the day center) and provided by 8 caregivers (4 drivers and 4 assistants). They have 4 vans with 9-person capacity with wheelchair access.

During the implementation, a change occurred regarding the services included in the pilot. Another social service provider was brought in to replace C.D.D. The reason for this unexpected change was that the vehicle, which was already facing a significant delay in procurement, was not usable by C.D.D. Consequently, their role in the pilot was called into question, and it became necessary to bring in a new social service provider.

Centro Socio Educativo per l'Autismo (CSE) of the Municipality of Bergamo was involved to replace C.D.D. It is a daytime socio-educational service for young adults and adults with autism spectrum disorders whose support needs do not require placement within the regional socio-healthcare system. The service is based on individualised projects aimed at maintaining and developing personal, relational and daily-living skills, while promoting social participation and greater autonomy. It operates from Monday to Friday, generally from 9:00 a.m. to 4:00 p.m., and provides educational activities in small groups, including workshops focusing on wellbeing, personal and domestic autonomy, communication and socio-occupational skills. The service works closely with families and local community organisations, and several activities are implemented outside the centre to strengthen the users' inclusion in the urban environment. Its operation therefore generates regular mobility needs connected both to access to the centre and to educational, social and community-based activities carried out at different locations within Bergamo. The transport service is used by around 40 users and provided by two vehicles.

3.2. Szombathely, Hungary

Two social service providers participated in the Szombathely pilot:



- FÉHE Public Nonprofit Ltd. for the Disabled and Homeless;
- Pálos Károly Social Service Centre and Child Welfare Service.

Although both organisations provide essential social services, their mobility profiles and vehicle requirements differ substantially.

FÉHE provides support and transport services for people requiring special assistance, including people with disabilities, elderly persons and persons with reduced mobility. Its activities may involve transporting beneficiaries to schools, workplaces, healthcare appointments and administrative services, as well as carrying mobility aids, packages and other equipment. The organisation may visit 10-15 locations within Szombathely during a single day and also travels to nearby settlements. 2 cars are working regularly in relation to the service.

The Pálos Károly Social Service Centre provides home-care services for elderly people who are unable to manage independently or whose relatives cannot provide the necessary assistance. Care-related mobility includes journeys connected to personal care, grocery shopping, medication collection and other forms of home-based support. These tasks generally require short individual trips within the city, with occasional journeys to surrounding settlements. Caretakers use their own cars for the job, which means that 14-15 passenger cars serve in relation to the social service in a year.

3.3. Klis, Croatia

The Klis pilot involved household assistance and meal delivery services for elderly, infirm and socially disadvantaged residents living across the municipality. The service includes grocery shopping, medication collection, bill payment, the delivery of basic necessities and assistance with everyday household tasks. The service is delivered by ten female care workers, each generally responsible for a group of regular beneficiaries.

The territorial structure of Klis creates a distinctive mobility challenge. Beneficiaries are dispersed across different settlements, the average distance between service locations is relatively high, and the hilly terrain limits the practical use of some alternative transport modes. Before the pilot, providers relied mainly on personal petrol or diesel vehicles, walking and, where available, public transport, while daily routes were largely organised by the caregivers themselves.



4. Structure of the pilot action implementation

The pilot action implementation followed a common structure designed to ensure that activities carried out in Bergamo, Klis and Szombathely are coordinated, documented and monitored in a comparable manner. This structure was created leaning on the content of Deliverable D.2.1.1 - Pilot Action Guidelines elaborated beforehand by the WP2 leader CGM. This common approach supported the systematic testing of the recommendations formulated in the Joint Strategy and Action Plan while leaving sufficient flexibility to respond to locally identified needs and operational challenges.

From practical point of view, the goal was to provide a common, clear framework (with phases, tasks, and deadlines) for the implementation of pilot activities that will be feasible and all its elements perfectly understandable for the three pilot partners, and along which the pilot activity will be successfully implemented. To support this, WPN prepared several supporting documents with detailed information (instructions, descriptions, explanations, etc.) about how to implement each element in this internal structure.

It is important to highlight that this was an internal framework, meaning that the partnership decided to implement the pilot activities accordingly, and it was not defined in the application form of the project. It follows that this structure cannot be described as rigid, there was room for some flexibility. Partners were asked to work within these frames to ensure a consistent process, but it was also acceptable if pilot partners - for any reason - might not place equal emphasis on every element of the structure at a given location.

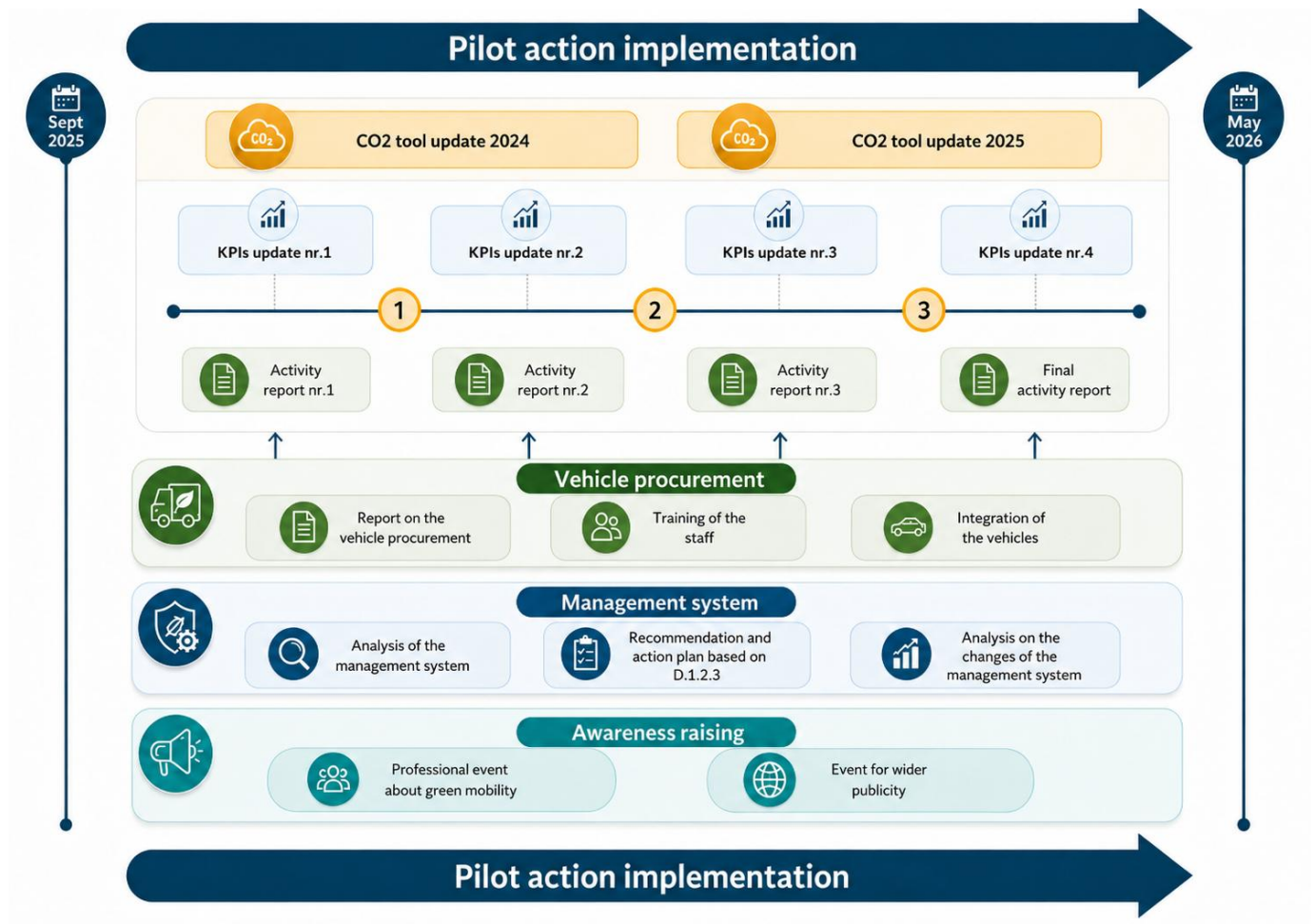
This internal structure was established with three main objectives:

- (1): to ensure that pilot action tasks are implemented in a consistent and coordinated manner, both in terms of timing and content;
- (2): to support the project partner, and particularly the Municipality partner, in progressing efficiently and successfully completing all activities required;
- (3): to provide a transparent framework for monitoring the implementation process



4.1. Elements of the structure

The figure below illustrates the elements and process of the pilot action implementation.



1. Figure: Main elements and process of the Pilot Action Implementation

The structure basically includes two types of elements:

- (1) Content-related elements
- (2) Monitoring-related elements

The first category covered all the practical actions and organisational interventions undertaken in the pilot territories. The second category consisted of monitoring and reporting elements, which were introduced to document progress, assess the impacts of the interventions and provide comparable information from the three pilot municipalities. This distinction ensured that the pilot actions were not treated as isolated investments or events, but as structured processes in which implementation, monitoring, evaluation and organisational learning were closely linked.



4.1.1. Content-related elements

The three main content-related elements were categorized as follows:

1. Vehicle-related elements
2. Management system-related elements
3. Awareness raising type of elements

The content-related elements were implemented around three main thematic lines. The first was the vehicle-related line. During the pilot actions, pilot partners implemented vehicle-related and non-vehicle-related actions and interventions with the aim of moving the delivery of home social services in a positive direction. Vehicle-related actions covered all elements starting with the car selection, through the whole procurement process, then putting them into use at the social service providers involved to the experiences on their usage. Green vehicle procurement was key component and major common point of the pilot action in every pilot settlement, social service providers of Bergamo, Klis and Szombathely all enriched with electric vehicles. Municipalities were required to document the factors influencing their vehicle-related decisions, including service characteristics, territorial conditions, financial considerations, calculations produced through the project tools and the recommendations of the Joint Strategy and Action Plan. After the procurements finished, attention was also given to other topics, such as charging, maintenance, trainings for the staff who will use the new vehicles and then gaining experience in using the electric vehicles. Pilot Municipalities provided input documentation regarding the vehicle procurement then about the integration of the new vehicles in which they reported the details of the processes.

The second thematic line focused on the management systems of the social services involved. Every other type of actions that do not refer to the vehicle procurement, or is not related to it, can be categorized to the **management system-related elements** category. Under this category (as an “umbrella” category), pilot partners implemented organizational and/or operational type of interventions regarding the social services providers involved. These actions might be different depending on the characteristics of the different service providers and the social services they are providing. As an initial step, the municipalities and mobility managers examined how home visits and related transport activities were organised in practice. This could include the allocation of beneficiaries to care workers, daily scheduling, route planning, the management of vehicles and human resources, the treatment of regular and ad hoc service needs, and existing data collection practices. Municipalities and mobility managers were granted a relatively high degree of flexibility in carrying out this activity, with fewer predefined requirements, constraints and expectations regarding its implementation. Based on this analysis, potential weaknesses and intervention points were identified, and Municipalities could move forward in their related work by using these as a basis. The municipalities could subsequently test changes intended to improve operational efficiency, reduce unnecessary travel and emissions, and support the effective integration of the new vehicles. At the end of the pilot period, the partners could assess the changes introduced and their effects on service operation. During the pilot period, pilot partners provided input documentation about the work done and its results.

This management-system thematic line also provided the main framework for testing the recommendations and actions formulated in Deliverable D.1.2.3. - as main target of the activity. Nevertheless, the implementation framework was not limited exclusively to interventions defined during WP1. Municipalities and mobility managers were also allowed to incorporate additional measures identified during the pilot period, provided that these responded to demonstrated local needs and contributed to more sustainable or efficient service delivery. In this way, the pilot actions combined a common transnational methodological basis with a flexible, practice-oriented local implementation process.

The third thematic line was about **awareness raising** which were complementary elements intended to increase awareness of sustainable mobility, present the practical experiences gained through the pilot



actions and facilitate the transfer of knowledge beyond the organisations directly involved. The target groups of these elements were professionals and wider public.

4.1.2. Monitoring-related elements

The monitoring framework combined several complementary elements to support both the qualitative and quantitative assessment of pilot implementation. As illustrated in the implementation flow chart above, the partnership monitored progress through three distinct mechanisms, each building on results and tools developed during earlier stages of the project.

The elements of the monitoring framework were the following:

1. Updates of the baseline analyses
2. KPIs updates
3. Activity reports

Baseline analyses updates: The first quantitative monitoring element consisted of updating the baseline analyses prepared under WP1. These original assessments were based on 2023 data and focused on the social services involved in the pilot, including the carbon footprint associated with their vehicle fleets. To track changes over time, each pilot municipality collected updated input data from the relevant social service providers and repeated the analysis for the years 2024 and 2025 by using the Carbon Footprint Tool developed within the project. This served to monitor the longer-term development of the processes, where the 2025 data could already reflect the results of the Green LaMiS project.

KPIs updates: The second quantitative monitoring element was the set of pilot action KPIs defined under WP2. A dedicated data collection template was prepared to gather the input required for calculating the selected indicators. These KPIs provided a structured basis for monitoring changes in the environmental, economic and operational performance of the pilot actions over the course of implementation. During the piloting phase, the involved service providers (through the Municipalities) needed to provide this data collection altogether 4 times, and data collection focused on 2-week periods. Unlike the baseline updates, KPIs updates provided the opportunity to monitor shorter-term processes. Data collection template is prepared and provided with the Municipality partners in three languages.

Activity reports: Activity reports were the qualitative monitoring elements in the structure. During implementation, the partners were required to provide the activity leader with various inputs at predefined points in time in order to support the monitoring of the process and its subsequent evaluation. Each municipality provided four activity reports over the course of the pilot process every two months, in which pilot partners described their process regarding the pilot action implementation. More specifically, they needed to write about the progress in relation to all above-written content-related pilot elements, plus the role and work of the mobility manager in the given period. In addition, they needed to attach all the relevant evidence. This internal reporting was carried out using an activity report template prepared by the activity leader WPN. Activity report template can be found as Annex.

4.2. Timing of the implementation

The Implementation of the pilot actions was carried out between September 2025 and April 2026. The schedule for the pilot phase was largely influenced by the progress of vehicle procurement and the mobility manager appointments in the pilot municipalities. Until these steps had been taken, there was no basis for starting the pilot activities. Eventually, the partnership was able to launch the pilot implementation according to the internal structure in September 2025.



During the implementation, the partnership was working on the execution of the above-described tasks. Even though the pilot phase officially ended at the end of April 2026, several activities will continue in the following period. For example, the activities of the mobility managers did not end on April 30th, their work with the municipalities and the social service providers will continue after that. As well as the performance of the electric vehicles will be monitored.

Timing of the monitoring: The 8 months of the pilot action implementation phase were divided into four equal 2-month long sub-periods, as follows:

- Period 1: 1st of September - 31st of October 2025
- Period 2: 1st of November 2025 - 31st of December 2025
- Period 3: 1st of January 2026 - 28th of February 2026
- Period 4: 1st of March 2026 - 30th of April 2026

Pilot partners prepared their regular activity reports according to this schedule.

Between the periods, internal monitoring moments were integrated when WP2 partners assessed the progress of the pilot process. The 3 internal monitoring moments were 1st of November 2025, 1st of January 2026 and 1st of March 2026.



5. Role and contribution of mobility managers

Each pilot municipality appointed a mobility manager to support the local implementation of the Green LaMiS pilot action. The role connected the strategic objectives of the project with the everyday operation of the participating social services. Mobility managers therefore provided not only technical advice on vehicles, but also practical support for procurement, route planning, staff training, monitoring, data collection and cooperation between municipalities and service providers.

One of their main responsibilities was to support the selection, procurement or rental of environmentally preferable vehicles that were also suitable for the actual service profiles. The assessment considered not only the initial cost, but also expected distances, passenger and cargo requirements, accessibility, charging possibilities, energy consumption, maintenance needs and operating costs. Mobility managers contributed to the preparation of technical specifications and evaluation criteria, assessed available vehicle options and supported communication with suppliers. This helped ensure that the selected vehicles were appropriate for everyday service delivery.

Staff training and the operational integration of the new vehicles formed another important area of activity. Mobility managers provided guidance on vehicle operation, charging, energy-efficient driving, range management and basic maintenance. Where necessary, they also prepared user manuals and practical guidance materials. These activities helped reduce uncertainty among employees and supported the integration of electric vehicles into existing working routines. They also contributed to defining parking and charging arrangements, vehicle allocation and responsibilities related to maintenance and daily use.

A further task was the analysis of mobility-related management processes. Together with municipal teams and service-provider staff, mobility managers examined beneficiary allocation, work schedules, vehicle use, route-planning practices, technical journeys and data-collection procedures. The objective was to identify opportunities to organise travel more efficiently without negatively affecting the quality and continuity of service provision. Home-delivered social services cannot be organised exclusively according to transport-efficiency criteria. Appointment times, beneficiary needs, accessibility requirements and the professional judgement of care workers must remain primary considerations. The role of the mobility manager was therefore not to impose the shortest route in every case, but to identify avoidable journeys, unnecessary backtracking and opportunities for better coordination while preserving the flexibility and social sensitivity of the service.

Mobility managers also contributed to monitoring and reporting by supporting the collection and verification of data required for CO₂ analyses and KPI calculations.



6. Key Performance Indicators - KPIs

In an earlier phase of the project, prior to the start of the pilot activity, a common set of Pilot Action Key Performance Indicators (KPIs) was developed to support the implementation and evaluation of the Green LaMiS pilot actions. The KPI system was designed to provide a comparable monitoring framework for the three pilot territories, while still allowing the partnership to take into account the different local service models, territorial conditions and mobility solutions tested in Bergamo, Klis and Szombathely. In Deliverable “D.2.2.1 - Pilot Action KPIs” these indicators are described and summarized.

The KPIs served three main functions:

- they supported the selection of green mobility solutions by assessing their expected environmental and economic feasibility before implementation.
- they monitored the actual results of the implemented solutions during the pilot period, particularly in terms of CO₂ emissions, usability and operational performance.
- they helped assess whether the tested solutions could be maintained, improved or transferred to other services after the pilot phase.

The KPI framework combined environmental, economic and operational indicators. The environmental dimension focused mainly on the reduction of CO₂ emissions per service contact. The economic dimension examined vehicle-related costs, cost per service contact and investment payback period. The operational and organisational dimension included user satisfaction, operational flexibility and adoption readiness, which are particularly important in social service delivery, where new mobility solutions must fit into sensitive, time-dependent and user-centred care processes.

By using this set of KPIs, the partnership did not only measure environmental outputs. It also helped to understand whether the tested green mobility solutions were operationally realistic, financially justifiable and acceptable for the social service providers. This is an important aspect of the Green LaMiS pilot actions, because home-delivered social services are complex and cannot be reorganised purely on the basis of transport efficiency. Any mobility-related intervention must also respect many factors like the continuity, reliability and professional quality of social care.



The following KPIs were used:

KPI group	Name of the KPI	What it measures	Interpretation
Selection of green mobility solutions	Sustainability Impact Score	Estimated CO ₂ reduction compared to the baseline scenario	Shows the expected environmental benefit of replacing conventional vehicles or introducing greener mobility solutions
	Cost-Benefit Feasibility Score	Energy/fuel cost savings per kg of CO ₂ avoided	Indicates whether the environmental benefit is accompanied by reasonable operational savings
Results of the implemented solution	Reduction of CO ₂ emissions	Change in kg CO ₂ per service contact between monitoring periods	Shows whether the pilot action reduced the carbon intensity of service delivery
	Employee Green Solution Usability Score	Drivers' and staff members' experience with the green mobility solution on a 1-7 scale	Indicates whether the new solution is accepted by the staff and compatible with daily work
	Change in average km per day per operator	Change in travel intensity per operator	Helps assess the impact of route optimisation and service reorganisation
	Breakdown and Maintenance Rate	Share of pilot days affected by vehicle unavailability	Shows whether technical reliability may limit operational use
	Cost per Service Contact	Vehicle-related operating cost per service contact	Indicates cost efficiency of the service delivery model



Green LaMiS

Scalability and transferability	Adoption Readiness Index	Readiness for adoption on a 4-20 scale	Shows whether the solution can be transferred or scaled with limited barriers
	Operational Flexibility Score	Applicability of the solution across different service types on a 1-7 scale	Measures whether the solution can support different operational needs
	Investment Payback Period	Time needed for savings to offset the investment	Indicates the longer-term financial feasibility of the new solution

1. Table: Kex Performance Indicators used during the pilot actions



7. Implementation of pilot actions

This chapter consolidates the main findings and lessons emerging from the implementation of the Green LaMiS pilot action in Bergamo, Klis and Szombathely. Although the activities were carried out within a common implementation and monitoring framework, the pilot locations differed in terms of territorial conditions, service profiles, organisational structures and approaches to integrating green vehicles. These contextual differences are therefore considered when interpreting and comparing the results.

This chapter provides a summary of the pilot actions broken down by pilot area, using the same subchapter structure for all three municipalities: vehicle procurement, management system and monitoring and KPI data collection. At the beginning always mentioning the municipality-specific recommendations of the Joint Strategy and Action Plan. Within the monitoring and KPI data collection sub-chapters, CO₂ analyses updates and KPI related information and data can be found, with several tables and related descriptions presenting the results.

7.1. Bergamo

The Joint strategy and action plan formulated recommendations regarding the following topics:

- Vehicle selection based on the characteristics of the city and the needs of the service providers. Since the service involves transporting individuals with disabilities, the document named electric van as feasible vehicle type to be procured. The made suggestions to lease a 9-seater contained exact car types, as possibilities: Ford e-transit; Citroen e-SpaceTourer.
- Trip planning regarding the services involved. Due to the static-nature of routes related to the social services, there is room for only minor improvements to optimize the trips by reviewing the routes when the service users change. the possibilities to involve green energy to the related transportation activities of the social service.
- Green energy: buying electricity from greener sources and using biofuels for the diesel vans
- Appointment of a mobility expert

7.1.1. Vehicle procurement

In Bergamo, the objective of the pilot action was not merely to acquire new vehicles, but to test whether a rental-based electric mobility solution could meet the capacity, accessibility and operational requirements of social services under real working conditions.

The preparation of the investment began with an assessment of the mobility needs of the two initially involved service providers, Associazione Pellicani and CDD. The Municipality of Bergamo, the mobility manager and the service providers examined passenger capacity, the characteristics and frequency of the journeys, accessibility requirements, expected mileage, charging opportunities and the need to ensure continuity of service provision. Several alternatives were considered, including the continued use of conventional vehicles, hybrid or plug-in hybrid vehicles, the purchase of electric vehicles and the long-term rental of fully electric vehicles.

The long-term rental model was selected because it combined environmental benefits with predictable costs and operational flexibility. In comparison with direct purchase, it limited the long-term asset-management obligations of the Municipality and included maintenance, assistance, insurance and other fleet-management services within the contractual arrangement. The twelve-month rental period corresponded



to the minimum contractual duration available on the market for vehicles of the required category and was therefore considered the most proportionate solution for the time-bound pilot action.

Before launching the procurement procedure, the Municipality verified whether suitable electric vehicles were available through the Consip¹ framework agreements accessible to Italian public administrations. As no available framework agreement provided vehicles that met the required technical configuration and rental conditions, the Municipality proceeded through the regional SINTEL e-procurement platform. Following approximately three months of market research and consultations with the service providers, a call for tenders for the supply of two electric vehicles was published² on 18 September 2025. The procedure was addressed to KINTO Italia, which submitted its financial offer on 29 September 2025. The service contract was formally awarded through an executive determination issued on 3 October 2025.

The procurement resulted in the long-term rental of two fully electric Toyota Proace vehicles. Each vehicle has 9 seats and can be driven with a standard category B driving licence. This configuration provides the passenger capacity required for disability-related social transport while eliminating tailpipe emissions during service operation. The total eligible investment cost was 42 936 EUR.

During the period preceding the delivery of the final vehicles, the Municipality and the mobility manager worked with KINTO Italia to identify an interim solution. Associazione Pellicani accepted a temporary electric vehicle with characteristics and capacity comparable to those of the final vehicle. This allowed the provider to gain practical experience with electric mobility and to start testing its operational integration before the completion of the procurement process. CDD did not take up the temporary vehicle because it was operating from provisional premises and did not yet have an appropriate location for parking and charging.

Under the contractual conditions, the final vehicles were to be delivered with an expected deadline of 3 March 2026. From the beginning of February, the mobility manager and the project manager repeatedly contacted the supplier to obtain updated information and prepare the handover and onboarding of the service providers. KINTO Italia subsequently reported technical and logistical difficulties within its supply chain. The vehicles reached the registration phase on 23 March 2026. A preliminary inspection was then carried out by the Municipality and the mobility manager to verify that the registration documents, equipment and technical characteristics corresponded to the procurement specifications. Both vehicles were formally collected by the Municipality of Bergamo on 3 April 2026. The Municipality subsequently concluded the necessary operational agreements with the service providers, establishing the legal and insurance conditions under which the vehicles could be used for project-related activities.

The first final vehicle was handed over to Associazione Pellicani on 13 April 2026 and was immediately integrated into the transport activities of the service provider. Pellicani already had previous experience with electric mobility, which facilitated the technical and operational transition.

The allocation of the second vehicle required an additional organisational adjustment. Due to internal restructuring, relocation-related difficulties and changes in the transport needs of its users, CDD was no longer able to integrate the 9-seat electric vehicle into its activities. In particular, the service increasingly required specialised vehicles that were not compatible with the configuration selected under the pilot. As this change could not reasonably have been foreseen during the original procurement process, the Municipality and the municipal department responsible for social services identified Centro Socio Educativo (C.S.E.) as an appropriate substitute beneficiary.

Following the preparation of the necessary agreement and the verification of the operational and monitoring capacities of CSE, the second electric vehicle was collected by the new provider on 11 June 2026 and entered operational use. CSE adopted a combined charging strategy, using municipal rapid-charging stations located

¹ Consip S.p.A. - Consip is an Italian state-owned company that provides frameworks and consultation for the procurement of public goods and services

² under procedure ID No. 207383763



close to its premises for larger charging requirements and a standard Schuko connection for smaller overnight charges. This solution was considered suitable in terms of both cost-effectiveness and operational convenience.

The mobility manager played an important role throughout the acquisition process. His contribution included supporting the definition of the technical requirements, maintaining contact with KINTO Italia and its local representative, checking the vehicles and documentation against the tender specifications, assisting the service providers with charging and operational arrangements, and supporting the transition from CDD to CSE. The investment was also linked to the common monitoring framework of the project, through which vehicle use, service performance, costs and environmental impacts were recorded and assessed.

As a complementary element, Associazione Pellicani also received a cargo bike provided by Repower. This solution supplements the rented electric vehicle and enables the provider to test a smaller zero-emission mobility option for activities where passenger capacity and longer-range transport are not required.

Overall, the Bergamo investment combined a structured needs assessment, public procurement, long-term electric-vehicle rental, temporary vehicle provision, operational agreements and service-specific technical support. Although the supplier delay and the replacement of one beneficiary required additional administrative and organisational work, both electric vehicles ultimately entered operational service. The experience demonstrates that a rental-based model can offer a flexible and replicable approach for greening social-service mobility, provided that vehicle characteristics, charging conditions and service-provider readiness are continuously aligned throughout both procurement and implementation.



2. Figure: Rented electric van for the social services in Bergamo

Source: Municipality of Bergamo

7.1.2. Management system

The management-system-related activities in Bergamo focused on the operational integration of the new mobility solutions, coordination between the Municipality, the mobility manager, the vehicle supplier and the participating service providers, and the adaptation of service organisation to the characteristics of the electric vehicles. Compared with the other pilot territories, the Bergamo model involved a relatively large



number of institutional and operational actors and was strongly influenced by the complexity of urban traffic, accessibility requirements and the specific needs of services transporting people with disabilities.

During the initial implementation phase, management activities concentrated mainly on supporting the vehicle-rental procedure, preparing the service providers for electric-vehicle use and collecting the information required for pilot monitoring. The project manager, the mobility manager and the relevant municipal offices maintained regular contact with the service providers and with KINTO Italia and its local representative. Particular attention was given to the staff responsible for vehicle operation and maintenance, the identification of appropriate vehicles to be replaced, charging arrangements and the relationship between the new vehicles and existing service routes.

An important organisational challenge emerged when CDD, one of the originally selected service providers, was unable to accept the second electric vehicle. CDD was undergoing internal restructuring connected to its relocation and to changes in the composition and transport needs of its users. In particular, an increasing need for specialised transport equipment meant that the nine-seat electric vehicle selected under the project was no longer sufficiently aligned with its operational requirements. This development was not caused by the project and could not reasonably have been anticipated during the original vehicle-selection process.

To prevent the vehicle from remaining unused and to preserve the objectives of the pilot action, the Municipality and the municipal social-services department identified CSE as a replacement service provider. The substitution was conditional on CSE being able to provide sufficiently detailed historical and current information on its users, operators, vehicles and mobility activities. This was necessary to maintain the continuity and comparability of the baseline analysis and KPI monitoring despite the change of service provider.

For Associazione Pellicani, the integration of the electric vehicle was comparatively straightforward because the organisation had already been operating an electric vehicle for approximately two years. As a result, its staff were familiar with the main operational characteristics of electric mobility, including charging, maintenance, range management and day-to-day vehicle use. Training and technical support could therefore concentrate on the characteristics of the newly provided vehicle and on opportunities for improving service organisation.

Identified intervention points:

Two online coordination meetings were organised with Pellicani to examine whether the nine-seat capacity of the vehicle could support changes in route and service planning. The analysis identified the Wednesday transport activities as a realistic area for intervention. By using the higher-capacity vehicle, two journeys that had previously required two separate vehicles could be consolidated into a single trip. The service provider did not consider more extensive restructuring appropriate, because many of its users are vulnerable persons for whom stable schedules, familiar routines and continuity of service are important elements of care quality. The Bergamo pilot therefore applied route optimisation selectively, balancing environmental and operational efficiency with the social needs of service users.

The following actions have been tested during the pilot:

- rethinking and restructuring transport activities - optimizing journeys

Preparatory training and technical support were also provided to CDD from January 2026, before the final vehicles became available. As CDD had no previous experience with electric vehicles, the mobility manager organised several calls to explain vehicle operation, charging and maintenance requirements. A central challenge concerned the identification of an appropriate charging location. The installation of a wallbox at the service's new premises was examined and Repower offered to make charging equipment available on a free-loan basis. However, technical difficulties connected to the renovation of the new facility prevented the installation. Alternative external charging options would have been more expensive and operationally



less efficient. Together with the changing service requirements, this contributed to the eventual decision of CDD not to take over the vehicle.

Following the substitution, training and operational support for CSE began on 11 June 2026, immediately after the agreement had been signed and the vehicle was collected by the designated service manager. Support covered the general operation and management of the electric vehicle as well as the identification of an appropriate charging strategy. CSE selected a combined solution: municipal rapid-charging stations located close to its premises were used for larger charging requirements, while a standard Schuko connection was used for smaller overnight charges. This combination was considered appropriate in terms of both cost and operational convenience.

The route-planning analysis for CSE showed that the structure of its activities differed from the more regular home-to-service transport undertaken by Pellicani. Users are generally accompanied to a common meeting point at the CSE premises, from which the vehicle transports users and staff to different programme locations. Some destinations, such as swimming pools, libraries and educational farms, are relatively stable, while others, including parks, nature reserves and occasional recreational destinations, vary according to the service programme. As a result, comprehensive route standardisation was not considered feasible. The management-system review therefore concentrated primarily on the fixed and more predictable journeys, where structured planning and operational improvements could be introduced without reducing the flexibility required by the service.

7.1.3. Monitoring and KPI data collection

Monitoring and KPI data collection in Bergamo followed the common Green LaMiS KPI framework, but the available data show that the different services were at different stages of pilot implementation. The KPI material includes data for Pellicani, CDD and CSE. However, the level of completeness differs by service and by reporting period. Therefore, the Bergamo KPI results should be interpreted with caution and together with the qualitative implementation information from the activity report.

The ex-ante KPI calculations already indicated that Bergamo had relevant emission reduction potential. In the case of Associazione Pellicani, replacing the most used vehicle with an electric solution was estimated to reduce emissions by 20 % using the location-based approach and by 26 % using the market-based approach. Replacing the two most used vehicles would increase the estimated reduction to 41 % and 52,7 %, respectively. For CDD, the potential effect was even stronger: replacing the most used vehicle was estimated to reduce emissions by 22,5 % location-based and 28,2 % market-based, while replacing the two most used vehicles was estimated to reduce emissions by 50,7 % and 61,6 %, respectively.

7.1.3.1. CO₂ analysis updates

Pilot partners prepared updates of the baseline analysis (data from the year 2023) by using the CO₂ assessment tool, which resulted that data between the years 2023, 2024, 2025 are now comparable.

- **Pellicani**

Vehicle breakdown - presents some data regarding the vehicles used in relation to the Pellicani service in the 3 years under review (km travelled and the related CO₂ emissions)



	Model	Vehicle typology and fuel type	Km travelled (km)			Emissions (kg CO ₂)		
			2023	2024	2025	2023	2024	2025
Vehicle 1	Fiat Scudo	van, diesel	11 085	-	-	1 896	-	-
Vehicle 2	Renault Traffic	van, diesel	21 100	11 596	11 676	4 009	2 203	2 218
Vehicle 3	Iveco Daily	van, diesel	15 250	14 037	-	3 233	2 976	-
Vehicle 4	Opel Astra 1.8i	car, gas	11 050	7 570	13 270	2 011	1 378	2 415
Vehicle 5	DOBLO' CV 19 '03	van, diesel	24 280	9 051	11 227	3 958	1 475	1 830
Vehicle 6	DOBLO' CV 1.9 '09	van, diesel	-	13 328	12 809	-	2 172	2 088
Vehicle 7	Opel Movano 2.3 CDTI	van, diesel	-	13 270	-	-	2 880	-
Vehicle 8	Peugeot boxer 2200 hdi	van, diesel	-	9 822	12 071	-	2 161	2 656
Vehicle 9	Doblò PMG 1.900	van, diesel	-	-	1 189	-	-	194
Vehicle 10	Toyota Proace	van, electric	-	5 107	10 053	-	196	385
Total km			82 765	83 781	72 295	15 107	15 441	11 786

2. Table: Vehicles used in relation to the service of Pellicani between 2023 and 2025

The vehicle-level data show that mobility demand of Pellicani remained broadly stable between 2023 and 2024, while both total km travelled and related CO₂ emissions decreased clearly in 2025. Emissions fell more sharply than the distance travelled, indicating that the improvement was not driven solely by reduced mobility, but also by changes in fleet composition and vehicle allocation. An electric van had already been part of the fleet since 2024; this vehicle was acquired independently of the Green LaMiS project. Its role in service delivery increased substantially, with annual distance travelled rising from 5 107 km in 2024 to 10 053 km in 2025, so the annual almost doubled, increasing its role in everyday service delivery, while several conventional vehicles were withdrawn or used less intensively. The growing share of service-related travel performed by the electric vehicle contributed to a cleaner mobility mix and was consistent with the marked reduction in total fleet emissions recorded in 2025. The additional electric minibus procured through Green LaMiS entered service on 13 April 2026, and its effects are therefore not reflected in the 2023-2025 baseline table. Nevertheless, its operational integration, combined with further route consolidation and service-planning improvements, is expected to support additional emission reductions in 2026.



CO₂ emissions breakdown - shows how much each element contributed to the total emission by year

Year	Total CO ₂ Emissions	Conventional fleet (gas + diesel)	Public transport	Electric fleet
2023	15 107	15 107	0	0
2024	15 441	15 245	0	196
2025	11 786	11 401	0	385

3. Table: CO₂ emissions breakdown in relation to the social service of Pellicani

▪ CSE

Vehicle breakdown - presents the vehicles used in relation to the CSE service in the 3 years under review (km travelled and the related CO₂ emissions)

	Model	Vehicle typology and fuel type	km travelled (km)			Emissions (kg CO ₂)		
			2023	2024	2025	2023	2024	2025
Vehicle 1	FIAT Ducato 2.2L	diesel van	15 600	18 400	21 600	2 465	2 907	3 413
Vehicle 2	VOLK Golf 1.6 TDI DPF 5p	diesel car	8 500	6 500	9 800	1 267	969	1 460
Total km / emissions (kg CO ₂)			24 100	24 900	31 400	3 732	3 876	4 873

4. Table: Vehicles used in relation to the service of CSE-Bergamo between 2023 and 2025

CSE served 40 beneficiaries with 8 care workers in 2023, 38 beneficiaries with 7 care workers in 2024, and 41 beneficiaries with 8 care workers in 2025, while two conventionally fuelled vehicles were in operation throughout all years of the period. Total distance travelled increased over the years, by 2025, it exceeded 31 000 km. The strongest increase can be described in relation to the use of the FIAT Ducato van. Consequently, the combined fleet emissions rose from 3 732 kg CO₂ in 2023 to 4 873 kg in 2025. As the increase in mobility was considerably stronger than the change in the number of beneficiaries and care workers, the results highlight the relevance of reviewing recurring journeys and applying route-planning measures to the fixed and more predictable elements of the service. The electric vehicle provided through the Green LaMiS project entered operation only in June 2026, and its impact is therefore not reflected in the figures of baseline analysis updates, nevertheless, its integration is expected to reduce the emissions intensity of future service delivery.

CO₂ emission breakdown - shows how much each element contributed to the total emission regarding CSE service



Year	Total CO2 Emissions	Conventional fleet (gas + diesel)	Public transport	Electric fleet
2023	3 732	3 732	0	0
2024	3 876	3 876	0	0
2025	4 873	4 873	0	0

5. Table: CO₂ emissions breakdown in relation to the social service of CSE - Bergamo

At fleet level, CO₂ emissions remained relatively stable between 2023 and 2024, before rising more substantially to in 2025 (4 873 kg). This development reflects the marked increase in total vehicle mileage, particularly the growing use of the diesel van. The results confirm that, before the project vehicle was introduced, mobility-related environmental performance of CSE was closely linked to the volume of travel carried out by conventional vehicles. Future monitoring should therefore assess whether the combined effect of electric vehicle use, and targeted optimisation of recurring routes can reverse this trend while maintaining the required level and flexibility of service provision.

7.1.3.2. KPIs

- Pellicani

Pellicani provided the required dataset for the KPI four times within the pilot period.

	Period 1	Period 2	Period 3	Period 4
Fuel type - old vehicle	Gasoline	Gasoline	-	-
Fuel type - new vehicle	-	Electric	Electric	Electric
Service delivery				
Km travelled	499	190	205	286
Operators	8	9	9	9
Operational days	6	7	7	8
Service contacts	21	44	n/a	19
CO ₂ emissions	-	-	-	0
Service fuel / energy cost (EUR)	92	12,35	17,22	23,94
Economic KPIs				
Old vehicle tax (EUR/year)	0	0	-	-
Old vehicle insurance (EUR/year)	1200	1200	-	-
Old vehicle maintenance (EUR/year)	3200	3200	-	-
Old vehicle other costs (EUR/year)	1200	1200	-	-
Total old vehicle cost (EUR)	11196,67	11196,67	11196,67	11196,67
Total new vehicle cost (EUR)	-	643,96	628,53	1092,26
Qualitative KPIs				
Adoption Readiness Level	-	15	16	n/a



Operational Flexibility Score	-	4,8	5,2	n/a
Employee Green Solution Usability Score	-	6,6	6,7	n/a

6. Table: KPI inputs - Pellicani

For Pellicani, the KPI data indicate the clearest and most consistent pilot-related development among the Bergamo service providers. The comparison between Period 1 and the subsequent monitoring periods shows a clear transition from conventional vehicle use towards the operational integration of the temporary electric vehicle. While Period 1 mainly reflected the pre-pilot situation, Period 2 already demonstrated a more efficient service pattern: the number of service contacts more than doubled, despite a substantial reduction in the distance travelled. At the same time, energy-related costs massively dropped (12,3 EUR) compared to period 1 when a conventional vehicle served (93 EUR).

The qualitative indicators also confirm a generally positive transition. In Period 2, the service achieved a high adoption readiness level and a high employee usability score, suggesting that staff were willing and able to integrate the electric vehicle into everyday operations. Operational flexibility was assessed as moderate, indicating that the vehicle was suitable for the main service tasks, although some practical constraints remained.

The results remained stable and improved slightly in Period 3. Adoption readiness increased from 15 to 16, the operational flexibility score rose from 4.8 to 5.2, and employee satisfaction remained high, increasing from 6.6 to 6.7. These changes suggest that familiarity with the vehicle strengthened over time and that the operational experience continued to be favourable. Energy costs also remained low, supporting the economic advantages of electric mobility in day-to-day use.

In Period 4, the vehicle continued to be used under normal operating conditions, with a moderate increase in distance travelled and operational days compared with the previous period. Energy related costs remain at the same low level as in period 2 and period 3. However, no qualitative indicators were available for this period, so no further conclusions can be drawn regarding changes in staff acceptance or operational flexibility.

- CSE

	Period 1	Period 2	Period 3	Period 4	Period 5
Fuel type - old vehicle	Diesel	Diesel	Diesel	Diesel	
Fuel type - new vehicle					Electric
Service delivery					
Km travelled	234	627	250	237	205
Operators	33	31	38	37	17
Operational days	13	12	15	14	9
Service contacts	68	164	73	58	33
CO ₂ emissions	n/a	n/a	n/a	n/a	n/a
Service fuel / energy cost (EUR)	111	148	120	103	34,65
Economic KPIs					
Old vehicle insurance (EUR/year)	650	815	650	650	
Old vehicle maintenance (EUR/year)	2650	2800	3500	3500	
Total new vehicle cost (EUR)					0

7. Table: KPI inputs – CSE-Bergamo



The CSE service was incorporated into the pilot at a later stage following the organisational change affecting CDD. The data for Periods 1-4 were collected retrospectively and primarily describe the service's mobility and cost profile before the integration of the new electric vehicle. The additional Period 5, referring to July 2026, provides the first operational data from the use of the electric vehicle after it entered service in June. Consequently, Periods 1-4 can be treated as a conventional-vehicle reference, while Period 5 ensures an initial, although still limited, indication of the operational and economic effects of the transition to electric mobility.

The most visible change concerns direct fuel and energy expenditure. During the four conventional-vehicle periods, reported fuel costs ranged from 103 to 148 EUR, while the electricity cost recorded for the electric vehicle in Period 5 was 34,65 EUR. Although the lower number of operational days and service contacts contributed to the reduction in absolute expenditure, the difference remains favourable when the cost is considered in relation to distance travelled. The approximate direct energy cost decreased to 0,17 EUR per km in Period 5, compared with approximately EUR 0,24-0,48 EUR per kilometre in the earlier diesel-vehicle periods. This provides preliminary evidence that the electric vehicle may reduce the variable energy costs of the mobility activities of CSE.

Period 5 therefore provides initial evidence of the operational feasibility of the electric vehicle and of lower direct energy expenditure compared with the earlier conventional-vehicle periods. However, the available dataset does not contain quantified CO₂ emissions, complete vehicle-related costs or qualitative indicators concerning adoption readiness, operational flexibility and employee usability. The scenario analysis based on the Carbon Footprint Tool, presented below, therefore complements the observed Period 5 data by assessing the potential longer-term environmental effects of integrating the electric vehicle into CSE's fleet.

7.1.3.3. Scenario analysis:

Since the new electric vehicle entered operational use only on 11 June 2026, it was not yet available during the test period defined in the internal structure of the pilot. Its actual performance will therefore continue to be monitored by the Municipality of Bergamo and the mobility manager during the summer of 2026. Nevertheless, the Carbon Footprint Tool developed during the earlier phase of the Green LaMiS project could be tested and made it possible to assess different scenarios and the potential longer-term environmental effects of integrating the vehicle into the CSE fleet.

Three alternative fleet configurations were modelled by using the Carbon Footprint Tool:

- **Version A:** the Toyota Proace electric van replaces the currently used Fiat Ducato diesel van.
- **Version B:** it replaces the Volkswagen diesel passenger car.
- **Version C:** the electric van is added as a third vehicle alongside the two existing diesel vehicles.

For each version, three annual total distance covered assumptions were examined: the total distance travelled remains unchanged compared with the 2025 baseline, decreases by 2,000 km, or increases by 2,000 km.



	Total emissions (kg CO ₂)	Difference in emissions (kg CO ₂)	Difference in %
Baseline update 2025	4873	-	-
A version			
Scenario for 2027 - with the same distance covered	2626	2247	46,1
Scenario for 2027 - with 2000 km less distance covered	2733	2140	43,9
Scenario for 2027 - with 2000 km more distance covered	2518	2355	48,3
B version			
Scenario for 2027 - with the same distance covered	3942	931	19,1
Scenario for 2027 - with 2000 km less distance covered	3834	1039	21,3
Scenario for 2027 - with 2000 km more distance covered	4050	823	16,9
C version			
Scenario for 2027 - with the same total distance covered ³	3814	1059	21,7
Scenario for 2027 - with 2000 km less distance covered ⁴	3571	1302	26,7
Scenario for 2027 - with 2000 km more distance covered ⁵	4057	816	16,7

8. Table: Key figures of the scenario analysis regarding CSE - Bergamo

The scenario results show that the environmental benefit of electrification depends strongly on which existing vehicle is replaced and how the total distance covered is distributed within the fleet. **Version A produces the largest reduction in all three cases**, lowering annual emissions by approximately 44-48% compared with the 2025 baseline value. This is because the electric van replaces the Fiat Ducato, which currently accounts for the larger share of distance covered and emissions. The results therefore indicate that replacing the most intensively used and most emission-intensive vehicle should be prioritised where the objective is to maximise the environmental impact of the investment.

Replacing the Volkswagen passenger car under **Version B** results in a considerably smaller reduction of approximately 17-21%. In addition, substituting a passenger car with a nine-seat electric van may alter the operational role of the vehicle, since the two vehicle types are not necessarily used for identical transport tasks. Consequently, this option should be assessed not only in terms of emissions, but also in relation to passenger capacity, accessibility requirements and the actual structure of CSE trips.

³ Distances travelled: Fiat Ducato: 14 400 km; Volkswagen Golf: 6533 km; Toyota Proace, electric van: 10 467 km

⁴ Distances travelled: Fiat Ducato: 13 484 km; Volkswagen Golf: 6116 km; Toyota Proace, electric van: 9800 km

⁵ Distances travelled: Fiat Ducato: 15 318 km; Volkswagen Golf: 6949 km; Toyota Proace, electric van: 11 133 km



Version C represents a gradual fleet transition combined with an expansion of operational capacity. In this scenario, the Toyota Proace is added as a third vehicle while the two existing diesel vehicles remain available. Even without immediately removing either conventional vehicle from the fleet, the calculated results indicate an emission reduction of approximately 17-27%, provided that the electric van takes over a substantial share of the journeys previously completed by diesel vehicles. The scenario therefore demonstrates that the introduction of an additional electric vehicle can generate meaningful environmental benefits while preserving the existing vehicles as operational reserves.

7.2. Klis

Regarding Klis, the Joint strategy and action plan also made recommendation on the following topics:

- Replacement of fossil-fuel vehicles with electric vehicles: the strategy identified electric cars as the most suitable green mobility solution for Klis, considering the hilly terrain, dispersed settlement structure and relatively long distances between beneficiaries.
- Route optimisation: the strategy recommended improving the daily organisation of visits by using simple route planning tools and optimisation logic, in order to reduce unnecessary kilometres and related CO₂ emissions.
- Reassignment of beneficiaries where possible: where it is feasible, the beneficiaries should be assigned to service providers living or operating closer to them, in order to reduce travel distances and improve service efficiency.
- Possible use of greener modes for short-distance trips: for shorter distances, walking or other low-emission modes were considered as potential complementary solutions, depending on local conditions, weather and the physical ability of service providers.
- Green energy: buying electricity from greener sources and using biofuels for the petrol and diesel vehicles

The action plan named the steps to implement the above-described points. In parallel to the vehicle selection and procurement process, appointment of a mobility manager was recommended to support vehicle integration, route planning, operational optimisation and the monitoring of the pilot results.

7.2.1. Vehicle procurement

In Klis, the pilot action was implemented in connection with household assistance and meal delivery services provided to elderly, infirm and socially disadvantaged residents living across the municipality. Before the pilot intervention, service-related mobility largely depended on the resources of the individual social service providers, including their private vehicles, walking and, where available, public transport. Consequently, the continuity and efficiency of mobility were strongly influenced by the providers' individual circumstances, their place of residence, the dispersed location of beneficiaries and the limited availability of suitable vehicles.

According to the original project plan, the Municipality of Klis intended to rent environmentally sustainable vehicles for the pilot action. The initial rationale was that a rental arrangement could include maintenance, insurance and other operating costs, while also enabling consultation with mobility providers regarding the most appropriate technical solution. During the preparation of the investment, however, this approach was reassessed through a structured evaluation carried out with the support of the project's scientific and technical partners. The assessment showed that vehicle purchase was more appropriate for the regulatory, financial and operational conditions of Klis.



The decision was based on a combination of service-related, territorial, technical and market criteria. The evaluation considered the intensity and expected duration of vehicle use, travelled distances, the hilly terrain and dispersed settlement structure, service-continuity requirements, mileage limitations, charging compatibility, maintenance needs, vehicle condition, warranties, residual value and the availability of suitable models. Rental, leasing and vehicle sales companies were consulted, and the available offers were compared through a documented market analysis. Rental would have provided only temporary access to the vehicles and would have involved recurring costs, possible mileage restrictions and availability risks. Furthermore, the applicable municipal rules did not permit leasing or rental as a financing method for municipal assets, which made direct purchase the legally compliant solution.

The decision-making process was also supported by calculations prepared within the Green LaMiS framework. Scenario analyses based on the Carbon Footprint Tool examined the potential environmental effects of replacing fossil-fuel vehicles with electric alternatives. The results showed that replacing one vehicle would already produce a meaningful reduction in emissions, while replacing two vehicles would deliver a substantially stronger impact. The two-vehicle scenario was estimated to reduce fleet-related emissions from 4620,10 kg CO₂ to 2240,72 kg CO₂, representing a decrease of 2379,38 kg CO₂, or approximately 51.5% compared with the baseline. KPI-based calculations similarly indicated that the two-vehicle solution offered more favourable sustainability and cost-effectiveness outcomes.

A financial comparison between leasing and purchasing further supported the final choice. Although leasing appeared less expensive during the first year, purchasing was expected to become more economical after approximately 12-18 months because of its lower recurring costs. Over a five-year projection, purchasing was estimated to generate cumulative savings of approximately 33 500 EUR compared with leasing. Direct ownership also ensured that the vehicles would remain available for social service delivery after the completion of the Green LaMiS project.

The Municipality therefore purchased two used Dacia Spring Electric passenger cars. Both vehicles are from model year 2021 and are classified as four-seat, M1-category passenger vehicles, with a maximum net power of 33 kW and a maximum permissible mass of 1 513 kg. They are equipped with air conditioning, navigation, Bluetooth connectivity and rear-view cameras. Their technical condition, ownership documentation, price-quality ratio and suitability for local field visits were verified before the procurement was completed. The fully electric drivetrain produces no tailpipe emissions and was considered suitable for the predominantly short and medium-distance journeys associated with local social service provision.

The final investment amounted to 30 724 EUR. This included 14 612 EUR for each of the two vehicles and 1 500 EUR for the installation of the associated charging infrastructure. AC charging facilities were installed at the municipal premises, and dedicated parking and charging spaces were designated and marked. The investment was finalised on 14 September 2025, and the vehicles entered operational use during the same month.

The Municipality of Klis retained ownership of the vehicles, charging equipment and associated parking infrastructure. The vehicles were assigned to two social service providers for daily beneficiary visits. Their allocation took account of the providers' place of residence and the distance from the municipal premises, since assigning them to providers living farther away would have created additional journeys solely for collecting and returning the vehicles. The cars are therefore collected from and returned to the municipal site, supporting transparent vehicle management, regular charging and consistent monitoring of their use.



3. Figure: The two Dacia Spring Electric passenger cars procured in Green LaMiS

Source: Ádám Bolyós

The integration of the vehicles was accompanied by staff training, route optimisation and mileage monitoring. The mobility manager provided practical guidance on electric-vehicle operation, charging, basic maintenance, energy-efficient driving and the organisation of daily routes. Vehicle mileage and performance were subsequently monitored through the pilot's activity and KPI reporting system. This ensured that the investment was not implemented as an isolated equipment purchase, but as part of a broader, data-driven mobility-management approach.

Initial operational feedback was positive. Although some service providers initially expressed reservations about changing from conventional vehicles to electric mobility, these concerns decreased after practical experience had been gained. The providers reported satisfaction with the comfort, reliability, functionality and efficiency of the vehicles. Route optimisation and, in some cases, the reallocation of beneficiaries between providers further supported the reduction of unnecessary kilometres and the more efficient use of the newly purchased cars.

Beyond the project period, the Municipality will remain responsible for vehicle registration, insurance, servicing, tyres, technical inspections, charging costs and the maintenance of the charging equipment. Continued municipal ownership reduces the risk of service interruption and preserves the environmental and social benefits of the investment. The Klis experience also demonstrates that purchasing suitable used electric vehicles can represent a viable and replicable alternative for smaller municipalities where rental is costly, legally unsuitable or unable to guarantee continuous vehicle availability.

7.2.2. Management system

The management system-related part of the Klis pilot focused on the organisation of daily social service delivery, the allocation of users to providers, route planning, vehicle use and the identification of operational improvement points. The service context of Klis differs from larger urban pilot areas because beneficiaries are geographically dispersed, public transport options are limited, and the terrain and settlement structure make mobility organisation a central element of service delivery.



The basic organisation of the service is built around permanent beneficiary-provider relationships. Each social service provider has a stable group of users, with approximately six beneficiaries assigned to one provider. Daily work is organised in a way that each provider visits around three users per day according to a pre-arranged schedule. During these visits, providers deliver basic necessities, carry out grocery shopping, pay bills, collect medication and assist with everyday household tasks. This means that mobility is not only a supporting element of the service, but an integral part of the social assistance process.

A key organisational principle is territorial proximity. The system was arranged so that service providers generally live within the municipality and users are assigned to them based on proximity of residence. This approach supports better spatial organisation and reduces time spent driving. During the Green LaMiS pilot, additional efforts were made to further align the location of providers and users. In some cases, beneficiaries were reassigned between providers in order to create more efficient routes, reduce unnecessary travel and lower emissions.

Route planning in Klis is based on several factors at the same time. These include the distance between users, the frequency and type of user needs, and daily priorities such as urgent medicine pick-up or bill payment. The providers plan their daily routes independently, while paying attention to the order of visits in order to optimise time and fuel or energy use. Daily routes may also include logistical or technical activities, such as grocery shopping, refuelling or other errands. These are usually carried out at the beginning or at the end of the workday, depending on user needs and the location of shops or other service points.

The mobility manager played an important role in improving this system. His work focused especially on route optimisation, using the MapQuest platform to review and adjust routes. Through this process, travel patterns were modified to reduce total distance travelled and to make the daily organisation of service provision more efficient. The route optimisation exercise also showed that operational efficiency can be improved not only by changing vehicles, but also by reorganising user allocation and daily routes. In one case, a provider's beneficiary list was adjusted so that the users were located in her immediate area. This allowed part of the visits to be carried out on foot, which directly supported the environmental objectives of the pilot.

The management system analysis also identified several practical challenges. Although two electric vehicles were purchased for fieldwork needs, their distribution and use proved to be complex. Some providers live in more remote settlements, some have health-related limitations that make driving difficult, and others rely on family members for transport. These factors required further adjustment of schedules and routes in order to ensure that the vehicles could be used efficiently while maintaining continuity of service provision. The analysis also pointed out that many providers are middle-aged or older women with extensive experience in social work, but sometimes with limited digital skills. This is relevant because the introduction of route planning tools, digital reporting or mileage monitoring requires gradual capacity building and a user-friendly approach.

Data collection and communication practices were also reviewed. Providers are required to record mileage regularly and participate in periodic meetings with the project coordinator, where challenges, progress and opportunities for improvement are discussed. They also occasionally complete surveys and evaluation forms to monitor user needs, satisfaction and service quality. These practices provide a basis for more systematic monitoring, but the pilot also showed that further formalisation would be useful. Potential areas for further improvement include simple performance indicators, clearer procedures for urgent requests and changes in the beneficiary structure, and better logistics planning.

Overall, the management system-related pilot experience in Klis confirmed that the service already has a stable territorial logic, but that this logic can be improved through route optimisation, better alignment between providers and beneficiaries, and gradual capacity development. The objective is not to make the system rigid, because the service must remain flexible and socially sensitive. Instead, the main development



direction is to introduce more conscious planning elements, strengthen the use of simple digital and mapping tools, and support providers in adopting sustainable mobility practices in a practical and acceptable way.

7.2.3. Monitoring and KPI data collection

Monitoring activities and KPI data collection were continuous of during the pilot action process in Klis. The monitoring process followed the common Green LaMiS KPI framework. By the end of the pilot period, all four KPI updates had been completed, and the CO₂ tool updates for 2024 and 2025 were also carried out. Furthermore, all the needed internal documentation serving qualitative monitoring purposes (vehicle procurement report, vehicle integration report, internal activity reports), had been prepared and forwarded to the responsible project partner.

7.2.3.1. CO₂ analysis updates

Vehicle breakdown - presents the vehicles used in relation to the social service in the 3 years under review (km travelled and the related CO₂ emissions)

	Model	Vehicle typology and fuel type	km travelled (km)			Emissions (kg CO ₂)		
			2023	2024	2025	2023	2024	2025
Vehicle 1	OPEL ASTRA	car, gas	2 756	3 208	3 120	402	468	456
Vehicle 2	SKODA OCTAVIA 1	car, diesel	2 756	2 806	-	328	334	.
Vehicle 3	MAZDA DEMIO 1.3	car, gas	10 283	10 959	5 356	1 717	1 830	894
Vehicle 4	BMW, seria 1	car, diesel	5 564	5 522	4 160	662	657	495
Vehicle 5	NISSAN QASHQAI	car, gas	2 002	2 492	2 236	288	359	322
Vehicle 6	SKODA FABIA	car, diesel	5 538	5 743	4 716	676	701	575
Vehicle 7	VW POLO	car, diesel	1 560	1 748		170	190	-
Vehicle 8	PEUGEOUT 307	car, gas	1 726	1 905	1 638	268	295	254
Vehicle 9	BMW seria 1	car, diesel	915	839	2 097	109	100	250
Vehicle 10	Toyota Auris	car, gas			1 560			239
Vehicle 11	Dacia Spring 1	car, electric			1 560			79



Vehicle 12	Dacia Spring 2	car, electric			1 049			53
Total (km / kg CO ₂)			33 100	34 383	31 071	4 620	4 934	3 617

9. Table: Vehicles used in relation to Klis social services between 2023 and 2025

Between the base year of 2023 and 2025, there were changes to the fleet in connection with the service. Several vehicles were taken out of service, while new cars were added to the fleet. The two electric vehicles that entered service in September 2025 replaced the gasoline-powered Opel Astra (Vehicle 1) and the diesel-powered BMW 1 Series (Vehicle 4) for the last four months of 2025, so the accompanying table includes 8 months of data for these two vehicles. They jointly covered 2 609 km while generating only 132 kg of associated CO₂ emissions, demonstrating a substantially lower emission intensity than the conventional vehicles. The reduced use or withdrawal of several petrol- and diesel-powered cars also contributed to the overall improvement.

While distance travelled decreased only moderately by 2025, the overall CO₂ emissions fell considerably more sharply. This suggests that the improvement cannot be explained solely by reduced travel activity but also reflects changes in fleet composition and a more efficient distribution of journeys among the available vehicles. The two Dacia Spring electric cars, introduced during the final four months of 2025. Taken together, the results indicate that fleet electrification, route optimisation and more targeted vehicle allocation can reduce the carbon footprint of service delivery without requiring a proportionate reduction in mobility. On a monthly basis, emission associated with the Opel Astra in 2025 was 57 kg, while the BMW had 61,8 kg of CO₂, meanwhile emissions from the two electric cars remained slightly below 20 kg.

Year	Total CO ₂ Emissions	Conventional fleet (gas + diesel)	Public transport	Electric fleet
2023	4 620	4 620	0	0
2024	4 934	4 934	0	0
2025	3 617	3 485	0	132

10. Table: CO₂ emissions breakdown in relation to the social services of Klis

The table shows the amount of emissions regarding the conventional petrol- and diesel-powered vehicles used by the social service provider in 2023 and 2024. Year 2025 brought a change in this regard, following the introduction of electric vehicles for the last four months of the year. In parallel, the overall carbon footprint of the service decreased considerably by 2025. The results indicate the beginning of a shift towards a lower-emission mobility model rather than a simple reduction in service activity, as the number of service contracts and vehicles remained unchanged over the years under review. As 2025 represents a transitional year, the longer-term environmental benefits of fleet electrification are expected to become more visible once the new vehicles have been used over a complete annual cycle.

7.2.3.2. KPIs

In the case of Klis, the KPI data collection covered four monitoring periods.



	Period 1	Period 2	Period 3	Period 4
Fuel type - old vehicle	Gasoline	Gasoline	Gasoline	Gasoline
Fuel type - new vehicle	Electric	Electric	Electric	Electric
Service delivery				
Km travelled	1057,4	1057,4	1102,1	1290,9
Operators	9	9	9	9
Operational days	10	10	10	10
Service contacts	54	54	54	54
Service fuel / energy cost (EUR)	585	587,5	587,5	688,1
Economic KPIs				
Old vehicle tax (EUR/year)	1330,78	1330,78	1330,78	1330,78
Old vehicle insurance (EUR/year)	2008,29	2008,29	2008,29	2008,29
Old vehicle maintenance (EUR/year)	4600	4600	4600	4600
Old vehicle other costs (EUR/year)	1071,2	1071,2	1071,2	1071,2
Total old vehicle cost (EUR)	3963	3963	3663	3663
Total new vehicle cost (EUR)	1375,17	1375,17	1175,17	1175,17
Qualitative KPIs				
Adoption Readiness Level	n/a	18,5	19,5	20
Operational Flexibility Score	n/a	6	6,8	7
Employee Green Solution Usability Score	n/a	6,8	7	7
Environmental KPIs				
CO ₂ emissions per service contact	68,87	64,98	64,53	64,53
Reduction of CO ₂ emissions	n/a	210,20	234,67	234,67
Reduction of CO ₂ emissions per service contact	n/a	3,89	4,35	4,35

11. Table: KPI inputs - Klis

Across the four monitoring periods, the Klis pilot shows a broadly stable service profile combined with gradual improvements in environmental performance and user acceptance. The number of operators, operational days and service contacts remained unchanged, while the distance travelled increased moderately and then more noticeably in Period 4. Despite this higher mobility demand, reported CO₂ emissions per service contact decreased from 68,87 in Period 1 to 64,53 in Period 3 and remained at this lower level in Period 4 as well. This indicates that the pilot was able to accommodate a growing travel requirement without a corresponding deterioration in the emission-efficiency indicator.

The organisational indicators demonstrate an even clearer positive trend. Adoption readiness increased continuously to the maximum recorded value of 20, while operational flexibility rose from 6 to 7 and employee satisfaction reached 7 by Period 3 and remained stable thereafter. These results suggest that the electric vehicles became progressively integrated into everyday service delivery and were increasingly accepted by the employees. This is important because the success of the pilot in Klis depended not only on the technical performance of the vehicles, but also on whether the social service providers were willing and able to integrate the new mobility solution into their daily routines. The monitoring data confirm that this integration was successful. The economic results were also consistently favourable: the estimated total costs of the new vehicles remained substantially below those of the replaced conventional vehicles.

Overall, the monitoring and KPI data collection process showed that the Klis pilot achieved measurable environmental and operational improvements. The introduction of two electric vehicles, combined with



route optimisation and beneficiary reallocation, contributed to lower CO₂ emissions per service contact and improved the efficiency of service delivery.

7.3. Szombathely

The Joint strategy and action plan formulated recommendations regarding the following topics:

- Provider-specific vehicle selection: since two different social service providers were involved, two different vehicle solutions were recommended according to their service profiles and mobility needs. Procurement of an electric van was recommended for FÉHE for transporting people with disabilities, elderly people and persons with reduced mobility, while also providing sufficient storage capacity for daily service-related tasks. For Pálos, a smaller compact electric vehicle was the recommendation which is suitable for short urban trips and occasional journeys to surrounding settlements.
- trip planning: the vehicle replacement should be complemented by better route planning and service organisation, especially because caregivers visit several locations during their daily work.
- appointment of a mobility expert/manager who will support vehicle selection, staff preparation, route planning, vehicle integration and the monitoring of practical experiences

7.3.1. Vehicle procurement

The vehicle procurement process in Szombathely was designed to support both social service providers involved in the pilot action, namely FÉHE and the Pálos Károly Social Service Centre and Child Welfare Service. The decision-making process was carried out in cooperation with the service providers, the municipal project team, the mobility manager and the project's scientific partners. The selection was based not only on the available financial resources, but also on the operational requirements of the services, the results of the baseline CO₂ assessment, economic KPI calculations and the vehicle-related recommendations of the joint strategy and action plan.

Considering the available budget, the Municipality decided to procure two used battery-electric vehicles, one for each service provider. Before the final decision, different vehicle-replacement scenarios were assessed. The calculations indicated that replacing a vehicle covering longer distances and regularly serving destinations outside Szombathely with a standard electric vehicle could achieve three to four times greater CO₂ savings than replacing a vehicle used exclusively for shorter urban trips with an electric microcar. The microcar option was ultimately rejected because of limitations related to speed, range and safety, uncertainty regarding maintenance and servicing, and the concerns expressed by employees during the preparatory consultations.

The procurement procedure was prepared from May 2025, and the first call for tenders was published in June. Due to the limited supply of suitable used electric vehicles on the Hungarian market, the Municipality had to conduct four procurement rounds. The first three rounds were unsuccessful because no bids, or an insufficient number of technically and financially acceptable bids, were received. The fourth procedure was successfully completed in September 2025, after which the vehicles were contracted, delivered and registered. The total investment cost amounted to 28 000 EUR.

FÉHE received a 2022 Citroën ë-Berlingo with a power output of 100 kW. The vehicle replaced an older diesel-powered Renault Kangoo and was selected specifically to meet the organisation's passenger-transport requirements. FÉHE regularly transports elderly people and persons with reduced mobility to workplaces, educational institutions, healthcare services and administrative appointments. The vehicle's higher body,



sliding doors, spacious passenger compartment and luggage capacity support easier access and the transportation of mobility aids and other equipment. Its operational profile also corresponds to the service's daily routes, which may include numerous locations within Szombathely as well as destinations in nearby settlements.

The Pálos service provider received a compact 2018 Volkswagen e-Up! with a power output of 60 kW. The vehicle is primarily used by a home-care worker for short urban journeys connected to home visits, shopping, medicine collection and other assistance tasks, although occasional destinations outside the city are also included in the service area. Its compact dimensions facilitate urban driving and parking, while its range is sufficient for the service's typical daily mileage. The vehicle is normally assigned to one care worker but may be used by another employee on days when the designated worker is not on duty, ensuring more intensive utilisation. It replaces the previous practice in which care workers relied primarily on their privately owned internal-combustion vehicles.

Municipality of Szombathely remains the owner of both vehicles, while the service providers received them for long-term operational use under separate agreements. These agreements define the permitted purposes of use and allocate responsibility for insurance, maintenance, continuous operation and the related running costs to the user organisations. Both vehicles are normally charged overnight at the premises of the respective service providers. This arrangement supports their reliable integration into daily service provision and provides a stable basis for monitoring their environmental, economic and operational impacts during the pilot action.

Following the necessary administrative procedures and the supporting decision of the General Assembly, the vehicles were officially handed over to the two service providers on 10 November 2025. From that date, the vehicles started operating in relation to the two social services involved in the pilot action. The handover was accompanied by local media presence and the participation of municipal representatives and employees of the service providers. On the same day, the staff members who would use the vehicles received practical training from the mobility manager of Szombathely. The training covered the basic technical characteristics of the vehicles, driving techniques, charging procedures and other practical issues related to daily use. Later, both providers also received vehicle-specific user manuals prepared by the mobility manager, including descriptions and visual guidance to support everyday operation. As a result, the green vehicle procurement process in Szombathely was completed by the end of 2025, and the pilot could move from the procurement phase to the operational testing phase.



4. Figure: Handover of the electric vehicles on 10th of November 2025 in Szombathely

Source: Ádám Bolyós



The operational testing phase of the newly acquired electric vehicles could start at the end of 2025. The core period of testing was the first half of 2026, the pilot phase finished by the end of May 2026. During this period both social service providers used the new vehicles on a daily basis.

Since the operational testing began during the cold winter months, FÉHE faced some charging issues in the first few weeks: the battery drained faster than expected, therefore, the range of the vehicle was not appropriate, the car could not serve a full day without recharging, which caused some organisational issues to solve at the beginning. The situation was further complicated by the fact that the on-site conditions only allowed for slow charging of the car. On the one hand, there was no dedicated fast-charging station available, and on the other hand, the characteristics of the electrical grid at the site did not allow for a reduction in charging time. Later, as the weather became milder and then warmer, the range of the vehicle was increased, and the service provider was able to draw relevant conclusions about the use of the car based on the initial experiences.

The vehicle regarding the service of Pálos is used in the daily home care service by one caregiver to visit clients. It has been designated to a certain caregiver, but in each day when this caregiver does not work, the vehicle is used by another one, to utilize the car as much as possible.

7.3.2. Management system

The management system-related part of the Szombathely pilot focused on understanding how the two involved services organise their daily work, how mobility is embedded into service delivery, and where practical improvement points could be identified. The aim was not to redesign the professional content of the social services, but to examine the mobility-related components of the service organisation, especially route planning, scheduling, data collection and the use of digital tools. This approach was important because social care services are primarily driven by the needs and conditions of the beneficiaries; mobility optimisation can only be introduced if it remains compatible with the professional and human requirements of care provision.

The project team, together with the mobility manager and Westpannon, organized meetings with the two service providers on 4 December 2025. The meeting with FÉHE was held in the morning, while the meeting with Pálos took place in the afternoon. The participants included the leaders and employees of the service providers who are directly involved in operational tasks, including daily planning and route organisation. These meetings provided the basis for the analysis of the management system and helped to identify the possible points of interventions. These potential intervention points identify long-term opportunities to improve the planning and implementation of the services, particularly with regard to their mobility-related operations. It was not possible to test all of these during the pilot action period.

7.3.2.1. FÉHE - Management system

FÉHE provides two closely related services with distinct mobility characteristics. The first is a personal assistance service delivered at the users' homes, where staff support people with disabilities in daily activities such as household tasks, shopping and other individual assistance. The second, and operationally more mobility-intensive activity, is a transport service that enables users to travel to workplaces, schools, day-care centres, healthcare facilities and administrative appointments. These two service components require different approaches to planning while sharing the same vehicle fleet and staff resources.

Service requests are largely known in advance, allowing weekly work schedules to be prepared by the service coordinator. Staff members are assigned primarily to their regular users in order to maintain continuity of care and stable personal relationships. Consequently, route planning is influenced not only by geographical efficiency but also by professional and social considerations. Regular transport requests represent the most predictable part of the service, while occasional medical or administrative trips are incorporated into the



schedule whenever sufficient notice is available. Same-day requests can only be accommodated if operational capacity allows it.

Daily vehicle movements are characterised by a combination of fixed and variable trips. Passenger transport often involves strict time windows, while home assistance requires considerably longer stays at individual locations, typically ranging from approximately 40 minutes to several hours depending on the needs of the users. In practice, drivers already combine passengers travelling in similar directions whenever feasible, although the primary objective remains reliable service delivery rather than minimising travel distance. Route planning therefore represents a compromise between operational efficiency, user-specific requirements and service quality.

Intervention points in relation to FÉHE:

- Introduce simple route-planning support tools that allow daily routes to be reviewed before implementation without overriding professional judgement.
- Group geographically close transport requests where time schedules allow, particularly for regularly recurring trips.
- Reduce unnecessary returns to the service base by organising urban and suburban destinations into separate service loops where operationally feasible.
- Develop a simple protocol for handling occasional transport requests and urgent interventions to improve consistency in daily planning.
- Gradually introduce digital recording of vehicle movements and operational data to support future optimisation and performance monitoring.

The following actions have been tested during the pilot:

- **Preliminary route review before daily operations:** During the pilot, selected daily transport schedules were reviewed jointly by the mobility manager and the service coordinator using Routific route-planning software. The objective was not to redesign the service, but to assess whether minor adjustments in the sequence of planned trips could reduce empty vehicle movements while respecting users' appointment times and individual needs. The exercise confirmed that, although most routes were already constrained by service requirements, several daily schedules could be slightly improved by reorganising the order of visits.
- **Grouping of geographically compatible transport requests:** For selected recurring transport services, compatible passenger requests were analysed using Google Maps together with the Routific route proposal to identify opportunities for combining journeys towards similar destinations. The test demonstrated that passenger grouping was feasible in several cases without affecting service quality, although individual appointment times remained the primary planning constraint.

7.3.2.2. Pálos - Management system

The Pálos service focuses primarily on home care for elderly people living independently or with limited family support. Unlike FÉHE, mobility is not centred on transporting service users but on enabling caregivers to reach a large number of individual households throughout the day. Daily activities include personal care, shopping, medication collection and various forms of practical household assistance. Consequently, travel represents an essential enabling activity rather than the service itself.

The organisation operates with a relatively stable territorial structure. Service users are allocated to individual caregivers, who generally continue serving the same clients over longer periods. Daily schedules are therefore predictable, while only a limited proportion of visits change because of new users or unexpected circumstances. Each caregiver is largely responsible for organising the sequence of visits within



the assigned service area. Most journeys are relatively short and take place within Szombathely, although occasional visits to nearby settlements are also required. The newly introduced electric vehicle replaces the previous vehicle of one caregiver while maintaining the existing organisational structure.

Current route planning is mainly based on practical experience rather than formal optimisation methods. Caregivers naturally combine geographically nearby visits, but the final order of daily tasks is strongly influenced by agreed appointment times and the specific needs of individual users. Shopping, pharmacy visits and other supporting activities are integrated into daily routes whenever possible, allowing several tasks to be completed during a single journey.

Intervention points in relation to Pálos:

- Introduce voluntary use of route-planning software to verify whether alternative visit sequences could reduce travel distance.
- Review territorial allocation periodically when new users enter the system in order to maintain geographically balanced service areas.
- Formalise simple route-planning guidelines while preserving caregivers' flexibility to respond to individual user needs.
- Introduce basic digital recording of routes and vehicle use to support monitoring and future optimisation.
- Explore opportunities to combine supporting activities (shopping, pharmacy visits and administrative tasks) more systematically within planned daily travel chains.

The following actions have been tested during the pilots:

- Daily route verification using digital maps: During the pilot, the mobility manager reviewed selected daily home-care routes using MapQuest before the start of service delivery. The software was used to compare the planned visit sequence with an automatically suggested route while preserving all scheduled appointments. The exercise showed that caregivers' experience generally resulted in efficient routes, although in some cases minor changes reduced unnecessary backtracking and travel distance.
- Territorial review of caregiver assignments: The pilot also included a review of selected caregiver service areas using Google Maps to visualise the geographical distribution of users. Newly admitted clients were analysed to determine whether allocation to another caregiver could reduce travel distances while maintaining continuity of care. The exercise indicated that small adjustments in territorial allocation could improve operational efficiency without requiring organisational restructuring.

7.3.3. Monitoring and KPI data collection

Monitoring and KPI data collection formed an important part of the Szombathely pilot action. The purpose was to follow the integration of the new electric vehicles, assess the operational experience of the service providers, and measure the results of the green mobility intervention in a comparable way. Data collection was linked to the common KPI framework of the Green LaMiS project and to the updated CO₂ assessment. The Municipality and the mobility manager contributed to the collection and preparation of datasets, which were then forwarded to the responsible project partner for KPI calculation and evaluation.



7.3.3.1. CO₂ analysis updates

Szombathely project team collected data and prepared updates of the baseline analysis (prepared by using data from 2023), which means that the relevant data between the years 2023, 2024, 2025 are comparable. There is a difference between the data of Szombathely and the previous two Municipalities: in the case of Szombathely litres upfilled was the input data instead of km travelled.

- FÉHE:

	Model	Vehicle typology and fuel type	litres upfilled (litres)			Emissions (kg CO ₂)		
			2023	2024	2025	2023	2024	2025
Vehicle 1	Ford Transit	diesel van	3 129	3 053	3 483	8 246	8 045	9 179
Vehicle 2	Renault Kangoo	diesel car	1 332	1 510	1 294	3 510	3979	3 410
Total litres upfilled (litres)			4 461	4 563	4 777			
Vehicle 3	Citroen E-Berlingo	electric car			340*			75
Public transport	bus					170	102	102
Total emissions (kg CO ₂)						11 926	12 126	12 766

12. Table: Vehicles used in relation to FÉHE between 2023 and 2025

*Consumption in kWh

The vehicle-level data indicate that overall emission trend of FÉHE was primarily shaped by the continued intensive use of the conventional fleet, particularly the Ford Transit, whose higher fuel consumption became the main driver of the increase recorded in 2025. At the same time, the declining use of the Renault Kangoo and the introduction of the electric Citroën ë-Berlingo suggest the beginning of a gradual change in fleet composition and vehicle allocation. Since the electric vehicle was only in operation for approximately one month in 2025, its potential impact is not yet fully reflected in the annual figures. Nevertheless, its relatively limited contribution to emissions demonstrates that transferring a larger share of suitable journeys from the diesel vehicle to the electric vehicle could substantially reduce the carbon intensity of service delivery. The results for 2025 should therefore be considered transitional, with the environmental benefits of electrification expected to become more visible over a complete year of operation.

CO₂ emissions breakdown - shows the share of each element in total emissions

Year	Total CO ₂ Emissions	Conventional fleet (gas + diesel)	Public transport	Electric fleet
2023	11 926	11 756	170	0
2024	12 127	12 025	102	0
2025	12 766	12 589	102	75

13. Table: CO₂ emissions breakdown in relation to the social service of FÉHE

Although total CO₂ emissions increased over the course of the testing years, this trend should be interpreted in the context of changes in the internal structure of the service and the resulting mobility demand.



Particular attention should be paid to 2025, as the electric vehicle entered operation, but only at the end of that year. By that point, the two conventional vehicles had already accumulated a substantial amount of travelled km and the related emissions. Nevertheless, the one-month location-based emissions of the electric vehicle, amounting to approximately 75 kg CO₂, provide a useful basis for comparison with the diesel Renault Kangoo, whose estimated monthly emissions were around 297 kg CO₂. This indicates that, if the electric vehicle were able to replace the diesel vehicle entirely, the annual reduction in emissions could be considerable. A potential decrease of approximately 2 500-3 000 kg CO₂ per year would represent a reduction of more than 20% in the current carbon footprint associated with the service delivery of FÉHE.

- Pálos

Vehicle breakdown - input data was litres upfilled instead of distance travelled

	Model	Vehicle typology and fuel type	Litres upfilled (litres)			Emissions (kg CO ₂)		
			2023	2024	2025	2023	2024	2025
Vehicle 1	Hyundai IX 20	gas, car	217	200	222	513	473	525
Vehicle 2	Nissan Micra	gas, car	962	1 079	1 055	2 276	2 553	2 496
Vehicle 3	Peugeot 206	gas, car	736	708	772	1 741	1 675	1 826
Vehicle 4	Citroen C3	gas, car	1 070	404	-	2 453	956	-
Vehicle 5	Peugeot 306	gas, car	877	854	787	2 075	2 251	2 074
Vehicle 6	Renault Twingo	gas, car	12	21	19	28	55	45
Vehicle 7	Suzuki swift	gas, car	589	564	-	1 393	1 334	-
Vehicle 8	Opel Agila	gas, car	8	12	12	19	28	28
Vehicle 9	Ford Fiesta 1.4	gas, car	6	-	-	14	-	-
Vehicle 10	Fiat Punto s55	gas, car	1 037	-	-	2 453	-	-
Vehicle 11	Opel Mokka	gas, car	5	10	23	12	24	54
Vehicle 12	Toyota Avensis	gas, car	11	-	-	26	-	.
Vehicle 13	Nissan Micra-2	gas, car	10	-	-	24	-	-
Vehicle 14	Volkswagen Bora	gas, car	36	394	-	88	932	-
Vehicle 15	Toyota Avensis	gas, car	70	-	-	166	-	-
Vehicle 16	Toyota Yaris	gas, car	-	277	484	-	653	1 145
Vehicle 17	Fiat Fiorino Qubo	gas, car	-	132	289	-	312	684
Vehicle 18	Fiat 500	gas, car	-	326	-	-	771	-
Vehicle 19	Fiat 312	gas, car	-	-	334	-	-	790
Vehicle 20	Ford Focus	gas, car	-	-	297	-	-	703
Vehicle 21	Volkswagen Golf	diesel, car	-	-	34	-	-	90
Vehicle 22	Volkswagen Beetle	diesel, car	-	-	680	-	-	1 792
Vehicle 23	Opel Corsa	gas, car	-	-	11	-	-	26
Vehicle 24	Toyota Corolla	gas, car	-	-	203	-	-	480
Total litres upfilled (litres)			5 646	4 981	5 222			
Vehicle 25	Volkswagen AA E-up	electric car	.	.	269,02*			59
Total emissions (kg CO ₂)						13 281	12 017	12 817

14. Table: Vehicles used in relation to Pálos between 2023 and 2025

*Consumption in kWh



The annual numbers of beneficiaries of the social service, care workers and vehicles used in service delivery varied to some extent over the period analysed. Nevertheless, the overall scale of operations remained broadly stable, with approximately 14-15 vehicles in use each year and the number of beneficiaries remaining close to 200 throughout the three-year period. Although the composition of the fleet changed considerably between years, as can be seen in the table above, a relatively small group of intensively used vehicles can be clearly identified as accounting for a substantial share of the service-related CO₂ emissions.

In 2023, 15 passenger cars were involved in the delivery of Pálos services. Based on the distances travelled (litres upfilled), six to seven vehicles formed the core of the fleet, while the remaining eight were used less frequently and mainly provided supplementary or occasional support for service-related mobility. In 2024, a total of 14 vehicles were involved, with utilisation distributed more evenly across the fleet. A similar concentration can be observed in 2025, when five of the 15 vehicles were responsible for a significant proportion of total CO₂ emissions. It should also be noted that two diesel-powered vehicles entered the fleet in 2025. One of these covered a relatively high distances and therefore contributed to the increase in the overall emission level recorded for that year.

Due to the nature of the service, the colleagues only work passenger car (their own cars) there are no vans in the fleet. The electric vehicle is the first element of the fleet which is not the private vehicle of the caregivers, assigned exclusively to this social service. The electric car purchased as part of the Green Lamis project entered service at the end of 2025 and, even in that short time, has covered significant distances, replacing the gas-powered car that one of the caregivers had been using until then.

CO₂ emissions breakdown - shows the share of each element in total emissions

Year	Total CO ₂ Emissions	Conventional fleet (gas + diesel)	Public transport	Electric fleet
2023	13 281	13 281	0	0
2024	12 017	12 017	0	0
2025	12 817	12 758	0	59

15. Table: CO₂ emissions breakdown in relation to the social service of Pálos

The total carbon footprint associated with the service remained broadly stable throughout the period under review. The lower emission level in 2024 was associated with a smaller number of active vehicles and a more balanced distribution of journeys across the fleet. In 2025, the entry of two diesel-powered vehicles (one of which covered a relatively high distance) contributed to the renewed increase in conventional-fleet emissions. At the same time, the electric vehicle entered service only towards the end of 2025 and therefore accounted for just 59 kg of location-based CO₂ emissions, meaning that its potential effect is not yet fully reflected in the annual results. Overall, the data suggest that future reductions will depend not only on electrification, but also on how journeys are distributed among vehicles and how effectively the higher-emitting conventional cars can be replaced.

7.3.3.2. KPIs

Szombathely project team started collecting and providing the needed input data for the KPI-s since the beginning of the pilot action. During the second internal reporting period, the vehicles had been handed over and started operating, therefore, from the second provided KPI dataset the calculated KPIs can already show some impacts of the new vehicles.

- FÉHE



For FÉHE, the KPI results should be interpreted with caution due to incomplete input data. No data were available for Period 1, meaning that no consistent baseline could be established for the conventional petrol- or diesel-powered vehicles previously used by the service. Consequently, the monitoring results do not allow a robust before-and-after comparison between the former internal-combustion fleet and the new electric vehicle.

	Period 1	Period 2	Period 3	Period 4
Fuel type - old vehicle	-	-	-	-
Fuel type - new vehicle	-	Electric	Electric	Electric
Service delivery				
Km travelled	-	625	625	1013
Operators	-	1	1	2
Operational days	-	9	10	10
Service contacts	-	229	229	193
CO ₂ emissions	-	6,68	6,68	38
Service fuel / energy cost (EUR)	-	-	-	52
Qualitative KPIs				
Adoption Readiness Level	-	10,00	14,00	17
Operational Flexibility Score	-	3,4	5,4	5,4
Employee Green Solution Usability Score	-	4,9	6,3	6,57
Environmental KPIs				
CO ₂ emissions per service contact	-	-	0.3	0.2
Reduction of CO ₂ emissions	-	-	-	17,00
Reduction of CO ₂ emissions per service contact	-	-	-	0.10

16. Table: KPI inputs – FÉHE

The service maintained a mobility-intensive operational profile throughout the testing period, characterised by a relatively high number of service contacts and substantial distances travelled. The final-period calculation indicates a reduction of 17 kg CO₂ and 0.10 kg CO₂ per service contact. This suggests a measurable, although comparatively modest, environmental benefit (compared to the other services examined). Since the volume and structure of service delivery changed between periods, the results should primarily be interpreted as an improvement in emission efficiency rather than as a clear reduction in absolute service-related emissions.

The qualitative KPIs provide the clearest indication of progress within the available dataset. The Adoption Readiness Level increased steadily from 10 to 17 by the end of period 4, showing that FÉHE moved from medium to high readiness as practical experience accumulated and the initial barriers to implementation were gradually reduced. The Operational Flexibility Score rose as well, which indicates that the electric vehicle became considerably easier to integrate into daily operations, although charging conditions and range limitations continued to restrict full operational flexibility. Later, these problems significantly reduced. At the same time, the Employee Green Solution Usability Score increased from 4.9 to 6.57, representing a shift from moderate to high staff satisfaction. Overall, these trends suggest that the initial difficulties associated with winter range and slow charging were progressively managed through operational learning and adaptation, and that the vehicle became increasingly accepted and suitable for everyday service delivery.

- Pálos

In the case of Pálos, the input datasets are complete, properly showing the trends within the pilot period.



	Period 1	Period 2	Period 3	Period 4
Fuel type - old vehicle	Gasoline	Gasoline	Gasoline	Gasoline
Fuel type - new vehicle	-	Electric	Electric	Electric
Service delivery				
Km travelled	517	246	361	387
Operators	1	2	2	2
Operational days	10	9	10	10
Service contacts	75	63	65	73
CO ₂ emissions	93,38	7,31	21	14
Service fuel / energy cost (EUR)	61,87	14,38	20,7	14,63
Economic KPIs				
Old vehicle tax (EUR/year)	53,64	53,64	53,64	53,64
Old vehicle insurance (EUR/year)	89,13	89,13	89,13	89,13
Total old vehicle cost (EUR)	368,6	2401	2401	2401
Total new vehicle cost (EUR)		1182	1182	1165
Qualitative KPIs				
Adoption Readiness Level	-	14	15	17
Operational Flexibility Score	-	6,2	5,4	5,8
Employee Green Solution Usability Score	-	5,7	7	7
Environmental KPIs				
CO ₂ emissions per service contact	1,25	0,12	0,32	0,19
Reduction of CO ₂ emissions	-	86,07	72,38	79,38
Reduction of CO ₂ emissions per service contact	-	1,13	0,92	1,05

17. Table: KPI inputs - Pálos

In the case of Pálos, the introduction of the electric vehicle was associated with a clear decrease in CO₂ emissions per service contact compared to the initial period. The first period showed 1.25 kg CO₂ per service contact, while the following periods after the introduction of the electric vehicle showed substantially lower values, including 0.12 in Period 2, 0.32 in Period 3 and 0.19 in Period 4. Although the number of kilometres and service contacts varied between monitoring periods, the results indicate that the electric vehicle contributed to a lower emission intensity of service delivery. The employee green solution usability score also improved and reached a high satisfaction level by the later periods, while the adoption readiness level increased from medium to high by the end of the monitoring process.

Overall, the monitoring process in Szombathely confirmed that the two electric vehicles were successfully integrated into daily social service delivery. The KPI results suggest a reduction in emission intensity, especially in the case of Pálos, and show improving acceptance and usability among employees. At the same time, the monitoring process also demonstrated the importance of regular data collection, clear definitions and consistent reporting. These elements are essential not only for evaluating the pilot action, but also for supporting future decisions on fleet development, route planning, digitalisation and the broader greening of home-based social services in Szombathely.



8. General results based on the KPIs

This chapter summarizes the findings related to the KPIs presented in Chapter 7 in relation to the three pilot municipalities. The following subsections assess the performance of the tested mobility solutions from several complementary perspectives. First, the environmental results are examined, with particular attention to changes in CO₂ emissions and emission intensity. This is followed by an assessment of the main economic and cost-related findings, including operating costs and estimated investment payback periods where sufficient data were available. The chapter then considers the adoption readiness and scalability of the tested solutions, as well as their operational flexibility and usability from the perspective of the participating staff. Finally, the individual findings are brought together to identify the main conclusions emerging from the KPI monitoring process across the three pilot territories.

8.1. Environmental results

Environmental performance was assessed through two complementary indicators.

- **Total CO₂ emissions** represent the overall climate impact generated by mobility during each monitoring period. This indicator is important for understanding the absolute environmental burden of service-related travel, but it is strongly influenced by the distance travelled, the number of operational days and the overall volume of service activity.
- The CO₂ emissions per service contact indicator provides a more service-oriented measure of environmental performance. It relates the emissions generated during a monitoring period to the number of contacts delivered to service recipients and therefore indicates how carbon-intensive each unit of service delivery was. A decreasing value generally means that the service was able to maintain or expand its activities while generating less mobility-related CO₂ per contact. This indicator is particularly useful for comparisons over time within the same service, although differences in service type, territorial coverage and the definition of a service contact must also be taken into account.

Service/pilot location	Total CO ₂ Emission (kg CO ₂)				
	P1	P2	P3	P4	P5*
Pellicani - Bergamo	94.79	7.28	7.85	10.95	-
CSE - Bergamo	36.97	99.07	39.50	37.45	7.85**
Klis	3719.13	3508.93	3484.46	3484.46	-
Pálos - Szombathely	93.38	7.31	21.0	14.0	-
FÉHE - Szombathely	n/a	6.68	6.68	38.0	-

18. Table: Total CO₂ Emissions regarding the social services involved

The total emission figures show substantial differences between the participating services. These differences should not be interpreted as a direct ranking of environmental performance, as the services operate at very different geographical scales and under different organisational conditions. Klis, for example, recorded considerably higher absolute emissions than the urban services because its activities involve longer travel distances across a more dispersed service area. By contrast, the lower absolute values



recorded in Bergamo and Szombathely reflect both the introduction of electric vehicles and the more compact or differently structured service environments.

The table nevertheless reveals several relevant within-service tendencies. In Pálos and Pellicani, the transition from conventional to electric vehicle use was followed by a pronounced decrease in total emissions. Subsequent fluctuations largely corresponded to changes in vehicle utilisation and travelled distance rather than to a reversal of the environmental benefit. For CSE, Periods 1-4 represent the operation of the conventional vehicle, while Period 5 provides the first observation of the electric vehicle.

The marked decrease in the final period therefore provides an initial indication of the environmental advantage associated with the new vehicle. In FÉHE, total emissions increased in Period 4, but this coincided with a substantial increase in vehicle use and travelled distance. The change should therefore be interpreted together with the service-output indicator presented in the following table.

Service/pilot location	CO ₂ emissions per service contact (kg CO ₂ /service contact)				
	P1	P2	P3	P4	P5*
Pellicani - Bergamo	4.51	0.17	n/a	0.58	
CSE - Bergamo	0.54	0.60	0.54	0.65	0.24**
Klis	68.87	64.98	64.53	64.53	
Pálos - Szombathely	1.25	0.12	0.32	0.19	
FÉHE - Szombathely	n.a	0.03	0.03	0.20	

19. Table: CO₂ emissions per service contact regarding the social services involved

* Period 5 is added because there was an extra provided dataset regarding CSE-Bergamo after the closure of the pilot phase

** Italian CO₂ values were reconstructed from monitored mileage and vehicle-specific emission intensities derived from the Carbon Footprint assessment. The CSE Period 5 value is an estimate based on the emission intensity of the same electric vehicle model operated in Bergamo.

The CO₂ emissions per service contact indicator related results show a clear improvement in most services following the introduction of electric vehicles. In Klis, emissions per service contact decreased moderately from 68.87 kg in Period 1 to 64.53 kg in Periods 3 and 4. The limited scale of the reduction reflects the long travel distances and dispersed service area, suggesting that further fleet electrification and route optimisation would be required to achieve stronger effects. Pálos recorded a substantially larger and sustained improvement, with all electric-vehicle periods remaining well below the initial value of 1.25 kg CO₂ per contact.

Pellicani also showed a marked decrease compared with the conventional-vehicle period, despite some fluctuation caused by changing distances and service volumes. For CSE, the indicator remained relatively stable during the conventional-vehicle periods and decreased to approximately 0.24 kg CO₂ per contact after the electric vehicle entered operation, providing initial evidence of a significant environmental benefit. In FÉHE, the value increased in Period 4 because travelled distance rose while the number of service contacts decreased. Due to the absence of a conventional-vehicle baseline, the FÉHE data demonstrate low-emission electric operation but do not support a complete before-and-after comparison.

The results also show that the absolute level of CO₂ emissions per service contact differs significantly between territories and services. This is not necessarily a sign of better or worse performance. It reflects differences in service geography, travel distances, number of contacts, density of beneficiaries and the type



of social service provided. For this reason, the most meaningful interpretation is the trend within each service over time.

8.2. Economic and cost-related results

The cost indicators show that electric vehicles can reduce certain operational costs, especially fuel and maintenance-related costs, but the overall financial picture depends heavily on the procurement model, investment cost, rental arrangements and the completeness of available cost data.

Service / pilot location	Latest old vehicle cost (EUR)	Latest new vehicle cost (EUR)	Payback period	Interpretation
Bergamo - Pellicani	11 196.67	1,092.26*	n/a	New vehicle costs appear lower, but rental fees were not included
Bergamo - CSE	8 327	1,405.75*	n/a	The available data indicate lower energy-related operating costs, but rental and other fixed costs are missing
Klis	3 663.05	1,175.17	5.53 years	Clear operational cost advantage for the new vehicles
Szombathely - Pálos	2 401.03	1,165.40	9.98 years	Annual operating savings are indicated, although investment recovery is relatively gradual
Szombathely - FÉHE	514.65	2,500.95	n/a	Payback could not be calculated; cost data require cautious interpretation

20. Table: Cost indicators of the involved social services

* Rental fees were not included in the new vehicle cost regarding the two Bergamo services

Klis provided the clearest evidence of financial feasibility. The annualised cost of the electric vehicles was substantially lower than that of the conventional vehicles, resulting in an estimated payback period of 5.53 years. Pálos also recorded lower costs for the new vehicle, although its payback period of 9.98 years indicates a more gradual recovery of the investment. This is consistent with the comparatively lower mileage of the urban service, which limits the amount of annual fuel savings.

For the two Bergamo services, Pellicani and CSE, the recorded energy costs of the electric vehicles were considerably lower than the reference costs of the conventional vehicles. However, the new-vehicle values exclude rental fees and other fixed cost components. They therefore indicate a potential energy-cost advantage but cannot be interpreted as complete total-cost comparisons, and no reliable payback period could be calculated.



For FÉHE, the available data do not support a straightforward payback interpretation. The monitoring report did not calculate a payback period in the latest period. This does not necessarily mean that the electric vehicle is not useful or justified; rather, it highlights that economic KPIs are sensitive to the structure and completeness of cost data.

Overall, the findings indicate that electric vehicles can reduce recurring energy and operating expenditure, but the scale of the financial benefit depends on vehicle utilisation, annual mileage, procurement arrangements and the completeness of cost records. The most favourable payback was observed where the electric vehicles replaced frequently used conventional vehicles and the main cost components were consistently documented.

8.3. Adoption readiness and scalability

The Adoption Readiness Index provides an important view on whether the tested solutions could be transferred or scaled after the pilot period. It captures several dimensions that are essential for real-world implementation, including cost feasibility, infrastructure needs, user feedback and regulatory fit.

Service / pilot location	P2	P3	P4	Final interpretation
Bergamo - Pellicani	15.0	16.0	n/a	High adoption readiness in available periods
Bergamo - CSE	n/a	n/a	n/a	Adoption readiness was not assessed due to the absence of survey-based KPI data
Klis	18.5	19.5	20.0	High adoption readiness
Szombathely - Pálos	14.0	15.0	17.0	Improved from medium to high readiness
Szombathely - FÉHE	10.0	14.0	17.0	Strong improvement, reaching high readiness

21. Table: Adoption Readiness Index regarding the involved social services

The strongest result was observed in Klis, where the Adoption Readiness Index increased from 18.5 to 20.0. This indicates that, by the end of the pilot period, the tested solution had very strong scaling potential, with limited barriers from the perspective of cost, infrastructure, user acceptance and regulatory fit. In Klis, we have to see that the index showed a higher value already at the first monitoring point (P2), which then continued to increase.



Szombathely also showed positive development. In the Pálos service, by the last monitoring point (P4), the score increased from 14.0 to 17.0, meaning that the solution moved from medium to high adoption readiness. The FÉHE service improved even more strongly, but started with a very low starting value, then moved from 10.0 to 17.0 by the end. This development is particularly important because it suggests that initial operational or organisational uncertainties can be reduced by time and through practical experience.

In Bergamo - Pellicani, the available scores were also in the high readiness range, increasing from 15.0 to 16.0 between Period 2 and Period 3. However, no data were available for Period 4, so the final trend cannot be fully assessed.

Overall, the results indicate that readiness generally improved as the pilot solutions became more familiar and better integrated into service routines. Nevertheless, the scores reflect the circumstances and perceptions observed during the pilot period. Actual replication may still depend on local funding, charging infrastructure, procurement arrangements and organisational capacity.

8.4. Operational flexibility and staff usability

The **Operational Flexibility Score** assesses how easily the tested mobility solution can be adapted to different service activities, routes and operational situations. The **Employee Green Solution Usability Score** measures how staff experience the solution in everyday work, including ease of use, comfort, reliability and compatibility with their tasks. Both indicators are important because long-term continuation depends not only on technical performance, but also on operational adaptability and employee acceptance.

Service / pilot location	Operational flexibility, (final available value)	Staff usability (final available)	Interpretation
Bergamo - Pellicani	5.2	6.7	Moderate flexibility, high usability in available periods
Bergamo - CSE	n/a	n/a	Not assessed due to the absence of survey-based KPI data
Klis	7.0	7.0	Very strong operational fit and staff acceptance
Szombathely - Pálos	5.8	7.0	Moderate flexibility, high staff satisfaction
Szombathely - FÉHE	5.4	6.57	Moderate flexibility, high staff satisfaction

22. Table: Operational flexibility and Staff usability values of the involved social services

Klis achieved the highest final values, reaching 7.0 for both operational flexibility and staff usability. This indicates that the tested solution was fully compatible with daily service activities and was strongly accepted by employees.

Pálos and FÉHE both recorded high staff-usability scores, while their operational-flexibility values remained moderate. The results suggest that employees considered the electric vehicles suitable for their everyday tasks, although their use in other service types, departments or operational situations could require some



organisational adaptation. In FÉHE, the improvement from the earlier monitoring periods also shows that initial concerns related to charging and vehicle range were gradually reduced through practical experience.

Pellicani showed a similar pattern: staff usability was high, while operational flexibility remained moderate. This indicates positive employee acceptance but also suggests that wider operational integration may depend on route planning, charging arrangements and service-specific logistical conditions. For CSE, neither indicator could be calculated because the required survey-based data were not available.

Overall, staff acceptance was one of the strongest results of the pilot actions. The somewhat lower flexibility scores in several services do not indicate that the solutions were unsuitable; rather, they reflect the operational constraints of social service delivery, including fixed schedules, urgent requests, service-user needs and local geographical conditions. The results therefore support continued use of the tested solutions, while highlighting the importance of organisational adaptation alongside vehicle introduction.

8.5. Main findings, conclusion based on the KPIs

The KPI monitoring confirms that the Green LaMiS pilot actions produced measurable improvements, but it also highlights that green mobility in home-delivered social services is a more complex organisational issue than simply a matter of vehicle replacement.

1. The introduction of electric vehicles generally **reduced the carbon intensity** of service delivery where comparable CO₂ data were available. The strongest relative improvements were observed in Szombathely, especially in the Pálos service, while Klis showed a smaller but stable reduction. The differences between the territories underline the importance of local geography and service structure.
2. Route optimisation and service organisation measures are essential complements to vehicle replacement. The Klis experience shows that reassigning beneficiaries and improving daily routes can contribute to emissions reduction even when longer distances remain unavoidable. This confirms that mobility management should not be limited to procurement but should also include the continuous review of service routes, schedules and beneficiary allocation.
3. Staff acceptance was a strong result of the pilot actions. Where survey data were available, the usability scores were high in the final available monitoring periods, indicating that the green mobility solutions were generally compatible with daily social service work. This is a major success factor, because the long-term continuation of the solutions depends on the willingness and ability of staff to use them in routine operations.
4. The economic results were positive in several cases, but they must be interpreted carefully. Klis and one of the involved social services in Szombathely (Pálos) showed clear operational cost advantages for the new vehicles. However, payback periods differed, and in some cases the available data were not sufficient for a full investment assessment. For future applications, it would be useful to standardise cost data collection even further, including purchase price, rental or leasing costs, maintenance, insurance, energy, charging infrastructure and staff time related to vehicle operation.
5. The monitoring process itself revealed important lessons about data collection. The KPI framework created a structured basis for comparison, but the pilot experience showed that social service providers do not always have complete, standardised or automatically collected mobility data. Manual data collection can support pilot monitoring, but for long-term management purposes, more systematic and digitalised data collection would improve the quality of future evaluation.
6. The adoption readiness results suggest that the tested solutions have scaling potential. By the end of the pilot period, Klis, Szombathely-Pálos and Szombathely-FÉHE had all reached high adoption



readiness. Pellicani also recorded high readiness in the available monitoring periods, although no final-period value was available, while CSE could not be assessed because the required survey-based inputs were not collected. Overall, the results indicate that electric vehicles and mobility management practices can be transferred to similar home-delivered social service contexts, provided that local service characteristics, charging possibilities, staff capacities and organisational routines are properly assessed before implementation.

In summary, the KPI-based evaluation demonstrates that the Green LaMiS pilot actions contributed to greener and more conscious mobility management in home-delivered social services. The results show that electric vehicles can reduce emissions and, where sufficiently complete and comparable cost data are available, recurring operating costs, especially when combined with route optimisation and service-planning measures. At the same time, the pilot actions also confirmed that the success of green mobility solutions strongly depends on organisational integration, staff acceptance and the ability of service providers to collect and use operational data.

The KPI framework proved useful not only for measuring results, but also for identifying future development needs. The main directions for further improvement are the continued use of low-emission vehicles, the extension of electric fleet, more systematic route planning, stronger data collection practices, and the gradual integration of digital tools into everyday service organisation. These findings provide a relevant basis for the further development of the Green LaMiS joint solution and for the transfer of pilot experiences to other municipalities and social service providers.

9. Main results, findings and lessons learnt

This chapter synthesises the main results, findings and lessons emerging from the implementation of the Green LaMiS pilot actions. While Chapter 8 concentrated primarily on the quantitative and qualitative KPI results, the present chapter considers the pilot process more broadly, including vehicle selection and integration, mobility-management measures, organisational adaptation, staff involvement and monitoring practices. The findings show that the transition towards greener social-service mobility depends not only on the technical characteristics of the vehicles introduced, but also on their compatibility with service needs, the organisational conditions of their use and the capacity of the participating organisations to monitor and continuously improve their mobility-related activities.

9.1. Vehicle selection and operational integration

The pilot actions demonstrated that electric vehicles can be successfully integrated into different types of social-service mobility. However, the experiences of Bergamo, Klis and Szombathely also confirmed that no single vehicle type or procurement model is suitable for every service. The tested solutions ranged from compact electric passenger cars used for individual home-care visits to larger vehicles capable of transporting several passengers, mobility aids or service-related equipment.

Vehicle selection therefore needs to be based on a detailed assessment of the actual service profile. Relevant factors include daily mileage, passenger capacity, accessibility requirements, route predictability, territorial coverage, charging possibilities and the operational role of the vehicle within the wider fleet. The pilot also showed that implementation must remain flexible. Procurement delays, limited market availability, changing service-provider circumstances and seasonal conditions may require the originally planned arrangements to be adapted during implementation.

The gradual integration of the vehicles into daily routines proved particularly important. Initial operational constraints, including uncertainty regarding charging or driving range, generally became more manageable as staff gained practical experience and the services adjusted vehicle allocation and charging practices.



9.2. Mobility management and service organisation

A major finding of the pilot is that vehicle replacement alone is not sufficient to achieve the full sustainability potential of social-service mobility. Electrification should be combined with improvements in route planning, beneficiary allocation, vehicle scheduling and the organisation of recurring journeys.

The scope for optimisation differed considerably between the participating services. In some cases, the review of routes and beneficiary locations resulted in concrete adjustments, such as reassigning visits to geographically closer operators, combining journeys or reducing unnecessary backtracking. In other cases, the analysis confirmed that the existing routes were already largely efficient, although smaller organisational improvements could still be identified.

At the same time, the pilots demonstrated that route optimisation cannot be based exclusively on minimising distance or travel time. Home-delivered social services operate under specific constraints, including fixed appointment times, continuity of care, urgent requests, the individual needs of beneficiaries and established relationships between users and care workers. Digital mapping and route-planning tools should therefore support professional decision-making rather than replace it.

9.3. Organisational capacity and staff acceptance

Staff acceptance and organisational ownership were essential for the effective integration and longer-term use of the tested mobility solutions. Initial concerns were mainly related to vehicle range, charging procedures, technical operation and possible changes in working routines. These concerns generally decreased once employees had gained direct experience with the vehicles and understood how they could be incorporated into their everyday tasks.

Training and practical technical support contributed significantly to this process. Guidance on vehicle operation, charging, range management, efficient driving and basic maintenance helped reduce uncertainty and supported the gradual development of user confidence. Where survey information was available, the results indicated generally positive usability and increasing acceptance of the introduced solutions.

Mobility managers played an important coordinating role throughout the process. Their contribution extended beyond the selection of vehicles and included communication with service providers and suppliers, route analysis, charging arrangements, staff training, monitoring and the identification of further improvement opportunities. The pilot experience suggests that mobility management should be treated as a continuous organisational responsibility rather than a temporary task linked only to vehicle procurement.

9.4. Monitoring and data-related lessons

The combined use of updated Carbon Footprint assessments, repeated KPI data collection and qualitative reporting created a structured basis for evaluating the pilot actions. This approach made it possible to examine not only environmental and cost-related performance, but also operational flexibility, employee usability and adoption readiness.

At the same time, the monitoring process revealed differences in data availability, completeness and consistency. In some services, baseline information, emission values, cost components or survey responses were incomplete, while data-recording practices also differed between organisations and monitoring periods. These limitations reduced the possibility of making fully standardised comparisons between territories.

For this reason, trends observed within individual services over time are generally more reliable than direct rankings between pilot locations. The experience highlights the importance of agreeing on common data definitions before implementation, establishing complete baseline datasets and collecting relevant



operational and financial information in a consistent manner. In the longer term, simple digital recording systems could improve the quality of mileage, energy-use, charging, cost and service-delivery data.

9.5. Transferability and longer-term lessons

The pilot actions validated the overall logic of the Green LaMiS approach. Mobility-related environmental impacts should first be assessed, appropriate green mobility solutions should then be selected according to actual service needs, and implementation should be supported by organisational measures, staff involvement and continuous monitoring.

The exact solutions tested in the three territories cannot be transferred without adaptation, as the participating services operate under different territorial, organisational and operational conditions. Nevertheless, the overall implementation process is applicable to other municipalities and social-service providers. Successful transfer requires appropriate vehicle selection, suitable charging arrangements, realistic utilisation estimates, staff training, clear organisational responsibility and reliable operational data.

The main lesson is that sustainable mobility in social-service delivery should be understood as both a technical and organisational transition. Electric vehicles can substantially contribute to reducing mobility-related emissions and operating costs, but their long-term benefits depend on how effectively they are integrated into service planning, fleet management and everyday working practices.



10. Conclusions

The Green LaMiS pilot action demonstrated that the environmental impact of mobility related to home-delivered social services can be reduced without compromising the continuity and quality of service provision. At the same time, the implementation experience confirmed that greening the last mile cannot be achieved through vehicle replacement alone. Sustainable change requires an integrated approach combining cleaner vehicles, improved operational practices, systematic monitoring, organisational development and the active involvement of the people responsible for daily service delivery.

The pilot territories applied this common approach under different territorial, institutional and operational conditions. Although the specific solutions and implementation models varied, the activities followed a shared framework and addressed comparable challenges. This made it possible to test the Green LaMiS methodology in real-life settings while preserving sufficient flexibility to respond to local service needs. The experience therefore supports the relevance of a common transnational model that can be adapted rather than mechanically reproduced in other territories.

The introduction of electric vehicles proved to be a feasible direction for several types of social service mobility, particularly where daily routes, vehicle requirements and charging arrangements were carefully assessed in advance. However, the pilot also showed that vehicle suitability must be evaluated in relation to the actual service profile. Range, capacity, accessibility, charging opportunities, procurement or rental conditions and the ability to respond to unexpected needs may all influence whether a solution can be successfully integrated into everyday operations. Employee preparation and practical training are equally important, as the long-term use of new technologies depends strongly on user confidence and acceptance.

The Carbon Footprint Tool, the common KPI framework and the repeated data collection periods provided a structured basis for monitoring environmental, economic and operational developments. Beyond measuring changes, these tools helped municipalities and service providers better understand their mobility systems and identify areas requiring further attention. At the same time, differences in data availability and completeness underline the importance of establishing simple but consistent data collection procedures as part of routine service management.

A further key conclusion concerns the role of mobility management. The pilot experience showed that a dedicated mobility manager or similarly responsible professional can connect strategic sustainability objectives with practical decisions on vehicle selection, route planning, fleet management, staff engagement and monitoring. The lasting impact of the pilot actions will therefore depend on whether these functions and the related cooperation between municipalities and service providers become embedded in regular organisational processes.

In summary, the pilot action successfully translated the Green LaMiS strategy into practical and locally adapted interventions. It generated operational experience, strengthened organisational capacities and provided evidence that home social services can gradually shift towards lower-emission mobility. The results create a solid basis for the further refinement, transfer and upscaling of the tested solutions and for their integration into broader local sustainable mobility policies. The main value of the pilot consequently lies not only in the immediate improvements achieved, but also in establishing a replicable process through which local authorities and social service providers can continue assessing and improving their mobility-related environmental performance.



Annexes

Activity report template

Pilot Municipality	Szombathely (HU)
Activity report number and period	1st activity report - Until end of October 2025

1. Status of the sub-activities

Please update the status of the activities and internal documents within Activity 2.2 – Pilot Action Implementation. Please use 3 different statuses (and colors) according to your progress: finished/ ongoing / not started yet, based on the given example below.

1.pillar: CO2 tool	updated analysis 2024	finished
	updated analysis 2025	ongoing
2.pillar: KPIs	KPI update nr.1	finished
	KPI update nr.2	not started yet
	KPI update nr.3	not started yet
	KPI update nr.4	not started yet
3.pillar: mobility manager activities	Intermediate activity report nr.1	finished
	Intermediate activity report nr.2	not started yet
	Intermediate activity report nr.3	not started yet
	Final activity report	not started yet
	Report on vehicle procurement	ongoing
	Training of the staff for efficient vehicle use and maintenance	finished
	Report on the integration of new vehicle(s)	not started yet
	Analysis of the management system	ongoing
	Analysis on the changes of the management system	not started yet
	Awareness raising event for wider publicity	not started yet
	Professional event	not started yet
	Integration of recommendations and action plan based on D.1.2.3.	ongoing

Remarks: if you have any remarks that cannot be included in the further categories below, here you can mention it.

- Summary** - Please give a descriptive summary of everything you were working on during the related 2-month period, including those activities that you finished, as well as those ones that are ongoing. You can use the table above at the 1. point as help. If you indicated something as “ongoing” or “finished”, please write about them in this summary. If you finished with something in the earlier periods, obviously you do not need to repeat it in every activity report. If you are/were working on something relevant which is out of the list above, please include these activities/elements as well. Please pay particular attention to the following topics:



- a. **vehicle line** – what happened and where are you in the process
- b. **management system line** – what happened and where are you in the process
- c. **awareness raising line** – besides the events, here you can mention if anything was communicated regarding the project and/or the pilot action

If you were working on things which are not part of the list above (of course, you have option to do this), please write about these activities as well.

- 3. Mobility manager activities** – here please highlight the contribution of your mobility manager in the given period. Please describe those activities your mobility manager was involved in within the respective period and what his contribution was. The list at the 1. point above can help you to summarize what your mobility manager's contribution/addition to each element was.

For example:

- *he was working on the preparation of an event targeting wider publicity and planned to be organized in Szombathely on 28th of October 2025 – preparing the agenda and did the first contacts with the possible presenters*
- *he was continuously communicating with the city management – the focus was on the following topics: x,y,z*
- *he was involved in the preparation and interpretation of the updated baseline analysis (based on data from 2024) – drawing conclusions, pointing out trends*
- *together with the leaders and operative staff of our social service provider involved, our mobility manager started to analyze the current management system. The related internal document is not finalized yet, but many weaknesses regarding the management system were defined (and these weaknesses can be mentioned shortly)*

If your mobility manager contributed and involved in activities that are not part of the list in the 1. chapter, please mention them as well.

4. Findings, results, consequences

In this chapter, please shortly try to highlight the main findings, results, and consequences (or lessons learnt) regarding the activities you are working on /implemented in the given period. Of course, there is no need for long descriptions here, just to highlight the main points in form of a few sentences and/or bullet points. You can use the table above at the 1. point as help. If you organized/finished with an element in the given period, please write some sentences about them here as well.

For example:

- in case of a document → what are the main findings.

For example: the analysis of the management system of our social service provider pointed out that currently there are two fields where we have plenty of room for improvement: 1. Route planning; 2. Fleet management and maintenance

- in case of an event → what the main experience

For example: xy event brought more participants compared to what we expected. XY topic seemed particularly interesting to the audience since the presenter received a lot of



questions about it. Based on this, we can say that our citizens are basically open for this and that.

5. Proof and evidence

All proof and evidence are important to us that shows and verifies the progress of the pilot action implementation. If you indicated above in the table (1. chapter) that you finished with an element, we need proof about them. Since the internal structure of the implementation consists of different types of elements (documents, events), so the evidence are different.

Proof regarding internal documents elaborated

The proof in this case is the elaborated document itself, there is nothing else needed. When you have finished with an internal document, please send us (Westpannon) via e-mail and/or upload it to the right place in our repository. In this activity report, please just list the documents prepared in the given period – together with the date when you sent it to Westpannon.

Proof regarding events: under “event” we mean every element that can be justified by photos, list of participants and/or invitation/agenda (if relevant).

- Please take **photos** on the event and make sure that you provided them to us (uploaded to the repository and/or sent them to us via e-mail)
- Please make a **list of participants** and make sure that you provided them to us (uploaded to the repository and/or sent them to us via e-mail)
- if relevant - please provide us the **invitation/agenda** of the event (upload to the repository and/or send to us via e-mail)

Proof of mobility manager’s contribution: not every element of the mobility manager’s contribution can be verified by exact evidence. But for example, if you had considerable and mentionable internal meeting(s) between your municipality and/or your mobility manager and/or the service provider(s) and/or anyone else, it can be documented as an event. And we recommend doing this, as proof of the co-work and involvement of the mobility manager. Similarly, to the events:

- Please take **photos** of the event and make sure that you provided them to us (uploaded to the repository and/or sent them to us via e-mail)
- Please make a **list of participants** and make sure that you provided them to us (uploaded to the repository and/or sent them to us via e-mail)

You can insert photos and lists of participants here in the activity report if you want, but it is not a must. If you sent them to us via e-mail and/or uploaded them to the repository, it is fine. What we definitely want here from you is a list:

For example:

- *Report on vehicle procurement (document) – sent on 12.10.2025 – uploaded to repository*
- *Analysis of the management system (document) – sent on 28.10.2025 – uploaded to repository*



- *Training of the staff about how to use the newly acquired green vehicle on 30.08.2025 (event) – photos and list of participants sent via e.-mail on 01.09.2025 – uploaded to repository*