



Reports on the research pilots' design, implementation, results

Deliverable 4.3

Version 1.0

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List of abbreviations

APEASE	Affordability, Practicability, Effectiveness and cost-effectiveness, Acceptability, Side-effects/safety, Equity
B2B	Business to Business
BCT	Behavioural Change Technique
BMBF	Bundesministerium für Bildung und Forschung (Federal Ministry of Education and Research, Germany)
BMFTR	Federal Ministry of Research, Technology and Space (Germany)
CEP	Courier, Express, and Parcel services
DUT	Driving Urban Transitions
FFG	Austrian Research Promotion Agency
GDPR	General Data Protection Regulation
hds	South Tyrolean Association of Commerce, Services, and Tourism
IND	Independent L. ONLUS
MIMIT	Ministry of Enterprises and Made in Italy
OR	Odds Ratio
SIC	Sustainability InnoCenter
SRFG	Salzburg Research Forschungsgesellschaft mbH
STA	Südtiroler Transportstrukturen AG – Green Mobility Department
SVAL	Sustainable Value Orientation (scale)
UI	User Interface
ULEI	Universität Leipzig
UX	User Experience
VIA	VIABIRDS Technologies GmbH
WP	Work Package

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Administrative information

Basic information on the SuCoLo project and this deliverable:

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Purpose of the document

The SuCoLo project designed, implemented and evaluated accessible and inclusive research pilots in three cities: Leipzig (DE), Salzburg (AT) and Merano (IT) (T4.1 & 4.2). In these pilots, different modalities of sustainable last-mile logistics were piloted: online customer-facing behaviour change techniques (BCTs) on online shops in a simulated environment, cargo bike courier service for local shops and customers, the integration of cargo bike sharing into a municipal bikesharing system, and the use of a pick-up station to collect parcels.

The purpose of this document is to outline and describe the phases of each pilot's development, execution and outcomes – while employing a careful eye on the uptake of such solutions by follower cities. Such results will feed into future SuCoLo works that aim to maximise the exploitation of the tools, methods and procured equipment employed within the pilots (e.g., D4.4 *Toolkit for bicycle hubs & sustainable logistics in urban outskirts*, D5.4 *Recommendations for sustainable urban bicycle logistics policies*).

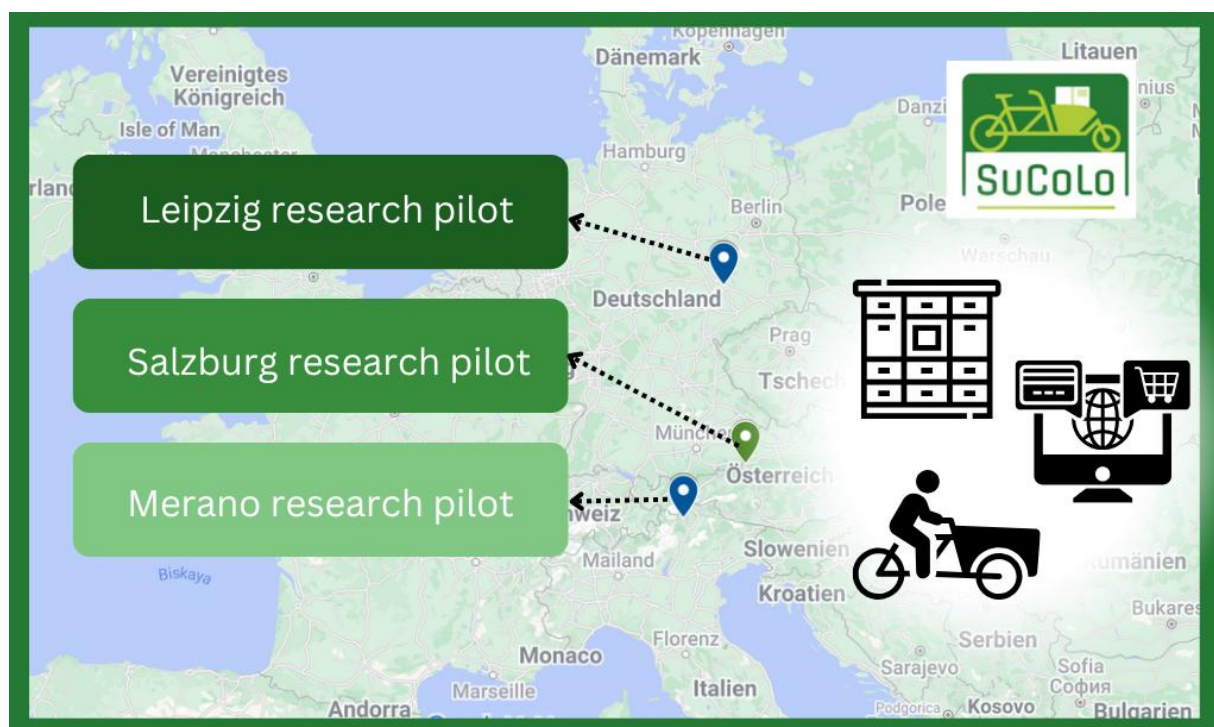


Figure 1 Mapping of the SuCoLo research pilots

Executive Summary

This deliverable reports on the design, implementation, and results of the three SuCoLo research pilots conducted in Salzburg (Austria), Leipzig (Germany), and Merano (Italy). Each pilot tested a distinct approach to fostering sustainable last-mile logistics in urban outskirts.

The Salzburg research pilot focused on the digital demand side, investigating the effectiveness of six behavioural change techniques (BCTs) embedded in a simulated webshop environment to encourage consumers to choose sustainable cargo bike delivery. A web-based experiment with 1,101 participants found that while the overall effect of BCTs did not reach statistical significance, individual nudge types such as the customer loyalty points and green leaf nudges showed meaningful improvements over the control group. Sustainability values and nudge acceptance emerged as the strongest predictors of sustainable delivery choice.

The Leipzig research pilot tested a physical infrastructure approach, deploying a mobile micro-hub with cargo bike delivery in the outskirts district of Lutzschena-Stahmeln from May to November 2025. A total of 289 deliveries were made to the pilot area by bike, complemented by a cargo bike rental station. The pilot demonstrated the potential of mobile micro-hubs for last-mile delivery in low-density residential areas, while highlighting the economic challenges of operating such services at limited delivery volumes.

The Merano research pilot implemented both a cargo bike sharing service and a cargo bike delivery service for local retailers. Six electric cargo bikes were deployed across the city, and a delivery service operated by local bicycle courier FIX served participating shops. The pilot generated strong community engagement, with local actors expressing concrete interest in continuing the services beyond the project duration.

Across all three pilots, the findings provide evidence-based insights into the opportunities and challenges of sustainable urban logistics solutions, with direct implications for the SuCoLo toolkit (D4.4) and policy recommendations (D5.4).

1 Overview

SuCoLo addresses sustainability in urban outskirts logistics through integrated environmental, social and economic actions. Across the European pilot cities of Leipzig (Germany), Merano (Italy) and Salzburg (Austria), the project evaluates cargo bike deliveries, mobile micro-hubs and shared mobility solutions to reduce emissions, noise and congestion in urban outskirts. At the same time, SuCoLo actively engages citizens, local shops and small and medium sized enterprises through co-creation formats, digital tools and inclusive mobility offers, improving accessibility and acceptance of sustainable logistics solutions. By collaborating with logistics providers and developing cost-efficient, replicable business models and open-access tools, SuCoLo supports resilient local economies and enables the upscaling of low-emission, socially inclusive logistics systems aligned with key Sustainable Development Goals.

1.1 Accessibility aspects across SuCoLo project

Communication aspects:

The entire project was designed with a strong focus on accessibility and inclusiveness, also through the adoption of inclusive communication practices thanks to the work of IND. Project partners agreed from the outset on the importance of consistently using inclusive language in all dissemination activities. Such language recognizes diversity, fosters respect for all individuals, remains sensitive to differences, and supports equal opportunities.

By integrating inclusive language, the SuCoLo products and events became more accurate, respectful, and representative of diverse audiences. This approach also helped broaden the project's reach. In this regard, IND played a key role by supporting the implementation of inclusive communication, drawing on its expertise and experience in the field.

During the project implementation, IND oversaw the use of simple and understandable language to describe the accessibility and functionality of the services provided by SuCoLo.

The main activities regarding inclusive language usage were on:

- Icons and symbols
- Easy-to-read language (all important published documents (deliverables) were translated into simple language in so-called one-pagers)
- Brief project description in form of videos in International sign (IS), subtitled for people with hearing impairments
- a notification function on the SuCoLo project website to report accessibility issues, providing a feedback mechanism
- synchronised translation and synchronised speakers' transcripts or translations into sign language for the final public project event
- Digital web accessibility for *all*

Within the project's WP5, the report on the digital accessibility assessment of the project website (see [D5.2](#)) has been done. This document is the report on the digital accessibility

audit carried out on the SuCoLo website (and also on the MOQO app, which is the cargo bike sharing booking platform used in the Merano research pilot).

For professional accessibility analysis, IND used a special test procedure based on the Web Content Accessibility Guidelines (WCAG) 2.2 to ensure easier access to the project information.

The assessment of digital accessibility was carried out in four steps:

- Objective analysis: Test procedure with special software (IT accessibility)
- Subjective Analysis (usability): Test group with people with disabilities
- Evaluation
- Reporting, to document digital barriers

The analysis carried out demonstrated several areas for improvement on the SuCoLo website in order to provide all project participants with barrier-free access to digital information. Based on the analyses carried out, usability can now be significantly improved to attract a diverse audience to communicate SuCoLo's activities, products and results.

To ensure equal and inclusive project information and dissemination, IND commissioned the translation of the project website into Easy-to-read language and sign language/LIS.

Reference guide of what directs inclusive language

SuCoLo's communication was based on two fundamental concepts: inclusion and accessibility for *all*. Inclusion means respecting everyone exactly as they are. It means that all people have the opportunity to participate fully in social life. For this reason, we have developed the following essential guidelines for inclusive language in the project, fostering sustainable consumer behaviour with inclusive bicycle logistics infrastructure in urban outskirts. With regard to communication in the project, the project consortium kept an eye on politically correct language and labelling:

Differently abled, invalid, handicapped: shall we try not to use them anymore? Words are important. More, words show the culture, the degree of civilisation, the way of thinking, the level of care for the weakest.

Generally, one can simply say: person with a disability. The focus is there, on the person. His condition, if it needs to be expressed at all, comes later.

In the field of accessible logistic and mobility, we can go beyond the generic term, valuing the role of the person with disabilities. In the world of transport, for example, it should be defined as "passenger with a disability" while in the hotel and non-hotel hospitality sector it should be defined as "guest (or visitor) with a disability".

Inclusive language - Words to use and avoid when writing about disability

Using the guidance of the UK government (Gov.UK, 2021), the following information on inclusive language is as follows:

Table 1 Inclusive language guidance of the UK government (Gov.UK, 2021)

Avoid	Use
(the) handicapped, (the) disabled	disabled (people)

afflicted by, suffers from, victim of	has [name of condition or impairment]
confined to a wheelchair, wheelchair-bound	wheelchair user
mentally handicapped, mentally defective, retarded, subnormal	with a learning disability (singular) with learning disabilities (plural)
cripple, invalid	disabled person
spastic	person with cerebral palsy
able-bodied	non-disabled
mental patient, insane, mad	person with a mental health condition
deaf and dumb; deaf mute	deaf, user of British Sign Language (BSL), person with a hearing impairment
the blind	people with visual impairments; blind people; blind and partially sighted people
an epileptic, diabetic, depressive, and so on	person with epilepsy, diabetes, depression or someone who has epilepsy, diabetes, depression
dwarf; midget	someone with restricted growth or short stature
fits, spells, attacks	seizures

Reference guide for Easy language and Easy-to-understand language

Many people have difficulty understanding information. For example: a letter from the insurance company or a letter from court. Texts in Easy-to-understand language help make complex information more understandable. Easy language and Easy-to-understand language enable understanding, promote participation and are therefore important points towards greater inclusion in our society. This is why it was also important in SuCoLo's communication and dissemination strategy.

In contrast to certified Easy-to-understand language (Inclusion Europe), Easy language has no fixed rules: Following a few principles, we can make our content and texts linguistically simple and thus make it easier for more people to understand.

Texts in Easy language are particularly suitable for people with:

- learning difficulties,
- reading difficulties and
- people who do not understand the language well.

2 Salzburg Research Pilot

While the research pilots in Merano and Leipzig tested infrastructural last-mile logistics solutions, the Salzburg research pilot primarily employed a focus on developing and testing digital demand-side behavioural change techniques (BCTs) to persuade, motivate and incentivise consumers to choose sustainable modes of delivery (specifically, the use of cargo bikes). Taking into account co-creation methods (WP3, see [D3.1 Scientific publication of reviewed behaviour change techniques for sustainable logistics](#), [D3.2 Report on open idea challenge and co-creation workshops](#), [D3.3 Behaviour change guidebook for sustainable logistics choices](#), and [D3.4 Webshop prototype for behaviour change interventions for sustainable logistics choices](#)), the Salzburg research pilot tested a select number of BCTs on a simulated online retail environment. Here, the most suitable digital BCTs for motivating customers for sustainable cargo bike delivery were investigated by using the SuCoLo webshop prototype. The webshop prototype and its associated integrated behavioural interventions were developed by partner VIA, along with the expertise on behaviour change by SRFG.

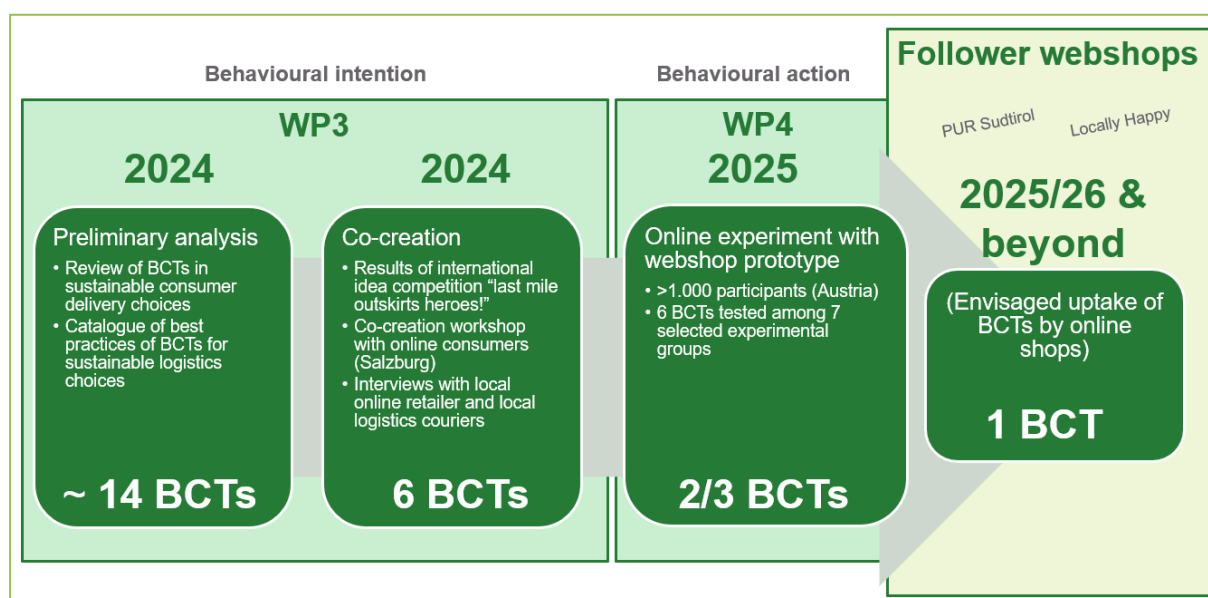


Figure 2 Process of developing, designing and testing the BCTs employed in the Salzburg research pilot

2.1 Design and preparation

2.1.1 Design process

The design process followed a structured, sequential approach that linked foundational research activities in WP3 directly to the pilot implementation in WP4 (see Figure 3). The process began with a state-of-the-art analysis of existing BCTs for sustainable logistics choices (T3.1), which reviewed prior published studies and examined the practical implementation of BCTs across leading e-commerce platforms. This was followed by user- and commercial-centric co-creation methods (T3.2) including an international IdeaSpace campaign and an in-person workshop to identify the needs and preferences of consumers and retailers regarding sustainable delivery options. Based on these insights, a novel inventory of digital BCTs was systematically developed (T3.3), evaluated using the APEASE

criteria (West et al., 2019) and the methodology of Rubinstein (2018), and subsequently integrated into a purpose-built experimental webshop prototype simulator (T3.4).

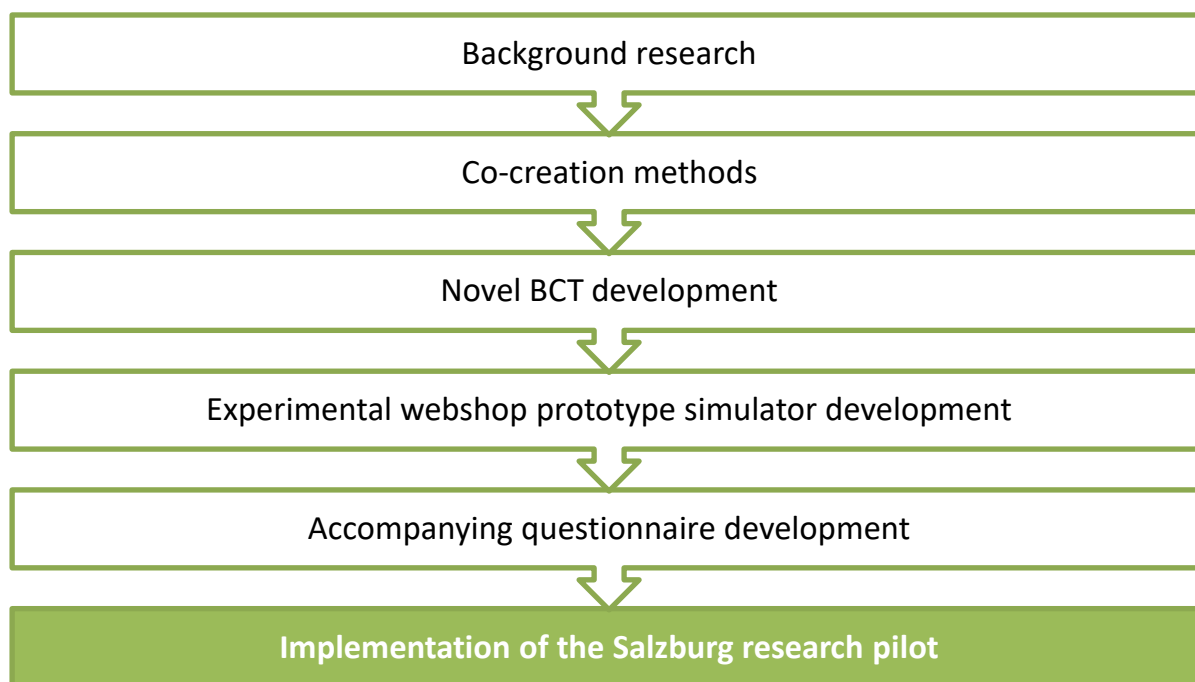


Figure 3 Development sequence of the Salzburg research pilot

2.1.2 Stakeholder involvement

Stakeholder engagement was embedded throughout the design phase of the Salzburg research pilot, drawing on both broad citizen participation and targeted expert involvement. The primary co-creation activities were carried out within WP3 (T3.2) and took two main forms: an international open innovation campaign and an in-person stakeholder workshop.

The IdeaSpace campaign "Sustainable last-mile delivery heroes" (September 2024 – January 2025) was conducted via SRFG's open innovation platform IdeaSpace (<https://www.ideaspace.cc/en/>), which has been active since 2019 and has a community of over 2,000 members. The campaign invited citizens across all four consortium partner countries to contribute ideas for sustainable last-mile logistics, structured around four thematic categories: Behaviour Change, Green Online Store, Perfect Pick-up Station and Ultimate Booking Platform. To ensure broad accessibility, the campaign was promoted in English, German, and Italian. A total of 53 ideas were submitted, which were then evaluated by an expert jury on the basis of originality, ecological and social impact, feasibility, scalability and local embeddedness. The winning ideas and the broader pool of submissions served as direct input for subsequent project tasks, including the development of the BCT inventory (T3.3), the webshop prototype (T3.4) and the pilot design (T4.1).

In addition to the open innovation campaign, an in-person workshop was held on 26 September 2024 to gather targeted UX feedback on the webshop prototype. This workshop revealed important usability and accessibility considerations, including the need for improved text and image contrast, larger text and icons, and a revised display of shipping costs. These

findings were directly incorporated into the iterative development of the webshop simulator. Throughout the design process, partner VIA contributed technical expertise in agile web application development, while Independent L. ONLUS (IND) ensured that accessibility and inclusiveness were considered across all pilot activities and project communication (see also section 2.1.5).

2.1.3 Resources and tools prepared

The preparation of the Salzburg research pilot required the development and integration of several methodological and digital resources. The central tool was the SuCoLo webshop prototype simulator, developed by partner VIA through an agile development process with iterative releases (T3.4). The simulator replicated a realistic online retail environment in which participants could browse products, add items to a shopping cart, and select a delivery option. Six behavioural change techniques were integrated into the prototype as experimental conditions: a green leaf eco-label, a default sustainable delivery pre-selection, customer loyalty points, priming messaging, an urgency cue and a voucher incentive, alongside a control condition with no nudge. The prototype underwent multiple rounds of refinement based on co-creation feedback, with particular attention to the user journey, UI and UX quality, and the realistic presentation of the BCTs.

The methodological framework drew on several established resources. The BCT inventory was developed following the methodology of Rubinstein (2018) and evaluated using the APEASE criteria (West et al., 2019). The classification of BCTs drew on Michie et al.'s Behaviour Change Taxonomy (Michie et al., 2013). The background research (T3.1) drew on a systematic review of ten studies from 2018–2024 identified through Scopus, Web of Science, and Google Scholar, as well as an analysis of the top 65 e-commerce sites by net revenue in 2022. A complementary best practices catalogue identified 18 real-world and research-based cases of BCTs for sustainable delivery choices, including examples such as cargo bike-specific delivery services and data-driven tools like Vanden Borre's SmartDrop.

An accompanying structured questionnaire was developed (T4.1) to capture key variables including demographic information (age, gender, income, education, degree of urbanisation), sustainable value orientation (measured via the SVAL scale), online shopping behaviour (frequency, participation in customer loyalty programmes), and acceptance of each nudge type.

A priori power analysis was conducted using G*Power 3.1.9.7 (Faul et al., 2009), based on an a priori estimate of $1-\beta = 0.95$ and an estimated medium effect size of $w = 0.15$ (Faul et al., 2007). The analysis indicated that a minimum sample size of 927 participants was required for an analysis of variance with seven groups ($df = 6$). The mean duration of the study was approximately 10 minutes per participant.

2.1.4 Regulatory considerations

As the Salzburg research pilot involved a web-based behavioural experiment with human participants, regulatory considerations primarily concerned data protection and research ethics. The study was designed in compliance with the European General Data Protection Regulation (GDPR). Participants were informed about the purpose of the study, the types of data collected, and their right to withdraw at any time. Participation was voluntary and

required informed consent prior to accessing the webshop prototype and the accompanying questionnaire. All collected data (demographic information, survey responses, and behavioural data from the webshop simulator) were processed and stored in accordance with applicable data protection requirements. No personally identifiable information beyond what was necessary for the study was collected.

2.1.5 Accessibility considerations

Accessibility and inclusion were two important fundamental principles of SuCoLo: The project wanted to deploy inclusive bicycle logistics to foster net-zero ways of delivery and pick-up of goods in urban outskirts. Pick-up stations were designed to serve as well as social places for residents, with a focus on accessibility and inclusiveness for *all*. Using living lab methods and involving IND as competence center for accessibility, the novel concepts were collaboratively designed and tested in Salzburg, Leipzig and Merano to promote sustainable, neighbourhood-centred and inclusive goods delivery and pick-up in urban fringe areas. The involvement of this project partner has ensured accessibility and inclusion in all project activities and in project communication.

2.2 Implementation (description of running the pilot, time length, etc., who tested it, what was tested)

2.2.1. What was implemented/piloted

The Salzburg research pilot consisted of a web-based behavioural experiment followed by a structured questionnaire, conducted using the SuCoLo webshop prototype simulator. Participants were asked to simulate an online shopping experience, selecting one or two items as though making a real purchase, and then choosing a delivery option. The experiment tested six distinct behavioural change techniques (BCTs), also referred to as nudges, against a control group (no nudge). The six BCTs were: (1) a green leaf nudge, which visually highlighted the sustainable delivery option with an eco-label; (2) a default nudge, which pre-selected the cargo bike delivery option; (3) a customer loyalty points nudge, which offered bonus loyalty points for choosing cargo bike delivery; (4) a priming nudge, which exposed participants to sustainability-related messaging before the delivery choice; (5) an urgency nudge, which created time pressure around the sustainable option; and (6) a voucher nudge, which offered a discount voucher as an incentive for selecting cargo bike delivery.

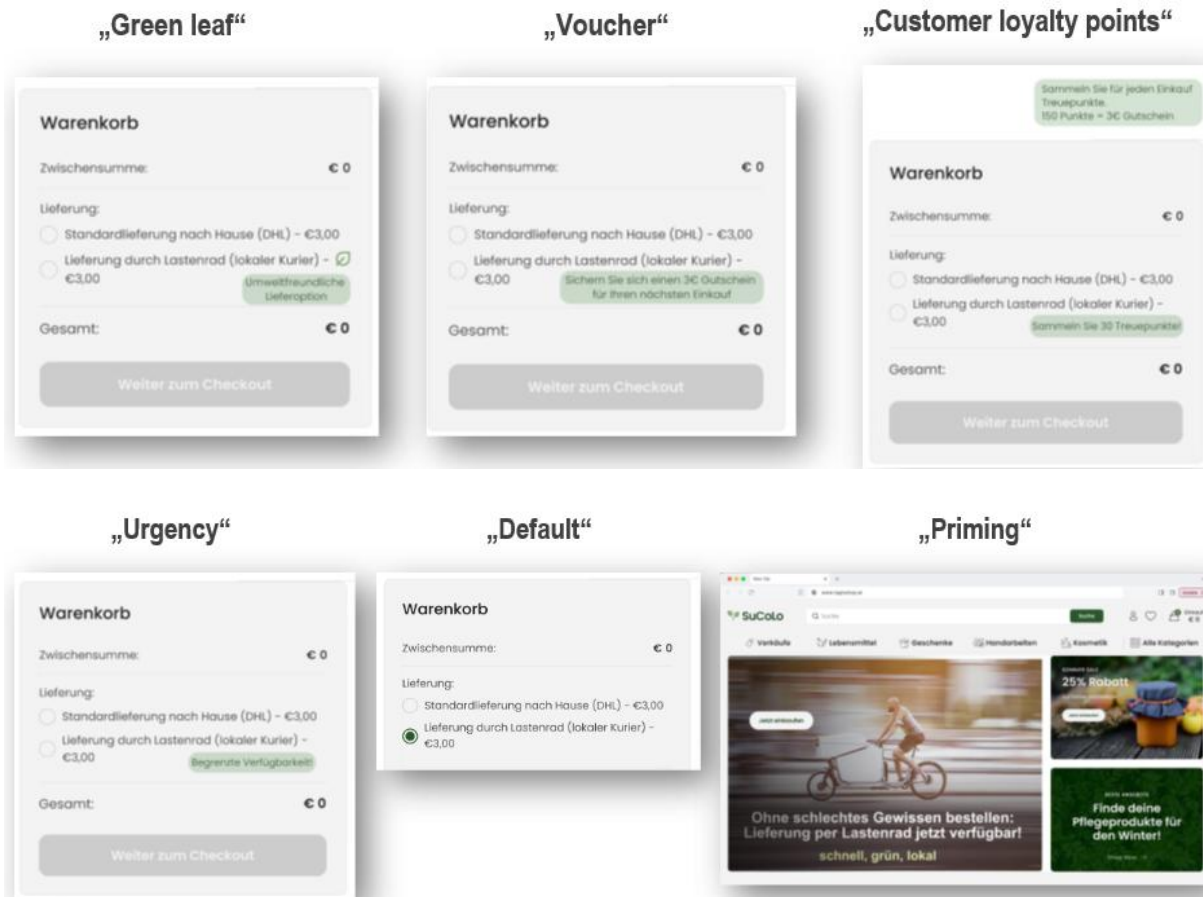


Figure 4 Overview of 6 employed BCTs

Following the simulated shopping task, participants completed a structured questionnaire capturing demographic information (age, gender, income, education, degree of urbanisation), psychographic variables (sustainable value orientation measured via the SVAL scale), online shopping behaviour (frequency, participation in customer loyalty programmes), and their acceptance of each nudge type. The primary dependent variable was the binary delivery choice: standard delivery versus sustainable cargo bike delivery.

2.2.2 Who was involved

The research pilot was designed and coordinated by Salzburg Research (SRFG), which provided scientific expertise on behaviour change and led the experimental design, data collection, and statistical analysis. Partner VIABIRDS Technologies (VIA) was responsible for the technical development of the webshop prototype simulator, including iterative user interface and user experience improvements informed by co-creation feedback. The study recruited an Austrian sample of online shoppers who purchase goods online at least twice per year.

2.2.3 Number and type of stakeholders reached

A total of 1,101 participants were recruited for the study, exceeding the minimum required sample size of 927 as determined by the power analysis. The sample comprised Austrian residents who shop online at least twice per year. The mean age of participants was 46

years, with a near-normal distribution of age across the sample. In terms of gender, 54% of participants were male and 45% were female. Participants were relatively well-educated, with the majority holding qualifications at the secondary school level or higher. The participants were randomly assigned to one of seven experimental conditions: six nudge treatment groups and one control group.

2.2.4 Challenges faced and mitigation strategies

A key challenge involved ensuring a sufficiently large and representative sample to detect potentially small effects of individual BCTs on delivery choice. Given the novelty of the research area and the lack of prior effect size estimates for BCTs in delivery choice contexts, the power analysis was conservatively designed with a medium effect size ($w = 0.15$) and high statistical power ($1 - \beta = 0.95$). This was mitigated by recruiting 1,101 participants, well above the minimum threshold of 927.

Another challenge was related to the ecological validity of the simulated shopping environment. While the webshop prototype was designed with iterative UX improvements informed by co-creation workshops to closely replicate a realistic online retail experience, participants were aware that they were not making real purchases. This inherent limitation of experimental simulations was mitigated through careful task design (e.g., instructing participants to shop as though making a real purchase) and through the iterative refinement of the prototype's visual design and user experience based on stakeholder feedback.

Additionally, the accessibility of the webshop prototype required ongoing attention. Feedback from the in-person co-creation workshop in September 2024 identified issues including insufficient text and image contrast, small icons, and unclear display of shipping costs. These were addressed through dedicated UX revisions, including larger text and icons, improved contrast ratios, and a revised shipping cost display that only showed fees after a delivery option was selected.

2.3 Results

The Salzburg research pilot addressed five research questions concerning the effectiveness of BCTs on sustainable delivery choice, the roles of sustainability values, socio-demographic factors, nudge acceptance, and online shopping behaviour. The analytical approach employed chi-squared tests, Fisher's exact tests, binomial logistic regressions, and Cramér's V as a measure of effect size. The following sections present the quantitative outcomes, qualitative insights from exploratory analyses, and notable innovations or unexpected findings.

2.3.1 Quantitative outcomes

RQ1: Effectiveness of BCTs on delivery choice. A chi-squared test revealed no statistically significant association between the behavioural nudge group and the choice of sustainable delivery option, $\chi^2(df = 6) = 10.60$, $p = 0.102$. A Fisher's exact test with simulated p -values supported this result ($p = 0.088$). The effect size, measured by Cramér's V , was small ($V = 0.098$), suggesting only a weak relationship between the nudge condition and delivery choice. Nevertheless, descriptive patterns revealed meaningful variation across conditions (see Figure 5. Delivery choice by behavioural change technique (BCT) condition).

The chart displays the percentage of participants selecting standard delivery versus cargo bike delivery across the seven experimental conditions (N = 1,101). The customer loyalty points nudge yielded the highest rate of cargo bike selection (30.63%), followed by the green leaf nudge (29.56%), the default nudge (28.40%), and the voucher nudge (27.92%). All four of these BCTs outperformed the control group (22.15%). Notably, the urgency nudge (17.61%) was the only condition that performed below the control group, and the priming nudge (26.28%) showed a modest advantage over the control.

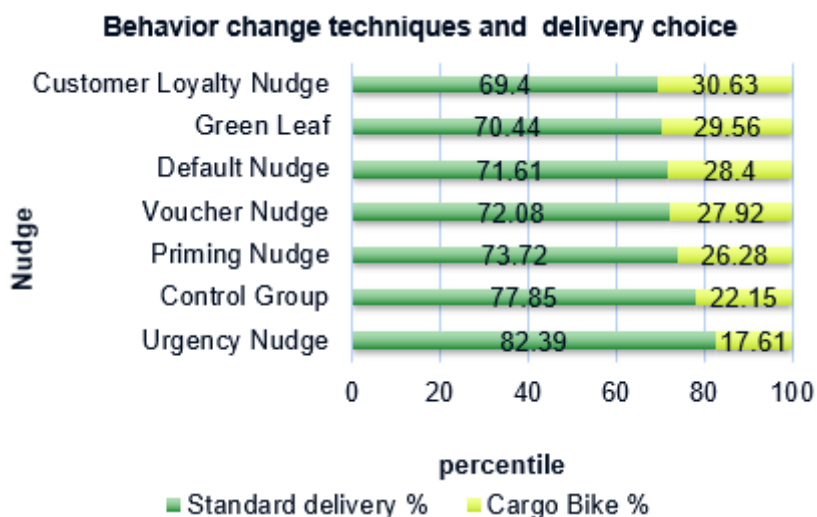


Figure 5. Delivery choice by behavioural change technique (BCT) condition. The chart displays the percentage of participants selecting standard delivery versus cargo bike delivery across the seven experimental conditions (N = 1,101).

RQ2: Influence of sustainability values. A binomial logistic regression demonstrated that individuals with stronger sustainability values, as measured by the SVAL scale, were significantly more likely to choose the sustainable cargo bike delivery option. For every one-point increase in the sustainability values scale, the odds of choosing the sustainable delivery option increased by 30% (Odds Ratio = 1.30). This effect was highly statistically significant ($p = 0.0001$).

RQ3: Socio-demographic factors. A binomial logistic regression found that age, gender, income, and regional background did not significantly influence participants' delivery choice processes ($p > .05$ for all variables).

RQ4: Role of nudge acceptance. A binomial logistic regression revealed that participants who exhibited greater acceptance of nudges were significantly more likely to select the sustainable delivery option. For every one-unit increase in nudge acceptance, the odds of choosing sustainable delivery increased by 33% (Odds Ratio = 1.33). This effect was highly statistically significant ($p = 0.0001$).

RQ5: Online shopping behaviour. A chi-squared test found no statistically significant relationship between the frequency of online shopping and the likelihood of selecting a sustainable delivery option ($p = 0.50$). Cramér's V was 0.063, indicating no meaningful connection between shopping frequency and delivery choice.

2.3.2 Qualitative insights

Exploratory analyses beyond the primary research questions revealed several noteworthy patterns regarding the interplay between demographic characteristics, sustainability values, nudge acceptance, and shopping behaviour. While no statistically significant associations were observed between delivery choice, the tested nudges, and demographic variables in the primary binomial logistic regression models ($p > .05$), additional regression analyses uncovered meaningful relationships among the measured variables.

Regarding sustainable value orientation (SVAL), men demonstrated a significantly lower average level of sustainable value orientation compared to women ($p < .05$). Additionally, individuals with higher levels of education tended to score higher on the SVAL scale ($p < .05$). In terms of nudge acceptance, middle-aged and older adults showed significantly lower acceptance of nudges ($p < .05$), men exhibited significantly lower nudge acceptance than women ($p < .05$), and higher education had a positive influence on nudge acceptance ($p < .05$). Importantly, people with stronger sustainable values were significantly more likely to accept nudges ($p < .05$), suggesting that sustainability orientation and openness to behavioural interventions are mutually reinforcing. This pattern is illustrated in Figure 6 and 6, which compare nudge acceptance across experimental conditions for participants with high versus low sustainable value orientation.



Figure 6 Nudge acceptance by experimental condition among participants with high sustainable value orientation (SVAL). Box plots display the distribution of nudge acceptance scores (scale 0–7) for each condition.

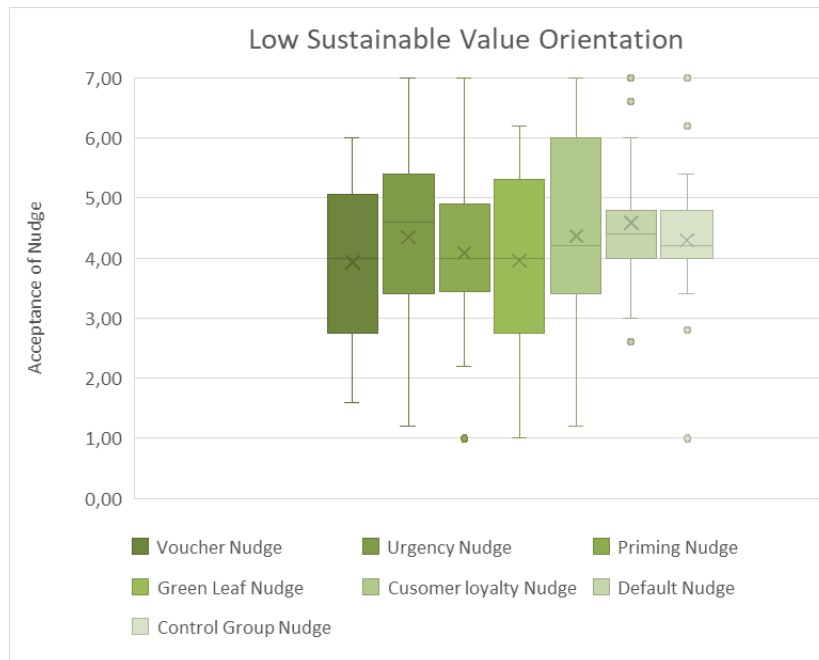


Figure 7 Nudge acceptance by experimental condition among participants with low sustainable value orientation (SVAL). Box plots display the distribution of nudge acceptance scores (scale 0–7) for each condition.

With respect to online shopping frequency, older adults were significantly less likely to shop online frequently ($p < .05$), and the middle age group also tended to shop less frequently than younger people ($p < .05$). Men shopped online significantly less frequently than women ($p < .05$), while higher income increased the likelihood of shopping online more frequently ($p < .05$). Notably, individuals with higher sustainable values (SVAL) shopped online less frequently ($p < .05$), while more frequent online shoppers showed greater acceptance of nudges ($p < .05$). People who shopped frequently were also more likely to participate in customer loyalty programmes ($p < .05$).

2.3.3 Innovations or unexpected results

The most notable finding of the Salzburg research pilot was that, while the overall effect of BCTs on delivery choice did not reach statistical significance, the descriptive data revealed considerable variation in the effectiveness of individual nudge types. The customer loyalty points nudge and the green leaf nudge yielded the highest rates of cargo bike delivery selection (30.63% and 29.56%, respectively), representing a substantial improvement over the control group (22.15%). This suggests that certain types of BCTs, particularly those that leverage tangible incentives or clear environmental signalling, may hold promise for future interventions, even if the aggregate effect across all nudge types was not statistically distinguishable from the control.

An unexpected result was the poor performance of the urgency nudge (17.61%), which was the only BCT condition that performed below the control group. This finding suggests that creating time pressure may have a counterproductive effect on sustainable delivery choices,

possibly by prompting participants to default to more familiar or convenient standard delivery options under perceived urgency.

Perhaps the most innovative insight was the strong predictive power of both sustainability values (SVAL) and nudge acceptance on delivery choice, independent of the specific nudge applied. The finding that these individual-level dispositions were highly significant predictors (both $p = 0.0001$) while demographic variables were not suggests that effective interventions for sustainable logistics choices may need to focus less on demographic targeting and more on engaging individuals' existing value orientations and receptivity to behavioural interventions. The observed positive relationship between SVAL and nudge acceptance further implies that consumers who already hold sustainability values are more receptive to BCTs, indicating a potential synergy that future interventions could exploit through tailored approaches that reinforce and activate pre-existing sustainability dispositions.

3 Leipzig Research Pilot

3.1 Design and preparation

3.1.1 Design process

A district on the northwestern edge of Leipzig, Lützschena-Stahmeln, was selected as a pilot area. The special characteristic here is the different age structures and the resulting demands for the living environment of the residents. Our pilot district has an ageing population, a small number of local shops, and a low population density. Therefore, it is important to consider future users of the pilot project at an early stage. As already mentioned in [D3.2 Report on open idea challenge and co-creation workshops](#), a co-creation process with residents is essential. However, we held a workshop with local residents to identify their needs and determine the current state of infrastructure in the pilot area. We discovered that there are only a few local shops, and that micromobility solutions linked and leisure meeting places, such as community centers, are lacking.

In the next step, we published a survey (see [D3.2](#)) that records shopping and mobility behavior in the pilot area. The survey ran from December 2024 to April 2025 and recorded 182 responses ($N=182$). Of these, 153 ($n=153$) could be assigned to the pilot area. The most important results are provided in the following.

Demographic analysis

28% of participants are 65 years of age or older. There are no participants in the 18-24 age group and six participants in the next age group (25-34 years). The 35-44, 45-54, and 55-64 age groups are relatively evenly distributed. The average age (mean assumption) of the survey participants is 56.1 years. The majority of respondents are 65 years of age or older. Younger age groups between 18 and 34 years are underrepresented in the survey.

Mobility behavior analysis

The majority of respondents use cars (81 people) or public transportation (63 people) to travel to Leipzig city center. Only 15 participants use bicycles. This suggests that the distance to the city center is longer or that the target group is older.

Shopping behavior analysis

In the city center, people mainly buy clothing and shoes, followed by books and electronics. Respondents visit the city center for decorative items or gifts, jewelry and glasses, ceramics, tickets, or fresh fruit and vegetables. The outskirts residents visit the city center primarily to buy products that they cannot get in their neighborhood.

As an alternative, residents order goods online. 68% of participants order regularly, while just under 16% order online less frequently. The most frequently ordered items are clothing and shoes, as well as electronics, books, household goods, and furniture. However, the open-ended responses show that people specifically search the internet for specialized or hard-to-find products, such as printer cartridges.

Delivery analysis

The majority of respondents (142 people) prefer home delivery, while alternative options such as parcel stations (23 people) or post offices (21 people) are significantly less popular. Other responses indicate a desire for convenient, secure, and individually suitable pick-up locations such as the workplace, parcel boxes, or a central district pick-up station. Three people can imagine picking up their order at a café and having a social gathering. Just under half of respondents (42%) would use a parcel collection station or drop-off point in their area, while around a third (28%) are undecided. This shows a fundamental interest in alternative delivery options, provided they are practical and easily accessible. Then we played a thought experiment with the respondents and asked them if they would be willing to order online and then pick up the goods at a store near them, and if they could suggest a suitable location. The results: most participants (61%) are open to the concept of "click & collect". The future town center of Lützschena, the Stahmeln shopping center, and several existing businesses, such as a car repair shop, gas station, hardware store, and the old Lützschena town hall, were mentioned as suitable locations.

The survey shows that most respondents shop online regularly and prefer to have their packages delivered home. The main reasons for shopping online are time savings, convenient delivery, and lower prices. There is general interest in alternative pick-up options such as parcel stations or local stores, provided they are easily accessible and practical. Brick-and-mortar retail is often perceived as inadequate, for example due to limited availability of certain products, lack of accessibility, or inconvenient opening hours. The target group is predominantly older and with limited mobility, which is reflected in their preference for using cars and public transport.

3.1.2 Stakeholder involvement

From the very beginning of the design process, the city of Leipzig, a cooperating bike courier company, outskirts residents, and the district mayor were involved in the pilot project. This was achieved through networking events, a co-creation workshop, and a survey (see [D3.2](#))

3.1.3 Resources and tools prepared

The co-creation workshop was designed using the “Flower of Proximity” method. This allowed insights to be gathered into how residents perceive distances to certain services (see [D3.2](#)).

The survey was made available using the online tool LimeSurvey and in paper form at public collection points in the pilot area.

The beforehand collected information and data was used to create three digital user profiles of the residents. In combination with the previously found open municipal data sets (see [D2.2](#)), comprehensive information about the pilot area could be collected. This information was used to design a simulation-based decision support model that shows potential locations for micro-hubs and pick-up stations (see [D2.3](#)).

In addition, a scheduling and routing prototype app for bicycle couriers was developed to support sustainable delivery options (see [D2.4](#)). To create a reality comparison, data is collected during the delivery pilot, which can be implemented in the app in the future.

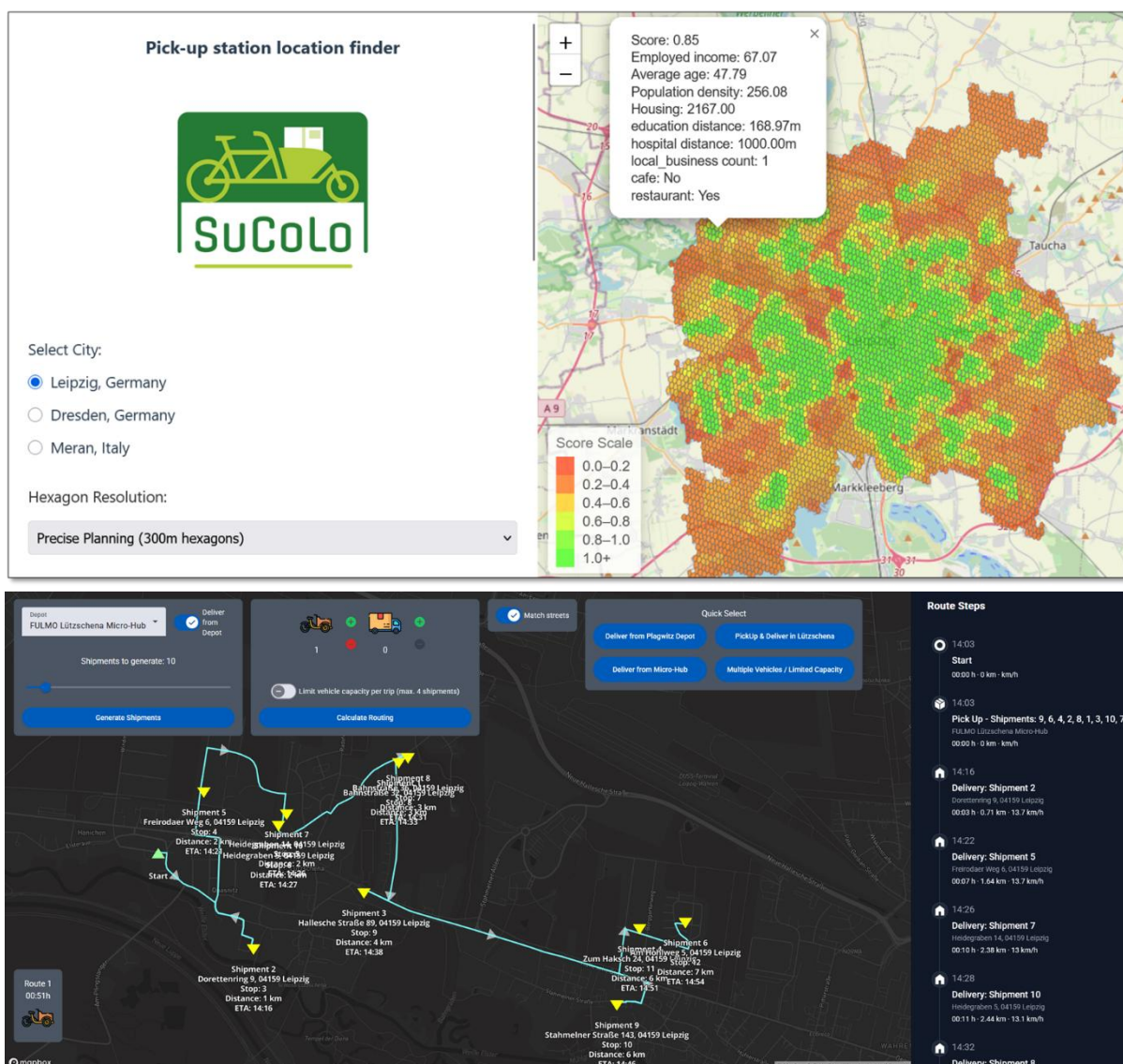


Figure 8 Simulation-based decision support model and routing prototype

3.1.4 Regulatory considerations

The micro-hub location should be easily accessible and as barrier-free as possible for both suppliers and residents. Through the modular adaptation of the simulation model to user requirements, further urban planning approaches can be simulated regarding accessibility.

3.1.5 Accessibility considerations

As mentioned above, the simulation app contains user profiles with different needs. For example, accessibility options can be selected to influence the model with step-free infrastructure for identifying suitable pick-up station locations.

Furthermore, IND examined the pilot area regarding accessibility aspects, and a walking tour was created (see [D4.2](#)). In addition, IND has developed a specific PEBA - Plan for the Elimination of Architectural Barriers for the Lützschena Stahmeln Tram station in Leipzig (see [D4.1](#))

To describe the accessibility and reachability of the pilot site in Lützschena Stahmeln (Leipzig) in an interactive way, IND has also created an [interactive virtual tour \(3D\)](#) and

described in a document the context, the development and the implementation of innovative 3D virtual tours designed to digitally assess the accessibility and inclusiveness of the two SuCoLo peri-urban pilot sites (in Merano and Leipzig) and surrounding points of interest (POIs) (see [D4.2](#)). This contributed to SuCoLo's objective of ensuring the inclusiveness of its designed pilot sites by fully taking into account barrier-free accessibility for *all*, with a focus employed on the requirements of families, persons with disabilities and the elderly who might partake in the pilot sites.

3.2 Implementation

3.2.1. What was implemented/piloted

In the pilot district a mobile micro-hub with cargo bike delivery was trialled from May 2025 to the end of November 2025 from Monday to Friday by a local bike courier company. A micro-hub is a small district-based storage facility that shortens the delivery travels for bike couriers. In this case, it is also mobile because it is a van with various locking permissions or the couriers for pick-up and drop-off deliveries. If the requirements change, the micro-hub can be moved to another location.



Figure 9 Mobile micro-hub and cargo bike rental station in front of the old townhall of Lützschena-Stahmeln.

Based on the above findings (workshop, survey, open data), it was decided to use a mobile micro-hub, since no suitable stationary local location was available, and deliveries are made to recipients' homes as requested in the survey. In addition, regional fruit and vegetable boxes and regionally sourced coffee were added to the delivery service. Regular parcel and letter deliveries from this area were also taken over.

As an additional service, a cargo bike was offered for rent with an app. To increase rental activity in the pilot area, an offer was launched that allowed the first 24 hours of rental free of charge. We are thus expanding local mobility options, allowing citizens to test the practicality of cargo bikes in everyday life for themselves.



Figure 10 Advertisement for 24 hours free cargo bike rental in Lützschena-Stahmeln.

Furthermore, our mobile hub is intended to serve as a social meeting place and event venue. Here, information about the project, cargo bike logistics, and mobility in general will be provided. The goal is to use the experiences and discussions to derive requirements for permanently implemented micro-hubs in urban outskirts. As part of European Mobility Week from September 16-22, 2025, there was an open micro-hub event to get to know the neighbourhood and the micro-hub delivery concept.



Figure 11 Open micro-hub event in Lützschena-Stahmeln.

3.2.2 Who was involved

The bicycle courier company took over the operation of the micro-hub and distribution of parcel deliveries. Deliveries from larger parcel service providers, such as DHL, were taken over. The customers are the residents of the pilot area. Therefore, all events or actions have been communicated via the local council and local association to the residents. The city administration provided us with the parking lot in front of the old town hall.

3.2.3 Number and type of stakeholders reached

We reached 182 people with a citizen survey and met about 10 people in an in-person workshop for individual interviews.

The delivery amount from May to the end of November was about 568 deliveries in total by bike for the entire area of Leipzig northwest. Of these, 289 deliveries were made to the pilot area.

3.2.4 Challenges faced and mitigation strategies

No suitable location could be found as a micro-hub or pick-up station in the pilot area. Alternatively, orders were delivered to customers' homes, and a mobile micro-hub was set up. This resulted that bicycle delivery drivers could not be guaranteed a full-time workplace within the delivery district with necessary infrastructure, such as office rooms or restrooms, which is why they had to start work at the central office near the city centre and travel for about 45 minutes to the micro-hub every day of delivery.

3.3 Results

3.3.1 Quantitative outcomes

In total, 289 deliveries were made to the pilot area during the weekdays from Monday to Friday. Figure 11 shows that deliveries in the pilot area are concentrated around the main road. This indicates a low volume of private orders in purely residential areas.

It can be noted that during the summer months and school holidays between early July and early September, there were fewer or no deliveries in the pilot area (see figure 12). A high volume of deliveries can be attributed to B2B deliveries or targeted deliveries to parcel stations.

With regard to the shipping details, about 73% of deliveries were delivered normally, more than 6% were left with neighbours, and almost 7% were left at parcel stations (see figure 13). The drop-off at the mobile micro-hub took about 5% of the total deliveries.

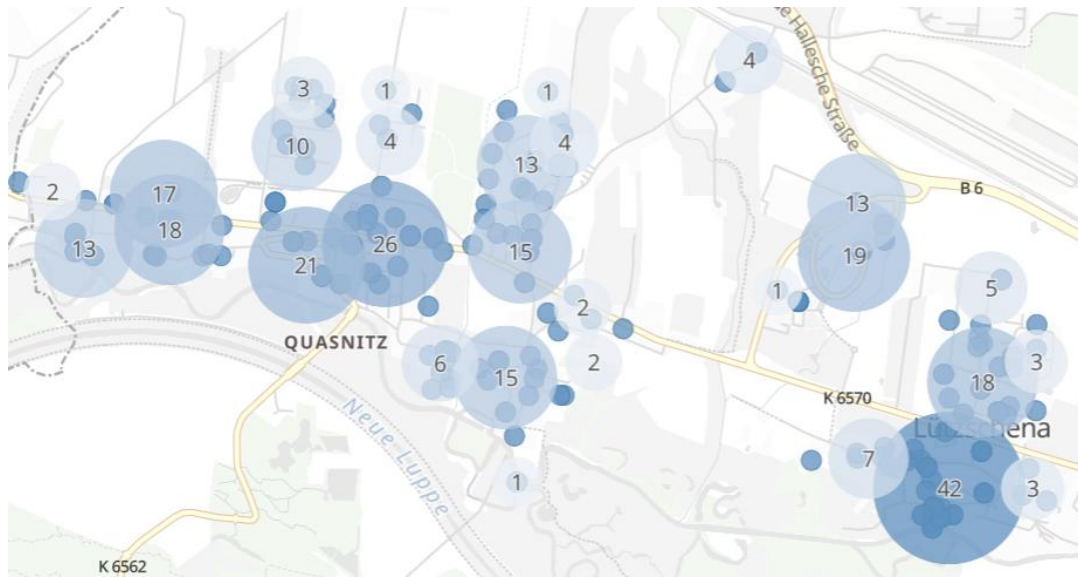


Figure 12 Distribution of deliveries in the pilot area from May 20 to November 28, 2025.

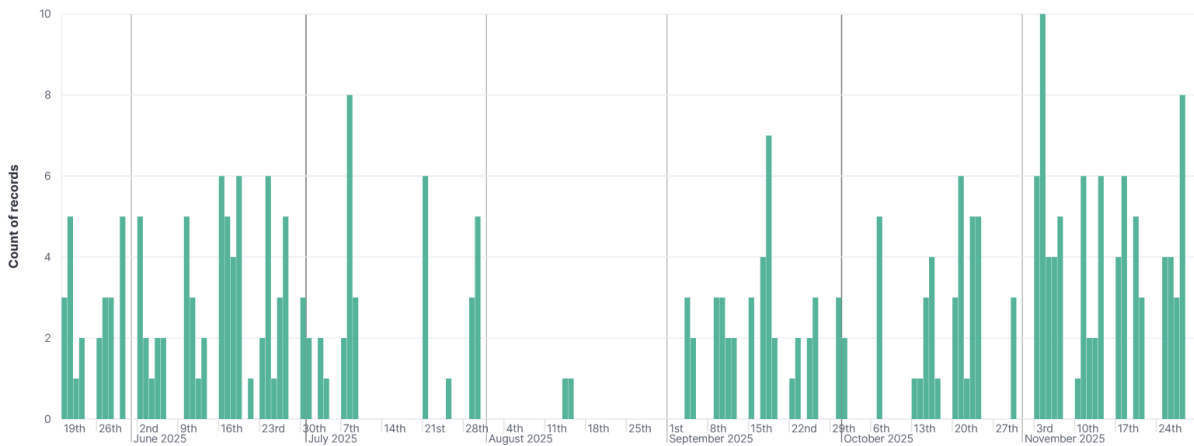


Figure 13 Total shipment volume in the pilot area from May 20 to November 28, 2025.

Top Drop off characteristics

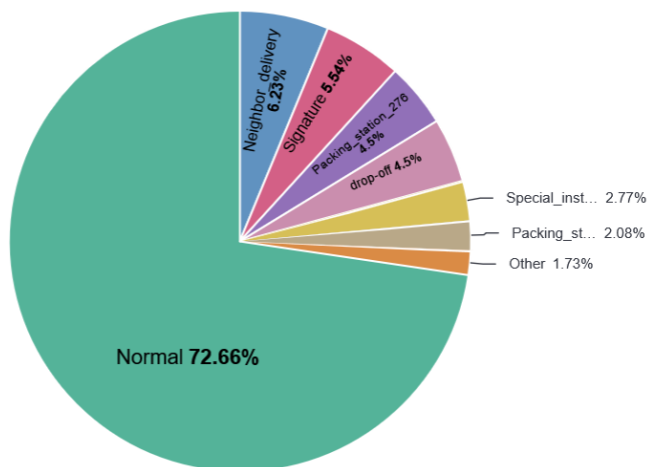


Figure 14 Shipping details in the pilot area from May 20 to November 28, 2025.

During the pilot period, the cargo bike offered has been rented 20 times from 11 different customers for a route length of 315,45km in total. The average tour length is about 16km per trip. Most of the tours went in the direction of the city centre and appear to be for tourist or leisure use.

3.3.2 Qualitative insights

The bicycle delivery drivers enjoyed delivering parcels to the pilot area, as it is easily accessible via routes close to nature. Some of the recipients were also happy to receive their deliveries by bicycle and gave positive personal feedback to the couriers.

Overall, deliveries to the micro-hub for the bicycle courier company fitted in very well with the interregional delivery route to the city of Halle (Saale). This made it possible to combine two delivery routes in a cost-effective way.

3.3.3 Innovations or unexpected results

Overall, delivery using a mobile micro-hub and the recorded shipment volume in the pilot area would not be economic viable for a bicycle delivery service. There would need to be more deliveries per day/hour and a permanent space with infrastructure for drivers would need to be available. As a possible solution, additional deliveries could be taken over from other delivery companies, as described in white labelling concepts, or combine different CEP (Courier, Express, and Parcel services). This would not only result in increasing productivity but also eliminate travel time for employees.

The cargo bike rental station was used very rarely during the pilot period. However, when the cargo bike was rented, it was used mostly for longer trips, probably with baggage or children, to the nearby nature. Most of the time during the pilot period, the cargo bike was available at the bike rental station. Perhaps placing the rental station in a more central location, such as the hardware store parking lot or near the shopping centre area, would have generated greater use. Moving the station closer to higher densely populated residential areas rather than destinations could also be an improvement. No vandalism was detected on the cargo bike during the pilot period. In future, the cargo bike partner is seeking a cooperative partnership with housing operators in the pilot area.

4 Merano Research Pilot

4.1 Design and preparation

4.1.1 Design process

The design process was developed in Merano, a medium-sized town with approximately 41,000–42,000 inhabitants. The municipality covers 26.34 km² and has a population density of around 1,550–1,600 inhabitants per km². Its urban structure is characterised by a compact historic centre set within a mountainous landscape, with varying elevations that influence everyday mobility patterns. A lively and innovation-oriented local retail sector made the area particularly suitable for testing sustainable urban logistics solutions.

4.1.2 Stakeholder involvement

Participation was integrated throughout the entire implementation phase and was not limited to the start of the project. Continuous monitoring was carried out through structured surveys and dedicated working groups. In this context, Blufink srl supported the participatory process. Workshops and regular monitoring meetings were organised with a working group of local retailers, applying an iterative learning loop as a method to test, evaluate and refine the services over time.

Municipality engagement

The pilot was designed through an iterative process of co-creation with key stakeholders, including the Municipality of Merano, specifically the Mobility Office and the Deputy Mayor, and hds, the South Tyrolean Association of Commerce, Services, and Tourism. Consultation and coordination meetings were conducted to define operational structures, management procedures, and the strategic deployment of services, considering territorial constraints such as the availability of public space, maintenance requirements, and safety considerations.

Between April 2024 and February 2025, a series of meetings took place (see [D3.2](#)):

- Four online coordination meetings with the Municipality of Merano
- Three online meetings and one in-person meeting with hds;

A final, decision-making in-person meeting on 18 December 2024 in Merano, attended by all institutional and operational stakeholders including the Mobility Office, Deputy Mayor, the Councillor for Economic Affairs, hds representatives, the local hds delegate, and the social cooperative Independent L.

Shop-owners / Shop employees engagement

A cycle of activity with a focus group with partner shops was also organised. This ongoing feedback mechanism allowed the project to adapt progressively during implementation.

In April 2024 a meeting with partner shops (see [D3.2](#)) was held to define operational procedures, service coverage, and the financial framework. Each delivery is priced at €8.50, with costs shared among the retailer (€2), the customer (€2), and the project (€4.50). The focus group was also enriched by one-to-one interviews with available shop-partners, in the month of February 2026.

Citizen engagement

In line with the participatory approach, a public competition was launched in December 2024 to name the six vehicles via the Open Innovation Challenge Design platform developed by Salzburg Research (see [D3.2](#)). The selected names were Sissi-Cruiser, Passe(r)gino, Eco-Mover, Cargo-Lina, Captain-Cargo and Cargonaut. From a communication perspective, it was decided to introduce a clearer and more engaging project name. The initiative was renamed "Move to Cargo", a title intended to invite people to integrate cargo bikes into their daily mobility habits.

Qualitative and quantitative data were collected through surveys open to the whole population.

4.1.3 Resources and tools prepared

Cargo Bike Sharing

An extensive market analysis was conducted to identify cargo bikes suited to different mobility and transport needs in Merano. The objective was twofold: to provide vehicles for commercial goods transport and models adaptable to everyday family life, including the transport of children. Given the town's varied topography, most selected models were electric to ensure effective and accessible use.

The fleet consists of four electric cargo bikes by Butchers & Bicycles (two Vario Business models for heavy loads and two Vario Family models equipped with child seats and safety belts), one muscle-powered Muli Muskel cargobike for goods transport, and one Eco-Mover electric scooter Sunrise Sterling to guarantee inclusive access for people with reduced mobility. Purchase and maintenance were entrusted to EVIVA s.r.l. under a €35,000 contract, while inclusive mobility services were ensured by Independent L. in collaboration with Handicar Cooperative.



Figure 15 Cargobikes and E-scooter used in the Merano pilot project

Vehicle access from the final user is managed through the MOQO sharing system, already active and familiar in Merano. Residents can register free of charge within the dedicated “Move to Cargo” group, providing tax code and ID verification (approval from STA within approximately three days), and unlock vehicles autonomously via the app. The platform, managed by Mobility Digital Solutions GmbH, was customised to ensure both accessibility and traceability for research purposes. All bikes are equipped with Lock-It Pro smart locks featuring integrated GPS for theft alerts.

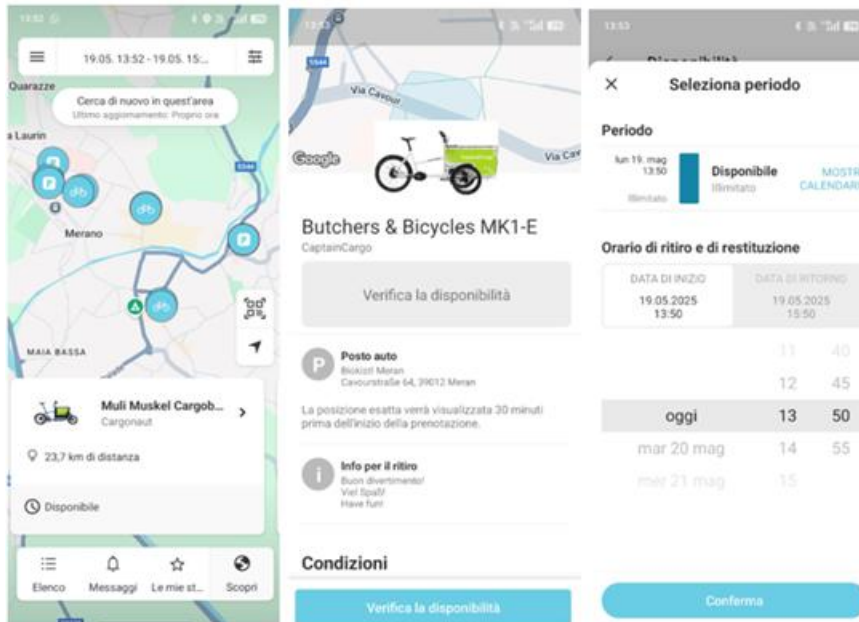


Figure 16 Screens of Moqo App – Cargobike-sharing in Merano

The service follows a decentralised model: six stations were identified across the municipality after extensive dialogue and on-site research to secure reliable host partners. Five local retailers and the association Independent L., agreed to host the bikes, ensuring balanced geographic distribution. Retail partners include Klamotte Vintage & Secondhand, Biokistl Südtirol - changed later in AVS Sportclub Meran, Naturalia-der Biomarkt, Tabaktrafik Pfitscher J. Ellmenreich, Papin Sport). Each signed formal agreements defining responsibilities, insurance clauses (including deductibles in case of theft or vandalism), and operational duties such as charging batteries and storing vehicles overnight, an essential measure given recurring vandalism during nighttime hours in Merano. Initial operational adjustments, such as reinforcing charging routines and proper storage procedures, were resolved within the first months.

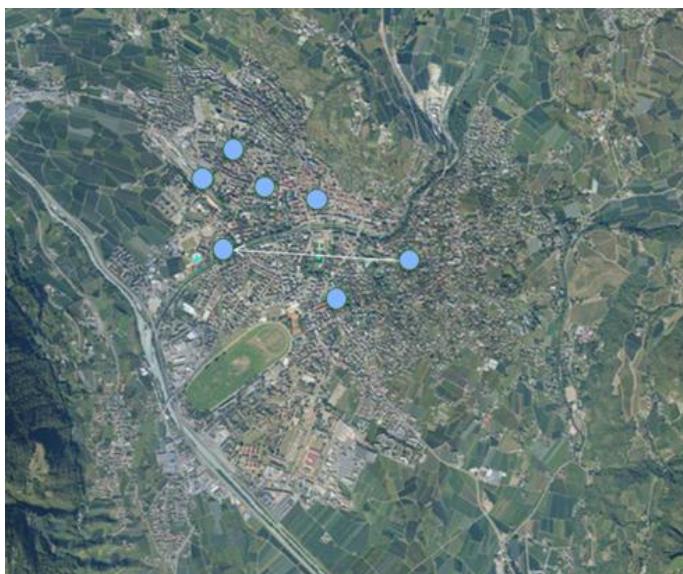


Figure 17 Position of shops hosting a cargobike in Merano

Deliveries

A cooperation agreement was signed with FIX-Fahrradkurier, including an assessment of its operational capacity. FIX – Fahrradkurier, is an established bike-delivery operator in Merano that explicitly rejects gig-economy practices and operates under fair working condition.

During the preparation phase, the absence of a comprehensive monitoring system became evident. To overcome this limitation, a parallel digital platform was developed to connect retailers directly with the courier service, ensuring streamlined coordination and transparent management of deliveries: mometocargo.ermes-srv.com.

The platform was created in collaboration with Hermes s.r.l. specifically for the project. It enables retailers to schedule deliveries, track shipments in real time, and monitor monthly delivery volumes and related budget allocation. In addition, the system was integrated with the pick-up station to ensure coordinated parcel handling and controlled access management.

ID	Azienda	Nome	Cognome	Telefono	Indirizzo	Creazione	Consegna	Stato	Azioni
400	STA	Valentina	Mera		via Portici 242, Merano	19/11/2025 15:39	Home	Completed	[Icons]
399	Pur Südrol				Laurobach 34, Merano	19/11/2025 14:41	Home	Completed	[Icons]
398	Obst und Gemüse Oberrhein	Maximilian	Zöhrer		Planckstraße 13, Merano	19/11/2025 09:18	Home	Completed	[Icons]
397	Forno - Aus De Perleggio				Merano	19/11/2025 07:40	Home	Completed	[Icons]
396	Forno - Aus De Perleggio				Merano	19/11/2025 07:39	Home	Completed	[Icons]
395	Forno - Aus De Perleggio				Merano	19/11/2025 07:38	Home	Completed	[Icons]

Figure 18 Management deliveries Platform

In March 2025, a campaign was launched to involve local merchants through hds. The initiative was promoted through social media posts and an hds newsletter, with the aim of inviting shops to participate in the project.

A total of 10 local merchants joined the initiative, representing different sizes and types of businesses.

Table 2 List of partner shop in Meran

Business Name	Sector	Type	Structure / Size	Notes
Forno di Ivo	Bakery	Local merchant - independent shop	1 owner	Small local bakery
Obst und Gemüse Maximilian Pichler	Food – fruits and Vegetables	Local merchant - independent shop	1 owner, 5 employees	Small greengorcer
Klamotte Vintage and Secondhand	Vintage clothing	Local merchant - independent shop	1 owner, 1 employee	Small vintage shop
Alte Mühle	Bookshop	Local merchant - independent shop	1 owner, 5-10 employees	Local bookstore
Artiana	Vintage furniture	Local merchant - independent shop	1 owner, 1 employee	Small vintage shop
Edelweiss	Clothing	Local merchant - independent shop	1 owner	Local clothing retailer
Biokistl Merano	Organic food	Branch / local chain store	approx. 4 employees	Central management also involved

Naturalia - Merano	Organic Food	Branch / local chain store	10-15 employees	Central management also involved
Pur - Merano	Organic Food / Gastronomy	Branch / local chain store	10-15 employees	Central management also involved

Pick-up Station

Several potential sites were assessed, with particular attention given to peri-urban areas near key mobility nodes such as the railway station and the MEBO state road. The final location was identified close to MIND (Merano Innovation District), ensuring both accessibility and visibility. The pick-up station includes multiple storage units and acts as a complementary logistics hub within the overall system, improving last-mile efficiency and reducing unnecessary vehicle movements within the urban centre.

4.1.4 Regulatory considerations

Cargo Bike Sharing

Access to the cargo bike sharing service requires user registration through the dedicated platform. Users must provide their personal data and formally accept the terms and conditions specifically developed for the service. These terms regulate liability, correct use of vehicles and compliance with traffic rules. User regulations were defined in compliance with national road traffic legislation. The registration to the cargobike-sharing system "Move to Cargo", requires explicit acceptance of the privacy policy in accordance with Articles 12, 13 and 14 of the General Data Protection Regulation (GDPR). The service initially allowed daily access and was later extended to seven-day use.

Due to recurring vandalism in Merano, an additional security step was introduced. During registration, users are required to send a copy or photo of a valid identity document to STA at the address movetocargo@sta.bz.it. STA verifies the submitted data before approving the registration. Only after this manual validation process is completed does the user receive confirmation and access to the service.

Cooperation agreements were also signed with the participating retailers hosting the stations. These agreements define their responsibilities, including overnight storage of the bikes, basic user support, and the obligation to report vandalism, theft or other critical incidents. This structure ensures clear accountability and secure management of the service.

Deliveries

The cooperation with FIX is regulated through a formal agreement defining the respective responsibilities of FIX and STA. The use of the digital platform for registering and monitoring deliveries is mandatory to ensure traceability and structured data collection.

For deliveries involving fresh products, specific procedures apply. Fresh goods are transported exclusively in insulated boxes provided and defined by FIX. In addition, coordination meetings were held with the local hygiene office and hds to verify compliance with health and food safety regulations.

The delivery-management platform requires user registration and explicit acceptance of the privacy policy in accordance with Articles 12, 13 and 14 of the General Data Protection Regulation (GDPR). During registration, users are also asked to grant permission to be contacted for monitoring surveys related to the evaluation of the service.

STA acts as the data controller. Both the courier and the participating retailers are considered responsible parties for the proper handling and management of personal data within their respective operational roles. These roles and responsibilities are defined in formal cooperation agreements, which also regulate operational procedures and data protection obligations.

Pick-up Station

The pick-up station is not refrigerated and is therefore intended exclusively for dry goods and non-perishable items. The storage of fresh food is not permitted. This condition is clearly specified in the operational rules of the service.

4.1.5 Accessibility considerations

Communication aspects:

IND carried out audit on the the MOQO app, which is the cargo bike sharing booking platform used in the Merano research pilot. (see [D5.2](#))

For professional accessibility analysis, IND used a special test procedure based on the Web Content Accessibility Guidelines (WCAG) 2.2 to ensure easier access to the project information.

The assessment of digital accessibility was carried out in four steps:

- Objective analysis: Test procedure with special software (IT accessibility)
- Subjective Analysis (usability): Test group with people with disabilities
- Evaluation
- Reporting, to document digital barriers

The analysis carried out demonstrated several areas for improvement on the MOQO app in order to provide all project participants with barrier-free access to digital information.

Cargobike-sharing

To ensure the involvement of the entire population in the pilot project in Merano, IND conducted market research to collect data on accessible bicycle/cargo bike models and supported STA in the selection and purchase of an inclusive model for all to be integrated into the SuCoLo cargo bike-sharing fleet. To this end, IND organised specific consultations and testing of appropriate models at a specialised provincial supplier in Bolzano (Handicar) and at its competence centre in Merano: In addition to easy-to-use cargo bikes, we tested suitable electric bikes and senior-friendly tricycles with luggage racks and electric assist motors: the declared accessible cargo bikes proved to be just quite identic to those we

wanted to purchase for the general cargo bike sharing scheme, while the various tricycles tested proved to be too weak to start on steep inclines. For this reason, we opted for an accessible electric scooter that met all safety requirements for road use and successfully passed all test situations. In addition, we considered that people with severe disabilities already have personalised means of transport and that the accessible cargo bike to be provided should therefore be intended primarily for people with motor impairments or older people. To ensure the best possible usability for everyone, we supplemented the accessible base model with inclusive features such as controls on both sides, side mirrors on both sides, adaptable driver seat settings, an extra-large bicycle basket at the front and a walking stick holder at the rear. After defining all the features and requesting a detailed purchase offer, we were surprised to find that the electric scooter with all the selected extras was significantly cheaper than the cargo bikes and city tricycles with auxiliary motors we had looked at. This also made the final decision in favour of the electric scooter still easier. STA ordered the electric scooter as configured by the Independent L. competence centre and marked it with the logo and claim of the pilot project in Merano, 'Move to cargo'.



Figure 19 E-scooter Eco-Mover, and promoting banners

Rental of the accessible 'EcoMover' electric scooter at IND

Just like the other cargo bikes, the accessible 'EcoMover' electric scooter could be borrowed free of charge and booked via the MOQO app. The accessible means of transport was located at IND in the immediate vicinity of Merano railway station. The competence centre staff managed booking requests via the app and took care of cleaning the electric scooter, charging the batteries and instructing users in the safe use of the means of transport. In order to charge the battery outdoors in accordance with regulations, IND has installed a suitable high-voltage socket in the covered outdoor area. To promote the new service, the accessible EcoMover cargo bike was presented in the city, and interested parties were able to test the electric scooter and other cargo bikes on site:



Figure 20 Public events in Merano, organised by STA and Independent L.

Deliveries

There were no major adjustments to the pilot project in terms of the ordering options offered via parcel delivery. However, with regard to accessibility and inclusiveness for *all*, we simply ensured that goods could be ordered not only online, but also in the traditional way by telephone or in person at participating shops, as older people are not always familiar with the necessary online applications.

Pick-up station

As competence centre for accessibility, IND also supported and advised STA in the planning and provision of an accessible pick-up station in an urban outskirts of Merano. The choice fell on the Merano racecourse in the south-western end of the city, which is conveniently located in terms of transport, close to the Maia Bassa railway station and central intercity bus routes, and well connected to the urban cycle path network, too. The result was an accessible pick-up station reachable without architectural barriers and consisting of accessible storage boxes with digital lockers equipped with a voice guidance system and Braille keyboard for visually impaired people, as well as easy access for wheelchair users.

To describe the accessibility of the urban environment involved in the research pilot site, IND in a first step also programmed an IT tool as a plugin for WordPress to display POIs around the pilot sites in Merano and Leipzig on the project website, using an interactive digital map. The IT tool plugin for POI was programmed and completed with the technical documentation necessary for the implementation and operation of the plugin on the Sucolo.eu project website (IT tool SuCoLo Code Kit for Plugin, IT tool SuCoLo Developer documentation and IT tool SuCoLo User documentation). As second step, IND has digitally mapped the accessible POIs around the pickup station and the relevant mobility points in Merano, to describe the accessibility of the pilot interventions: <https://sucolo.independent.it>.

In addition, IND has developed a specific PEBA - Plan for the Elimination of Architectural Barriers for the MIND Merano Innovation District and for the Lützschena Stahmeln Tram station in Leipzig (D4.1) and published a detailed description of the accessibility of the facility on the **internet portal for accessible mobility in the Autonomous Province of Bolzano - "Alto Adige per tutti"** (https://altoadigepertutti.it/de/mind_merano_innovation_district) according to the IG-VAE (Guaranteed Information for Accessibility Assessment for your Needs) methodology, providing people with disabilities, the elderly and families with small children and pushchairs with all the important information they need to assess the degree of accessibility of the facility in relation to their specific needs.

To describe the accessibility and reachability of the pilot site in Merano in an interactive way, IND has also created an interactive virtual tour (3D), and described in a document the context, development and implementation of innovative 3D virtual tours designed to digitally

assess the accessibility and inclusiveness of the two SuCoLo peri-urban pilot sites and surrounding points of interest (POIs) (D4.2). This contributed to SuCoLo's objective of ensuring the inclusiveness of its designed pilot sites by fully taking into account barrier-free accessibility for *all*, with a focus employed on the requirements of families, persons with disabilities and the elderly who might partake in the pilot sites.

4.2 Implementation

4.2.1. What was implemented/piloted

The Merano pilot, launched on 10 May 2025 and scheduled to run for 14 months, involves ten local businesses and at least 100 residents. Its main research objectives are to:

- assess the penetration of cargo bikes within Merano's urban ecosystem, considering both shared use and delivery services;
- identify the most suitable operational and management model for the service;
- evaluate the effectiveness and usability of the pick-up station;
- analyse user profiles and patterns of service usage;
- map spatial trends in service adoption across the city.

In April 2025, the cargo bikes and delivery infrastructure were formally handed over to the participating retailers. Each operator received a comprehensive technical dossier detailing procedures for operating smart locks, charging the batteries, and maintaining the vehicles. Cooperation agreements were also signed, clearly defining roles, responsibilities, and contingency procedures, including protocols for theft or vandalism.

At the same time, the pick-up box station at the Merano Racecourse was installed, tested, and made operational in preparation for the pilot launch.

The pilot was officially launched following a press conference held on 30 April 2025. The event featured the Provincial Councillor for Mobility, Deputy Mayor, the Councillor for Economic Affairs, representatives from Independent L., and staff from STA Südtirolmobil.

The launch event (10 May 2025), held in Piazza Rena, included a public presentation of the services, a Living Lab activity aimed at gathering feedback from residents, and several engagement initiatives designed to introduce the community to the pilot's objectives and functionalities. Independent L. and blufink srl also participated in the event.



Figure 21 Public events in Merano, organised by STA and Independent L.

Targeted communication activities were progressively adapted based on observed usage patterns.

A similar public event was also organised on 30 May in Piazza Terme, providing an additional opportunity to present the project and interact with citizens. Independent L. and blufink srl participated as moderators, facilitating dialogue with the public and supporting the engagement activities.

During the summer 2025 young people and families were engaged through activations at local festivals and public events, while elderly residents and people with disabilities were offered tailored workshops and guided sessions to facilitate the adoption of e-scooters. Project partners also took part in several local events to raise awareness and distribute informational materials, including the popular “Martedì Lunghi” evenings in Merano.

Between July and August, two promotional and explanatory videos about the project were produced: Move to Cargo – Cargo Bike Sharing and Move to Cargo – Bike Deliveries. The videos were published on the City of Merano’s communication channels and displayed on the Südtirolmobil information totems located at the railway station and at bus stops in the Terme area and the city centre.

In addition, a dedicated information campaign was carried out with the participation of the Mayor and the Councillor responsible for mobility, economy and commerce, further promoting the pilot services and encouraging citizen participation.



Figure 22 Mayor and Councillor for Mobility, Tourism, Economics and Sport of the City of Merano

Newspaper articles were published to promote the project and increase public awareness. Coverage appeared in Maiser Wochenblatt (in German) and Qui Merano (in Italian).

The campaign aimed both to promote the services and to encourage residents to participate in a public survey. In total, the communication included five advertising insertions and one full-page article, helping to reach a broad local audience in both language groups.

Figure 23 Newspaper article promoting Move to Cargo, SuCoLo

The project was also featured on **RAI Südtirol Alto Adige**, within the regional television news program, thereby increasing visibility of the project among a wider regional audience: [Merano il progetto per testare le bici cargo](#)



Figure 24 Screen of the regional television news program RAI Südtirol Alto Adige

The project was also presented at the Bike Forum Alto Adige, held on 25 September 2025 at NOI Techpark in Bolzano, where the initiative and its pilot activities in Merano were shared with stakeholders and professionals working in the field of sustainable mobility.



Figure 25 Promotion of SuCoLo, Move to Cargo during the Bike-Forum 2025 South Tyrol

In addition, promotion days (PROMO DAYS) were organised to raise awareness of the cargo bike delivery service. These took place between 13 and 22 September and between 5 and 29 November 2025, involving several local shops that promoted the service directly to their customers.

In February, a research survey was launched and disseminated through the Südtirolmobil communication channels, inviting residents of Merano to provide feedback and share their experiences with the services.

Following the observation that relatively few women were using the cargobike sharing service, a targeted communication action was introduced. This included the publication of a [video](#) on Südtirolmobil social media, portraying women using cargo bikes in their daily routines, with the aim of normalising their use and showing that cargobikes are practical and accessible for everyone, without implying additional responsibility or barriers.

Throughout the project, communication activities were further supported by a social media campaign shared across the channels of key stakeholders, including hds, the Municipality of

Merano, and the Mayor, helping to amplify the project's visibility and reach a broader audience.

4.2.2 Who was involved

The project involved several key stakeholders, including the citizens of Merano, the Municipality of Merano, and hds - Handels- und Dienstleistungsverband Südtirol, as well as local shop owners who applied to participate in the initiative.

Overall, the pilot engaged a broad group of participants through both the operational use of the services and communication activities. In addition to the participating shop owners, their employees were also directly involved in the daily use of the cargo bikes and delivery services. Furthermore, a significant number of residents subscribed to and tested the services, contributing to the evaluation of the pilot and providing valuable feedback on usage patterns and user experience.

4.2.3 Number and type of stakeholders reached

The project reached different stakeholder groups through service use, communication campaigns, and local engagement activities. Key figures include:

- Cargobike-sharing partners: 4 local retailers and 2 local associations (including Independent L.) hosted cargo bikes and participated in the sharing system.
- Delivery service partners: 11 local shops joined the cargo bike delivery service.

4.2.4 Challenges faced and mitigation strategies

During the implementation of the pilot, several operational and engagement challenges emerged. The project team addressed these issues through adaptive management and targeted mitigation actions.

Limited use of the pick-up station

The pick-up station for deliveries did not achieve the expected level of use. The location had originally been selected because it is situated close to the city's peripheral areas and was considered a good interchange point. The project team discussed the possibility of relocating the station with the Municipality of Merano, also presenting analyses based on the Leipzig logistics simulation tool. However, relocation was not approved, and the station therefore remained in its original location.

Technical challenges with the delivery platform

Another challenge involved the digital delivery platform. Customers were often reluctant to complete the registration process, as they were unwilling to download and sign up for yet another app or share additional personal information. As a mitigation measure, the project team introduced a simplified procedure that allowed customers to place orders without requiring full registration on the platform.

Different levels of engagement among retailers

While some participating shops quickly integrated the delivery service into their daily operations, others were slower to adopt it. To address this, additional promotional actions and direct engagement activities were organised to support retailers and encourage more

consistent use of the service. Such as the PROMO DAYS where the deliveries were free for the clients.

Slow growth in service subscriptions

The number of registered users initially grew more slowly than expected. In response, communication activities were strengthened through more direct outreach strategies, including explanatory videos, targeted information campaigns, and increased presence at local events.

Gender imbalance in cargo bike sharing usage

Usage data showed that the cargo bike sharing service was predominantly used by men, with relatively low participation among women. To address this imbalance, the communication strategy was adapted to include targeted videos portraying women using cargo bikes in everyday situations, as well as outreach activities such as flyer distribution near schools and other community locations.

Continuous feedback and user input

User feedback remained an important element throughout the pilot. A survey was launched to collect input from residents regarding their experiences and expectations. The survey also served as an additional communication tool to inform citizens about the project and its services.

Request for extended cargo bike sharing availability

Users expressed interest in extending the availability period of the cargo bike sharing service. As a result, an extension to 7 days for the booking became possible starting February, responding to demand from participants and allowing further testing of the system.

4.3 Results

4.3.1 Quantitative outcomes

The pilot generated several measurable results in terms of outreach, service uptake, and stakeholder engagement.

Citizens reached: around 3,000 flyers were distributed across the city to raise awareness of the project and its services.

Cargo bike sharing users: 120 residents registered for the cargo bike sharing service by April 2026.

Deliveries completed: approximately 620 B2C deliveries were carried out during the pilot phase until April 2026 through the cargo bike delivery service.

Retail participation and engagement:

Interest in the delivery service was observed particularly among small and medium-sized local retailers, who were generally quicker to adopt the system. Larger retail chains showed interest but tended to integrate the service more slowly due to internal organisational procedures.

Survey results:

The citizens' survey conducted during the project provided additional quantitative insights on awareness, interest in bike deliveries, and potential future use of cargo bike sharing and

delivery services. The survey responses helped identify communication gaps, preferred types of goods for delivery (mainly food products), and expectations regarding pricing and service conditions.

4.3.2 Qualitative insights

Feedback collected from stakeholders highlighted both interest in the project and areas requiring further development. Local retailers expressed a positive attitude toward the initiative and recognised the potential of the cargo bike delivery system, while also underlining the need for further growth in service usage and customer demand in order to make the system more sustainable in the long term.

Between August 2025 and March 2026, a survey was conducted among citizens of Merano to assess awareness of the *Move to Cargo* project, understand user needs, and monitor the perception and use of the services. The questionnaire gathered 250 responses and covered five thematic areas: the 15-minute city concept, bike deliveries, cargo bike sharing, the pick-up station, and general user data.

Key findings:

- **Low awareness of the project:** many respondents reported that they had never heard about the *Move to Cargo* services, although several indicated they would potentially be interested. This suggests that the communication channels used may not have been sufficiently effective.
- **Interest in bike deliveries:** respondents showed the strongest interest in receiving food products through bicycle delivery. Participants also suggested involving additional types of shops, particularly supermarkets, pharmacies, and farmers' markets.
- **Delivery price sensitivity:** the current delivery price (around €8.50 within the city area) is perceived as relatively high by potential users. The results indicate that the system may require continued external financial support to remain attractive and competitive.
- **Limited awareness of cargo bike sharing:** many respondents were not familiar with the cargo bike sharing service, and several stated that they do not know how to use a cargo bike. Among those expressing this concern, the majority were women, highlighting a gender participation gap.
- **Motivations for use:** users who had experience with cargo bikes indicated that their main motivations were environmental sustainability and travel convenience.
- **Preferred rental conditions for cargobikes:** respondents indicated that an acceptable rental price would be between €3 and €5 or free, and many expressed interest in extending the rental duration beyond the current 9-hour limit. Based on this feedback, an extension of the rental period was planned starting in February
- **Low use of the pick-up station:** the pick-up station is not widely known and is rarely used. Respondents indicated that they would mainly use it for food items. However, it showed a scarce interest in the use of it.

4.3.1 Innovations or unexpected results

During the pilot, several new developments and unexpected outcomes emerged, particularly regarding the future continuation of the services.

A new survey conducted in March 2026 showed clear interest among associations and shops of Merano in maintaining the services introduced through the project. The results also highlighted the opportunity to reallocate the existing cargo bikes to ensure the continuation of their use beyond the pilot phase.

As a result, forty local actors, including associations and commercial activities, expressed concrete interest in continuing the project and taking over the use and management of the cargo bike in the form of cargobike-sharing for the citizens. In addition, 15 associations indicated that they would like to keep using the cargo bikes through a long-term rental scheme of approximately six months for their job purposes. To respond to this demand, a rotation system is being considered so that several organisations can benefit from the available vehicles.

Regarding the cargo bike delivery service conducted by the local FIX bicycle courier, different continuation scenarios are currently being evaluated, including co-financing options with the Municipality of Merano.

At the regional level, together with hds, STA is preparing a survey to be launched in May across the Province of South Tyrol to better understand the demand for cargo bikes among commercial activities, companies, and organisations. The survey will also explore the broader attitudes toward sustainable logistics, including both B2B deliveries and the development of micro-logistic hubs.

This initiative aims to assess how ready businesses in South Tyrol are to adopt sustainable logistics solutions. Cargobike deliveries represent only one component of a wider sustainable logistics system, but they can play an important role in supporting more environmentally friendly urban distribution models in the region.

5 Lessons learned and next steps

The three SuCoLo research pilots, each addressing different facets of sustainable last-mile logistics, have yielded complementary insights that can inform future replication and upscaling efforts.

A key lesson from the Salzburg pilot is that digital behavioural change techniques alone may not be sufficient to shift consumer delivery preferences at a statistically significant level. However, the strong predictive role of sustainability values and nudge acceptance suggests that BCTs are most effective when they activate pre-existing dispositions rather than attempting to override established behaviours. Future interventions should consider combining digital BCTs with broader awareness-building measures and could benefit from targeting consumers who already demonstrate some openness to sustainable options. The notably poor performance of the urgency nudge also serves as a practical warning: time pressure appears to push consumers toward familiar, conventional delivery choices rather than encouraging exploration of sustainable alternatives.

The Leipzig pilot demonstrated that mobile micro-hubs can function as a flexible entry point for cargo bike delivery in urban outskirts where permanent infrastructure is not yet available. However, the limited delivery volume (289 deliveries over six months) confirmed that economic viability requires higher daily delivery density. Promising avenues include white-label concepts and the consolidation of deliveries from multiple CEP providers. The cargo bike rental station, while used infrequently (20 rentals), showed that when rented, bikes were used for meaningful longer trips, suggesting that placement in higher-traffic locations could improve uptake.

In Merano, the pilot validated a collaborative model involving the municipality, the local retail association, and a bicycle courier. The co-financing structure (retailer, customer, and project each contributing to the delivery cost) proved workable during the pilot phase, and 15 associations expressed interest in continuing cargo bike use through long-term rental arrangements. The regional survey launched across South Tyrol represents a significant step toward scaling sustainable logistics beyond the pilot city.

Looking ahead, the results from all three pilots will feed directly into the SuCoLo toolkit (D4.4), providing replicable guidelines, tools, and business models for follower cities. The policy recommendations (D5.4) will draw on the cross-pilot evidence base to advocate for supportive regulatory frameworks and funding mechanisms. Key priorities for next steps include refining the economic models for cargo bike delivery in low-density areas, developing targeted BCT strategies that align with consumer value profiles, and establishing sustainable governance structures for continued service operation beyond the project duration.

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