

# Transferability and Scale-up analysis report

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## Abstract

Startups typically aspire to grow and conquer new markets. To help startups involved in the HiReach Startup Lab acceleration programme to embrace new challenges, and policy makers and investors alike to understand their underlying business potential, a transferability and scalability analysis was conducted. Stemming out of this analysis of each prototype of business model, a consolidated analysis has showed that the opportunities for grow are varying, with the most promising business model being the audio mobility assistant that promotes autonomy and independence of people with disabilities.

## About HiReach

HiReach aims at addressing the mobility needs of different groups vulnerable to transport poverty and social exclusion like people with temporarily or permanent reduced mobility, children, young and elderly people, women, migrants and ethnic minorities, low income and unemployed, to favour more inclusive and flexible mobility solutions. The project also analyses geographical and spatial elements affecting transport poverty to figure out mobility options that can simultaneously combine the needs of several groups in different target areas like urban-peripheral, peri-urban, rural, and remote or deprived territories.

By combining different attributes of available transport concepts and bottom-up initiatives with new operational schemes and IT applications, HiReach explores viable business models for small scale, modular and easily replicable mobility services that can be provided at affordable prices and/or with minimum subsidies. For the first time, community transport services, informal ridesharing and van pooling, innovative ride-hailing mobility services and on-demand public transport are assessed within the scope of a new collaborative and well-regulated business environment.

The HiReach mechanism for exploring, generating and testing inclusive mobility solutions is based on the creative work of startups and innovative entrepreneurs, but also on social innovation through the direct involvement of different social groups as developers, co-users and co-owners of the proposed solutions. HiReach is working in 6 EU study regions: Counties of Esslingen and Göppingen (Germany), Naxos and Small Cyclades (Greece), Inner Area Southern Salento (Italy), Guarda and Torres Vedras (Portugal), Buzau (Romania), North and South-East Luxembourg.

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## Definitions, acronyms and abbreviations

ACRONYM	DEFINITION
AIT	Austrian Institute for Technology
AMTU	Mobility Association of Municipalities in Catalonia
API	Application Programming Interface
APP	Mobile Application
ARI	Acoustics Research Institute
ASSET	Agenzia Sviluppo Ecosostenibile Territorio Regione Puglia
B&VI	Blind and Visually Impaired Individuals
B2B	Business-to-Business
B2C	Business-to-Consumer
B2G	Business-to-Government
BI	Business Intelligence
BM	Business Model
BMC	Business Model Canvas
CEO	Chief Executive Officer
CFO	Chief Financial Officer
COO	Chief Operating Officer
DB	Deutsche Bahn
DE	Germany
EC	European Commission
EFA	Elektronische Fahrplanauskunft
EMTA	European Metropolitan Transport Authorities
EP	European Parliament
ERA	European Research Area
ES	Spain
EV	Electric Vehicles
FSE	Ferrovie del Sud Est
FTI	Fast Track to Innovation
GPS	Global Positioning System
GR	Greece
GTFS	General Transit Feed Specification
H2020	Horizon 2020 Programme

ACRONYM	DEFINITION
HR	Human Resources
HRTFs	Head-Related Transfer Functions
HSL	HiReach Startup Lab
IHV	Impact Hub Vienna
INEA	Innovation and Networks Executive Agency
IoT	Internet of Things
IP	Intellectual Property
IT	Information Technology
IT	Italy
KPI	Key Performance Indicator
MaaS	Mobility-as-a-Service
MMTIS	Regulation on Multimodal Travel Information Services
MSP	Multisided Platform Solution
MVP	Minimum Viable Product
NBVW	Nahverkehrsgesellschaft Baden-Württemberg mbH
NGO	Non-Governmental Organisation
PRM	People with Reduced Mobility
POI	Points of Interest
PT	Public Transport
PWA	Progressive Web App
R&D	Research and Development
RO	Romania
SaaS	Software as a Service
SDK	Software Development Kit
SME	Small and Medium-Sized Enterprises
SNAI	Strategia Nazionale per le Aree Interne
SUMP	Sustainable Urban Mobility Plan
TRL	Technology Readiness Level
TuG	Take-up Group
UK	United Kingdom
US	United States of America
UX	User Experience
VAT	Value Added Tax
VCF	Value Chain Framework

ACRONYM	DEFINITION
VC	Venture capital
VVS	Verkehrs und Tarifverbund
WP	Work Package

DRAFT

## Executive summary

The dedicated acceleration programme developed under the frame of the HiReach project – the HiReach Startup Lab – has supported several promising startups to tackle transport poverty. Ten startups, out of 23, had the chance to evolve, receive mentorship and establish partnerships with real-life hosts, that paved the way for validation tests in pilots in different EU regions.

To help startups wishing to embrace new challenges and policy makers and investors supporting them, a transferability and scalability analysis was conducted. In a nutshell, **transferability** can be understood as a process in which knowledge – i.e.: business model – about a given arrangement – i.e.: startup – in a setting – i.e.: a market – is used in the development of an arrangement in another setting. On the other hand, **scaling-up** refers to the ability of a business model increasing the customers and, consequently, the revenues, above the costs incurred in serving the new customer-base.

Startups typically aspire to score high in both parameters. They are designed to grow fast and to conquer new markets. To help them adequately evaluate their potential and make that step, 7 prototypes of business models were inferred from the 10 startups that have participated in the acceleration phase of the Startup Lab.

The development of the prototypes of business models was based in an iterative methodological approach. A prototype of business models is regarded by the well-known author Alex Osterwalder as a “thinking tool” to heuristically support and guide the actual development of the business model by the interested stakeholders. Stemming out of the joint transferability and scalability analysis of each prototype of business model, a consolidated analysis has shown that the opportunities for grow are varying:

Prototype 1, the **Inclusive journey planner**, was designed to reduce digital exclusion, by allowing people with specific needs to easily interact with online platforms and make it easier for people fulfilling their daily mobility needs. Scalability and transferability for this business model are both regarded as low. Prospects for transferability however increase when analysing the market of peripheral EU regions, where the baseline for multimodal travel planners is low or none.

Prototype 2, the **Audio mobility assistant**, was designed to promote the autonomy and independence of people with disabilities and to increase the convenience, safety and security of multimodal journeys among visually impaired citizens. This is the business model with highest scalability and transferability potential, capable of prosper in such contrasting places as Romania or Luxembourg.

Prototype 3, the **Carpooling for commuters**, was designed to facilitate daily mobility needs, particularly reducing the burden of caretakers. The potential for scalability and transferability is medium. The former is facilitated under the B2C business model and the latter is leveraged by the absence of significant laws or rules which could raise obstacles for implementation (the carpooling market is open).

Prototype 4, **Mobility & transport poverty consulting & services**, was designed to provide onboarding services for customers, especially big employers located in rural or isolated areas. This consultancy-like business model was regarded as entailing no room for scalability and a very low level of replicability potential to areas suffering from mobility poverty (with the exception of heavily industrialised areas).

Prototype 5, **Data analytics platform**, was designed to enable businesses and cities to leverage data, make data-driven decisions and improve their mobility in order to act more effectively on the transport poverty domain. Although the value proposition is high, findings from the scalability analysis have shown that the potential to grow is reduced due to the resistance to change of public bodies. This conclusion is aligned with the transferability assessment, which found several obstacles, mainly due to traditional administrative procedures that usually hinder the introduction of innovative ways of collecting, sharing and analysing information and data.

Prototype 6, **Delivery of goods**, was designed to serve people that cannot go directly to the stores, especially elderly people, citizens with reduced mobility or those who live in rural and deprived areas. There is a high demand for these services, particularly during the Covid19 restrictions. The repeatability of the value proposition of this solution was regarded as very high only among the same country. This conclusion is also consistent with the transferability analysis which found that the potential to entry in new countries is limited. Moreover, this business model might come across with conflicts between key stakeholders, as a result of diverging material interests, which is expectable as the BM developer need to interplay with multiple actors (pharmacies, which may be organised together in associations, but also couriers that materialise the delivery).

Prototype 7, **Multisided platform for shared services**, was designed to provide reliable transport in the form of a demand-responsive transport service, serving especially people living in rural and deprived areas. The scalability of this business model is low due to the dependency on the policy and procurement processes of local public authorities and market fragmentation. The transferability potential is however fairly high, with findings suggesting that this is the business model with highest value proposition for both the market of the study areas and other deprived settings around Europe. The main drivers that facilitate the replicability of this market segment is the presence of a progressive mobility agenda from the transport regulators.

BUSINESS MODEL PROTOTYPE	SCALABILITY POTENTIAL	TRANSFERABILITY POTENTIAL
<b>Inclusive Journey Planner</b>	Low	Low
<b>Audio mobility assistant</b>	High	High
<b>Carpooling for commuters</b>	Medium	Medium
<b>Mobility &amp; transport poverty consulting &amp; services</b>	-	Low
<b>Data analytics platform</b>	Low	Medium
<b>Delivery of goods</b>	High	Medium
<b>Multisided platform for shared services</b>	Low	High

# 1 Introduction

## 1.1 Purpose and scope

HiReach is a three-year EU-funded Horizon 2020 project that aims at eliminating transport poverty by generating new mobility solutions that reach low accessibility social groups and areas.

This deliverable **D.4.4. “Transferability and scale-up analysis report”** was elaborated under the scope of **Task 4.6 (Transferability and scale-up analysis for Europe) of WP4 (Development of mobility solutions)** of HiReach.

Task 4.6 had two objectives: to analyse the (i) transferability and (ii) scalability of products showcased in HiReach Startup Lab (HSL), all of which are detailed in Section 3 of this report. Findings from these analyses will help drawing recommendations on how to promote the awareness and interest of the EU-wide entrepreneurial ecosystem towards mobility and transport poverty related problems. The ambition is to help mitigate and overcome mobility and transport poverty pockets by developing disruptive and successful business models.

**Transferability** is an assessment process in which the opportunities for implementing a specific business in a different location or industrial sector are assessed. **Scalability** is the ability to grow sales and revenues within and across geographical markets while being able to withstand the pressure as a result of growth, without being hindered by its resources or structure (Hayes 2020). Some symptoms of scalability include exponential growth, the acquisition of more customers for little or no operational change, increased cashflows harvested back into investment for growth. Most often, scalable business models are technology based, because it is technology that allows for the differentiation of the value proposition and growth at low variable costs. More recently, most cases of market disruption and scaling come from digital technology (Visconti 2020).

**The business model and value chain of the HSL products were considered in the analysis of the transferability and scalability.** The business model describes the rationale of how an organisation creates, delivers, and captures value, in economic, social, cultural or other contexts. A value chain, on the other hand, is a combination of the systems – i.e., collection of activities – a company or organization uses to create value for its customers. That is, a value chain is made up of various subsystems that are used to create products or services. The analysis of the business model and value chain were supported on established and well-known references framework, respectively the Osterwalder and Pigneur's Business Model Canvas and Michael Porter's Value Chain Canvas.

The scope of analysis were the products under development by the HSL startups. The HSL began with 25 promising startups. After the one-week bootcamp (that took place in Vienna, in February 2020), ten finalists were chosen to receive further mentoring and support. The HSL ended in September 2020 with the completion of the HiReach project.

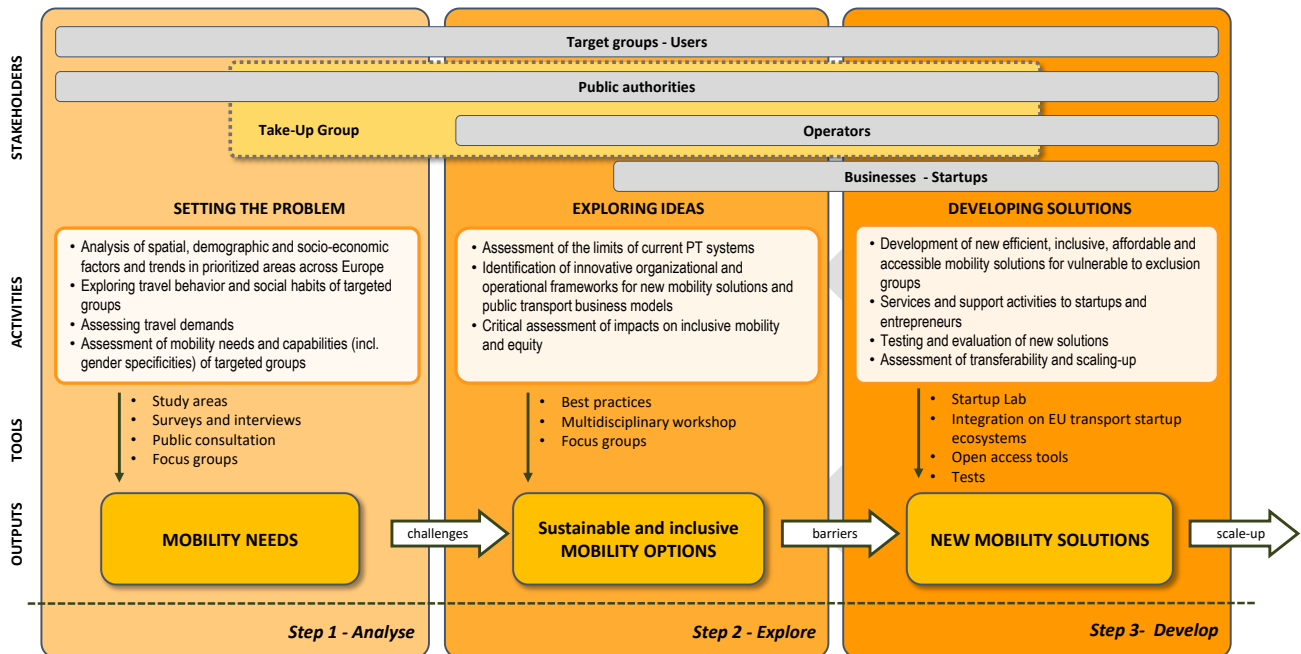
## 1.2 Linkages with other project Work Packages

As mentioned before, this deliverable is part of Work Package 4 (WP4) that consists in the “Development of new mobility solutions”. This work package has a fundamental exploitation role in the HiReach workflow as it embeds the activities of both the first and second step of the project (“Analyse” and “Explore”, respectively) in the development of



new concrete solutions to a wide range of stakeholders dealing with transport poverty issues.

**Figure 1: HiReach workflow**



Source: Own elaboration

Indeed, whilst the first step, materialized in WP2, has allowed HiReach to grasp and advance on the knowledge about transport poverty, the second step, materialised in WP3, has explored existing mobility solutions in the large EU transport ecosystem. This effort has allowed to have a good understanding of the users, on the one side, and of the market on the other side, but also enabled HiReach to critically identify major operational and organisational frameworks for the provision of transport schemes.

In this third and last step of the project, a specific **acceleration for ideas and Minimum Viable Products (MVPs)**, involving startups looking for product-market fit on new transportation possibilities for under-served urban and rural areas, with new business models and technological concepts, was implemented.

The **Startup Lab** was developed on the building blocks of the multidisciplinary workshop held in Brussels in March 2019, which involved several European startups that were selected upon an open call.

All in all, HiReach, has reached a good balance of theory and practical action, with the theoretical foundations being essential to frame the project and the challenges that the startups tried to overcome during the HSL. The theoretical approach also served of inspiration throughout the acceleration programme, as the startups performance and business model refinement was constantly evaluated on the basis of their alignment with the transport poverty dimensions and contribution to solve real problems from vulnerable groups of users.

This bulk of information collected in previous phases of the project is well condensed and digested in several public deliverables, the most relevant and recent ones being:

**Deliverable 3.2 - Innovative mobility solutions: case study description and analysis** (Van Egmond P., Wirtz J., Chiffi C., Bosetti S., Borgato S., Freitas A., Reis V., Moraglio M., Kuttler T., Döge N., Grandsart D. 2019) researched a series of frameworks and mobility solutions from different geographical areas and countries, in order to identify case studies and best practices. This has helped to determine which aspects of these solutions indeed lead to improved accessibility, better mobility and more equity in prioritised areas. 20 case studies of innovative transport solutions have been considered to understand their advantages and limitations.

**Deliverable 3.4 - Drivers and barriers of organizational frameworks aimed at delivering innovative mobility options** (Chiffi 2019) reports on the drivers and barriers of organisational frameworks aimed at delivering innovative mobility options. This document includes recommendations on how to implement mobility solutions to cope with transport poverty, tailored to different stakeholders, including public authorities, operators/new enterprises, and users, in the form of guidelines and recommendations.

WP4 has also produced two preliminary deliverables so far:

**Deliverable 4.1 - Open source tools for transport poverty solutions** (Gheorghiu and Iordache 2020) documents the research towards the identification of open software tools for solutions to transport poverty, relevant for new startups in the field of transport poverty. It offers a comprehensive analysis of existing software packages that can suffice transport poverty issues.

**Deliverable 4.2 - Solutions to transport poverty for start-ups** (Reis and Freitas 2019), is a guide corresponding to a specific booklet, which resumes and adapts the information contained in previous phases of the project into a publishable format, adapted to an audience with scarce knowledge of the transport and transport poverty fields.

**Deliverable 4.3 – Report on HiReach Startup Lab and testig activities** (Reis and Freitas 2020) corresponds to a comprehensive report of the acceleration programme developed by the HiReach project, providing insights and fundamental learnings, including detailed information about the process and the outputs produced by the startups engaged in the programme.

## 1.3 Structure of the document

This document, after this introduction (**Section 1**), includes the following sections:

**Section 2** explores the methodological approach undertaken in order to assess to what extent the business models considered in HiReach are transfer-worthy and scalable. It corresponds to the theoretical basis that guided all the data collection from multiple sources.

**Section 3** focuses on the business models developed during the HiReach Startup Lab. It offers a consolidated analysis of the business model prototypes, outlining the fundamental elements that characterise the MPV of the mobility solutions and playing a pivotal role in the analysis undertaken along the following chapters.

**Section 4** gives the floor to the agents (stakeholders) who can take-up the HiReach solutions in their own settings. It presents the prospects for transferring the business models to the project study regions and beyond. As such, it offers an 'horizontal' approach (per region) to the viability of transferring the mobility solutions developed in the project.

**Section 5** presents the possibilities for scaling up the business models, offering insights about the preconditions that could favour or hinder the startups growth.

Finally, **section 6** lay down final conclusions and complements with new insights the recommendations for startups (initially drawn in D.3.4), thus supporting entrepreneurs wishing to bring solutions to transport poverty into the transport market. A consolidated fact sheets of the potential for both the transferability and scalability of all the considered business models are also presented as a summary. This is a key takeaway from the present deliverable that is relevant for prospective stakeholders wishing to partner with the associated startups. Finally, a proposal for design of open innovation and acceleration programme at EU scale addressing mobility for all is made.

The **Annex** presents the seed information filled by each HSL startup (and their designated business coaches), describing their i) current business model, ii) the prototype of their business model and finally iii) their value chain.

## 2 Methodology

This deliverable reports the works and outcomes of project Task 4.6 (Transferability and Scale Up Analysis for Europe). The overarching purpose of Task 4.6 was to analyse the possibilities of transferability and scaling-up of the business models covered by the HiReach Startup Lab (HSL). At the core of this Task lays two main concepts: transferability and scaling-up.

**Transferability** is understood as a process in which knowledge (i.e.: business model) about a given arrangement (i.e.: startup) in a setting (i.e.: a market) is used in the development of an arrangement in another setting. The transferability analysis provides information about the plausibility of implementing a business model in a new market geography. As such, the transferability scrutiny helps (i) identifying unexplored markets, and/or (ii) adapting business model to contextual specificities of those unexplored markets.

It is relevant to note that the transferability analysis does not necessarily provide information about the expectable success of a business model, as other adverse factors may concur (e.g.: competition, or cultural dimension), although the research team made an effort to understand the extent to which there would be commercial impact when transferring a business model to certain contexts.

**Scaling-up** refers to the ability of a business model increasing the customers and, consequently, the revenues, above the costs incurred in serving the new customer-base. A perfectly scalable business model would mean gaining more income, with no changes in the cost structure. Typical examples of scalable business models can be found in digital-driven companies (e.g.: gaming companies selling a game in a marketplace, or music companies selling music in on-line platforms).

In a startup lifecycle, scaling-up refers to the stage where the startup aims at widening the customer base, with minimal costs. Such movement commonly entails entering new geographies. By doing this, the startup is trying to unlock new growth opportunities, access new markets, expand its team, and build upon its core strengths.

**Figure 2: Startup lifecycle**

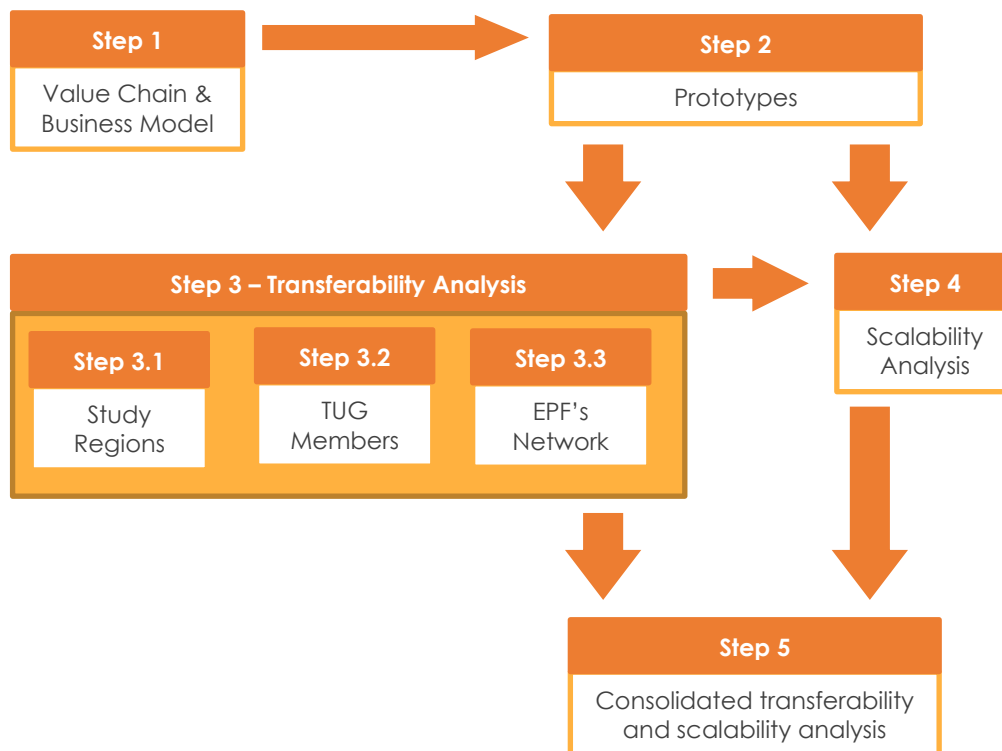


Source: <https://medium.com/@obrienpat/meet-britains-top-10-healthcare-life-sciences-scale-ups-you-should-watch-d9340b116309>

The methodological approach of Task 4.6 followed six essential steps, notably:

- **Step 1:** Description of HiReach startups' value chain and business models.
- **Step 2:** Design of prototypes of business models.
- **Step 3:** Transferability Analysis of the business models:
  - Step 3.1: Transferability analysis to the HiReach Study Regions,
  - Step 3.2: Transferability exercise in the Take-up Group members areas of interest,
  - Step 3.3: Transferability exercise in the EU wide territory, across the European Passenger Federation (EPF's) network.
- **Step 4:** Scale-up Analysis of the business models.
- **Step 5:** Consolidated transferability and scalability analysis.

**Figure 3: Task 4.6 methodological approach**



Source: Own elaboration

Here it follows a brief description of each Step.

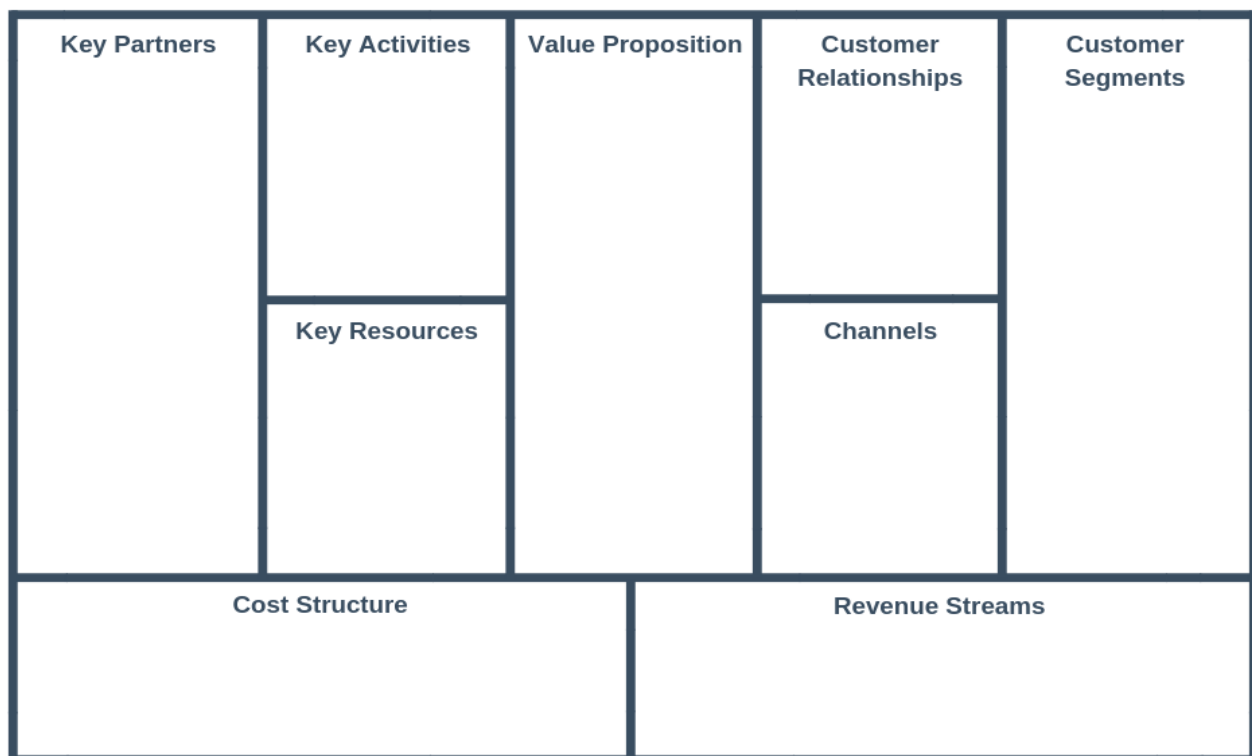
**Step 1** was dedicated to the **detailed analysis of the business model and value chain of the 10 startups** involved in the acceleration phase of the HiReach Startup Lab. In a nutshell, the business model describes how a company creates *Value* to its customers; whereas the value chain describes how the company's internal organisation delivers the *Value*.

The analysis of the HSL startups' business model was supported by the well-known **Business Model Canvas** (BMC), originally proposed by Osterwalder and Pigneur (Osterwalder and

Pigneur 2010). The BMC is widely used and commonly accepted EU-wide in the entrepreneurial ecosystem and acceleration programmes.

The authors proposed a framework and a canvas to characterise the business models. A description of the business model can be obtained by writing a coherent narrative containing the nine variables in a chosen sequence. Such variables, or building blocks, can be depicted in the following figure.

**Figure 4: Osterwalder and Pigneur's Business Model Canvas**



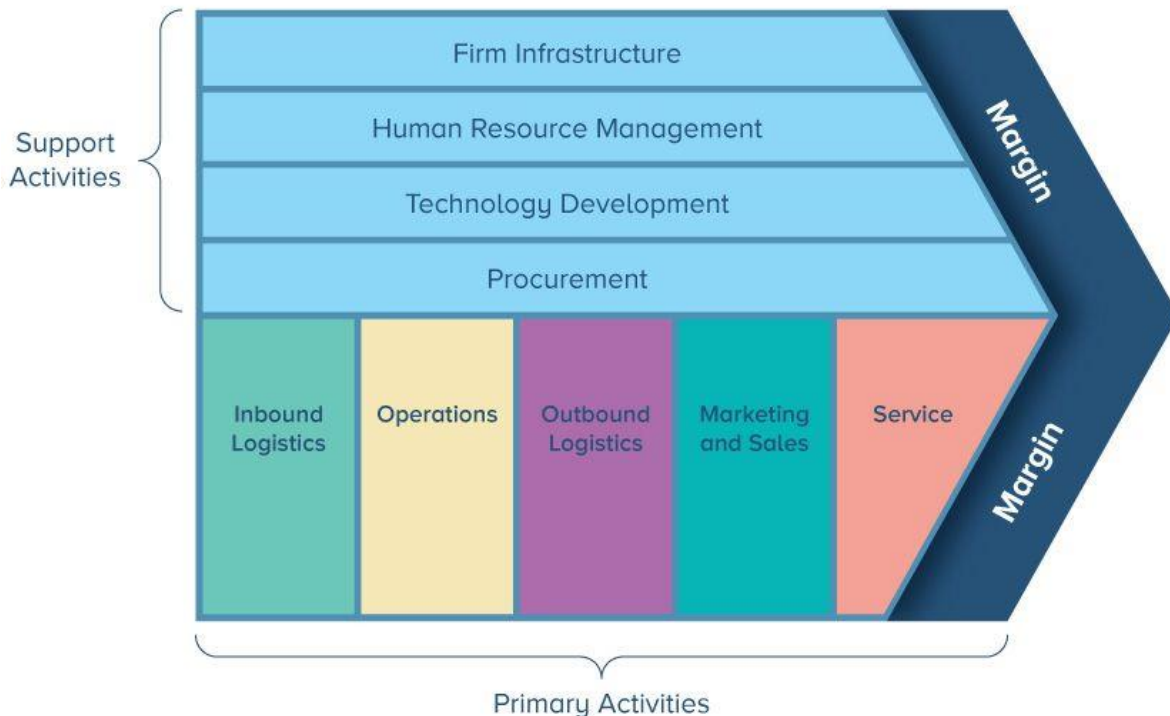
Source: Osterwalder and Pigneur 2010

The analysis of the value chain was supported by Michael Porter's **Value Chain Framework** (VCF) (Porter 1985). The VCF identifies the company's – support and primary – activities that are relevant to create value, services and distinctiveness for its customers.

The framework is therefore divided in two main types of activities:

- **Primary Activities** – have an immediate effect on the production, maintenance, sales and support of the products or services to be supplied;
- **Support Activities** – required to assist the primary activities and forming the basis of any organization. A support activity such as human resource management, for example, is of great importance within the primary activity operation, but also supports other activities such as service and outbound logistics.



**Figure 5: Michael Porter's Value Chain Framework**

Source: <https://www.smartsheet.com/everything-you-need-to-know-about-value-chain-analysis>

Even if over the years several variants to the traditional framework proposed by Porter have been developed, the two fundamental activities of the model have remained stable. The **primary activities** include a wide set of variables<sup>1</sup>:

- Inbound Logistics: these are all processes that are involved when receiving, storing, and proceeding with internal distribution of the raw materials or basic ingredients of a product or service.
- Operations: these are all the activities (for example production floor or production line) that convert inputs, products or services into semi-finished or finished products. Operational systems are the guiding principle for the creation of value.
- Outbound logistics: these are all the activities that relate to delivering the products and services to the customer.
- Marketing and Sales: these are all processes related to putting the products and services in the markets including managing and generating customer relationships.
- Service: this includes all activities that maintain the value of the products or service to customers as soon as a relationship has developed based on the procurement of services and products.

<sup>1</sup> As can be seen further in-depth in: [https://www.mindtools.com/pages/article/newSTR\\_66.htm](https://www.mindtools.com/pages/article/newSTR_66.htm)

The **supportive (or secondary) activities** include the following variables:

- Firm infrastructure: this concerns the supportive activities within the organisation that enable the organisation to maintain its daily operations. Line management, administrative handling or financial management are examples of activities that create value for the organisation.
- Human resource management: this includes the support activities in which the development of the workforce within an organisation is the key element.
- Technology development: these activities relate to the development of the products and services of the organisation, both internally and externally. Examples are IT, technological innovations and improvements and the development of new products based on new technologies. These activities create value using innovation and optimisation.
- Procurement: these are all the support activities related to procurement required to serve the customer from the organisation. Examples of activities are entering into and managing relationships with suppliers, negotiating to arrive at the best prices, making product purchase agreements with suppliers and outsourcing agreements.

The description of the business models and value chains was produced and validated by the startups engaged in the HSL programme, after several iterations with their business mentors. They are finally presented in Section 3.1 and Annex I of this Deliverable.

**Step 2** was related with the **design of prototypes of business models**. The design process of the prototypes took into consideration the startups' business models developed under the umbrella of the HSL programme and it was enriched with other businesses already investigated in early stages of the HiReach project, and extensively described in Deliverable 3.2. (Innovative mobility solutions: case study description and analysis).

A business model describes how a company creates, delivers, and captures value. Such description is, by definition, attached to a specific market – that is, geography, customer base, political and legal context, or even technology. Hence, when evaluating the possibilities of transferring the same business model elsewhere or scaling-up, the business model must be purged from such market-related traits. The outcome is a concept – or prototype – of a business model.

A prototype of business models can be seen a “thinking tool” (Osterwalder, 2010) to heuristically support and guide the actual development of the business model by the interested stakeholders. As Osterwalder (2010) writes, “prototypes of business models may be thought-provoking – even a bit crazy – and thus help push out thinking”. As such, a prototype does not intend to provide a rough or fixed picture of what the actual business models should look like, but simply to guide and present suggestion for the design of superior business models. Consequently, the prototype must focus on key or fundamental aspects of the business model and, thus, indicating directions and paths for exploring alternative designs, which ultimately will lead to superior business models.

The prototype of business model provides two valuable pieces of information:

1. whose building blocks – i.e., traits of the building blocks – are independent from the target market – that is, their characteristics are irrespective of the market conditions;
2. whose building blocks depend on the specific characteristics of the target market.

The prototype provides guidance about the specific market conditions that influence the business model. Table 1 presents the seven prototypes of business models and their relations with the HSL startups' business models.

The description of the outcomes of this Step 2 (prototypes of business models) are presented in Section 3.2.

**Table 1: HSL startups and prototypes of business models**

HSL STARTUP	DESCRIPTION OF STARTUP IN BRIEF	PROTOTYPE OF BUSINESS MODEL (KEYWORDS)
B2Ride (DE)	Helping organisations promoting sustainable mobility for their employees and customers.	Mobility & Transport Poverty Consulting & Services
Childfy (ES)	Carpooling solution for families with children or young kids in school age.	Carpooling for Commuting
Hoop (ES)	Carpooling solution for rural and low-density areas, designed to give transport options for both hospital employees and patients.	
CityMaaS (UK)	Inclusive and customisable travel planner, with self-adaptive UX/UX for elderly and disabled people.	Inclusive Journey Planner
Dreamwaves (AT)	Navigation and orientation application to help people moving around with ease in multiple transport modes.	Audio Mobility Assistant
Lamiloo (DE)	Home delivery of medicines and pharmaceutical products, using bicycles.	Delivery of Goods
Neobility (RO)	Fast and affordable delivery of goods to low income people.	
Mobito (BE)	Data analytics platform to help customers - notably, local authorities - taking informed decisions and inform the wider community with accurate information	Data Analytics Platform
Nemi (ES)	Demand responsive bus services in rural and low-density areas	Multisided Platform for Shared Services
Tandem (UK)	Shared taxi services for low income people, working in areas with poor public transport services.	

Source: Own elaboration

**Step 3** was dedicated to the **transferability analysis** of the HSL startups' business models to several EU regions. The vector of analysis was the respective prototype of business model (see Table 1). As mentioned before, a prototype is agnostic to specific market and geographical characteristics, embodying the fundamental properties of the business

models. The transferability analysis requires assessing if the fundamental properties of a business model could be implemented elsewhere. Such fundamental properties are embodied in the prototype of business model.

The transferability analysis was developed along three parallel streams, as a way to maximise the available resources in HiReach project, as follows:

- Step 3.1: Transferability analysis to the HiReach Study Regions,
- Step 3.2: Transferability exercise in the Take-up Group members areas of interest,
- Step 3.3: Transferability exercise in the EU wide territory, across the European Passenger Federation (EPF's) network.

Concerning Step 3.1, the HiReach project has selected six study regions, aiming to provide an in-depth understanding of transport and accessibility problems experienced in different Member States, at urban, peri-urban and rural levels. The study regions are:

- Counties of Esslingen and Göppingen (Germany),
- Naxos and Small Cyclades (Greece),
- Southern Salento, inner area (Italy),
- Guarda (Portugal),
- North and South-East Luxembourg (Luxembourg),
- Buzau (Romania).

The study regions were thoroughly analysed along the HiReach project in different Work Packages. The accumulated knowledge made them particularly suitable for a transferability analysis.

A template to guide the transferability analysis was developed for each prototype of business model and concerned project partners have filled in one template, assessing the transfer-worthiness of each business model to their respective study region.

Concerning Step 3.2, the HiReach Take-up Group (TuG) is composed of public and private actors<sup>2</sup>, which have been supporting several project research activities since the outset of the project. They were interested in investigating the new tools and business models developed within HiReach.

As a permanent and accompanying forum, the TuG members were acknowledged about the HSL startups and their business models. The transferability exercise was conducted during a virtual event that took place on the 16<sup>th</sup> September 2020, at the end of which the TuG members voiced their opinion about the plausibility of transferring the business models to their respective region or market.

Concerning Step 3.3, the European Passenger Federation (EPF) has access to a vast network of cities and regions. The underlying idea was to use such valuable resource to conduct transferability exercises in other EU regions, beyond the network of the HiReach partners and TuG members. The transferability exercise involved an EPF-network-wide consultation, materialised in targeted interviews. During the interviews, stakeholders were inquired about

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<sup>2</sup> The list of TuG members can be found here: <https://hireach-project.eu/content/take-group>

the plausibility of transferring the prototype of business model to a region selected by the respondent. The choice of the regions was supported in the following:

1. It must take into consideration the overarching objective of HiReach priorities,
2. It should include people in situation of transport poverty,
3. It should target at least one vulnerable social group.

The interviews conducted by EPF enabled to complement some missing information and to further explore the transferability opportunities on most promising regions. A total of 18 interviews were conducted with national and regional passenger organisations (EPF members from the Netherlands, Poland, Germany, Denmark, UK, France, Italy, Spain, Finland and Sweden) and other organisations from EPF's network: Eurocities, POLIS and EMTA (representing European cities), European Disability Forum (representing people with a disability at European level), Taxistop (a Flemish NGO working on carpooling), Transport & Mobility Leuven and The New Drive (research and consultancy, experienced in transport - poverty- solutions).

The results of this transferability analysis are presented in Section 4.

**Step 4** was entirely dedicated to the **scale-up analysis of the prototypes of business models**.

The underlying purpose was to evaluate the ability of a given prototype to grow sales and revenues within and across geographical markets, while being able to withstand the pressure as a result of growth, without being hindered by its resources or structure.

The assessment of the scalability was done according to the following five criteria:

#### **1. Globally differentiating value proposition**

A scalable product must have some value advantage that is applicable not only in a geography, but that is relevant across geographies, the problem and needs faced by customers are similar in different places.

#### **2. Repeatability of solutions**

Not only the user needs have to be similar, but also the local conditions must be similar enough such that the same solution functions well in different locations. Various factors interfere with the possibility that the same solutions will address certain needs in different contexts:

- Social/cultural characteristics,
- Geographic differences,
- Economic structure / Repeatability of value chain elements,
- Legal and governance,

#### **3. Diminishing marginal cost**

While the business grows, the costs of producing additional units continually shrink. The operating leverage effects allows companies to scale quicker, more customers can be taken on for little to no operational change.

#### **4. Repeatability of sales process**

The cultural, institutional and legal processes might determine different approaches to sales and, in some cases, represent a key barrier and/or differentiating factor. This is particularly relevant when selling solutions to public institutions.

## 5. Network effects

Network effects are when the solution becomes better as more customers and/or territories are served. For example, a public transport line is more attractive the more connected it is to other lines. Some businesses become viable only after a certain critical mass is achieved to reap off enough network effects.

The evaluation of the five criteria was based on the information collected in the previous steps, notably Step 2 and Step 3. In some situations, instead of the BM prototype, it was required to use the original business model or value chain of the respective HSL solution or information from other similar startups.

Also, whenever necessary the information was complemented with the analysis undertaken to other companies and compiled in the previously mentioned Deliverable 3.2. Considering the scarcity of information and volatility of the markets, a qualitative analysis was undertaken, following a structured guide organised in eight stages. Each prototype was evaluated along a Likert-scale, with four evaluation levels. A final evaluation was attributed. The scalability analysis was concluded with a comparative assessment of six<sup>3</sup> prototypes of business models.

The results of the transferability analysis are presented in Section 5.

Finally, **Step 5** builds on the findings of the previous steps to provide a **consolidated analysis of the potential for both the transferability and scalability of all 7 business models**, under the light of the knowledge gain in the previous steps.

These fact sheets are presented in Section 6.

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<sup>3</sup> Mobility & Transport Poverty Consulting & Services business model covered in the transferability chapter is not addressed in the scalability analysis, as the consultancy was not regarded as a type of model with a potential for scaling.



### 3 Business Models

#### 3.1 Glimpse of the HiReach Startup Lab business models

The HiReach Startup Lab<sup>4</sup> (HSL) was an acceleration programme which had the main objective of validating and integrating innovative transport solutions to improve mobility in urban, peripheral, rural, remote and deprived areas, while addressing the needs of potentially vulnerable groups.

This acceleration program entailed a multiple phase approach, intended to develop projects with real challenges in mind. The several phases served to filter the most appropriate projects aligned with the programme objectives. Stepwise, the programme comprised a one-week bootcamp, followed by a roughly seven months acceleration programme which is divided in two different stages, i) the acceleration phase and the ii) field testing phase, on both of which startups were called to work with “real-industry” partners.

**Figure 6: Timeline of the Startup Lab Programme**



Source: Own elaboration

As presented in Section 2, the transferability and scalability analyses were supported in the prototypes of business models, which were, in turn, inferred from the business models of the 10 startups involved in the acceleration phase (highlighted above in Table 1).

The HSL startups worked in a quite wide range of products and business models, aiming at curtailing mobility and transport poverty situations among the vulnerable groups.

Below, a brief presentation of the business models by means of storytelling is made:

<sup>4</sup> Details about the HSL can be found in Hireach Deliverable D4.3.

- **B2Ride – “Helping organisations promoting sustainable mobility for their employees and customers”**

Typical customers of B2Ride are authorities and companies with around 50 to several thousand employees with (vulnerable) employees – with or without disabilities – in rural or peripheral areas. These employers have the problem of high cost of parking and travel and at the same time of producing massive emissions and traffic. They have to get more sustainable. Their employees suffer from transport poverty or expensive public transport or are stressed by driving their cars through traffic jams or searching for an available parking space.

B2RIDE delivers a ridesharing/van-pooling solution to increase the usage of vehicles, immediately reducing cost of parking and travel and avoiding emissions and traffic. B2Ride offers onboarding services including project management, software configuration and training to successfully deploy our solution, achieving the critical mass of users. Additionally, B2Ride offers value added services and products, such as parking space reservation for driver's, fleet management, van-pooling. MaaS services and departure displays, mobility budget and mobility guarantee for passengers, smart charging for electric vehicles, mobility experience days and seasonal rewards. Key partners and suppliers are regional and long-haul public transport operators as partner for B2B MaaS solutions, providers of B2B mobility budget solutions, vendors of smart charging stations. The most important costs are the software licenses and the salaries.

- **Childfy – “Carpooling solution for families with children or young kids in school age”**

Childfy offers a carpooling solution for families contributing to achieving work life balance and creating a network of families. Childfy's platform connects families for sharing trips to schools, academia and clubs. Increasingly, children participate in multiple daily activity on and off school, such as sports, arts and cultural activities. Often the schedule of such activities is not compatible with parents, who must chauffeur their children.

Childfy provides a location based real-time notification system ensuring route optimisation and providing all the functionalities for parents to keep track of their children. The service ensures the safety of the ride and promote trust on the ride and service. Key partners include schools and local drivers. Schools will facilitate the communication between parents and drivers. Main cost elements include the development of the service and platform, and payment to drivers.

- **CityMaaS – “Inclusive and customisable travel planner, with self-adaptive UX/UX for elderly and disabled people”**

CityMaaS developed a hyper customisable journey planner - CODIE (CityMaaS Optimised Dynamic Interface Engine). CODIE provides on real-time information about mobility services and routes. CODIE creates individual user profiles to (1) provide routing information and (2) create a unique user interface on the smartphone. The routing information is based on the needs and travel requirements of the passengers. The unique user interface is customised based on the needs and utilisation patterns (e.g.: personalisation of the colour pallet; or resizing and location of the buttons to adapt to the passenger's dexterity). The CODIE focusses on several key features: (1) Data collection, (2) Personalisation, (3) Journey Planner, (4) User location sharing, and (5) Transport Operator Dashboard. CODIE is made available as

a White-Label, Software as a Service, with an initial payment for customisation and then a monthly fee.

- **Dreamwaves – “Navigation and orientation application to help people moving around with ease in multiple transport modes”**

Dreamwaves is developing an intuitive audio navigation system, in partnership with blind and visually impaired associations. The key value proposition of their app is that people can understand where they need to walk to, in the most natural and intuitive way, simply by following virtual sounds. There is no need to look at the map or interpret instructions. Typical customers are blind and visually impaired people. Dreamwaves app will be sold through the Apple Appstore and the company will earn money with a freemium model where users can use a limited version of the product for free and pay a monthly fee for premium features. To create their value proposition, the company relies in intensive user research, software development and technical research, but also on accurate mapping and infrastructure data. Most of the company costs are related with human resources.

- **Hoop – “Carpooling solution for rural and low-density areas, designed to give transport options for both hospital employees and patients”**

Hoop believes carpooling has a great potential to change the world and people's mobility habits. Therefore, Hoop offers a mobile app that connects people so they can share their everyday rides in the city. Hoop partnered with companies, universities, city halls, and hospitals, to reach as many potential users as possible. They've used B2C marketing campaigns to acquire users as fast as possible. All in all, their main resources are based on human talent, being 60% of the company composed by a full-time team of software developers, and another 40% leading the business development, marketing and financial areas.

- **Lamiloo – “Home delivery of medicines and pharmaceutical products, using bicycles”**

Lamiloo's business model is based on a two-sided platform business model based on crowdsourcing of existing resources and digitally supported workflows. In the logistics part of the platform, Lamiloo brings together the customer's needs for drug deliveries with independent bike couriers, as the full provider of the transport service. The platform approach makes the business model asset-light and therefore quickly scalable. Through integration into the processes of the pharmacy and intelligent route planning, Lamiloo can provide same-day delivery within 3 hours of ordering. In addition, Lamiloo offers a plannable time window delivery. Through efficient bundling of deliveries, speed advantages of bicycle couriers in urban areas and an intelligent route planning algorithm. The company charges pharmacies a fee per order. Lamiloo acts as an intermediary between pharmacies and bicycle couriers and is paid a percentage of the delivery fee (planned 30%) for this mediation service. The independent bicycle couriers are paid per completed order.

- **Mobito – “Data analytics platform to help customers - notably, local authorities - taking informed decisions and inform the wider community with accurate information”**

Mobito recognises the mobility ecosystem to be characterised by uncoordinated single solution providers and disorganized data flows. As a result, benefits of using

data are obstructed and cities struggle to understand mobility needs and habits. Mobito addresses this problem with two complementary products: i) a B2G City Terminal that helps cities take control of their data and make data-driven decisions; and ii) B2B Data Marketplace that facilitates the exchange of mobility data. The complementarity of the Mobility Terminal and the Mobility Data Marketplace is at the core of Mobito value proposition. The data Marketplace offers a direct channel of data to the City Terminal and vice versa. Mobito builds partnerships with data suppliers, platform tools and sales channels and has been investing in the development of the platform infrastructure supporting these two products.

- **Nemi – “Demand responsive bus services in rural and low-density areas”**

Nemi makes public transport in low-density areas feasible by providing transport operators with a software solution that enables flexible bus services. Providing regular bus services in low-density areas is very costly. As a result of conventional operational schemes, public transport remains inaccessible for a large number of people who don't have a good alternative to private modes of transport. Nemi recognises that this scheme is not working from both the public administration's and the user's point of view. The software solution for enabling flexible bus services of Nemi allows for the competent public authority with whom they work for to set up a range of stops and expeditions in a territory. Whoever wants to use the service, must make a trip request through the user app, indicating origin and destination stop, and the time of the trip. Nemi then optimizes the route to serve only the stops that were requested, saving thus kilometres travelled and emissions. The costs of making changes and developments in Nemi's platform with every new service are covered by the transport operator through a setup fee and a maintenance fee. If the service is not publicly subsidised, the operator benefits directly from the cost reduction enabled by Nemi's solution; if, on the other hand, the service is publicly subsidised, the operator benefits from implementing the startup solution by becoming more competitive in public tenders, which are increasingly requesting demand-responsive transport services.

- **Neobility – “Fast and affordable delivery of goods to low income people”**

Neobility helps businesses and NGOs keep operations as close to their target groups as possible with an accessible delivery platform. They bring together available drivers on optimised routes to aggregate real-time deliveries on common routes, thus saving cost and time for the NGOs and companies Neobility work for. Neobility also increases revenue for drivers and take a commission in order to further improve the platform and the service.

- **Tandem – “Shared taxi services for low income people working in areas with poor public transport services”**

Tandem turns local taxis into shared shuttles to get to work or other key locations. Tandem's technology enables passengers to pay for just their seat in the vehicle - creating a new affordable transport option. They are matched with other passengers whose journey overlaps within the same “corridor of demand”. The journeys are fulfilled by local transport providers (taxi and minibus companies) who are paid a set fare regardless of passenger numbers. This model helps them grow their business by reaching passengers who would not have made this journey if it had involved paying

for a full taxi. Services are then underwritten by Journey Generators (public transport authorities or private sector employers/agencies), who cover the difference if the average income from passenger fares drops below the amount paid to the transport providers. Journey Generators value Tandem's service because there are zero costs when no passengers are travelling, so high-quality services can be introduced without large financial risks. Tandem's core costs relate to building technology and business development. They reach passengers through a B2B2C model i.e. through their Journey Generator partners.

Table 2 presents two building blocks of the Business Model Canvas. These are commonly seen as core in the design and analysis of business models.

**Table 2: Selected elements of the HSL startups's value proposition**

STARTUP	VALUE PROPOSITION	CUSTOMER SEGMENT (*)
B2Ride	Onboarding services for customers. Operating services for customers.	People with Reduced Mobility, People living in rural and deprived areas.
CityMaaS	Universal travel information platform. Provides personalised journey/information. Inclusive digital product helps PRM to navigate and get information.	Elderly people, Migrants and ethnic minorities, People with Reduced Mobility, Children and young people
Childfy	Community of families based on their centres where they children go to. Transparency into the system so families can easily track their kids and get notified before and after the trip takes place.	Children and young people
Dreamwaves	Easy and safe navigation using audio only.	People with reduced mobility
Hoop	Allow people to drastically change their mobility experience.	People living in rural and deprived areas
Lamiloo	Same-day delivery within 3 hours of ordering.	Elderly people, People with Reduced Mobility, People living in rural and deprived areas.
Mobito	To leverage the power of data to make data-driven decisions.	All
Nemi	Optimization of transport operator's resources. Shorter travel times and higher frequency, as well as better access to public transport.	People living in rural and deprived areas
Neobility	Low cost delivery of goods anywhere.	Low income and unemployed people, Migrants and ethnic minorities
Tandem	Reliable service in comfortable vehicles at affordable prices.	Low income and unemployed people, People living in rural and deprived areas

(\*) Relevant to the HiReach Social Vulnerable Groups (other customers segment may exist).

Source: Own elaboration

A detailed description of the business models (and value chain) of each startup can be found in **Annex**.

Notwithstanding the heterogeneity of the business models, Table 2 highlights some common traits among the different building blocks notably: value proposition, and customer segments. The analysis also revealed overlap among various business domains (Table 3). As a whole, the 10 HSL startups work in only 7 different business domains. Such communalities were decisive for the identification and definition of the 7 prototypes of business models.

**Table 3: HSL startups' business products**

STARTUP	BUSINESS PRODUCTS
B2Ride	Consulting Services
Childfy	Carpooling (target group customised)
Hoop_carpool	
Citymaas	User Interface & User Experience in Journey Planners
Dreamwaves	Audio Guidance System (Navigation)
Lamiloo	Freight & Logistics
Neobility	
Mobito	Data Analytics
Nemi	Multisided platform solution for shared services
Tandem	

Source: Own elaboration

### 3.2 Prototypes of business models

The concept of prototype of business model was discussed in Section 2. In brief, a business model describes how a company creates, delivers, and captures value. By definition, a business model incorporates elements of the market, including geography, cultural elements, political and legal context, or even technology. Conversely, a prototype is agnostic of the market. It can be understood as an abstraction of a business model, purged from the market-related traits. It contains the fundamental elements of the original business model (without no strings to a given market).

The prototype can be regarded as a blueprint for the implementation of a business model in different markets. When transferring a business to a new market, the business model will be designed from the prototype: it will contain the elements of the prototype plus the additional elements to populate all building blocks. The prototype of business model provides information about (1) whose building blocks are independent from the target market – that is, their characteristics are irrespective of the market conditions, and (2) whose building blocks depend on the specific characteristics of the target market.

As explained in Section 2, the prototypes were inferred from the HSL startups' business models. The decision was to design one prototype per business domain (see Table 3 above), in a total of 7 prototypes, as follows:

- Prototype 1: Inclusive Journey Planner,



- Prototype 2: Audio Mobility Assistant,
- Prototype 3: Carpooling for commuting,
- Prototype 4: Mobility & transport poverty consulting & services,
- Prototype 5: Data Analytics Platform,
- Prototype 6: Delivery of Goods,
- Prototype 7: Multisided platform for shared services.

Each prototype is presented in the following sub-sections. Only the relevant building blocks of the BMC are presented. It is assumed that the remaining ones are not to be adapted to the local market conditions.

### 3.2.1 Prototype 1: Inclusive journey planner

- **Value Proposition:**
  - Reduces digital exclusion by allowing people with specific needs to easily interact with the platform (and retrieve all the required information).
  - Make it easier for people fulfilling their daily mobility needs by giving them higher autonomy and freedom of choice.
  - Helping customers' passengers avoiding time wasting/ have a better mobility experience.
  - Improve passenger communication.
- **Customers:**
  - Mobility and Transport Operators.
  - Local Mobility Authorities.
  - Cities and Regions.
  - Any organisation that may have interest in making available to a wider audience a journey planner.
  - Relevant HiReach Vulnerable Social Group:
    - Elderly people,
    - Migrants and ethnic minorities,
    - Children and young people.
- **Revenues Channel:**
  - Monthly Maintenance depends on API calls.
  - Commission on the only ticketing & payments (if implemented).
- **Variants:**
  - The representative startup is CityMaaS.
  - The journey planner can be enhanced to incorporate payment and billing.
  - It can be used to get feedback from the passenger (e.g.: brief surveys).
  - It can also evolve to incorporate other transport providers, in order to become multimodal.

### 3.2.2 Prototype 2: Audio mobility assistant

- **Value Proposition:**
  - Promotes autonomy and independence of people with disabilities (notably visually impaired) and people with other mobility limitations (e.g.: elderly, migrants).
  - Increases the convenience, safety and security, and comfort of the journey.
  - Allows to walk a route without the need to interpret complicated instructions or look at a map.

- Easily find out which public transport to take, be directed at doors, and be warned when to get off.
- **Customers:**
  - Any person that can benefit from a mobility assistant. The most obvious customers are blind and visually impaired people.
  - Relevant HiReach Vulnerable Social Group:
    - People with Reduced Mobility,
    - Elderly people that may have physical and cognitive limitations.
    - Migrant that do not know the local transport system and/or region.
- **Key Partners:**
  - Blind and visually impaired associations – these are key partners, since they may disseminate/spread the service among their associates.
  - Local public and NGO organisations working with any of the customer segments.
  - Local Public Authorities is another important partner, not only to support (and promote) but they can also subsidise the service.
- **Revenues Channel:**
  - B2C segment: Freemium - App contains free and premium services. Premium services are paid.
  - B2B segment: a Municipality, Local Authority or Company may buy a general licence to be used by specific people (e.g., employees) or in a geographical area.
- **Additional Information:**
  - Variants: the APP can be extended to include other services, such as:
    - Mobility services: ticketing, journey planner, route information, timetables, etc.
    - Other services: information points of interest along the route and at destination.
  - The representative start-ups is Dreamwaves amongst the HiReach acceleration programme, but also GoOV, a case study investigated in the frame of HiReach D.3.2.

### 3.2.3 Prototype 3: Carpooling for commuters

- **Value Proposition:**
  - Make it easier for people fulfilling their daily mobility needs by giving them higher autonomy and freedom of choice.
  - Reducing the burden of the caretakers (e.g.: parents in the case of Childfy or adults that need to take their parents to visit relatives at the hospital, in the case of Hoop).
  - Joining a community of shared values, where citizens can share rides and get to meet new people.
  - Reduce mobility emissions by leaving cars at home.
- **Customers:**
  - There are two business segments:
    - B2C: the customers are either the passengers or the caretakers (e.g.: parents).
    - B2B2C: the customers are the organisations that offer the service to the employees or customers.

- Relevant HiReach Vulnerable Social Group:
  - Children and young people (Childfy),
  - People living in rural and deprived areas (Hoop),
  - People with reduced mobility options (Hoop).
- **Key Partners:**
  - Local organisations – such as Hospital, Clinics, Schools – are key partners to the implementation of the Business Model.
  - Local Public Authorities is another important partner, not only to support (and promote) but they can also subsidise the service.
- **Revenues Channel:**
  - Fees/ride paid by the customers (B2C segment) or organisation (B2B segment).
  - Monthly subscriptions in the case of B2B and B2C segments.
- **Additional Information:**
  - The representative startups are Childfy and Hoop amongst the HiReach acceleration programme, but also Boleias.net, a case study investigated in the frame of HiReach D.3.2.
  - The car-pooling business models are highly flexible and adaptable. Hence, these business models can easily be enlarged to incorporate any other Vulnerable Social Group, such as Elderly people, Migrants, or Low Income or Unemployed People.
  - In the abovementioned segments, most likely public subsidies (or other clever way to monetise – e.g., sponsorship) will be required.

### 3.2.4 Prototype 4: Mobility & transport poverty consulting & services

- **Value Proposition:**
  - Fully tailored services to the actual needs of customers, such as:
    - onboarding services for customers including project management, software configuration, analysis of commuting route to work location.
    - operating services for customers to manage the ridesharing/van-pooling software for them, including weekly/monthly reporting of ridesharing/van-pooling KPIs, gamification.
    - user workshops and mobility experience days, parking management, fleet management, van-pooling services, smart charging of electric vehicles, seasonal rewards.
- **Customers:**
  - Public and Private Organisations with 50 or more employees or associates.
  - Relevant HiReach Vulnerable Social Group:
    - People with Reduced Mobility,
    - People living in rural and deprived areas.
- **Key Partners:**
  - Local/national consulting and service companies that could make the bridge with local companies (e.g.: to ease language, cultural barriers) and be responsible for the production of material and conduction of workshops or on-job training.
  - Local representatives to conduct commercial activity. A local organisation will be in better conditions to dialogue with local organisation and understand their actual needs (and propose a better offer),

- **Additional Information:**
  - The representative startup is B2Ride.

### 3.2.5 Prototype 5: Data analytics platform

- **Value Proposition:**
  - Enabling businesses and cities to leverage data, make data-driven decisions and improve their mobility offering through a cloud platform.
  - Integration of data from vendors in a standardised way, which allows to provide better quality checks and discovery mechanisms to end-data consumers.
- **Customers:**
  - All organisations, public or private, that need to exchange and analyse mobility data to cover their needs.
  - The most typical customers include: Cities, Metropolitan Areas; Regional Authorities; and Transport Authorities.
    - Relevant HiReach Vulnerable Social Group: All of them.
- **Key Partners:**
  - Data collection depends on the willingness of data providers to share it. Hence, a strong network of partnerships will have to be established with the various data providers. These include:
    - Transport and mobility operators, such as public and private transport companies, new mobility operators (e.g.: scooter, car sharing, etc.).
    - Local public authorities (e.g.: data coming from traffic sensors, etc.).
    - Virtually, any entity that generates mobility related data.
- **Revenues Channel:**
  - Annual subscription fee,
  - Monetisation of data.
- **Additional Information:**
  - The representative start-up is Mobito.
  - The platform not only collects data, but it also produces interesting visualisation outputs (such as maps, charts and animations).
  - The platform can generate multiple dashboards for different users, such as:
    - Population – with general mobility information
    - Staff – full access,
    - Partners – relevant information.
    - Artificial Intelligence and Machine Learning can be incorporated to generate meaningful information from the original data sources.

### 3.2.6 Prototype 6: Delivery of goods

- **Value Proposition:**
  - Enables the vendors to:
    - Enlarge their customer base by serving people that cannot go directly to the store (i.e., stay at home people),
    - Reduce the loss selling by serving unmet demand (i.e., in case of no availability).
  - Same-day delivery.
  - A plannable time window delivery.

- Payment by the customers in multiple ways, including cash.
- **Customers:**
  - The customers are the Pharmacies or Wholesalers, aiming at providing home delivery services to their patients.
  - The end-users are the customers' customers. These include, for example:
    - Any person wishing to receive the medicines at home (or any other place).
    - Any person looking a medicine that is not currently in stock (but it can be ordered in a few hours from the wholesaler).
  - Relevant HiReach Vulnerable Social Group:
    - Elderly People,
    - People with Reduced Mobility,
    - People living in rural and deprived areas.
- **Key Partners:**
  - Couriers that make the transport,
  - Local Public Authorities that may subsidise the service to help the population,
  - Organisations that may sponsor the service as part of their social responsibility strategy.
- **Revenues Channel:**
  - Fee paid by the pharmacy and/or end-user on each delivery,
  - Public subsidies (as part of social policies),
  - Sponsors (as part of social responsibility strategy).
- **Cost Structure (in addition to the typical cost elements):**
  - Payment to the Couriers per delivery.
- **Additional Information:**
  - The representative startup is Lamiloo.
  - Although the concept mentions «home delivery », it can be enlarged to any other destination, such as: offices, local parish, NGO, etc.
  - Lamiloo uses bike couriers, but other vehicles can be used. This can be of particular interest in rural areas.
  - Alternatives sources of revenues can be sought. Notably, subsidies of public authorities within the scope of social policies; or sponsors of large companies as part of their social responsibility strategy.

### 3.2.7 Prototype 7: Multisided platform for shared services

- **Value Proposition:**
  - Provision of reliable transport in the form of a demand-responsive transport service and which is booked in advance by passengers.
  - Provision of a high-quality, reliable service that is also tech-enabled (e.g. allowing passengers to book easily from the comfort of their home with a computer).
  - Passengers are offered shorter travel times and higher frequency, as well as better access to public transport.
  - Improving existing public transport lines with very little demand (those which are very difficult to sustain and cannot provide a convenient service), serving those low-density areas where regular public transport is less competitive.
- **Customers:**
  - There are two business segments:

- B2C: the passengers.
  - B2B2C:
    - the customers are the local authorities that (partially support) the service.
    - another customer can be the public transport companies that are aiming at reducing the costs of provision of the transport service.
  - Relevant HiReach Vulnerable Social Group:
    - Low income and unemployed people,
    - People living in rural and deprived areas.
- **Key Partners:**
  - Local transport companies – such as taxi drivers, bus/minibus companies, other transport service companies.
  - Local Public Authorities is another important partner, not only to support (and promote) but they can also subsidise the service.
- **Revenues Channel:**
  - Fees paid by the customers.
  - Subsidies paid by the local authority. Or monthly subscription by the public transport company or other stakeholder.
- **Additional Information:**
  - The representative startups are Tandem and Nemi.
  - The Business Model can be applied in any sparsely populated region.
  - Also, it can be used to serve major employers (Tandem already focuses on this niche), where the service can be paid by the employer, as part of their human resources/social responsibility programmes.

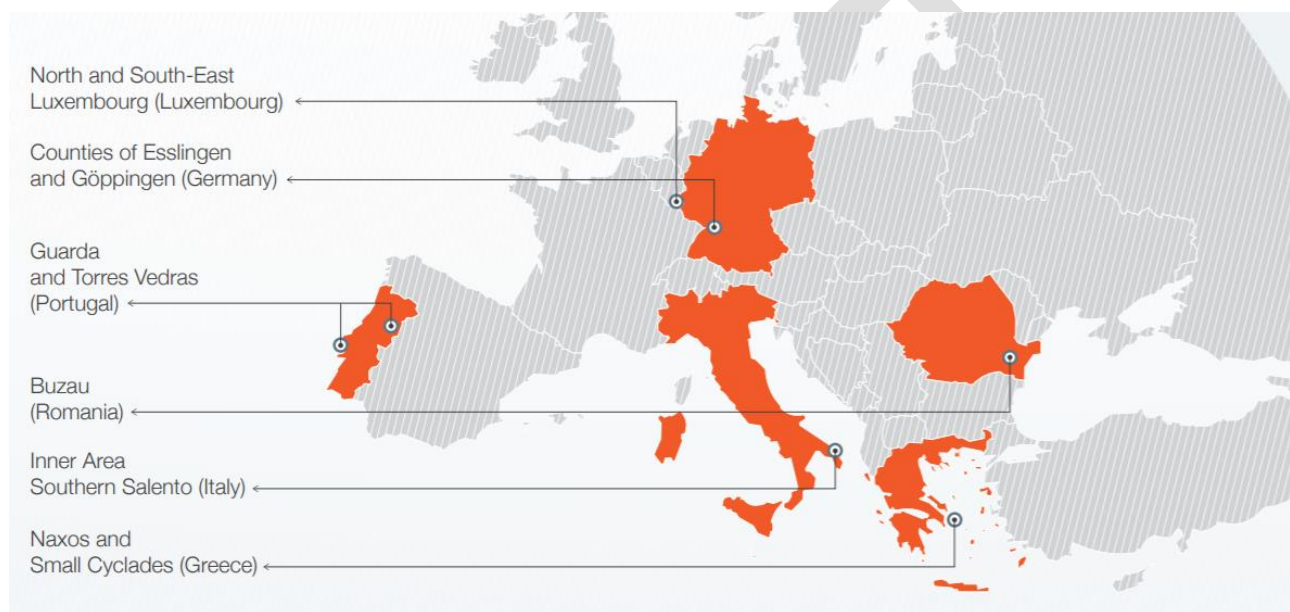


## 4 Transferability Analysis

### 4.1 Transferability to the HiReach study regions

Six study regions were identified at the outset of the HiReach project as being geographically representative of transport and accessibility problems experienced in different countries, at urban, peri-urban and rural level. The selected regions can be depicted in the following figure.

**Figure 7: HiReach study regions**



Source: Own elaboration

Several research activities were carried out in these regions during early phases of the project, notably field work with interviews and focus groups targeting specific vulnerable segments have taken place. The feedback collected in these regions, both from the end users and from the local stakeholders, significantly shaped the knowledge base of HiReach. It has influenced the selection of the startups and the HSL evaluation of their performance. It is then of utmost importance to get back in touch with local representatives and understand to what extent the solutions developed in the HiReach Startup Lab can be replicated in those settings.

#### 4.1.1 Counties of Esslingen and Göppingen in Germany

##### Inclusive journey planner

Different journey planners are in place in the target region, that provide door-to-door information on all available transport options. Electronic journey planning is available in the



target region since 1997, the state has been a forerunner in digitisation of travel information. The Elektronische Fahrplanauskunft (EFA) was one of the first of its kind in Germany, and today is one of the most elaborated journey planners, it offers a mobile application and integrates barrier-free routing, real-time departures and arrival, live maps, tariff information, multimodal routing, geo-referencing, personalization, etc. It is the base for all other local and regional systems, such as the VVS system for the Stuttgart region. German railway operates its own journey planner that integrates all existing public transport services in Germany as well as many additional services and runs the mobile application DB Navigator.

Given these many competing applications, which are constantly upgraded and redeveloped, the BM faces a particularly tough competition in the target area. It is safe to say that **willingness to invest in a further BM is very low** from the perspective of transport authorities and local/regional administrations in the regions of Esslingen and Göppingen.

### Audio mobility assistant

In the target region, since 2017 a journey planner for blind and visually impaired persons is in place (called Sinn<sup>5</sup>). The aim of this journey planner is to provide barrier-free and real-time passenger information for blind and visually impaired people Germany-wide in order to make local public transport more reliable and attractive for them. To make this possible, passenger information in the form of an app for smartphones is implemented in the project, which is specially tailored to the needs of the target groups mentioned. **The existence of this app reduces the opportunities for the business model.** However, since it is only available for Apple IOs and solely focuses on the public transport environment, there may be an opportunity for Dreamwaves to collaborate with the developers and the respective transport authorities and especially the municipalities and county authorities, to extend the scope to the whole urban and rural environment. Generally, the strong role and presence of advocacy groups for blind and vision impaired in Germany and the target region offers a supportive testbed for new solutions.

### Carpooling for commuting

Due to the dominant role of public transport in student and patient transportation, there is limited scope for pooling services for these target groups. However, there is some potential for organizing students' walking and cycling trips.

There are a few general pooling services operational in the target region. Hence there seems to be **limited potential for additional services**.

### Mobility & transport poverty consulting & services

**There is no overall platform for employee transport in the target region**, which could be an opportunity. There is a high car dependency, but also a well-developed public transport

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<sup>5</sup> <https://wm.baden-wuerttemberg.de/de/innovation/innovationsgutscheine/>

network. Setting up a system could benefit from several public-private initiatives already in place, and generally **high willingness to support sustainable employee mobility**.

### Data analytics platform

The target region is part of the wider Stuttgart metropolitan region, a digital and high-tech hub with **several institutions being specialised in data analytics**, also for transport and mobility solutions. Hence there is heavy competition in the target area. On the other side, this could be an asset for **potential collaborations** in the target region.

### Delivery of goods

Comprehensive supply of pharmaceuticals exists in most municipalities in the target area. However, there are small municipalities with a population below 2,000 that don't have pharmacies.

A complex legislation governs the pharmaceutical market in Germany. Delivery of pharmaceuticals is yet not organized on a joint platform, but via individual pharmacies, or via online pharmacies and delivered by the common delivery firms. Many pharmacies in the target area offer home delivery. However, such delivery services are organised by the individual pharmacies, and the medication is home delivered once it arrives at the pharmacy, hence time is lost due to the two-way delivery. Hence, **there is some potential for home-delivery**, e.g. with bikes, in a three-hour window.

### Multisided platform for shared services

Both Esslingen county and Göppingen county have municipalities with relatively low population density. Furthermore, some municipalities have relatively high shares of elderly population and are also characterised by high car ownership. Such areas need viable alternatives to attract more people to public transport. All these mentioned criteria make on-demand door-to-door services attractive in these areas in general.

Public transport coverage in the target region is comprehensive. Services in late/early hours, night-time and weekends are operated via call-a-bus/call-a-taxi services that are increasingly flexible and can be booked via app. Additionally, in many municipalities, customised, volunteer services called "citizen buses" are operating, which offer door-to-door services mostly for the elderly. Fully flexible, real-time, on-demand services are not envisaged in the region. However, there is much scope for flexibilization of existing services, and the responsible agencies are exploring the potentials for more on-demand services. Here, **interesting collaborations between the proponents of the BM and the local authorities could take shape**. On the other hand, substantial resistance against adding new services and complete flexibility of existing services can be predicted for the target area.

### 4.1.2 Naxos and Small Cyclades in Greece

#### Inclusive journey planner

The target region is Naxos an island South Aegean region, Greece. The municipality has an area of 495,76 km<sup>2</sup> and a population of 18,904 inhabitants. The seat of the municipality is Naxos town. Besides Naxos town, there are 22 villages in Naxos (ranging from 10 to 2,000 residents).

The transport related decisions are taken at a municipality level and they are implemented by the local transport operator 'KTEL NAXOU S.A.<sup>6</sup>'. The local public transport operator does not provide a journey planner and no other commercial journey planners are available. That makes **Naxos an untapped opportunity for such a business model**. Moreover, the municipality of Naxos and Small Cyclades is elaborating its first SUMP with a strong focus on social inclusiveness, on finding transport solutions that meet the needs of the residents and on solving important problems such as the mobility of vulnerable groups.

The **interest from the local elderly people would probably be limited**, due to the low-tech savviness that usually characterise those living in remote locations. However, all the other vulnerable groups analysed within the HiReach project and in general all **young and adult citizens might benefit from the presence and usage of an advanced journey planner**.

#### Audio mobility assistant

The audio navigation system is a completely unexplored market in Naxos and could be an **untapped opportunity**. This business model would be an added value to the target region and Greece in general, as this kind of service doesn't exist there. **However, the perceived added value of a multimodal navigation system for blind people is reduced from a business point of view**. To unlock business opportunities, the main contact person would be the national association of the blind and the municipality of Naxos.

#### Carpooling for commuters

There are no local competitors nor similar initiatives already undertaken in Naxos island. From the current situation in Naxos island, this could be an untapped opportunity for such a business model.

The business model of the carpooling solution would **have an added value** when concentrated on vulnerable users such as children and elderly people. Children in remote mountain areas of Naxos face the consequences of remoteness of their villages from the schools/after-school activities and of the limited transport opportunities. School buses are subsidised by the regional authority and are for free for the pupils. Regarding the willingness of people to pay for the service, it is important to emphasise that, in case this service will be offered as a public service, then most likely it will be used.

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<sup>6</sup> <http://www.naxosdestinations.com/>.

## Mobility & transport poverty consulting & services

There aren't any local consulting companies that could offer specialised counselling to the municipality in order to improve the mobility of the citizens living in Naxos. However, considering the local characteristics of the area, and the fieldwork conducted in early stages of the project, **this business model does not provide the desirable added value to the needs of the citizens.**

## Data analytics platform

There is no similar service in place in the island of Naxos. However, **the possibility to raise interest from the authorities in this business model is very limited**, mainly due to their internal organisation that usually suffer from low digital proficiency and specialisation of the public officials.

## Delivery of goods

Most municipalities in Greece run a program "Help at Home". The "Help at Home" program is aimed at seniors who are not fully self-sufficient and people with mobility impairments and special problems, with priority given to those who live alone or do not have full family care or whose income does not allow them to provide the services needed to improve their quality of life. The offered services are: a) Counselling and emotional support, b) Medical care with home visits (medicines prescription and delivery services included as well as escorting to hospitals for scheduled exams.), c) Family - Home Care and satisfaction of practical living needs, like small markets, cleaning of their home, payment of bills, etc.

In addition, there are a lot of pharmacies in Greece which allow online purchasing of medicines that deliver them within one day. However, it is only allowed to sell drugs online without prescription. It is also important to take in consideration that the **likelihood to pay for these services is relatively low**, especially considering that this service targets mostly elderly people, people with reduced mobility or those living in deprived areas, which are usually low-income.

## Multisided platform for shared services

Local competitors of a multisided platform for shared services could be the public transport company (KTEL NAXOU S.A.), whose service is provided with high-capacity vehicles. There is no flexible public transport service in Naxos island and the existing public transport company operates only on fixed schedules and does not offer convenient options for the people. However, the transport related decisions are taken at a municipality level.

Key partners are the Municipality of Naxos and Small Cyclades, the public transport operator and the local taxi drivers. **The Municipality of Naxos and Small Cyclades could be interested in co-funding this initiative.**

### 4.1.3 Inner Area Southern Salento in Italy

#### Inclusive journey planner

Through the European funds dedicated to the Regional Operational Programme 2014-2020, the Puglia Region finances various opportunities that includes social development, technological, scientific, environmental and infrastructural innovation, paying particular attention to the social inclusion of all citizens. Startups and existing businesses can benefit from different funding options.

Unfortunately, there are no mandatory requirements nor standards in the contracts for operating public transport services addressed to the provision of advanced and real time travel information for the users. Basic information on the current public transport offer is also often absent, not available or not properly communicated to the public: almost all companies in the region do not publish data in GTFS, the main barrier for the identified competitors myCicero and Moovit.

The Business Model might be applied to develop an intermodal journey planner solution that includes at least the whole province of Lecce or ideally the region of Puglia. In this sense, local authorities could act as partner more than customers exactly for modifying the minimum requirements for infomobility provision in the contracts with public transport operators.

At least two Interreg-funded demonstrative projects in this area, STEP-UP/ApuliaMoving and GIFT2.0, have been already developed. But the solutions were not scaled up nor used by local authorities and transport operators. Only the local railway and bus company FSE has already started a project for developing a new customer-oriented bus and train traffic control centre. The company NUGO has also developed a MaaS platform and solution (<https://www.nugo.com/nugoweb/>) and therefore collaboration with both companies is seen as an opportunity for evaluating possible integrations and additional while label features from the BM.

**Almost all vulnerable groups analysed** within the HiReach project and in general all young and adult citizens **might benefit from the presence and usage of an advanced journey planner.**

#### Audio mobility assistant

**This BM is seen as potentially suitable for transferability** in the province of Lecce and in the inner area of Southern Salento.

People with a cognitive or physical disability can obtain several incentives, either through tax reductions or lower VAT, or direct and free provision of special supporting devices and equipment for their autonomy. Disabled people can also access to a financial support of € 1,500 every 6 years for buying IT equipment (e.g. personal computers, etc.)

Interviewed representatives of blind and visually impaired people referred to the large use of smartphones, particularly Apple/iOS ones, and the good quality of installed screen readers. The walking stick is their most important tool, but they largely use also navigation systems such as Google Maps. Hence, the willingness to pay for a solution that incorporate

more information other than simply the assisted navigation to walk on the street or to physically access PT vehicles is very high.

In the Province of Lecce there are around 1,000/1,100 blind and visually impaired people. Only a small minority of them achieved a good level of autonomy in mobility and some cultural barriers exist. Blind people associations usually offer training for nurturing the capability of being autonomous while moving in the city: this might be extended to the use of audio navigation systems.

The most important element raised is the coverage and stability of the mobile phone/internet connection, that in turn affects the accuracy of the GPS and therefore of exact locations. More than focusing only on the accuracy of walking navigation the integration of other information is seen as crucial, particularly the one referred to public transport. The possibility to know which line reaches certain destinations and a message informing them of the arrival of the correct bus is much more important than simply receiving information on how to step in or out of the vehicle. Additionally, a solution that is independent from the hardware of the bus is perceived as a better option.

## **Carpooling for commuters**

**This BM is seen as potentially suitable for transferability** in the province of Lecce and more specifically in the inner area of Southern Salento.

The vision of local policy makers in the Inner Area accelerated the process of widening the scope of the local governance to include also sustainable mobility and public transport. The approved Inner Area Strategy might integrate a carpooling platform in the planned intervention for increasing public transport provision to link specifically dispersed schools (also for learning activities organised in the afternoon) and local health services (hospitals and clinics).

Past experiences on the so-called "Territorial Time and Space Plans" revealed interesting results both on the mobility behaviours and attitudes as well as on the activation of pilots to improve mobility of students and workers. The Local Health Service ASL, particularly their territorial units in the Cape of Leuca such as the Hospital in Tricase or the clinics in Gagliano del Capo may also support the BM, but more as partners.

The second round of focus groups carried out in the HiReach project revealed the attitudes and perceptions towards the carpooling platform 'Boleias' from a group of women. Several participants agreed on the fact that in the inner area there is still a kind of prejudice towards the idea of sharing things and this includes rides and the costs associated to car trips. They argued that also a more structured carpooling platform might encounter difficulties in attracting new users while on the contrary the scheme is well known and used within more informal and "close" communities (friends, family). Informal carpooling is already a common practice in the area. Also, the issue of 'security' was raised. The perception of the risk of being harassed in a rural road was very high and almost all the participants converged towards this main barrier.

A BM with the characteristics of Chidfy may encounter the full interest of local schools to become partners. Some NGOs, particularly those addressing the needs of disabled or elderly people, can be considered also as additional potential partners.



## Mobility & transport poverty consulting & services

**This BM is not seen as potentially suitable for transferability** in the province of Lecce and more specifically in the inner area of Southern Salento.

Past experiences on the implementation of the so-called "Territorial Time and Space Plans" showed interesting results both on the improvement of knowledge about mobility behaviours and on the activation of pilots to improve mobility but these have been limited to students and people and not enlarged to home-work commuting trips addressed to large employers (either private or public). Mobility management was not favoured nor supported among local businesses and public authorities in the past years.

Another element to be considered is the peculiar peri-urban and polycentric/scattered character of the study region: this avoids concentration of motorised traffic flows on certain road axis and cities/towns and make travel time quite low. Traffic congestion and lack of parking space at workplaces are not problems raised in the area.

## Data analytics platform

Data collection and particularly **data analytics and visualisation are not a common practice and therefore not recognised as a relevant tool for policy making**. The sole potential customers for this BM is the Puglia Regional Authority, notably the department for transport in its role of regional transport authority.

The Puglia Regional Authority through its mobility agency ASSET has recently started to buy floating car data and owns other datasets and information that might be useful for taking more informed decision (e.g. for planning purposes) but also for guiding the decisions of other entities such as municipalities and local mobility operators. There is no experience nor practice in this direction yet.

A key negative element to consider is that also basic information on the current public transport offer is often absent, not available or not properly communicated to the public. Almost all companies in the region do not publish data in GTFS mode.

Both the Province of Lecce (in its role of local transport authority) and the local municipalities (of the Inner Area but also the provincial capital Lecce) cannot be considered as potential customers. This is mainly due to their internal organisation that is quite often undersized and suffer from low digital proficiency and specialisation of the public officials.

## Delivery of goods

The sole potential customers for this BM are pharmacies and para-pharmacies localised in the provincial capital city of Lecce where a competitor, the Italian startup and marketplace for the purchase and delivery of medicines and healthcare products, Pharmap (<https://www.pharmap.it/>), is already present and quite active. In the city of Lecce, following a tailored training and support process linked to the EU project 'Cyclelogistics



Ahead<sup>7</sup>, the bike courier CPK Express has been established in 2020. They regularly work with local pharmacies in the city of Lecce.

**The BM is not seen as transferable** to the inner area of Southern Salento mostly due to its peculiar territorial characteristics: a polycentric scattered area characterized by the presence of compact historical towns but not villages nor isolated settlements. The local population lives close to town centres and this facilitates the access to very basic services such as pharmacies and doctors. Additionally, many patients, particularly elderly people, prefer to reach them in person and by walking.

Overall, every town of the inner area is served by one or more pharmacies. Local pharmacy owners know in person almost all their clients: the link between doctors, pharmacies and patients, including neighbours, is very strict and informal. The need to add an app-based delivery service is not perceived as useful nor convenient also because quite often home delivery is offered for free to nearby clients.

Because of the Covid19 pandemic, doctors can also send a pdf or the prescription ID number to the patient and the latter has simply to call the pharmacy and communicate such information together with his/her data. There is no need to do it in person anymore and pharmacies can easily deliver drugs and medications at home.

Several healthcare and social services are also offered by local associations and cooperatives to more vulnerable users (disabled, elderly, low income, migrants) including personal transportation and assistance to access clinics and doctors (and thus also medicines).

### **Multisided platform for shared services**

The **Business Model is in line with both the regional and local policy** and looks ideal for the specific context of Southern Salento, a remote polycentric scattered area with almost 68,000 residents characterised by the presence of numerous compact historical towns in the extreme south east of Italy. It also fits with the policy agenda to support flexible shared services with secured funding and a clear strategy for implementation. Furthermore, a successful innovative and inclusive approach might be potentially transferred to other inner areas in Italy within the framework of the national territorial cohesion programme (SNAI).

The BM is one of the HiReach piloting experiences being carried by the startup Nemi that has already benefited from the real commercial interest of two public transport operators: the local railway company Ferrovie del Sud Est and the urban public transport operator of the provincial capital Lecce SGM.

The analysis of potential customers identified also a local private operator - AirShuttle.it – that operates since many years' door-to-door airport shuttle services with 9 seats minibuses from Lecce and other provincial towns to the airport in Brindisi. The owner declared his willingness to buy/pay for a solution that can help the company to improve and digitalise/optimize the service.

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<sup>7</sup> <http://cyclelogistics.eu/>

Also HiReach fieldwork activities in the area demonstrated the interest and positive attitudes (including willingness to pay) from the local community in a very similar service (PickMeApp) as well as in more flexible and inclusive collective mobility (Local Link), particularly from two vulnerable social segments: women and people with reduced mobility which often live in remote areas.

Local municipalities can be important partners, both for demonstrative tests and for adapting public procurement procedure to favour the BM. Local startups still in the early stages of their business and without a proper IT platform (TAD, Night-shuttles and Zemove) have been also identified as potential partners.

#### 4.1.4 Guarda in Portugal

##### Inclusive journey planner

Guarda is a district that lies in the northeast of Portugal and features Guarda as the largest city. The municipality has 42,000 inhabitants scattered through a 712km<sup>2</sup> mountainous territory. The local transport operator is Transdev ([www.transdev.pt](http://www.transdev.pt)), a French-based international private public transport operator.

The local public transport operator has a journey planner which receives very low scores in both the main app stores and is not adapted to vulnerable users. **The value proposition of the inclusive journey planner is thus very high**, especially because it is UX/UI responsive and offers functionalities that are not present in the local market and, consequently, could help making PT more attractive to users and visitors alike. The interest from locals living in Guarda is however very limited, due to the market-size, the current share of public transport users and the expected low-tech savviness that usually characterise elderly people living in remote locations. However, if the inclusive journey planner technology proves to be stable, it can be expanded, for instance, to the wealth of public transport operation areas of the PT group, largely increasing the appetite of the journey planner service provider in offering a high quality service to Guarda citizens.

There does not seem to exist any local financial support to the development of an inclusive journey planner. There is, however, some political interest in tackling transport poverty problems from the main client (the municipality) and some key partners could be approached to facilitate the market entrance, including the regional authority for transport, the local university and the local public transport operator itself.

##### Audio mobility assistant

Audio navigation services for visually impaired or blind people is completely untapped in the small and mountainous municipality of Guarda, where there are no baseline figures that could help to understand the potential demand of such service.

Based on preliminary desk research, **the perceived added value of a multimodal navigation system for blind people is reduced from a business point of view**. However, the value proposition could increase if the service is adapted and extended to include other services, for instance, to allow people to independently navigate around public services

(municipality, post offices, river beaches etc) and provide audio descriptions of the spaces and places around them. The preconditions that should be met to attain such goal involve the partnership with local blind associations such as ACAPO<sup>8</sup>, the regional authority and other relevant local stakeholders.

### **Carpooling for commuters**

The motorisation rate in the municipality of Guarda is higher than the Portuguese average (663 and 559 vehicles/1,000 inhabitants, respectively), which is a good precondition for carpooling services.

There is a district hospital located almost in the city centre, 1 km away from the local municipality building, that serves a very old population (30% of the population is older than 65). The municipality of Guarda is also equipped with several schools, spanning all education levels. The number of youngsters enrolled in primary and secondary schools accounts to roughly 5,500 students.

There are no political incentives for deploying carpooling systems in Portugal and neither in Guarda. This is related to the **lack of tradition for sharing private vehicles in Portugal**, even if some action plans at broader territorial levels call for company mobility plans (for hospitals, for instance).

### **Mobility & transport poverty consulting & services**

The target company is Coficab (<http://www.coficab.pt/>), a company based in Guarda (Portugal) since 1993. With 563 local staff members, the company is simultaneously the largest private employer and the major export company in the municipality.

Even if located in the outskirts of the city, parking places around the plant are scarce, and the workers need to park their cars illegally along the regional street, raising concerns about safety for those who park and for those who drive through narrow streets. Workers complaint that there are no public transport connections to the plant. Hence, they must rely on their private vehicle to get to work. The board members of the factory are sensible to this problem. They are unwilling to pay a specific transport subsidy to their workers but would rather prefer to foster a mobility plan with soft measures tailored to the worker's needs.

With the political support of the municipality, which seeks to meet the objective of the regional action plan for sustainable mobility<sup>9</sup> and develop company mobility plans, the new consultancy company could approach Coficab.

Even if there are not local firms with similar expertise, there are several well-established consultancy companies in Portugal. **Considering all this competition, the client could resist in choosing a new company to work with.** However, it is important to point out that the

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<sup>8</sup> <http://www.acapo.pt/>

<sup>9</sup> <https://cimbse.pt/wp-content/uploads/2020/03/PROGRAMA-DE-ACAO-E-SISTEMA-DE-MONOTORIZACAO-DO-PAMUS-BSE.pdf>

existing national companies often do not successfully bundle the technical and the technological support, and this is the distinctive feature that could set the new consulting services company apart from their national competitors.

### **Data analytics platform**

In their quality of transport authority, under the legal Regime of the Public Transport Service of Passengers, Law 52/2015, Guarda municipality is the envisaged client for the data analytics platform. Even if no SUMP exists in Guarda, there is a regional action plan for sustainable mobility that calls for the implementation of a monitoring system for public transport operations and for the development of a mobility centre, concentrating all relevant mobility-related information. Hence, political support for a data analytics platform is likely to be achieved. Moreover, the Regulation on multimodal travel information services (MMTIS) will certainly give a boost in the provision of multimodal travel information in general and be relevant for the implementation of data analytics services in Guarda.

**Even if no local companies specialised in the field of data analytics can be found, there are however several companies based in Portugal**, that could eventually offer similar services to the municipality of Guarda when building cloud-based processing platforms. Other barriers likely to arise refer to the need to migrate information from legacy systems (often protected and not open) and to collaborate and share information that was previously under the helm of single bodies or units. This circular and sharing culture is still envisaged as a barrier in many public organisations in Portugal.

### **Delivery of goods**

**Multisided platform solutions for home delivery of medicines and pharmaceutical products already exists in Guarda** either in the urban centre and in the scattered villages around it. This service has been designed and accelerated during the outbreak of Covid19.

In such platforms, citizens may request the transport service either through the association of Portuguese pharmacies or the postal service provider using all their available channels (WhatsApp, email or phone). This is relevant as the current solution already makes use of previously existing assets, namely the dense network of postman's, with whom the local population has a strong and historic relationship of trust.

The cost of the current service is however regarded as very high for a population with very low purchasing power. Hence, should the startup collaborate with the postal service company<sup>10</sup> and be able to lower their operational costs, they can eventually become a relevant service provider/partner and bring medicines in people's homes.

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<sup>10</sup> The Portuguese company which operates the national postal service (CTT) run a specific startup programme, which is always open to support and accelerate ideas and business solutions (<https://www.ctt.pt/grupo-ctt/a-empresa/inovacao-e-startups/1520-startup-program/index>).

It is also important to note that the municipality of Guarda spreads along a mountainous area, so the use of conventional bicycles is not appropriate. The use of electric bicycles would make the delivery probably more expensive. It is important to note also that there is not yet a spread penetration of electrical bicycles in the Portuguese market, and Guarda don't feature on-street charging stations that could facilitate the take-up of this mode of transport.

### Multisided platform for shared services

Guarda municipality is the transport authority for the urban public transport service. However, in the surrounding villages, the transport authority is a regional governmental body called CIMBSE (<https://cimbse.pt>), which brings together the interests of several municipalities, and is responsible for a wide territory of 6,305 Km<sup>2</sup> and 236,023 inhabitants. They establish contracts with a high number of public transport operators (13) mostly operating in sparsely populated areas. There is, however, no on-demand public transport services in place, which can offer freedom levels to meet the population needs. Hence, **there seems to be room for implementing innovative shared services in this region, if the necessary arrangements and partnerships are made.**

MSP is perceived as a sound option for the sparsely populated areas of the municipality of Guarda. According to a regional action plan for sustainable mobility, about 5% of the population is not covered with the minimum required transport services, according to the Portuguese Law. This situation is more worrying during non-school periods, where the share rises to 10%, significantly increasing the number of persons with no public transport options to move around with ease.

Fortunately, there are several public funding streams that could support the implementation of shared services in areas where the current coverage is found inadequate. The most recent funding support was published in May 2020 and is aimed to the regional authorities that wish to implement flexible public transport schemes in their regions, promoting complementarity with other modes, improving communication channels, developing ticketing schemes and other supportive measures. Moreover, the new Portuguese regulation framework looks for more forward-looking models that make use of existing capacities, acting as a driver for shared services.

Even if there are no local competitors, the entrance in this market will not be easy for a new startup. There are some examples in Portugal of similar services mobilising flexible taxis and buses, organised by already established and mature national consultancy companies.

### 4.1.5 Luxembourg

#### Inclusive journey planner

To facilitate the multimodality in Luxembourg, the Verkeiersverbond, developed a journey planner which is available for the entire public transport network in Luxembourg. As Verkeiersverbond is partnering with all the transport operators in Luxembourg and is the direct adviser to the minister for Mobility and Public Works, **it will not be easy to enter the market** without their permission. The journey planner of Verkeiersverbond is not taking into

consideration vulnerable users like children and elderly people so there might be an opportunity when aiming at the Adapto<sup>11</sup> services. These services are also financed by the Government, yet if partnering with a local main operator there might be a small change of success. As Emile Weber, the biggest transport operator in the South-East region, is offering different types of services, from on-demand shuttle services, school transport or transport for people with reduced mobility to WEBTAXI services, a journey planner adapting to their services would be interesting.

### Audio mobility assistant

The blind and visually impaired people benefit from legal advantages and government aid, if they are covered by the Long-Term Care Insurance, and obtain equipment adapted to their situation. **The BM of Dreamwaves would be an added value to the whole Luxembourg,** as this kind of service doesn't exist. The State of Luxembourg offers a free on demand transport service for people with reduced mobility, called Adapto. Since March 2020, Adapto provides an application accessible to the visually impaired by the choice of colors and contrasts (color blindness and other visual impairments) and to the blind by means of a screen reader. However, this application is only useable for clients of the Adapto service.

It would be an added value to have an audio navigation system for the whole public transport (preferably in Luxembourgish, French, German, English, and Portuguese). The main contact person would be the Luxembourgish blind association and Verkeiersverbond, the national authority defending travelers' interests in public transport.

### Carpooling for commuters

**People in Luxembourg are still a bit sceptical about carpooling, considering it as not flexible and not safe.** Within whole Luxembourg, there is one carpooling solution (Klaxit), which was purchased by the State of Luxembourg and is concentrated on employees which work in Luxembourg. It is not adapted to vulnerable users like children or elderly people. A **carpooling service for children would be an added value**, as this type of service does not exist in this region. Especially in the case of the Schengen Lycée, a secondary school located in a cross-border region, which could be a potential client. Other customers in Luxembourg would be public schools in the municipalities of the canton of Remich. However, the Luxembourgish public schools would need to rely on the decision of the municipality or of the State of Luxembourg.

### Mobility & transport poverty consulting & services

A high percentage of employees are commuting from neighbouring countries to work in Luxembourg. This is a challenge for developing a sustainable mobility plan. **Mobility**

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<sup>11</sup> The "ADAPTO" service provides transport for disabled citizens. At the end of 2015, about 5,500 residents had an Adapto card, as to say potential customers.



**management companies can help both public and private employers to improve the mobility of their employees.** It needs a knowledge of the national/local mobility situation and culture therefore, local partnering companies should be included.

There are several local actors already present in the market, such as Moovee and Movesion. Specifically, a cooperation as a subcontractor of those companies could be valuable, as those organisations have already a large client database regularly requesting for services as provided by the startup.

### Data analytics platform

The potential customer is Emile Weber, which is the biggest transport operator. Due to their very large fleet of vehicles and number of routes served, **a data analytics platform can be useful** to offer mobility insights that help them optimise their operations, understand their users and help to identify potentials in their areas of operations. Another key partner could be a municipality, where the transport operator is operating in, yet in general they have little information. The most promising actor is the Verkéiersverbond that provides travel information in the whole country. They might be in the possession of valuable travel data. **A main question remains to which extent they are willing to provide and monetise their data. Based on earlier discussion this will most likely be not the case.**

### Delivery of goods

The Northern part of Luxembourg has a very low density of population and infrastructure. People living in this region depend on a car to do day-to-day activities. **Especially elderly people who do not own a car or do not benefit from a care service, could benefit of this type of service.** The delivery of pharmaceutical goods could use resources of professional integration and reintegration centres, which are funded by the State of Luxembourg. The delivery of drugs and medication sounds promising, however, has some barriers related with the distribution of costs and revenues. As the users would be willing to pay for this type of service, the revenues could come from the end-user on each delivery. Another revenue would be public subsidies, which depends on the municipalities involved.

Other potential organisations, which could be involved, are 'Hëllef Doheem' and 'HELP', two home medical care organisations. They already provide medication to their patients during home visits.

### Multisided platform for shared services

In the target region, **several shared services already exist.** The communes are responsible for organising this type of service. The Ministry of Transport does not intervene in the organisation of local public transport services. From March 2020, public transport is free within whole Luxembourg, however on demand services are not free of charge. In the case of Schengen, a round trip ticket costs 2€. Customers having already access to these services, wouldn't be willing to pay more for a similar additional transport service. The remaining communes of the Canton Remich (Bous, Dalheim, Lenningen, Stadtbredimus,



Waldbredimus) are smaller, however, a shared service between these communes or connecting the cities Mondorf or Remich would be interesting.

Most of the shared services use traditional methods to make reservations, which is by calling or writing an e-mail. They could welcome the possibility of making online reservations in a platform and benefit of tracking tools.

#### 4.1.6 Buzau in Romania

##### Inclusive journey planner

In Romania, the public transport operator is a subcontractor of the municipality. Therefore, this is the only entity with decision capabilities that can collect all the relevant data to provide a journey planner with real time information about the situation in the field. It is true that maybe other solutions could be applied, such as crowdsourcing (for data collection), but in a small city like Buzau it is doubtful whether enough data could be collected to provide reliable information.

At a local level, the City Hall is implementing many projects with European funding, some of them being dedicated to public transport system and alternative mobility solutions. For the municipality, the main policies are dictated by the Sustainable Urban Mobility Plan (SUMP), that details all the actions that should be taken to reach certain outcomes. Among other projects, the municipality will implement a mobility centre that will serve as a smart city platform, gathering data from all relevant sources and providing useful information for the municipality, but also for the citizens, via a dedicated app that will act as a journey planner. However, when discussing all the aspects involved in this business model, the concern was raised about the true value of such an application, because Buzău is a small city and it is rather easy to move around without dedicated smart systems.

However, there are some commercial journey planners already available, but with no connections to the local transport operator, like Google Maps or Moovit. All in all, **such applications can prove its usefulness, but not as a standalone solution**. The municipality has a current tender for new buses, that already includes a journey planner application that will be integrated with ticketing solutions and traveller information solutions, so it will be able to provide all relevant real time data. Therefore, if a startup is interested in implementing such solution in Buzau, this tender could be an opportunity.

##### Audio mobility assistant

This solution was seen an innovative and in-line with other measures designed to improve the quality of citizens' life. In the city there are already some measures implemented to assist visual impaired persons, such as beacons installed on the public transport vehicles. There is, also, an Association for Blind People present in Buzau, representing the interests of visual impaired persons and offering free services for this vulnerable segment. According to them, from around 400 of their members, half are retired (only 30 are working) having financial problems (fairly low pensions, money spent on medication and daily expenses). In this regard, the likelihood of people to pay for the proposed service is very low, subsidies from the Municipality being needed.

But the entity that decides the implementation of different solutions in public space is the City Hall. They are already open to new and/or enhanced solutions that can improve the life of citizens, hence they are willing to collaborate with a startup that provides such a system. The solution presented in this business model was seen to be in line with the current public policies, and the municipality is really interested in such solutions. Therefore, **the municipality is willing to subsidise a startup that implements such system as a public service.**

### **Carpooling for commuters**

The **municipality of Buzau sees value in this business model.** In Romania, ride sharing services were defined, until recently, as being served by vehicles with maximum 5 seats. In this regard, ride sharing solutions based on minivans or minibuses were not legal. The legislation has recently changed, and it is now in favour for such service. Buzau municipality already intends to create a school bus system that will be operated by the public transport operator but is questionable if it will suffice for all children. Therefore, **an opportunity may exist to start a partnership with the public transport operator for carpooling services.**

Regarding the willingness of people to pay for the service, it is important to emphasize that, in case this service will be offered as a public service, then most likely it will be used. As a subsidised service, the operating costs are transparent to the population. A partnership in this field could create some opportunities for both sides.

### **Mobility & transport poverty consulting & services**

For all the mobility projects that are implemented and that meet the objectives of the local SUMP, the municipality acquire consultancy serviced. These are purchased via tenders, and all the entities that respect the requirements (that depend on each project) may apply.

There are many local and national consultancy companies that are active in that area. The consultancy contracts are usually auctioned, so there is a **real competition in this field.** This may mean opportunities (the market is not restricted to some players), but also challenges (to be better than the others). If the beneficiary is the City Hall, the startup must first prove it can implement suitable mobility solutions aligned with the SUMP.

Considering that the customers should be organisations with at least 50 employees, **the pool of potential customers in the city of Buzau is rather high.** For example, in 2018 there were 98 private companies that fulfilled this criterion. **An important barrier is still finding a good local representative or opening a local office.**

### **Data analytics platform**

At a local level, the Municipality is implementing many projects with European funding. Among other projects, the municipality intends to implement a mobility centre that will serve as a smart city platform, gathering data from all relevant sources (such as traffic management centre, public transport management centre and bike sharing management centre), merging the data and providing useful information for the municipality, but also for the citizens, via a dedicated application that will act as a journey planner.

In Romania, the public transport operator is a subcontractor of the municipality. Therefore, this is the only entity with decision capabilities that can collect all the relevant data about the situation in the field. Therefore, this business model seems to be dedicated to the Municipality. From the current existing information, there is not another entity that has relevant information: all data that can be integrated in this platform is, or will be, collected by a department of the City Hall. To conclude, **this business model is seen as potentially successful** and the associated startups should regard the municipality as their client and take into consideration that the client would like to control the data flows.

### Delivery of goods

In Buzau there are 5 pharmacies operating in the public sector, 55 pharmacies in the private sector, and 8 pharmaceutical warehouses (data from the National Institute of Statistics of Romania, 2020). The pharmacies are concentrated in the centre of the city, on the main streets or commercial hubs, and less available in large neighbourhoods, peripheral or deprived areas. There are some of them that deliver medicines online, but only those that do not require a prescription (according to the current Romanian laws).

In Buzau, during the first months of the COVID-19 pandemic, the Iris pharmacy provided a telephone line for the distribution of medicines at home especially for people in the categories of chronically ill and elderly. Details about how the service worked or if it is currently running are not available. Moreover, the municipality has implemented a delivery system for vulnerable groups during the state of emergency in the spring of 2020. This system was implemented mainly for the supply of food but can be extended to the delivery of products from pharmacies. **The local policies support such a system.**

Regarding the willingness of people to pay for the service, if only elderly people, those with reduced mobility or living in deprived areas are considered, they are usually low-income persons, and the likelihood to pay is relatively low. The solution could be a subsidised system from the municipality, or, maybe, an agreement with the pharmacies. However, this service is not only intended for vulnerable groups but should be extended for all citizens.

### Multisided platform for shared services

Compared to carpooling solution, this business model was seen as a ride sharing service. In Romania, ride sharing services were defined until recently as being served by vehicles with maximum 5 seats. In this regard, ride sharing solutions based on minivans or minibuses was not legal. But the regulations changed, now such systems can be implemented, and Buzau municipality intends to create a ridesharing system that will be operated by the public transport operator with 9 seat minibuses.

In Buzau there are not many companies that could operate such system. The public transport service in Romania is managed by the City Hall via a subordinated company, and the service is provided with big vehicles (more than 9 seat capacity).

Regarding the willingness of people to pay for the service, one should take into regard that deprived areas are usually inhabited by low-income persons. The likelihood to pay is relatively low, unless the fee is very low, either by transporting many passengers at the same time, either by subsidising the service. Secondly, as Buzau is a growing city and there are

many peripheral industrial areas, active workers with medium incomes are more likely to be attracted by this kind of service. It should be noted that currently there are many neighbourhood ride-sharing solutions that are being used, so this may encourage a startup to implement an organised ride-sharing system.

Putting all the data in perspective, considering also the necessity expressed by the citizens (especially those with low income) to share rides, one may conclude that **this service may be successfully implemented in Buzau**. However, legislation defines some strict rules for such service, and these may cause some difficulties in implementation.

#### 4.1.7 Prospects for transferability of the business models to the HiReach study regions

To analyse the feasibility of transferring the mobility-related solutions, the underlying barriers and drivers that may prevent or leverage the transferability of the target business models into the respective study regions were considered. This information is crucial to anticipate the likely impact of the business models in a new setting and for market scouting purposes, as it helps to inform decision-makers and startups alike, allowing them to align processes and expectations in a more efficient manner, thus avoiding unnecessary mistakes when deciding upon transferring mobility measures.

The analysis of barriers and drivers was inspired in the framework of the CIVITAS process evaluation (Dziekan et al. 2013). Process barriers are the events or the overlapping conditions that get in the way of the process to reach measure's objectives. On the other hand, process drivers are events or overlapping conditions that stimulate the process to obtain measure objectives.

For the identification and for the derivation of activities directed at these barriers and drivers it is helpful to cluster them into different categories. Thereby, the same category of possible influencing factors can turn out to have a positive or a negative impact on the measure process.

**Table 4: Categories of barriers and drivers**

FIELD	BARRIER	DRIVER
Political	Opposition of key actors based on political and/or strategic motives	Commitment of key actors based on political and/or strategic motives
Political	Lack of agenda or vision for inclusive mobility	Presence of an inclusive mobility agenda or vision
Political	Conflict between key stakeholders due to diverging material interests and expectation of redistributive losses	Coalition between key actors due to shared/complementary material interests and expectation of redistributive benefits
Cultural	Impeding cultural circumstances and lifestyle patterns	Facilitating cultural circumstances and lifestyle patterns
Institutional	Impeding administrative structures, procedures and routines	Facilitating administrative structures, procedures and routines
Institutional	Impeding laws, rules, regulations and their application	Facilitating laws, rules, regulations and their application

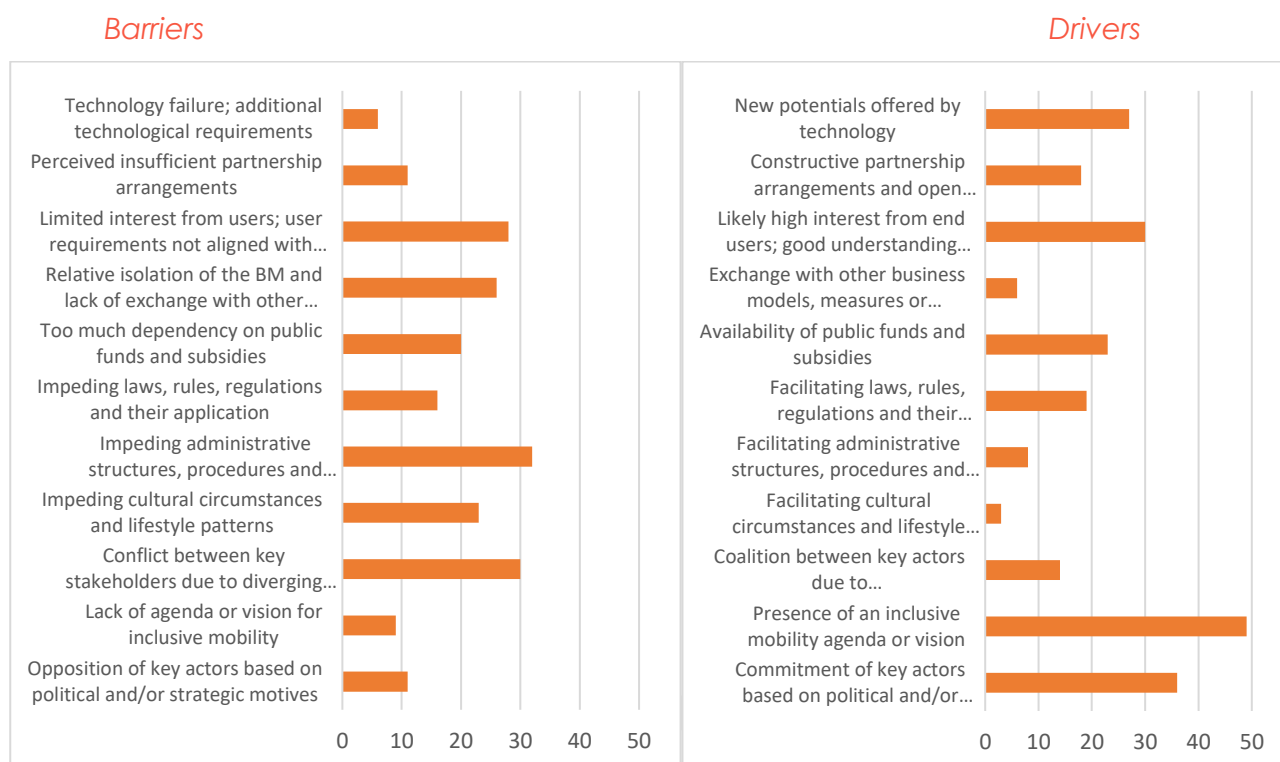
FIELD	BARRIER	DRIVER
Financial	Too much dependency on public funds and subsidies	Availability of public funds and subsidies
Positional	Relative isolation of the BM and lack of exchange with other measures	Exchange with other business models, measures or experiences
Planning	Limited interest from users; user requirements not aligned with BM	Likely high interest from end users; good understanding of user requirements
Organisational	Perceived insufficient partnership arrangements	Constructive partnership arrangements and open involvement of key actors and/or stakeholders
Technological	Technology failure; additional technological requirements	New potentials offered by technology

Source: Own elaboration based on Dziekan et al. 2013

The reports from the study region informed about the importance assigned to each envisaged barrier and driver. Concerned project partners were asked to identify the relevant enablers and bottlenecks and classify them by level of importance. Hence, normalised weights were produced, taking stock of the relevancy levels of the barriers and drivers to the success of the transferability analysis<sup>12</sup>.

<sup>12</sup> Barriers and drivers seen as the most important for the success of the transferability exercise were given a score of 3. The second most important factor received a score of 2 and the third a score of one. This exercise allowed to take stock of the specific relevance of the barriers and drivers to the transferability analysis.

**Figure 8: Weight of reported barriers and drivers**



Source: Own elaboration

The above figure presents the elements that facilitate and hinder the replicability of the business models, as acknowledge from local representatives of the six HiReach study regions.

It is noted that **the most important drivers present in the study regions relate to the 'existence of an inclusive mobility agenda or vision'**. This is unsurprising, as the regions are voluntarily involved in the HiReach project through the local partners and some of which through the TuG network. Notwithstanding, it is important to underline the fact that **being part of a city or region-wide programme for sustainable transportation is a fundamental enabler for the transference process**.

The 'commitment of key actors' is another strong driver reported as relevant and is linked with the former key category that maximise the potential for further deployment of a business model in a new setting. Conversely, these two elements (vision and local actors) are, on the contrary, seen, if not acting, as barriers for transference of new mobility solutions.

It is also identifiable that the driver with less impact was **'cultural and lifestyles patterns'**, a factor that was simultaneously **acknowledge by several stakeholders as one of the major barriers for implementing the business models**. Hence, one can conclude that the cultural background not only does not facilitate the smooth replicability of the HiReach solutions but also create concrete barriers for transference and implementation of the business models accelerated under HiReach.

On the barriers side, **'impending administrative structures' seem to be the main obstacle for transferring the business model of young startups into a new market**. Examples where



administrative structure raised significant obstacles could be found when analysing the possibility to transfer data analytics tools to Guarda. In this Portuguese region different systems already exist, and departments are used to work in silos and do not collaborate between them. Another example was related with the journey planner, which would face resistance in Naxos since there is no service to build upon (there are no multimodal planners of any kind in Naxos).

Lastly, it is important to point out that **‘user needs’ were simultaneously flagged as a strong barrier and a strong driver by stakeholders involved in this consultation**. The barrier is in some cases related with the market share, whenever other competitors already exist and are well-established or when there is no demand for this kind of services. This was made particularly evident when analysing carpooling in Luxembourg or in Esslingen and Göppingen or when analysing the delivery of goods in Salento, a region where locals essentially live close to city centres and do not require additional mechanisms to bring medicines and healthcare products to people's home. A particularly high interest from users was found in Luxembourg in several services, such as journey planner, delivery of goods or consulting services, the latter owing to the number of companies with large number of employees that seek new mobility approaches to their workers.

In addition to identification of drivers and barriers, the authors have scored the value proposition, the absence of barriers and the likely success that the business models could achieve if transferred to their territory and client base. Altogether, a transferability index was calculated, measuring the overall likelihood of transferring the HiReach business models to the study regions. One can see the main key indicators in the following table.

Findings suggest that **the region where the new business models would make a stronger impact would be in Buzau**, Romania, which scored a 4,6 in value proposition in a 1 to 5 scale, where 5 represents very high added value accrued by the business model. This means that the solutions developed within the HiReach umbrella would make a large difference and meet the needs of the locals. On the other hand, Esslingen and Göppingen, in Germany, seems to be the region where the wide set of business model bring less added value to the local communities.

Buzau is also the region where there are less barriers for transferring business models, unlike what happens in **Guarda, Portugal, where the local representatives flagged several obstacles** that might hinder the replicability process of the business models or make it more difficult. The major obstacle was an envisaged ‘conflict between key stakeholders due to diverging material interests and expectation of redistributive losses’, which was noted by local representatives as being a particularly relevant obstacle for the introduction of the delivery of goods (as the new business model does not seem to be competitive against other options that are already in place locally) or the MSP for shared services, because there are already other companies in Portugal offering similar services to organise flexible transport arrangements using fleets of taxis and mini-buses.

The regions where the envisaged success of the overall business models developed during the HiReach acceleration programme was regarded as lower were Southern Salento, in Italy (2,4) and Naxos, in Greece (2,9).

**Table 5: Key metrics for accessing transfer-worthiness of HiReach business models into the study regions**

STUDY REGION	VALUE PROPOSITION	ABSENCE OF BARRIERS	LIKELY SUCCESS	TRANSFERABILITY INDEX <sup>13</sup>	KEY BARRIER	KEY DRIVER
Guarda	3,6	2,0	3,3	3,0	Conflict between key stakeholders due to diverging material interests and expectation of redistributive losses	Presence of an inclusive mobility agenda or vision
Luxembourg	3,6	3,0	3,3	3,3	Lack of agenda or vision for inclusive mobility	Availability of public funds and subsidies
Buzau	4,6	4,7	4,3	4,5	Too much dependency on public funds and subsidies	Likely high interest from end users; good understanding of user requirements
Esslingen and Göppingen	2,7	3,1	3,1	3,0	Limited interest from users; user requirements not aligned with BM	Presence of an inclusive mobility agenda or vision
Naxos	3,3	2,9	2,9	3,0	Impeding administrative structures, procedures and routines	Presence of an inclusive mobility agenda or vision
Salento	3,0	3,0	2,4	2,8	Relative isolation of the BM and lack of exchange with other measures	Presence of an inclusive mobility agenda or vision
Mean	3,5	3,1	3,2	3,3		

Source: Own elaboration

<sup>13</sup> The transferability index is a 1 to 5 scale, where 5 stands for high transfer-worthiness. It is the product of the value proposition, the absence of factors that could hinder the transferability of the business model to a new setting and the likelihood that the business model will be successful in the new designated market.

**Table 6: Key metrics for accessing transfer-worthiness of the HiReach business models per mobility solution**

SOLUTION	VALUE PROPOSITION	ABSENCE OF BARRIERS	LIKELY SUCCESS	KEY MARKETS (HIGHER TI)	KEY BARRIER	KEY DRIVER
Inclusive Journey Planner	3,5	2,7	2,8	- Buzau (4,7) - Guarda (3,3)	Conflict between key stakeholders due to diverging material interests and expectation of redistributive losses	New potentials offered by technology
Audio Mobility Assistant	3,8	3,0	3,8	- Buzau (5,0) - Luxemb. (4,3)	Relative isolation of the BM and lack of exchange with other measures	Presence of an inclusive mobility agenda or vision
Carpooling for commuters	3,2	3,5	3,2	- Buzau (4,7) - Salento (4,0)	Impeding cultural circumstances and lifestyle patterns	Facilitating laws, rules, regulations and their application
Mobility & transport poverty consulting & services	2,7	2,8	2,5	- Esslingen (3,7) - Guarda (3,3)	Impeding administrative structures, procedures and routines	Presence of an inclusive mobility agenda or vision
Data Analytics Platform	3,3	3,5	2,8	- Buzau (4,3) - Esslingen (3,7)	Impeding administrative structures, procedures and routines	New potentials offered by technology
Delivery of Goods	3,3	3,0	3,2	- Buzau (5,0) - Esslingen (4,7)	Conflict between key stakeholders due to diverging material interests and expectation of redistributive losses	Likely high interest from end users; good understanding of user requirements
MSP for shared services	4,3	3,3	4,2	- Buzau (5,0) - Salento (4,7)	Impeding administrative structures, procedures and routines	Presence of an inclusive mobility agenda or vision
Mean	3,5	3,1	3,2			

Source: Own elaboration

When flagging the single barrier and driver that impacted most in the transferability assessment, the Italian region of Southern Salento raised the problem of relative 'isolation of the Business Models' as an obstacle for implementing the HiReach solutions. They have however waived the presence of an 'inclusive mobility agenda' as a key enabler. The same driver has been identified in Naxos, Esslingen and Göppingen and Guarda. 'Availability of public funds' that could potentially support startups that sought the HiReach business

models was regarded as a strong driver in Luxembourg and the 'high interest of users' in these innovative solutions was identified in Buzau as the most relevant driver for potentially implementing these business models in Romania. **The key strength that was found in Luxembourg, namely the 'existence of funding sources' is the main envisaged weakness of Buzau**, where there are limitations for implementing business models that are not self-sustained. Finally, other relevant barriers found in this analysis were related with 'impeding administrative structures' in Naxos and with a **'limited interest from local communities' in the German communities of Esslingen and Göppingen in most of the HiReach business models**.

Looking now attentively to the conditions for transferability for each business model, the results of the questionnaire applied to the local partners allowed the understanding of strengths and weaknesses of each MVP and to depict where they could likely succeed and where not.

Respondents of the transferability analysis were asked to classify, in a quantitative scale from 1 to 5, the value proposition of the different business models, as well as the absence of barriers and likely success in their own territory. The main findings suggest that **the business model with highest value proposition for the study areas is the multisided platform solution for shared services**. This result is unsurprising, as this business model reflects particularly well the initial ambition of the HiReach project, i.e. to explore viable business models for small scale, modular and easily replicable mobility services that can be provided at affordable prices and/or with minimum subsidies.

**Buzau, in Romania, and Southern Salento, in Italy** (where a pilot of the startup Nemi is already being conducted, as reported in Deliverable 4.3 (Report on HiReach Startup Lab and testing activities), **correspond to the main markets where this business model could proof its feasibility**. The main drivers that would facilitate the introduction of this business model is the presence of an inclusive mobility agenda or vision and the main barrier for implementation is the impending administrative structures, procedures and routines that usually create obstacles to the share use of local resources and to the organisation and design of transport schemes with higher levels of flexibility than usual.

Other findings per business model are identified below in bullets:

- The **journey planner** with customised features for elderly people or people with vision-impairment received a value proposition aligned with the average of all business models. The number of barriers for implementation are higher than average and relate mainly with the existence of a high share of elderly people with low technological savviness in the study regions. As a result, the likely success is lower than average. Buzau, and to some extent Guarda, are undoubtedly the ideal markets for this type of businesses. Representatives from these regions are driven by the potential this technology can bring to the local community, which would fulfil existing needs as there are no multimodal travel planners in place and the public transport journey planners hold basic features.
- The **audio mobility assistant** is envisaged as one of the business models with larger scope for transferability across the HiReach study regions. Buzau and Luxembourg are among the ideal markets where this type of solutions could prosper. The presence of a regional agenda for inclusiveness in transport policy can eventually facilitate the transferability of the business model, which will however have to deal with a

positional disadvantage and overcome the relative isolation of the measure and/or lack of exchange with other mobility actions in place.

- **Carpooling for commuters** is a mobility solution designed by the startups engaged in the HSL as appropriate for school communities and hospitals. Buzau and Southern Salento representatives are among the ones who see greatest value in this business model. The target niches of schools and hospitals could benefit from the solutions of companies such as Childfy or Hoop, who can find in the Romanian and Italian study region markets appropriate potential partners to roll out full-fledge pilots to increase accessibility for hospital appointments, schools and after-school activities. Impending cultural circumstances and lifestyle patterns is a typical barrier to carpooling schemes, which nonetheless do not find significant laws or rules raising obstacles for implementation.
- **Mobility & transport poverty consulting & services** corresponds to the business model that entails lower chances of success from a transferability point of view and taking into consideration the characteristics of the target areas. Administrative structures, procedures and routines are regarded as the key barrier impeding the smooth penetration of this business segment in the study regions and one of the factors that could help explaining this result could be the low number of big employers in the study regions, which could benefit from inclusive and sustainable mobility plans and actions. As a result, one can find in the German regions of Esslingen and Göppingen an ideal target market for this business model, owing to the presence of large industrial complexes in the local economy and the possibility to support sustainable employee mobility with this consulting-like business model.
- **Data analytics platform** is a technological solution to make use of existing data (or to help generating more data) in order to help taking more informed decisions on the mobility realm, but also on other associated fields. Prospects about this technology is recognised by the stakeholders from the regions as a relevant motivation for welcoming this business model segment. However, it is not among the solutions with higher added value for the study regions, mainly due to traditional administrative procedures that usually hinder the introduction of innovative ways of collecting, sharing and analysing information and data.
- **Delivery of goods**, a business model associated with one German and one Romanian startup, is strongly sought after by Buzau and the German study regions. This may mean that the business model is mostly site-specific and was designed taking into consideration the local/national market needs, a factor that may play a relevant role in the transferability possibilities across regions from the same country. All in all, this business model might come across with conflicts between key stakeholders, as a result of diverging material interests, which is expectable as the BM owner need to interplay with multiple actors (pharmacies, which may be organised together in associations, but also couriers to materialise the delivery, and other stakeholders). The high demand from the end users is the main motivation and the fundamental enabler that can facilitate the transference of this business model.

As a conclusion, it is important to underline that several reports from local stakeholders analysing the possibilities for transferability of the HiReach business models have **consistently pointed out the need to foster local partnerships and alliances**. Indeed, even in cases where the business potential is particularly high, it is of paramount importance to have country

commercial representatives capable of negotiating with local stakeholders and understanding the local mobility level of play, as well as the local predominant culture. This precondition is less relevant when transferring solutions among one specific member state (as it could be seen with the delivery of goods in the German and Romanian countries), but it is essential in all other cases. Therefore, partnering with local companies and local public bodies should be foreseen and any startup wishing to step into a new market will absolutely need a local commercialisation responsible with grassroot knowledge.

## 4.2 Transferability opportunities in the Take-up Group members areas of interest

The Take-up Group (TuG) of HiReach consists of 10 permanent members, which have been involved from the outset of the project, as they have shown potential interest in replicating the new tool and business models developed within the project.

Their scope of activity is large, ranging from local authorities (such as the municipality of Guarda, of Buzau, the Region of Puglia, AMTU the mobility association of municipalities in Catalonia), universities (University of Zagreb), passenger transport operators and industry representatives (such as the German regional public transport authority NVBW, GooOpti or DemandTrans) and representatives of EU and international stakeholders' associations and institutions (such as Luxembourg Institute of Socio-economic research and CIVINET Greece and Cyprus).

Due to the pandemic situation in Europe, the group has not had close contacts with the startups during the HSL. To facilitate interaction between TuG members and startups and to trigger new business opportunities that can take stock of transport poverty problems, HiReach organised a restricted event in order for the TuG members to meet the HiReach startups. The event took place on the 16<sup>th</sup> of September 2020 and key takeaways were the following:

Low/no interest:

- Multisided platforms involving private vehicles, such as the carpooling communities dedicated to little children developed by Childfy are not seen as relevant in German regions, where there seems to be no place for such business models;
- Inclusive journey planners have also not raised interest among the TuG members.

High interest:

- Despite the high interest in audio navigation systems, there is little interest in replicating this business model. This finding is consistent with the outcomes of the study regions and it proves that this business model suffers from a 'positional' problem. It is likely that the market for these business model lies in big tech companies, such as Google, that may embed the audio navigation algorithms in their existing technology.
- Multisided platforms for on-demand public transport schemes, such as the ones developed by the startup Nemi was under the spotlight and received large interest from the Croatian partner. The University of Zagreb believes this business model is particularly suitable to the little town of Jastrebarsko. There is also some opportunities



for replicability in rural German regions, although the existence of other similar companies in the country may pose obstacles to transferability.

### 4.3 Transferability opportunities in the EU wide territory

In order to further assess the transferability of the business model prototypes developed during the HiReach Startup Lab, a public consultation was conducted by the European Passenger Federation (EPF), partner of the project consortium. During each of the 18 interviews, several ideas were discussed in terms of barriers, incentives and conditions for market uptake of the HiReach business models. The main outcomes are described below.

#### Business model prototype 1: Inclusive Journey Planner

The primary target groups of this business model are elderly and disabled people. They might include 'non-digitals' citizens, for a number of reasons. EPF interviewees have stressed that it is important that people feel at ease with the tool, otherwise they will not adopt and use it.

Adapting the user interface or other features to the user's personal needs is regarded by the interviewees as valuable. However, in doing so, the app may need to gather sensitive information about a person's characteristics and disability. Hence, it was noted that it is very important to protect personal data & privacy.

One of the main positive aspects of the inclusive journey planner was the possibility to inform users about the accessibility of the vehicles. This feature requires real-time information and cross-links with the maintenance depots of public transport operators. Indeed, not all vehicles are accessible, and it is therefore of upmost importance to know with accuracy and in advance which buses and/or other vehicles will be accessible or not. As a final remark, it was noted the importance of CODIE (CityMaaS Optimised Dynamic Interface Engine) to embed software developments in any journey planner, in order to make them more inclusive and easy to use for elderly people and citizens with a cognitive or vision impairment. **In short, the attractiveness of this business model is very high, from a transferability point of view.**

#### Business model prototype 2: Audio Mobility Assistant

This business model has a high potential to improve customised wayfinding for *anyone* – not just blind and visually impaired people (in line with 'universal design' principles). The scope of the business model is therefore very large.

Visually impaired people already make journeys, so this business model is seen as a "like to have" rather than a "must have". Moreover, concerns were raised in terms of the applicability of this business model, which would have to deal with the main orientation and navigation problems hindering blind and vision impaired citizens mobility, notably unregulated public space and obstacles on the route. In short, **more pilot tests and training would be necessary to build up trust around this business model. A key conclusion was that this business model could fit particularly well if it were integrated in already existing navigation apps, such as Google maps for instance, instead of being developed as a standalone solution.**

Other points raised by the stakeholders involved in the public consultation were the need to comply with existing ICT standards on accessibility and to make the product affordable.

### Business model prototype 3: Carpooling for commuters

EPF interviewees consider that carpooling is *not* a good solution if it draws people away from public transport, walking or cycling. When it is designed to avoid parents chauffeuring their children's, it was noted that being driven around all the time makes children passive, less independent and less self-reliant ('back seat generation'). Children ought to be motivated to walk, cycle (school is often very nearby) or take public transport, and be taught the benefits of active, multimodal, sustainable travel. School transport is also part of the overall transport network. In short, it was noted that it seems counterproductive to support the decline of public transport by taking children away from it. Other barriers to replicability rely on trust and also the need to have a back-up plan in case the driver is sick, forgets or cancels.

When deciding to transfer this business model, it is important to contact the local governments. They may be willing to finance the startup or to provide support and act as an intermediary (it is difficult for a startup to address clubs, schools, directly). The regulatory framework is also important. Public administrations could do more to promote carpooling, e.g. dedicated carpool lanes on busy roads, obliging companies of a certain size to have a mobility plan, offering tax benefits for carpoolers, among other initiatives.

**All in all, the transferability potential of this business model is not particularly high.** Covid-19 may act as an additional barrier. Some interviewees have noted that governments (e.g. UK, NL) have been advising citizens to avoid public transport. People may also be afraid to share a ride with someone they do not know. In addition, ongoing trends towards more home working and flexible working hours have accelerated in the last months. This will affect public transport (more distributed traffic) and, also, carpooling (the ability to find a suitable carpool partner with the same schedule).

### Business model prototype 4: Mobility & Transport Poverty Consulting & Services

Stakeholders have identified companies with similar business models in for example Denmark ([www.gate21.dk](http://www.gate21.dk)) and France ([www.wymoov.org](http://www.wymoov.org)). They develop tailored mobility solutions for companies, that include not only carpooling, but also bike and car sharing.

Findings from the open consultation led by EPF have shown, nonetheless, that **a lot of support and knowledge of the local situation is required to be able to develop specific mobility solutions for companies, and a lot of work to tailor them to the employees.** This challenge raises difficulties for transferring Mobility and Transport Poverty Consulting and Services across Europe. Indeed, in order to make sure that tailored solutions work for specific target groups (notably people with a disability), it is important to talk to them, map their needs, inform and reassure them.

Individuals will probably not want to pay for B2RIDE services. Companies, on the other side, may be motivated to work with B2RIDE because they wish to reduce or have not got enough parking space, and/or wish to be seen as 'green'. As a result of the previous analysis, **overall transferability potential of this business model is regarded as fairly low.**

### Business model prototype 5: Data Analytics Platform

Some public transport authorities to a certain extent already started making use of big data capabilities to base their policies and optimise the mobility system. There seems to be a particularly high interest on these matters in France and Scandinavian countries. Large cities very often have their own data platform (mobility being part of it), but small and medium sized cities could outsource this activity to companies running this business model (like Mobito does).

Main barriers to transferability correspond to the hardships of convincing operators to share data (beyond what is strictly necessary for revenue sharing) due to mistrust, which is a problem for MaaS development and traffic management. Third parties as go-between entities can help as trusted keepers of the data.

The ultimate aim should be to set up standardised open data. Different Member States have different open data policies and EU regulation will play a big role in future development on this area. Moreover, it is still unclear how will the future evolve in terms of monetisation of data and the possibility to generate income by sharing data with other parties. Hence, **stakeholders involved in this open consultation were divided about the market potential for this business model.**

### Business model prototype 6: Delivery of Goods

The end-users of this business model are mainly elderly people and people with reduced mobility. The business model original scope is very narrow. To scale up and become transfer-worthy it should embrace other target groups, products and services (e.g. meals, home care, etc). Open consultation interviewees raised concerns about the working conditions of bike couriers. These are often freelancers with no fixed contract and no insurance, no protection in case of illness. It was suggested that it could be an option to collaborate with social economy. Additional barriers for the deployment of this business model are related with privacy concerns (sensitive medical information).

Problems with delivery of packages are much more acute in rural and remote areas, especially in countries where mail has become an open market (Sweden for example), where bike delivery only works in cities (on the condition that the cycling infrastructure is good). Using drones could be another solution, especially on islands (c.f. there are plans for such a pilot in the Stockholm archipelago). All in all, **the potential for transferability is limited** and there is a need to take stock of unwanted side effects related with the fact that delivery services can lead to the disappearance of local services and shops, which are occasions for social contacts and local employment.

### Business model prototype 7: Multisided platform for shared services

Multisided platforms for shared services are particularly suitable for rural or peripheral regions that are sparsely populated and have no regular public transport in case there is not yet such a system in place. The underlying idea is not novel, and its success can be seen in multiple locations (e.g. in Denmark, with the FlexTrafik investigated in the HiReach deliverable D.3.2). Multisided platform for shared services can also complement regular public transport in off-peak hours, in cities.

Where possible, this business model should be integrated in the broader mobility system, which would allow to reach more people and destinations. Integrated fares would also be

welcome as well as agility to allow last-minute bookings and easy to access for vulnerable people with low tech-savvy.

Public authorities need to be on board as they are in charge of the regulatory framework, setting fares and timetables, promoting and possibly financing the services. It is preferable to work on a regional level and collaborate across municipalities. For public transport operators, there could be commercial potential as well, if on demand shared services are conceived as feeding into their main routes and core network. Other partners could be private operators (this can be smaller companies, in some cases taxis) that deploy the on-demand services. However, the regulatory framework for taxis is complex and different per country. The law can be very strict (in Italy, this was mentioned as a barrier for deploying them as DRT). In other cases, due to the deregulation of the market it has become more difficult to get a taxi in remote areas. As taxi drivers face less demand, deregulation and increased competition (e.g. Uber), they will be interested in new opportunities, *if* these are economically viable.

**Low level of investment and low cost of the operations will appeal to several local authorities, raising the transferability prospects for this business model.** Nonetheless, stakeholders have mentioned that at the outset, there will be few users. Efficiency gains will only appear from a certain volume, but first there is a long phase of investment and waiting. The scale needs to be large enough to be viable. A solution could be to expand the service to other travel purposes (leisure travel, health care, elderly people).

All in all, the open consultation to stakeholders have shed some light about the transferability potential of the HiReach business models. It also raised arguments about the business model from a user point of view. For instance, it was noted that efficiency is not the only criterion. Digital solutions can help to increase efficiency. However, they are only part of the solution and should be regarded as a means and not a goal. At a certain point, investments are needed as well in vehicles and actual transport services.

Also, sometimes technological applications can lead to less social contacts. The value of social contacts cannot be expressed in monetary terms. In rural areas delivery services can lead to the disappearance of local services – an occasion for social contacts and local employment.

Collaboration between modes is important. Car-oriented solutions can only be a good option if public transport, walking or cycling are not possible or available. Moreover, when developing new ideas, we should aim to deliver a service that creates added value for all users – instead of focusing on a niche market. This is in line with the principles of 'Design for All' (Standardization 2019) and also creates benefits from a business viability perspective.

## 5 Scale-up Analysis

### 5.1 Business models analysed

In the footsteps of the transferability analysis, the scalability analysis covers the following cases:

- Inclusive journey planner
- Audio mobility assistant
- Carpooling for commuters (and the specific case of carpooling for children)
- Data analytics platform
- Delivery of goods
- Multisided platform for shared services

### 5.2 Inclusive journey planner

#### 5.2.1 User need

Many people with physical or cognitive disabilities are unable to drive, but also struggle with navigation systems on public transit that were not designed for riders with their specific needs. People who find it uncomfortable - or even impossible - to use transport-related apps or websites end up paying more for travel or miss out completely on using transport solutions. Wheelchair users need to find step-free infrastructure and transport. People with cognitive disabilities need user interfaces that they can understand.

#### 5.2.2 Existing solutions

"Information about which stations and routes are wheelchair friendly isn't always readily available or easy to find" (Rio Akasaka, Google product manager<sup>14</sup>). In the past few years, many cities and public transit systems have released mobile applications that allow riders to check schedules and routes, buy tickets and locate stations/elevators. They can be very useful for disabled people, but also frustrating because they have incomplete information about the availability of step-free infrastructure and vehicles, or they are not understandable for persons with cognitive issues.

Transport companies and city authorities are in a course of improving conditions for universal accessibility, but while those conditions are not 100% met (which could take many decades), specific information is needed for disabled. Transport operators are in some cases already offering this information in their internal channels, but the information is not yet integrated in multimodal information systems.

#### 5.2.3 Relevant trends

Mobile technology is making mobility easier due to the availability of information but needs to reach the segments of the population with specific needs. Ageing is increasing the

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<sup>14</sup> <https://www.blog.google/products/maps/introducing-wheelchair-accessible-routes-transit-navigation/>

amount of people with physical and cognitive limitations. The social and legal pressures for universal accessibility are also increasing and affecting the reputation of transport operators.

## 5.2.4 New solutions


"There are many different forms of disabilities so it's very challenging to deliver for everyone. Hidden disabilities are very hard to design for and I believe private companies need more public sector support for innovative product development" (Kris Beuret, chair of the Institute of Transport Studies, UK<sup>15</sup>).

Incumbents in the journey planning applications market are slowly addressing design needs for the disabled, starting with the most frequent issues (e.g. step-free accessibility). From the assessment undertaken, it is not yet clear whether the mainstream applications (like Google Maps, Moovit, Citymapper, etc) will reach the point where most disabilities are addressed or stop at the most common ones.

On the other hand, there are white label applications customisable to specific public transport operators and city authorities needs, but concerns about the inclusivity of the solutions are not yet revealed by the white label applications screened in this work (SkedGo, FluidGo, Pikel, Meep, Kisio), with the notable exception of the HSL startup CityMaas.

The following table presents applications according to types of disabilities they claim to address. The availability of some features (such as step-free) is available on limited sites. Solutions for blind people are covered in the next section.

**Table 7: Companies in the field of inclusive journey planning**

	1. Step-free routes	2. Step-free station/stop	3. Step-free veh.	4. Step-free sites	5. Cognitive disab.	6. Hand motor disab.	7. Hearing disab.	8. Low vision	Crowd-sourcing?	White label
Google Maps		✓	✓	✓					4	
Moovit					✓	✓	✓	✓		
Citymapper		✓							1	
ASSISTIVetravel		✓					✓	✓		X
Wheelmap				✓					4	
CityMaas 		✓	✓	✓	✓		✓	✓	2,3,4	X

## 5.2.5 Market size

For white label providers, the features for the disabled are part of a value proposition for cities and transport operators that is likely to be increasingly important, even though it is still

<sup>15</sup> <https://www.itsinternational.com/its17/news/transit-apps-exclude-most-disabled-users-experts-say>



uncertain how much this particular feature will be critical in the sale of this product to operators. The HSL startup CityMaas assesses its addressable market in Europe at 1 billion Euro, considering a 5% commission on smartphone ticketing sales sold to 25% of the ticket purchases across selected travel poor regions.

### 5.2.6 Challenges and opportunities for value creation and innovation

The segment of the population with disabilities represents a relevant share of the population from a market perspective, but the multiplicity of disability issues and the lack of available information as well as the cost to inventory it are still barriers to the development of solutions with quality.

Public authorities and transport operators have a strong responsibility in relation to the provision of such information, but it might also happen that, such as in case of Waze, it would be the private sector to manage a deeper level of information if the power of crowdsourcing is retrieved, in particular in what concerns the availability and quality of step-free infrastructure. The crowdsourcing systems applied to disabled accessibility are, with the exception of the identification of sites of interest, still too basic and can be further explored.

As MaaS information and services are becoming mainstream, the political and market pressures for their improvement towards the various disability types will increase, but it is not yet entirely clear – as for the MaaS app/platform market as a whole – whether the solutions will be pushed mostly by policy – with customisable, white label, applications - or markets – with global branded platforms. This will have major implications on the business models and relative importance of the provision of features for disabled people.

### 5.2.7 Scalability in Europe

Given the multiplicity of features for disabled, the analysis of scalability had a focus on the solution to disabilities with the highest share of relevance, step-free infrastructure.

Factor	Assessment	Scalability
Diminishing marginal cost	The data on accessibility features for the disabled is scarce and not uniform, implying significant marginal costs. A possible short-term remedy for the former limitation is the crowdsourcing of data from disabled users.	✓
Repeatability of solutions	The needs of the disabled are universal, but like for other MaaS platforms, local and global scaling requires technical adaptation to different standards and specific requirements of transport operators.	✓
Globally differentiating value proposition	Public authorities and transport operators are increasingly obliged to provide universal access to streets and public transport to disabled. Transport operators have significant related support costs. This is a	✓✓

Factor	Assessment	Scalability
	global trend that makes these entities particularly sensible to cooperate with MaaS platforms that accommodate the needs of the disabled.	
Repeatability of sales & marketing process	The importance of public entities and multiplicity of local operators implies a difficult sales process for any MaaS platform.	✓
Network effects	Significant network effects can be exploited if the disabled features data update system is crowdsourced from users.	0 to ✓✓
Overall scalability assessment	The marginal costs of acquiring information are relevant and a viable business model might require the participation and funding of public parties. A relatively slow path to scalability is expected unless the wildcard of crowdsourcing can be effectively played.	✓

Scalability: 0 - none, ✓ - some, ✓✓ - high, ✓✓✓ - very high

## 5.3 Audio mobility assistant

### 5.3.1 User need

Blind people and visually impaired, like any other people, need to move, but have constraints in doing so because they cannot see or have visual limitations. The average unemployment rate of blind and partially sighted persons of working age is over 75 percent. The United Nations Convention on the Rights of People with Disabilities states that most blind and partially-sighted people are not in a financial position to afford the full cost of mobility aids, such as a white cane manufactured from high technology materials, an electronic mobility aid or a guide dog (EBU 2020).

The existing common solutions for blind people to find their way give them limited confidence and constrain them to travel more than they do, especially when it comes to going to places and paths for which they are not acquainted to. Solutions that would increase the reliability, safety, confidence of the blind to move around will cause a positive impact on their freedom and capacity to access social and economic opportunities.

### 5.3.2 Existing solutions

The traditional solutions for navigation of blind people are the 'long cane' and the guide dog. For partially sighted, there are low vision aids, which are devices designed to help people with poor vision read and see. More recently, few years after the emergence of the smartphone, GPS based navigation systems became pervasive. However, the later have significant limitations related to the precision of the location, the precision of the voice indications provided (e.g. knowing the precise timing and direction to turn), and identification of micro landscape features (e.g. a door).

### 5.3.3 Relevant trends

The following trends affecting the needs of the blind and partially sighted are identified:

- **Universal accessibility** – the public pressure and legislation for the guarantee of the rights to one's mobility as an equality issue have been strengthening not only on the topic of universal design of public and private infrastructure. In the EU the most recent advance was the release of the European accessibility act in 2019.
- **Mobile technology** – the user interface and senses directed at the blind have been improving. While iOS has been for several years the preference of blind people, Android devices are currently catching up and becoming also a preference.
- **Artificial intelligence** – AI is enabling the building of adaptive environmental screening tools that identify objects for the instant passing of information cues about them.
- **Virtual reality** – virtual reality includes sound stimuli with a 3D spatial perception that allows to identify space elements through sound cues.
- **Home working** – The home working trend enables blind people to access work opportunities without the need to commute on a daily basis.

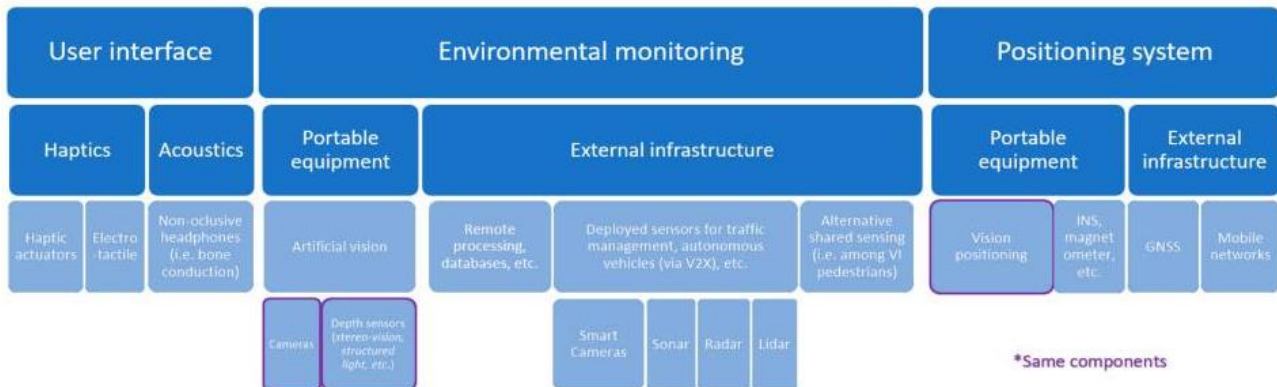
### 5.3.4 New solutions

"As we investigated solutions to the global issue of independent travel for blind and partially sighted people, it was clear to us that we needed to do more than create another app", Umesh Pandya, CEO and co-founder of Wayfindr<sup>16</sup>.

A navigation system's purpose is to provide users with required and/or helpful data to get to a destination point, monitoring their position in previous modelled maps. Numerous devices have been developed to guide and assist blind and visually impaired individuals along indoor/outdoor routes. However, they have not completely met the technical requirements and user needs. In recent years, there has been unprecedented scientific and technical improvements, and new tools are now at disposal to face this challenge, but researchers have yet to find effective, efficient, safe, and cost-effective technical solutions for both the outdoor and indoor guidance needs of blind and visually impaired people (Santiago Real 2019).

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<sup>16</sup> <https://www.wayfindr.net/blog/wayfindr-open-standard-launch>.

**Figure 9: Technological improvement avenues for navigation systems for blind people**


Source: (Santiago Real 2019).

As can be seen in the above figure, the challenges related to this technology are several:

- Positioning system - solutions that simulate virtual sound sources need cm accuracy positions, implying that the location techniques applied will have a significant influence on the product
- Environmental monitoring - navigation systems for BVI users need to gather specific data of the environment for an efficient and safe guidance. Static and dynamic elements, such as building or bus doors, can be detected with sensors such as cameras carried by the user, with artificial intelligence playing an important role in the learning process.
- User interface - Once the relevant data for navigation are gathered, they are then passed onto the user. This is one of the critical aspects in the design of products, and usually acts as a bottleneck of the information available in numerous navigation systems, with several challenges like the interference of the speech interface with the ability of the user to pay attention to the environment, the filtering of the data analysed according to the users' requirements at each time and place, and the use of accurate spatial cues (Santiago Real, 2019). Alternative options to audio information are tactile devices.

The following table presents some examples of solutions tackling these challenges.

**Table 8: Companies in the field of audio navigation**

	ORI- GIN	LOCA- TIONS	CUSTO- MERS*	RENEUE MODEL	TECHNOLOGY	VALUE PROPOSITION	STAGE
Blindsquare	FI	24 language	BVI	app purchase + in-app purchases	GPS & beacons Voice	safe, reliable travel	Launch 2012 €0 raised
Microsoft Soundscape	US	5 language	BVI	Free	GPS 3D sound	be confident and empowered to get around	Launch 2018 Developed by Microsoft
Dreamwaves 	AT	AT	BVI, Cy	App subscription	GPS camera object recognition 3D sound	See with your ears	Seed

	ORI- GIN	LOCA- TIONS	CUSTO- MERS*	REVENUE MODEL	TECHNOLOGY	VALUE PROPOSITION	STAGE
					Multimodal transport		
Aira	US	EN speak. countries	BVI, C	Subscription at minutes/month (businesses may subsidize)	Camera & human assistant	save time and be efficient	Series B, raised \$35M
ViaOpta Nav	CH	20 language	BVI	free app, for promotion of mother company	GPS Voice	help increase mobility and increase independence	Launch 2014 Owned by Novartis

\* Blind and visually impaired – BVI, Cyclists – Cy, Corporates – C

### 5.3.5 Market size

There are estimated to be over 30 million blind and partially sighted persons in geographical Europe, with an average of 1 in 30 Europeans experiencing sight loss. References in relation to the potential revenue related to advanced navigation products go from the cost of purchase of apps like Blindsquare – 40€ – to the purchase of a guide dog – 40,000€. As a result, one estimates the addressable market yearly value in Europe to be at €500m.

### 5.3.6 Challenges and opportunities for value creation and innovation

Over the last decades, the development of navigation devices capable of guiding the blind through indoor and/or outdoor scenarios has remained a challenge of multidisciplinary nature applying user-centered design fundamentals. Smartphones and wearables with built-in cameras seem to be indicated as the potentially most feasible options with which to support state-of-art computer vision solutions, thus allowing for both the positioning and monitoring of the user's surrounding area.

These functionalities can then be further boosted by means of remote resources, leading to cloud computing schemas or even remote sensing via urban infrastructure. The technological challenges for the improvement of the reach and accuracy of navigation remain at the three level of environmental monitoring, location accuracy and user interface design.

### 5.3.7 Scalability in Europe

Factor	Assessment	Scalability
Diminishing marginal cost	As a software solution based on AI with no particularly relevant variable costs and that rely on available map data, the cost structure of street navigation systems is mostly based on fixed software development costs.	✓✓✓
Repeatability of solutions	The nature of the problem and corresponding solution are universal. The slight variations of physical elements	✓✓✓

Factor	Assessment	Scalability
	like bus and building doors, steps, etc, across geographies are minimal and should be easily absorbed by AI identification methods.	
Globally differentiating value proposition	Blind people need better navigation everywhere. Other user groups may also benefit from the features offered by these products, like sound navigation for cyclists.	✓✓✓
Repeatability of sales & marketing process	Assuming a B2C model, the marketing process towards blind people should be similar across countries.	✓✓
Network effects	It is likely that crowdsourcing of data from users will be involved in the future.	✓
Overall scalability assessment	Once audio navigation based on camera environmental sensing and AI based object recognition is developed to a satisfying quality, it is very highly scalable.	✓✓✓

Scalability: 0 - none, ✓ - some, ✓✓ - high, ✓✓✓ - very high

## 5.4 Carpooling for commuters

### 5.4.1 User need

People living in the outskirts of urban areas, or people working in factories or other large workplaces outside urban centres, have low access to alternatives to the car. They also tend to be on the lower side of wealth, with a significant share of Europeans having economic difficulties in sustaining the possession and daily use of a car. Because of the low density of the origin and/or destinations in question, the public transport offer is usually not good and has a high time burden on commuters. For this reality, carpooling to and from work can be a viable alternative with better cost and time performance, as well as a social and environmental relevance for people who share trips with others.

### 5.4.2 Existing solutions

Besides the traditional solutions - e.g. corporate transportation – and options analysed in other sections – c.f. multisided platform for shared services - in contexts with a high need it is observed for workers to spontaneously organize to share commutes to work (Emerton 2017). There are cases of companies that incentivise such behaviour by offering rewards like privileged parking spaces for workers that commute together. The most common interest of companies is to save costs in parking space, while social responsibility and employee satisfaction are other relevant motivations, depending on the department in question. Actually the initiative towards the creation of alternatives to individual car use in companies



may come from different departments of the enterprise – facility management, human resources or transport management (Scoop 2020).

### 5.4.3 Relevant trends

- **Sharing economy** – the sharing economy, underpinned in mobility by the lowering of the status symbol of car possession, is a plus factor for future carpooling.
- **Covid19 crisis** – The avoidance of social contacts caused by the Covid19 pandemic is affecting carpooling in the short-term; the effects after the end of the crisis are still to be understood.
- **Economic downturn** – economic crisis are good moments for products that enable users to save or earn additional money.

### 5.4.4 New solutions

Dozens of carpooling applications appeared in Europe and America during the last 10 years. In the early years, they were online platforms yet without the use of smartphone, which have later come to provide functionalities that improve the ease and reliability of the carpooling experience. While long-distance carpooling had an earlier success with companies like BlaBlaCar, corporate carpooling for commuter trips has been taking a longer time to affirm.

After many attempts by startups, it seems that finally mature solutions are picking up, at least in the US, with Waze Carpool (which after launching in 2017 in the US has already extended to Brazil, Mexico and Israel) and the startup Scoop reaching high numbers of users and the renewed confidence of venture capitalists which have already invested near a hundred million dollars in Scoop. In Europe, despite products like BlaBlaLines and Zify having reached also significant numbers of users, the existing data still poses significant doubts about the viability of the business. Apart from other market characteristics, it seems that the urban sprawl that is characteristic of the US inflates the cost saving value for users, both passengers and drivers.



On the provision of the service to disabled people, the most relevant products – Waze Carpool, Scoop and BlaBlaLines – are not communicating specific features on the main communication channels. On the other hand, the HSL startups B2Ride and Hoop have used the program to take concrete steps to reach other segments of vulnerable users, including information on compatibility with wheelchair users and the addressing of groups like hospital patients.

The carpooling for commuting products applies essentially two types of business models:

- Customers are end-users with revenues coming from a commission on user-to-user trip cost repayment transaction;
- Customers are corporates paying a monthly subscription proportional to the number of employees

Waze Carpool also reports that some cities (San Diego, Miami) are subsidising user trips.

**Table 9: Companies in the field of carpooling for commuting**

	ORIGIN	LOCATIONS	CUSTOMERS	REVENUE MODEL*	SPECIFIC FEATURES	INSTALLS	STAGE
BlaBlaLines	FR	FR	Users	free		+2,000,000	Testing, pre-revenue
Waze Carpool	US	US,BR,MX, IL	Users	A, C		+10,000,000	Expansion
Scoop	US	US	Users	A	Guaranteed Ride Home	+200,000	Series C, raised \$96m
Zify	IN	IN,FR,GE, DK	Users	A		+200,000	Seed, raised €190k
Faxi	UK	UK	Users, corporates	A, B		+10,000	Acquired by Toyota in 2019
BePooler	CH	CH,IT	Corporates	B		+10,000	
Journify	ES	ES	Users, corporates	A, B		+10,000	Seed
Comovee	DE	DE	Corporates	B		-	Launched 2012 Phased out 2019
Empresas à Boleia (Boleias)	PT	PT	Corporates	B		-	Launched 2015 Phased out
Hoop 	ES	ES	Users	A	Hospital workers and patients	+2,000	Seed
B2Ride 	DE	DE,AT	Corporates	B	Information and vehicles for disabled	+1,000	Seed

\* A - Commission on user cost sharing; B – Corporate subscription; C – Public subsidisation of trips

### 5.4.5 Market size

Corporate carpooling market in Europe is expected to value 700 million Euro, with an expected yearly growth of 18.5% (Research 2018).

### 5.4.6 Challenges and opportunities for value creation and innovation

The analysis of the value propositions of the most successful cases of companies offering carpooling for commuting makes it clear that the most important element for users is the possibility to save commuting costs, with the improvement of travel times being relevant for public transport captives.

These advantages seem to be higher in contexts of large cities with a high urban sprawl, a context that is more characteristic of the US, where carpooling for commuting seemed to have definitely picked up in the last 2 years. In Europe, this advantage is lower and so the critical mass required to achieve viable businesses may be larger, requiring a larger initial investment. For that critical mass should be facilitated with time as the cultural acceptance to alternative shared mobility solutions continues to increase among the population.

Other critical factors are the simplicity reliability of the system. Users should as much as possible have the guarantee of trip availabilities, especially with a return from work to home. Besides the critical mass, the experience design is critical, with factors like the record of responsible behaviour of drivers and riders (e.g. not doing last minute cancelations or avoiding delays), as well as the guarantee of an alternative return trip in case of no

availability of drivers (as Scoop does), playing a major role in the satisfaction and recurrency of users.

### 5.4.7 Scalability in Europe

Factor	Assessment	Scalability
Diminishing marginal cost	The solution is software based. Depending on the relationship with trip aggregators, including marketing and end-user support, variable costs may or may not play a significant weight in total costs. These variable costs will decrease with scale.	✓✓✓
Repeatability of solutions	With minimal product adjustments and optional features (either software or local support related), the carpooling solutions for commuting are essentially the same.	✓✓✓
Globally differentiating value proposition	While the problems addressed by commute carpooling (trip cost and time) are global, it remains a question mark whether there are cultural and territorial elements which constrain this type of solution in European context	✓✓
Repeatability of sales & marketing process	Either focusing on corporates or end-users, the sales and marketing process is respectively well and very well scalable as processes are mostly replicable.	✓✓ to ✓✓✓
Network effects	Depending on whether the product is a B2B or a B2C, network effects will be either moderate or high.	✓ to ✓✓✓
Overall scalability assessment	All the scalability criteria match a very high scalable business type, as shown by Waze Carpool and Scoop, especially under the B2C business model. The major doubt remaining is whether the value proposition is significant enough in the European context.	✓✓

Scalability: 0 - none, ✓ - some, ✓✓ - high, ✓✓✓ - very high

### 5.4.8 Specific case of Carpooling for children

#### User need

Children need to travel to school, and from school back home or towards other activities. While children in Europe used to mostly walk to school decades ago, the emergence of the car use, its implications for the safety of children in streets, and the wider safety imperative trend, led to a radical change on how children move.

The car has, on the other hand, made it possible for children to access differentiating after-school and weekend or holiday activities which are important for their personal growth. But either due to safety concerns or additional activity opportunities, these trends have come to put a major burden on parents on having to transport their children everywhere. In an age of tight time management between work and personal life, managing children's mobility is a major pain to parents. Given the environmental and economic inefficiency of car use, the current system poses high socio-economic costs.

The problem of children's mobility tends to be stronger in not dense areas, particularly rural and peri-urban areas, where distances to school and services are higher; to guarantee the right to access schooling, in these areas public authorities become responsible for delivering transportation that guarantees children's access to school. In the current context of high time, monetary and opportunity costs, the latent for appearance alternative solutions for children's mobility seems high.

## Existing solutions

The existing mainstream solutions to children mobility include:

- **Parent driving** - parents driving children to school and other activities.
- **Walking, cycling and public transport** - children walking and cycling on their own, a solution that decreased drastically over decades mostly due to safety concerns, but which local public authorities are on a strong agenda to revert the trend.
- **School mobility bus** - a solution applied mostly in periurban and rural contexts to guarantee the access of every child to school. A similar solution is sometimes used by activity clubs transporting children from the school to after school activities.

Some alternative solutions that are not new have been persistently used but have never scaled to a mainstream level. However, they reveal certain behaviour of users which could be exploited in new solutions:

- **Walk/bike buses to school** - such initiatives occasionally occur either by promotion by public authorities or organic citizen initiatives. Even though they have persisted through decades, they never scaled as a mainstream solution.
- **(Informal) Carpooling between parents** - it is common for parents to organically organize carpool trips between children belonging to a given group at school or activity, enabling parents to free up time by sharing trips.

## Relevant trends

The children mobility sector is being affected by some trends that may foster new solutions:

- **Sharing economy** - Also known as collaborative consumption or peer-to-peer (P2P), the sharing economy has been challenging traditional notions of private ownership and is instead based on the shared production or consumption of goods and services. This trend has brought new alternatives to personal mobility including ride-hailing, car sharing, carpooling and bike sharing.
- **Road safety imperative** - the safety imperative trend had the perverse of drastically growing the unsustainable car transportation of children by fear of parents about their children's safety, while the resulting increased traffic made the problem higher around schools. Today, the safety imperative trend is starting to work in the other direction, where the unsafety of walking and cycling is increasingly deemed by

society as unacceptable, driving public policies for car and speed reduction around schools.

- **Mobile technology** - as for some many new services and products, mobile phone technology keeps on making new business models and transport operating processes possible, beyond the mainstream services (like ride-hailing and dock-less vehicle sharing) to more specific use cases like children mobility.
- **Work-life balance** - the search for work-life balance has a dual effect on children mobility. On the one hand releasing parents from the task of transporting children frees their time and offers alternative options, on the other hand the work-life balance demands for parents to take time for their children, where the travel to school and other places has a role.
- **Work from home** - while flexible working location was already a relevant trend, the Covid-19 situation might have instantly accelerated the trend, with multiple implications like reduced traffic. It is relevant to expect that the decreased number of trips to work by some parents will change the incentives underlying children's mobility, possibly in the direction of avoiding unnecessary trips.
- **Economic recession** - under economic recessions, individuals tend to value money savings, especially avoiding car trips, a result also stressed by the higher unemployment. The Covid-19 crisis is expected to cause this effect.
- **Personal distancing** due to health reasons – the Covid-19 crisis had high implications for how much people accept to be close together with other people; it is not clear whether this phenomenon is only short-term or persist in the future.

## New solutions

While conventional ride hailing services do not allow for the transportation of children unaccompanied by adults, new digital-based services oriented for children transportation are being tested or already scaled. There are essentially three variations of solutions being put forward:

- *Driver*: Professional driver vs community driver
- *Travellers*: Solo traveller vs pooled travellers
- *Scheduling*: Pre-scheduled vs on-demand

New solutions based on professional drivers seem to have proven their viability in some contexts (especially the US market) and, after proving their business viability, are at the scaling phase (Zūm, HopSkipDrive, Kango, Hopways). They work both or either with pre-scheduled and on-demand options and may function with a limited version of the pooling of travellers, normally only when the pools with other children are identified by the parents requesting the trips. Some of these services have coupled the transportation service with the provision of childcare services.


Community driver carpooling solutions have yet to prove their viability. Several seed level startups tried to create this kind of market, but so far they haven't succeeded by not acquiring enough engagement from users (GoKid, KidPick, Zouzoucar). Childfy, the startup supported by the HiReach Startup Lab, operates in this line of opportunity.

Besides the transportation solutions themselves, a new type of solutions has emerged which improves the willingness of parents to allow children to make lone trips either walking, cycling or by public transport, family trackers (Life360, LifeSafe, GeoZilla or GoOV). Family

trackers allow parents to know where the child is located at any moment, as well as to receive notifications of their arrival to places like home or school.

The following table presents information of some relevant startups in the fields above.

**Table 10: Companies in the field of carpooling for children**

	ORI- GIN	LOCA- TIONS	CUSTOMER S	REVENUE MODEL	DRI- VER *	POO- LING **	SCHEDU- LING	STAGE
Zūm	US	US	Schools, Families	Trip-km fee	Pr	S or P	PS or OD	series C, \$71M raised
HopSkipDrive	US	US	Schools, Families	Trip-km fee	Pr	S or P	PS or OD	Series B, \$45M raised
Kango	US	US	Families	Trip-km fee	Pr	S or P	OD	Series A, \$3.7M raised
Hopways	FR	FR	Families	Trip-km fee	Pr	S or P	PS	Seed
GoKid	US	US	Families	App freemium	C	P	PS	Seed, \$2M raised (closed 08/2020)
KidPick	DE	DE	Families	App freemium	C	P	OD	Seed
Zouzoucar	FR	FR	Families		C	P	PS	150k by VW (Closed 5/2019)
Childfy 	ES	ES	Activity centres	Subscription	C	P	PS	Pre-seed

\* Pr – Professional driver, C – Community driver; \*\* S – Solo traveller, P – Pooled traveller; \*\*\* PS – Pre-scheduled, OD – On-demand

## Market size

In Europe there are around 40 million children between 5 and 12 years old and they all need to be transported at least to school. Most are transported by car, while a few are transported by school buses (for example in France there are around 2050 registered school bus lines (Françaises 2016). Assuming a market penetration of the pooling solution types of 10% with a yearly revenue per child of 300€, the future market size in Europe may be estimated at €1.2 billion.

## Challenges and opportunities for value creation and innovation

While child mobility is a major problem facing parents (very often mothers) and other stakeholders, it has revealed to be difficult to build new solutions that accommodate the various needs at stake. Nonetheless, the current context of technological availability and openness of the general public to new mobility solutions may set the right timing for innovations:

### Time

Child mobility solutions allow parents to save time and/or open up their commuting mobility options besides the car. Any affordable and reliable solutions that replace the parent's car as the child transportation are expected to have a large market of interested customers. The structural changes that might be introduced by the Covid-19 crisis in the mobility



patterns of parents (including more working from home) compounds a habit change that is an opportunity for child mobility transformations.

**Cost**

The ability to transport children in a cost-effective way is a critical factor. Mobile IT technologies might be able to address this issue if they make carpooling possible, which in the case of this user group seems better attainable since the core of trips is done to specific trip aggregators (schools and child activity centres), at the same schedule and by a community with something in common (e.g. children from the same school). The upcoming economic crisis derived from the Covid-19 crisis might increase cost sensibility and promote community based cheaper transportation solutions (particularly carpooling) as the 2009 crisis did for Airbnb.

**Trust**

Parents tend to be conservative in relation to allowing their children to be transported by strangers, which has been a major barrier for this type of product. New businesses have been answering by involving drivers with not only rigorous security checks but also childcare credentials, which implies a higher cost. As these new transportation products go mainstream and while building the track record of review of drivers and maturity of selection and driver matching processes, the trust level of parents is likely to improve. For community-based driver solutions, current products seem to have not yet exploited the possibilities of building trust through experience design that applies community building and behaviour design techniques.

**Child trip aggregators**

Traditional transport business models rely on the purchases of users, but in the case of children mobility there seem to be opportunities to explore in relation to revenue support by children trip aggregators like schools and activity clubs, which either see as a differentiating factor to be able to facilitate the mobility of children to their location or may have public obligations to guarantee children mobility. In the US, the business model relying on the subsidization of schools seems to have already picked up among child carpoled ride hailing services. In Europe, despite some geographical and institutional differences, this opportunity may also be available.

**Political agenda**

The current political agenda is highly favourable to sustainable child mobility solutions, placing opportunities for partnerships with local public authorities.

**Legal aspects**

Legislation varies across countries with regards to the permissions and attribution of responsibility about carrying children. Scaling at the European level will require adjusting to the legal specificities of each country.

## Scalability in Europe

Factor	Assessment	Scalability
Diminishing marginal cost	A major share of the operational results is achieved through the digital experience of the users. Given the two-sided human interactions and need for handling validation of drivers and building trust, as well as sorting disputes, some human personalized customer support is needed. For the business model with professional drivers, variable costs of the business as whole are very relevant and therefore with lower scale savings.	✓ (profess. driver)  ✓✓ (community)
Repeatability of solutions	The types of solution in question are mostly repeatable, with some need for adjustment for cultural differences (e.g. trust factors), legal differences (about child carrying responsibility) and, in the case of business models focused on trip-generating customers (schools, activity centres), for types of business.	✓✓
Globally differentiating value proposition	Children's mobility poses undoubtedly a significant problem to parents, businesses and public administrations. If new mobility solutions manage to overcome the critical cost and trust factors, a disruption in children mobility could be observed.	✓✓✓
Repeatability of sales & marketing process	Social, economic and administrative structures of schooling and children activities may vary in different countries and regions. Some local adjustment and need for local branches of the company knowledgeable of the local market.	✓✓
Network effects	The business has network effects, which nonetheless operate mostly at local level and not at global level. The availability of a relevant offer of trips for each user depends on the number of existing users and drivers, and vice-versa	✓
Overall scalability assessment	The solution space for children's mobility, composed by pooling trips served either by professional drivers or parents, reveals a high diminishing marginal costs, high repeatability of solutions, the assumption of a very high market differentiation, reasonable repeatability of the marketing and sales process and reasonable network effects. Overall, a considerable scalability is anticipated.	✓✓

Scalability: 0 - none, ✓ - some, ✓✓ - high, ✓✓✓ - very high

## 5.5 Data analytics platform

### 5.5.1 User need

Urban mobility systems are increasingly complex due to the multiplicity of mobility service operators, while information to users is becoming an increasingly important asset for mobility choices. The pressures are increasing for more effective mobility planning and quick regulatory adaptation and monitoring in the context of the transition to better quality and more sustainable urban mobility systems. Mobility data that is spread around public and private actors is required to be shared and processed into clear decision-making tools.

For vulnerable user groups with special needs, the need for greater data use and integration either for planning of user information is essential for mobility opportunities.

### 5.5.2 Existing solutions

Conventional solutions for data storing and processing are static spreadsheets, often dispersed and not shared across city departments, much less with other mobility operators and stakeholders in the city. In large cities with high congestion levels, the more advanced systems are real-time traffic management tools that gather and process data instantly for daily operational traffic management adjusting for example traffic lights to existing flows and occurrences. In some other fields, like cycling flows, cities have real-time data. Different datasets are not systematically integrated or shared with different bodies and stakeholders. Services and infrastructure features for disabled people, elderly or children are often not inventoried and given back to users.

### 5.5.3 Relevant trends

- **New mobility** – multiple new mobility services have arisen in the last decade – ridesharing, carsharing, bike-sharing, scooter-sharing, carpooling, information systems, integrated ticketing, home deliveries – that are quickly changing the urban mobility environment and in some cases causing negative impacts including new conflicts between modes of transport or possibly negative influences on sustainability. This trend seems to be at the beginning only and will face new disruptions, for example caused by the expected emergence of self-driving.
- **Internet of things** – The internet of things has come to make data sharing and integration viable at a micro-cost of what this used to take.
- **Mobility information for users** – the pervasiveness of connected mobile devices is taking the mobility users to a paradigm of flexibility based on real-time information. Successful mobility services and mobility planning are now required to excel in extracting the maximum value of the newly available information.

### 5.5.4 New solutions


Urban data platforms integrate the large amount of data in cities, including energy, transport, crowdsourced data, etc., and provide holistic view of the information with the aim of improvement and development of innovative smart city services. Four types of data streams can be drawn from urban data (System 2020):

- demand-side stream which can give better understanding of specific properties and characteristics of urban processes, e.g. buildings services, government-to-citizens services, and provide solutions for improvement
- supply-side stream to monitor incidents and crisis situations and the respective responses and solutions with the aim of drawing conclusions and recommendations
- analytical stream to identify data patterns and correlations in order to derive predictions for urban innovation, provide impact assessment, and demonstrate the challenges and opportunities in urban development
- standardization stream to bring the data in line with the international standards.

Urban data platforms enable and stimulate a proper understanding of how infrastructure is used in different domains, the interdependencies between different elements of infrastructure and the effects of external drivers such as public policy, major events and weather patterns and precipitation.

A number of startups and initiatives are addressing this need. The most advanced case identified in this analysis (Coord, US based) started with a broad spectrum towards mobility data approach and partially pivoted to a more specific domain, the management of the curb space. Opendatasoft in France has a relevant traction managing data to transport operators. Other seed stage startups in Europe and the US are in the process of discovering what are the specific needs of cities that already may bring commercial traction for them.

**Table 11: Companies in the field of data analytics**

<b>Coord</b> <hr/> Focus on curb management <hr/> US	Customer: cities Locations: US cities Stage of development: Series A, \$5 million raised in 2018. Since then it pivoted to focus specifically on the data management of curbs.  Value: inventory of curbs, allocate uses, manage price and demand, support operations Features: curb space management programs - Smart commercial loading zones, Ride-hailing management, Demand-responsive parking pricing
<b>Vianova</b> <hr/> Broad spectrum "Control tower" <hr/> France	Customer: cities Locations: France, Switzerland Stage of development: Pre-seed  Value: Make better decisions thanks to better data insights, monitor compliance of policies Features: data visualization, activity monitoring, control tower (alerts)
<b>Mobito</b>  <hr/> Broad spectrum Marketplace approach <hr/> Belgium	Customer: cities Locations: Belgium, Portugal Stage of development: Pre-seed  Value: Connect, understand, monetize and share data Features:

<b>Urban SDK</b> <hr/> Broad spectrum <hr/> US	Customer: cities Locations: Southern US Stage of development: Pre-seed, Techstars Smart Mobility programme / 2020  Value: Reliability, accuracy, intuitive, open Features: Index datasets for real-time response, global data exchange, Intuitive web-based tools for decision-making, open data
<b>Opendatasoft</b> <hr/> Early focus on data management and analytics to transport operators <hr/> France	Customer: Transport operators (SNCF, SBB, Keolis, Infrabel ...) Locations: France Stage of development: Opendatasoft is company established in the field of data sharing management, which has urban mobility data as an applicable use case.  <b>Value:</b> Support mobility strategies, reuse data to generate value, create new services, differentiate from the competition, work with regulators <b>Features:</b> Share data internally with teams and with third-party stakeholders, Visualize data with maps, graphs and charts. Control who accesses data

### 5.5.5 Market size

The HSL startup Mobito estimates a European market composed by 800 cities spending an average of 30 thousand euro yearly on data connectivity and leveraging, amounting to a market of 240 million euro.

### 5.5.6 Challenges and opportunities for value creation and innovation

Even though urban mobility data is a very hot topic with a perception of a very high latent value, in practice it is not yet systematically clear for city officials and businesses how the use of data can be translated to into concrete change and improvements. There is an ongoing discovery process from all stakeholders involved about the opportunities in question. This is leading to specific use cases with data applications that might with time scale to standard practise across cities.

But this process takes time due both to the natural resistance to change within public governance and the institutional and technical complexity involved in the collection and sharing of data between different stakeholders. Startups should try to get some early traction working on specific needs on a case to case basis that allows them to hold financially to the ground while seeking and waiting for further opportunities, until the day when some use cases will become more standard and scale across cities. This will be a long path, therefore the profile of patient investors in needed in this field.

## 5.5.7 Scalability in Europe

Factor	Assessment	Scalability
Diminishing marginal cost	While the customization needs are deep, the larger is the set of customer cases, the larger the chance of each desired feature and integration to have already been developed. Minor marginal cost advantages are expected.	✓
Repeatability of solutions	The repeatability of solutions is limited due to the need of customization to the requirements of local authorities and operators, as well as due to the availability and standards of data in question. The product requires a high degree of customisation.	✓
Globally differentiating value proposition	The need of storing, sharing and processing mobility data is part of a common global trend.	✓✓
Repeatability of sales & marketing process	The core customers are public authorities, which imply long sales cycles and a robust commercial local presence. Also, the value of the product depends on the engagement of a multitude of local stakeholders.	✓
Network effects	No relevant network effects.	0
Overall scalability assessment	The need and value proposition and strong and widely recognized by potential customers, but the product-market fit still needs a significant discovery process from both startups and customers which is further constrained by the complexity of the sector and the resistance to change of public bodies. This market opportunity requires a patient investment.	✓

Scalability: 0 - none, ✓ - some, ✓✓ - high, ✓✓✓ - very high

## 5.6 Delivery of Goods

### 5.6.1 User need

Vulnerable people with difficulties of mobility, like the elderly or disabled, may have their accessibility needs met if basic products are delivered to them instead of them having to travel to obtain those products. Deliveries of regular commodities, including food, are today broadly easily accessible through conventional supermarket chains. In rural areas, the issue is often solved through itinerant shops, a long established viable local business model which guarantees deliveries of basic products.



A more complex case, for its specificities, and very relevant for the elderly, is pharmacy products. The need for pharmacy products increases dramatically with age and the elderly must move often to the pharmacy to get their medicine. This case focuses on deliveries of pharmacy products.

### 5.6.2 Existing solutions

For products that do not need a prescription, it is possible in most countries to order medicine online and get it delivered at home. But the elderly who are not digitally literate this is not a possibility, which in any case does not apply for the most common case of medicine requiring a doctor prescription.

Furthermore, in most countries there are strict regulations about the possibility to do home delivery of medicine, which is or used to be either forbidden or restricted to the delivery by pharmacists or pharmacy technicians, a rule that constrains the possibility for making deliveries at a reasonable cost either for the pharmacy or the end customer. Even so, some pharmacies formally or informally make arrange deliveries for customers in need or for the delivery of products which are out-of-stock when the customer goes to the pharmacy. In some sites, local administrations have support systems for the elderly and disabled which include deliveries of essential products.

### 5.6.3 Relevant trends

"This is [the] first generation in history to be comfortable using digital trends, as minor as using emojis or as major as work laptops (...) There is an immense opportunity in serving the older population, with the biggest being in the 'pain-relieving' model" (Kevin Nazemi, CEO of Renew<sup>17</sup>).

By 2018, startups aimed at the 65-plus users only attracted about 0.7 percent of venture capital in the US. As more baby boomer generation are reaching the elderly age, a generation with digital literacy, more investors and founders will take notice of this space.

In the specific case of medicine deliveries, most customers still seem to prefer the old way of purchasing in the pharmacy. A survey from 2018 carried out by Pharma Système Qualité<sup>18</sup> revealed that 86% of the patients preferred to continue to pick up their medication in their pharmacy instead of having their prescription to be prepared by a pharmacist and delivered at home (13%). But this situation might be changing as another survey by Avenir Pharmacie (2017) revealed that the younger population has higher expectations in terms of the dematerialization of relationships with pharmacists, with the 18-24 year olds favouring home delivery at 69%, (just over 60% among 25-49 year olds), while the elder segment of the population are less than half likely to express an interest in delivery (45%) .

The main three market segments interesting for the pharmacy deliveries business seem to be the elderly with high difficulties in mobility, as well as other persons with reduced mobility, the younger generation - which on its own represents a small share of the market – and finally the segment of busy parents. Another currently existing phenomenon is the Covid-19

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<sup>17</sup> <https://news.crunchbase.com/news/startups-serving-the-elderly-is-techs-next-big-market/>

<sup>18</sup> <https://www.pharmasystemequalite.com/>

crisis, which according to several news reports triggered from March 2020 many requests for deliveries from pharmacies, leading to the setting up of new delivery chains either by the public sector or the pharmacy retail industry.

A fundamental issue influencing the latent market for pharmacy deliveries is the legal requirements related to the deliveries of medicine. For example, in France, Germany and other countries these deliveries used to be restricted to their operation by pharmacists or pharmacy technicians, due to the security risks of dealing and delivering medicine. These laws highly restricted the possibility for home deliveries. Respectively in 2018 and 2019 France and Germany changed their laws to permit prescribed medicine to be delivered under certain regulated conditions.

In Portugal, for example, the law still does not allow for open medicine deliveries, even though authorities relaxed compliance during the Covid-19 crisis. In Spain, a temporary permission and protocol for home deliveries was emitted by the national pharmacy society for the Covid-19 crisis, but it is not clear if it will persist afterwards. Another restriction in some countries (like Germany and Spain) is that electronic prescriptions are still not allowed, which implies that a paper based prescription has to be exchanged between the customer and the pharmacy, while in countries like France and Portugal the e-prescription is already possible.

### 5.6.4 New solutions


The current ongoing legal changes in European countries towards medicine home deliveries and e-prescription are triggering new startups in this sector, improving the accessibility for vulnerable groups to pharmacy products via deliveries.

There are at least three business models integrated at different steps of the value chain, all of them working with local pharmacy stores:

- App-based platform connecting patients to local pharmacies, enabling them to make orders that are home delivered. In these cases home deliveries are performed by third parties (Otzil through AXA in France, Ludo through incumbent delivery cooperatives in Spain).
- Dedicated delivery services (Minute Pharma in France, Lamiloo in Germany), specialized in pharmacy deliveries and optimized for that type of service. These may be under competition with general deliveries incumbents like Deliveroo or Glovo.
- Software-as-a-service for pharmacies that operate their own deliveries (Apomap).

**Table 12: Companies in the field of pharmaceutical product deliveries**

	ORI- GIN	LOCA- TIONS	CUSTOMER S	BUSINESS MODEL*	REVENUE MODEL	DELIVERY TIME	STAGE / SIZE
Minute Pharma	FR	FR	Pharmacy	Deliveries	Delivery fee	<4 hours	+1000 pharmacies +2000 installs
Otzii	FR	FR	Patients	Orders platform	Delivery fee	<60 min	+2000 installs
Apomap	DE	DE	Pharmacy	SAS	Subscription	-	Founded 2020
Luda Partners	ES	ES	Patients	Orders platform	Medicine sales fee	-	

	ORI- GIN	LOCA- TIONS	CUSTOMER S	BUSINESS MODEL*	REVENUE MODEL	DELIVERY TIME	STAGE / SIZE
Lamiloo 	DE	DE	Pharmacy	Deliveries	Delivery fee	<3 hours	Founded 2020

### 5.6.5 Market size

For the elderly segment, the total addressable market is composed by the 85 million people. Under plausible assumptions<sup>19</sup>, this will represent a €1.85bn market in Europe.

### 5.6.6 Challenges and opportunities for value creation and innovation

The local pharmacy business is under threat by e-commerce, particularly for products that do not require a medical prescription. Local pharmacies are aware of this threat and look for ways to innovate. Home deliveries to home is a service that pharmacies will have to engage to in order to keep their ability to differentiate.

But at the same time, they need not to lose the close relationships they currently have with their local customers. By embarking on web-based orders the deliveries supply, local pharmacies risk losing that relationship and their differentiating aspect. The pharmacist's value proposition is not in the act of delivery but in supporting the patient and securing the dispensing in the same way as practiced at the counter (La Pharmacie Digitale, 2019). The various parts of the value chain – search and order system, and deliveries – must be designed to preserve the differentiating aspects of that support, even when the customer is not going physically to the pharmacy. At the same time pharmacies have to adjust to offer a quality support on online channels or via the delivery operators.

Currently, ongoing legislation changes in European countries – home deliveries and e-prescription - are fast triggering this solution, therefore not is the opportunity to create and gain a position in this new market.

### 5.6.7 Scalability in Europe

Factor	Assessment	Scalability
Diminishing marginal cost	The cost-structure is dominated by human resources for deliveries. Diminishing marginal costs are limited	✓
Repeatability of solutions	As seen with other delivery services, this is an essentially repeatable solution. In the case of pharmacy products there are legal issues with variations across countries which may imply different approaches.	✓ ✓

<sup>19</sup> Average yearly spending of 1000€ on medicine per elder; 20% rate of deliveries; 10% delivery costs

Factor	Assessment	Scalability
Globally differentiating value proposition	The accessibility of the elderly is an issue in every place, even though cities with better accessibility for all can delay the problem until older ages.	✓✓
Repeatability of sales & marketing process	At a country level, the sales process is repeatable. Across countries there are significant differences in terms of legislation and industry structure which have to be understood and navigated.	✓
Network effects	There are very relevant local network effects, as the scale of users and operations will improve marginal costs and delivery times.	✓✓
Overall scalability assessment	The repeatability of the value proposition and solution, and strong network effects, enables scalability, while diminishing variable costs outside each site are limited and the legislation and structure of the market varies per country. This type of solution is likely to have dominant players at a city or country level, but not more than that.	✓✓

Scalability: 0 - none, ✓ - some, ✓✓ - high, ✓✓✓ - very high

## 5.7 Multisided platform for shared services

### 5.7.1 User need

In low-density areas – peri-urban or rural - collective transport have a low and dispersed demand, generate low revenues and limited value, and as a consequence are scarce and/or have low cost-effectiveness. Populations lack alternatives to the private car, in territories where transport connectivity is not well developed, and where running full scale public transport may be prohibitively expensive. The situation is worsened whenever there is only one car per household, and members without a car (often women) suffer a limitation in mobility. On the other side many regions have seen operational results of operating public transport worsen following the urbanisation and car ownership (Europe 2017).

Traditional public transit modes have remained unchanged over decades and inherent flaws have remained unaddressed. The fixed-route and fixed-schedule model works efficiently on high-density routes but routes with lower demand and density along with demand at odd hours are not as efficiently catered to by traditional public transit (Frost&Sullivan 2018). Low-density areas need to become accessible for services, work and leisure activities, which are increasingly becoming focused within urban areas. Relevant user groups in this context are the elderly, children, women and the poor.

### 5.7.2 Existing solutions

The main existing solutions in low-density areas are the following:

- Private car – the private car is a dominant transport solution in low-density areas but is not accessible to several groups of the population.
- Bus – traditional bus lines have a high cost relative to demand, are scarce, and often depend on the existence of school bus lines.
- Taxi – when there are no alternatives, the taxi is the expensive solution for those who can afford it. In some cases local authorities partially or totally subsidize the operation of taxis for vulnerable groups (e.g. Locomobile, LU) (HiReach, 2019)
- (Informal) car pooling – in small communities, it is common to observe that needed trips of people (like the elderly) are guaranteed by their neighbours, in informal arrangements.
- Itinerant commerce or services – moving van-shops that deliver essential commodities or services on a daily or rather frequent basis, dispensing the local population from having to travel for shopping or services (e.g. the Buurtkar in Bornem, BE)
- Community offerings – at least since the seventies there are local community services operated by volunteer drivers (usually retired people or unemployed), like the cases of the Bürgerbus, the Bummelbus (HiReach, 2019).

Overall, the alternatives to the car are limited in time and space, or expensive, while the car is only available to an independent segment of the population.

### 5.7.3 Relevant trends

The following trends affecting low-density mobility needs and opportunities are identified:

- **Universal accessibility** – the concerns and legislation for the guarantee of the rights to one's mobility as an equality issue have been strengthening not only on the topic of universal design of public and private infrastructure, but also in guaranteeing everyone's mobility for access to basic elements like health.
- **Ageing** – as the elderly cannot drive from a certain age and will have more economic restrictions as pension systems collapse due to the lower young/elderly ratio, the share of this group of the population with mobility limitations will increase.
- **Mobile technology** – mobile technology facilitates more flexible solutions, making demand-responsive transport more viable. On the other hand, the population in question is often technology illiterate and mobile communication is yet not an option for that group.
- **Remote working** – The Covid-19 crisis increased home working and there is a strong chance that a large share of this shift will become structural. This might have future implications on place of residence choices towards less urban, lower-density areas.
- **E-commerce and deliveries** – The e-commerce trend might partly decrease the strength of the need of people transportation in low-density areas, especially as e-commerce reaches less technology literate segments of the population.

Universal accessibility, ageing, mobile technology and possibly some migration to less dense areas arising from the increase of remote working are trends that contribute to the emergence of demand-responsive transport alternatives, while e-commerce and deliveries are a substitute service.

### 5.7.4 New solutions

Demand-responsive transport is a flexible mode of transportation that adapts to the demands of its user groups. Day-to-day operation is determined by the requirements of its users. Typically, this involves users calling a booking service, which will then plan a route for the day to pick-up users and take them to their required destination. Increasingly, such systems are also using internet connections; via web browser or apps, to enable bookings. DRT, however, remains underutilised, despite its many benefits.

Demand-responsive transport is playing an increasingly important role in rural areas where public transport connectivity is not well developed, and where running full scale public transport may be prohibitively expensive. It can also provide a solution for linking rural tourist destinations with existing transport infrastructure, therefore supporting rural businesses and rural development. These DRT systems have normally been supported by government or third-sector funding, though they can also operate through subscription and fare-based business models (Interreg Europe Last Mile 2017).

Though still at a nascent stage of development, the market holds immense potential as passengers become more accepting of shared mobility modes and governments and cities take a number of measures to introduce efficient mobility options that are aligned with the concept of smart cities (Frost&Sullivan 2018).

HiReach has earlier given the example of Transport a la Demanda in Catalonia, with more than 200 services authorised and supported with public funding by the regional government (Generalitat) of Catalonia and the mobility agencies at provincial level, as well as ZOOV, in Achterhoek, NL (See Deliverable 3.2, Innovative mobility solutions: case study description and analysis).

A number of variations of demand-responsive transport systems can be observed in existing applications:

- Service: Pre-scheduled vs real-time, Fixed route vs flexible route
- Booking systems
- Network relations: stand-alone vs feeder
- Vehicle type, ownership and operation: car, minibus, bus; own vs third-party
- Vehicle allocation: fixed, extendable, dynamic
- Single vs multi use (e.g. school + adult)

With regard to the service elements, the following approaches to flexible public transportation services can be identified, dependent on the characteristics of the area served, varying between rural, small urban, and large urban regions (Transitwiki 2017):



- Route Deviation: a defined path and schedule is used to define a service area, but the vehicle(s) may serve requests for pick-up or drop-off within a specified zone around the path.
- Point Deviation: service is provided within a defined zone with a set of specific stops, but the path between the stops is unspecified.
- Demand-Responsive Connector: service operates entirely by demand-response, but includes scheduled transfer points connecting with a fixed route.
- Request Stops: a scheduled, fixed-route service in which certain stops are served only in response to passenger requests.



- Flexible-Route Segments: a portion of an otherwise scheduled fixed-route is operated as demand-response.
- Zone Route: a primarily demand-response service that has set departure and arrival times at its end points.

Startups in the field of demand-responsive transport within low-density areas are identified below. The main distinction is between business models that are financially autonomous from third parties, relying exclusively on users or trip generators (normally workplaces), and business models which require public subsidies. The latter usually operate in the circumstances target by HiReach, of low-density and user groups in greater need.

**Table 13: Companies in the field of multisided platform for shared services**

	ORIGIN	LOCATIONS	CUSTOMERS*	BUSINESS MODEL	CONTEXT	VALUE PROPOSITION	STAGE
ShoTi	ES	ES, DE, IT, PT	O, C, P	SAAS B2B	districts, medium and small cities, rural areas, disabled, corporations	cost, waiting times, expand service, data	Seed, €1.1M raised
Nemi 	ES	ES, IT	O, P	SAAS B2B	low-density areas	optimize distances, saving time for users, expand service, save CO2	Seed <€250k raised
Zeelo	UK	UK	C, O	Operator B2B & B2C	demand aggregators outside urban centres	C: Employee retention, park space, sustainability O: expand services, efficiency, new business	Series A, raised €6M
Via Van	DE	Europe	P,C,O	Operator B2B	demand aggregators outside urban centres	dynamic shared mobility services that complement existing transportation infrastructure	joint venture Mercedes-Benz Vans and Via
Tandem 	UK	UK	E,C,P	Operator B2B2C	Periurban, small cities with workplace trip aggregators	help workers get to site	Seed, raised €200k

\* Customers: O – operators, C – corporates, P – public authorities, E – Employment agencies

## 5.7.5 Market size

According to Frost & Sullivan (Frost&Sullivan 2018), the global market of demand-responsive transport will be valued at 500 billion Euro in 2030. In European low-density areas, this could represent a market of a magnitude of 25 billion.

## 5.7.6 Challenges and opportunities for value creation and innovation

The main challenges identified for the further development of services relying on demand-responsive approaches revealed by the cases considered and the literature (Interreg Europe Last Mile 2017) are the following:

Dependence on public money and institutional setting	Transport systems in low-density areas require public support and must rely on the coordinated leadership of local public institutions. Innovation in this sector therefore depends much on the public sector development, while the private sector is partly dependent on such process.
Procurement processes	Public procurement processes must adapt to the new nature of demand-responsive transport and are highly variable between sites, requiring a strong commercial follow-up at local level with long purchase cycles.
Technological literacy	A very relevant and in many contexts the most important target group of transport provision in low-density areas is the elderly, who tend to be mobile technology illiterate, making it harder to reap the information-based efficiency benefits that mobile technology would bring to demand-responsive transport.
Critical mass	Like for any public transport system, critical mass is a crucial factor due to the relevancy of positive feedback loops (the so-called 'Mohring effect') between demand and quality of service. Demand-responsive systems may achieve this kind of advantage beyond what traditional bus lines did in low-density areas, but a critical mass must be reached.
Integration in information systems	Part of the success of demand-responsive systems may depend on its integration on MaaS systems, which is a complex element both due to the specificities of the booking and information on demand-responsive systems but also the integration of multiple stakeholders.

### 5.7.7 Scalability in Europe

The innovative element of the value chain of flexible transport for low-density areas is essentially the management and user interaction software component that makes flexible transport feasible at scale. It's this element that is considered in the scalability assessment below.

Factor	Assessment	Scalability
Diminishing marginal cost	While the main innovative value component is the software that manages on-demand services, which has low variable costs. The level of support required, at least at an initial stage of adoption, should be considerable.	✓ ✓
Repeatability of solutions	The management of flexible transport includes a few typical use cases which. A solution covering those cases requires none or minimal customization.	✓ ✓

Factor	Assessment	Scalability
Globally differentiating value proposition	The problem of transport scarcity and high per-passenger costs is relevant in any low-density area. While territorial characteristics vary, the typical uses cases should apply globally. The lack of digital literacy of a large set of the user group is still a barrier.	✓✓
Repeatability of sales & marketing process	This is a difficult aspect of scalability of this type of product, since the types of customers and their purchase processes are varied, long and tend to require an intense local commercial presence, especially in the context of public authorities.	0 (public authorities) ✓ (corporates)
Network effects	In low-density areas, the potential for network effects is moderate.	✓
Overall scalability assessment	With a strong value proposition related to the increase of cost-effectiveness and reach of transport services, the introduction of demand-responsive transport in low-density areas remains to be highly dependent on the policy and procurement processes of local public authorities. Scalability can be expected, but with a slow speed of adoption and some market fragmentation.	✓

Scalability: 0 - none, ✓ - some, ✓✓ - high, ✓✓✓ - very high

## 5.8 Conclusions on the scalability analysis

Startups aim to scale-up and venture capital investors are willing to invest in startups with a scalability promise. The assessment of the market and solution cases that address mobility for all concluded that the analysed solution cases have a reasonable to high chance of scalability:

- **Highly scalable products:** audio mobility assistant, carpooling for commuting (including for children) and delivery of goods for the vulnerable people.
- **Scalable products:** Multisided platform for shared services, inclusive journey planners and data analytics platform.
- **Zero scalability:** Mobility & Transport Poverty Consulting & Services.

The main **barriers** to scalability identified have been:

- Diminishing marginal cost – which is limited in business models with high capital (multisided platform for shared services) or local support needs (data analytics platform).
- Repeatability of solutions – need for significant customer customisation in the business models of inclusive journey planners and data analytics platform.

- Repeatability of sales process – the reliance of public funding puts a heavy burden on the sales process in the cases of multisided platform for shared services, inclusive journey planners and data analytics platform.

In some cases, the product growth may benefit from some network effects, which is an additional driver of scalability (and also a barrier to early growth). Some network effects are relevant in the cases of the inclusive journey planner, carpooling for commuting (including for children) and delivery of goods.

**Table 14: Scalability assessment for considered cases**

CRITERIA \ BM	INCLUSIVE JOURNEY PLANNER	AUDIO MOBILITY ASSISTANT	CARPOOLING		DATA ANALYTICS PLATFORM	DELIVERY OF GOODS	MSP FOR SHARED SERVICES
			COMMUTING	CHILDREN			
Diminishing marginal cost	✓	✓✓✓	✓✓	✓✓	✓	✓	✓✓
Repeatability of solutions	✓	✓✓✓	✓✓✓	✓✓	✓	✓✓	✓✓
Globally differentiating value proposition	✓✓	✓✓✓	✓✓	✓✓✓	✓✓	✓✓	✓✓
Repeatability of sales & marketing process	✓	✓✓	✓✓	✓✓	✓	✓✓	0 (public authorities) ✓ (corporates)
Network effects	0 to ✓✓	0	✓ to ✓✓	✓	0	✓	0
Overall scalability score	✓ Some scalability	✓✓ High scalability	✓✓ High scalability	✓✓ High scalability	✓ Some scalability	✓✓ High scalability	✓ Some scalability

Scalability: 0 - none, ✓ - some, ✓✓ - high, ✓✓✓ - very high

## 6 Summary and conclusions

### 6.1 Final remarks

**Transport poverty** and the accessibility to jobs, education, health care, etc., are very closely linked. Various studies have shown that transport poverty can be at the root of exclusion on the labour market. And conversely this exclusion also means lower opportunities of purchasing certain resources, including transport.

Social groups particularly vulnerable to suffer from transport poverty include migrants, low income people, children, women, elderly, people with reduced mobility and people living in rural areas. Overcoming “transport poorness” cases involves a balanced mix of innovative transport services, public transport and car ownership.

Of course, the challenge of transport poverty is not limited to providing access to certain means of transport; the socio-economic position of the individuals (e.g. jobseekers, disabled, underprivileged, single-parent families, migrants and elderly people, etc.) and his or her skills are important factors to take into account when designing suitable solutions. Moreover, different regions in Europe face mobility poverty in a different way.

**The European Union and its Member States support the accessibility of their citizens, since good accessibility thrives the European economies, promotes inclusion and fosters the well-being of inhabitants.** The European Union particularly focuses at improving accessibility of vulnerable social groups such as the elderly, the disabled and people living in remote or deprived regions to arrive at a state of affairs with a ‘mobility for all’.

**HiReach assisted the European Union in achieving this goal by, among other actions, sponsoring an innovative Acceleration Program – the HiReach Startup Lab (HSL).** The HSL could unleash the potential of European startups to lead the twin transitions towards a sustainable and digital economy, as it was capable of involving them in the development of market-driven solutions to concrete transport poverty problems.

The HSL ran from February to September 2020<sup>20</sup>, involving a total of 23 promising startups. Ten of these startups were invited to fine-tune a business model and the five most promising ones actually conducted a pilot with a vulnerable social group together with a relevant host to test and validate their MVP.

During the acceleration programme, startups have proved their value and showed that they can make a real difference and resolve relevant problems that a wide range of institutions have been struggling to solve in the area of transport accessibility.

**All startups, to some extent, showed that with minimal resources and the support of suitable coaches (the HiReach team), they were able to detect new use cases and build a business proposition to different target groups, with minimal additional resources.**

They are available and ready to continuously improve their products based on collected feedback and showed high levels of agility and adaptability against unforeseen obstacles

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<sup>20</sup> A detailed description of the acceleration programme can be found in Deliverable 4.3, Report on HiReach Startup Lab and testing activities (Reis and Freitas 2019).

(e.g. the Covid19 pandemic outbreak, but also barriers related with institutional support from hosts, technological challenges and others). Lastly, they understood that trust is a fundamental dimension which needs to be nurtured, even in cases where they do not pay a service directly to the end user (B2C) but instead adopt other business arrangements (B2B or more complex B2B2C) to address transport poverty problems.

Table 15, overleaf, presents the **ten startups that participated in the most advanced phases of the HSL, their underlying business model prototype and the target vulnerable users they serve.**

**Table 15: Prototypes of business models and targeted vulnerable users**

STARTUP	PROTOTYPES OF BUSINESS MODELS	CHILDREN & YOUTH	ELDERLY	WOMAN	PRM	MIGRANTS & ETHNIC MIN.	RURAL AREAS	LOW INCOME
CityMaas	Prototype 1: Inclusive Journey Planner	✓	✓		✓			
Dreamwaves	Prototype 2: Audio Mobility Assistant		✓		✓	✓		
Childfy	Prototype 3: Carpooling for commuters		✓	✓	✓			
Hoop								
B2ride	Prototype 4: Mobility & transport poverty consulting & services				✓		✓	
Mobito	Prototype 5: Data Analytic Platform	✓	✓	✓	✓	✓	✓	✓
Lamiloo	Prototype 6: Delivery of Goods		✓				✓	
Neobility								
Nemi	Prototype 7: Multisided platform for shared services						✓	✓
Tandem								

It is now time to bring these, and other, promising products into the EU-wide market, raising the accessibility and mobility of EU citizens, particularly, of those most unfortunate that still face the hardships of transport poverty.

**The prototype of business models that these startups have developed also depict transferability and scalability potential.**



To understand the varied potential they entail, a transferability exercise to several EU regions was undertaken. The methodological tool that allowed such exercise involved the use of prototypes – i.e., conceptualisations – of business models.

In parallel, the project analysed the potential scalability of these prototypes – the prototypes refer to plausible mobility products in distinct business domains. This analyse is synthesised in the seven thematic sheets presented below.

We hope these thematic sheets inspire prospective entrepreneurs, policy makers and other agents finding the most suitable and promising business models for solving their mobility and transport poverty cases.

DRAFT

## 6.2 Transferability and scalability fact sheets per business model



### Prototype 1 – Inclusive Journey Planner

#### Business Model

#### Value Proposition:

*Reduces digital exclusion by allowing people with specific needs to easily interact with the platform.  
Make it easier for people fulfilling their daily mobility needs.  
Helping customers' passengers avoiding time wasting whilst having a better mobility experience.  
Improve communication with passengers.*

#### Customers (relevant HiReach Vulnerable Social Groups):

*Elderly people,  
Migrants and ethnic minorities,  
Children and young people.*

#### Key Partners:

*Local Transport and Mobility Operators.  
Retailers and other vendors.  
Transport Authorities*

#### Scalability Potential:



Low

High

**Main strength:** Global trend that makes public authorities particularly sensible to cooperate with MaaS platforms that accommodate the needs of the disabled.

**Main weakness:** data on accessibility features for the disabled is scarce and not uniform.

The marginal costs of acquiring information are relevant and a viable business model might require the participation and funding of public parties. A relatively slow path to scalability is expected unless the wildcard of crowdsourcing can be effectively played.

#### Transferability Potential:



Low

High

**Key Barriers:** Conflict between key stakeholders due to diverging material interests and expectation of redistributive losses

**Key Drivers:** New potentials offered by technology


— As a result of diverging material interests, coupled with the existence of a high share of elderly people with low IT savviness in the study areas, the potential for transferability is not high. Nonetheless, owing to its inclusive features, ideal marketplaces can be found, especially in peripheral EU regions, such as Buzau (RO) or Guarda (PT), where no advanced multimodal travel planners are in place.

#### Representative Startups:

##### Early Stage

City MaaS 

##### Growing

9292 

##### Mature

Moovit 

## Prototype 2 – Audio Mobility Assistant

### Business Model

#### Value Proposition:

Promotes autonomy and independence of people with disabilities.  
Increases the convenience, safety & security, and comfort of multimodal journeys.  
Allows to walk a route without the need to interpret complicated instructions or look at a map.  
Easily find out which public transport to take, be directed at doors, and be warned when to get off.

#### Customers (relevant HiReach Vulnerable Social Groups):

People with Reduced Mobility, particularly visually impaired people  
Elderly people that may have physical and cognitive limitations.  
Migrants that do not know the local transport system and/or the region.

#### Key Partners:

Blind and visually impaired associations.  
Local public and NGO organisations working with any of the customer segments.  
Local Public Authorities.

#### Scalability Potential:



**Main strength:** The nature of the problem and corresponding solution are universal

**Main weakness:** It is likely that crowdsourcing of data from users will be involved in the future.

Once audio navigation based on camera environmental sensing and AI based object recognition is developed to a satisfying quality, this business model is very highly scalable.

#### Transferability Potential:



**Key Barriers:** Relative isolation of the BM and lack of exchange with other measures

**Key Drivers:** Presence of an inclusive mobility agenda or vision

Envisaged as one of the business models developed in the HSL with larger scope for transferability. It could prosper in such contrasting places as Buzau (RO) and Luxembourg, although the replicability would benefit from installation in cities with accurate street view models. The presence of inclusive transport policies facilitate the transferability of the BM, which however must deal with positional disadvantages and overcome the relative isolation of the measure, by bundling with other supportive actions (e.g. MaaS schemes).

#### Representative Startups:

##### Early Stage

Dreamwaves 

##### Growing

GoOV 

##### Mature

ViaOpta Nav 

## Prototype 3 – Carpooling for commuters

### Business Model

#### Value Proposition:

Make it easier for people fulfilling their daily mobility needs.  
Reducing the burden of caretakers.  
Joining a community of shared values, where citizens can share rides and get to meet new people.  
Reduce mobility emissions by leaving cars at home.

#### Customers (relevant HiReach Vulnerable Social Groups):

B2C: the customers are either the passengers or the caretakers (e.g.: parents).  
B2B2C: the customers are the organisations that offer the service to the employees or customers.

#### Key Partners:

Local organisations – such as Hospital, Clinics, Schools.  
Local Public Authorities.

#### Scalability Potential:



**Main strength:** The solution is always software based. Children's mobility poses undoubtedly a significant problem to parents.

**Main weakness:** The business has network effects, which nonetheless operate mostly at local level and not at global level.

All the scalability criteria match a fairly high scalable business type, especially under the B2C business model.

#### Transferability Potential:



**Key Barriers:** Impeding cultural circumstances and lifestyle patterns

**Key Drivers:** Facilitating laws, rules, regulations and their application

This BM has an average transferability potential, leveraged by the absence of significant laws or rules which could raise obstacles for implementation. Indeed, the carpooling market is open. Impeding cultural circumstances and lifestyle patterns is however a typical barrier to carpooling schemes across Europe, where there is lack of confidence to safely share the vehicles.

#### Representative Startups:

##### Early Stage

ChldFy 

##### Growing

Hoop 

##### Mature

Boleias.net 

## Prototype 4 – Mobility & transport poverty consulting & services

### Business Model

#### Value Proposition:

Onboarding services for customers including analysis of commuting route to work location.  
Operating services for customers to operate the ridesharing/van-pooling software for them.  
Knowledge about multiple behaviour changing techniques, such as mobility experience days, parking management, fleet management, seasonal rewards.

#### Customers (relevant HiReach Vulnerable Social Groups):

People with Reduced Mobility.  
People living in rural and deprived areas.

#### Key Partners:

Local/national consulting & service companies that could make the bridge with local companies.  
Local representatives to conduct commercial activity.

#### Transferability Potential:



**Key Barriers:** Impeding administrative structures, procedures and routines

**Key Drivers:** Presence of an inclusive mobility agenda or vision

This is the business model from the HSL that entails lower replicability potential to areas suffering from mobility poverty. Administrative structures, procedures and routines are regarded as the key barrier impeding the smooth penetration of this business segment. It can be explained by the low number of big employers in the target regions. Hence, more industrialised areas are the ideal target markets for this BM, due to the possibility to support sustainable employee mobility with this consulting-like business model.

#### Representative Startups:

##### Early Stage

B2Ride 

##### Growing

RideAmigos 

##### Mature

Gate21 

## Prototype 5 – Data Analytics Platform

### Value Proposition:

*Enabling businesses and cities to leverage data, make data-driven decisions and improve their mobility.  
Integration of data from vendors in a standardised way.*

### Business Model

#### Customers (relevant HiReach Vulnerable Social Groups):

*All.*

#### Key Partners:

*Transport and mobility operators, such as public and private transport companies, new mobility operators (e.g.: scooter, car sharing, etc.).  
Local public authorities (e.g: data coming from traffic sensors, etc.).  
Virtually, any entity that generates mobility related data.*

### Scalability Potential:



Low

High

**Main strength:** Globally differentiating value proposition

**Main weakness:** Minor marginal cost advantages are expected and the repeatability of solutions is limited due to the need of customisation to the requirements of the clients.

The need and value proposition are strong and widely recognised by potential customers, but the product-market fit still needs a significant discovery process from both startups and customers which is further constrained by the complexity of the sector and the resistance to change of public bodies.

### Transferability Potential:



Low

High

**Key Barriers:** Impeding administrative structures, procedures and routines

**Key Drivers:** New potentials offered by technology

This solution help taking more informed decisions on the mobility realm or in other associated fields. The added value of this technology is recognised as high by all stakeholders involved in the present evaluation, especially because regions that suffer from transport poverty are not yet equipped with these decision-making tools. However, several obstacles arise, mainly due to traditional administrative procedures that usually hinder the introduction of innovative ways of collecting, sharing and analysing information and data.

### Representative Startups:

#### Early Stage

Mobito 

#### Growing

ViaNova 

#### Mature

OpenDataSoft 



## Prototype 6 – Delivery of Goods

### Business Model

#### Value Proposition:

Enlarge customer base by serving people that cannot go directly to the store.  
Reduce the loss selling by serving unmet demand (i.e., in case of no availability).  
Same-day delivery.  
A plannable time window delivery.

#### Customers (relevant HiReach Vulnerable Social Groups):

Elderly People,  
People with Reduced Mobility,  
People living in rural and deprived areas.

#### Key Partners:

Couriers that perform the transport,  
Local Public Authorities that may subsidise the service to help the population,  
Organisations that may sponsor the service as part of their social responsibility strategy.

#### Scalability Potential:



Low

High

**Main strength:** this is an essentially repeatable solution.

**Main weakness:** At a country level, the sales process is repeatable. Across countries there are significant differences in terms of legislation and industry structure which must be understood.

The repeatability of the value proposition and solution, and strong network effects, enables scalability, while diminishing variable costs outside each site are limited and the legislation and structure of the market varies per country. This type of solution is likely to have dominant players at a city or country level.

#### Transferability Potential:



Low

High

**Key Barriers:** Conflict between key stakeholders due to diverging material interests and expectation of redistributive losses

**Key Drivers:** Likely high interest from end users; good understanding of user requirements

In line with the scalability analysis, it was found that this solution was designed taking into consideration the user requirements of clients from the same country where the business model was designed for. As such, the business model is regarded as mostly site-specific. Moreover, this business model might come across with conflicts between key stakeholders, as a result of diverging material interests, which is expectable as the BM owner need to interplay with multiple actors.

#### Representative Startups:

##### Early Stage

Neobility 

##### Growing

Lamiloo 

##### Mature

Otzii 

## Prototype 7 – Multisided platform for shared services

### Business Model

#### Value Proposition:

Provision of reliable transport in the form of a demand-responsive transport service.  
Passengers are offered shorter travel times and higher frequency than regular PT services.  
Improving existing public transport lines with very little demand which are very difficult to sustain, and reach out more effectively and efficiently to low-density areas.

#### Customers (relevant HiReach Vulnerable Social Groups):

Low income and unemployed people,  
People living in rural and deprived areas.

#### Key Partners:

Local transport companies..  
Local Public Authorities.

#### Scalability Potential:



**Main strength:** the problem of transport scarcity and high per-passenger costs is relevant in any low-density area.

**Main weakness:** purchase processes are often long and tend to require an intense local commercial presence.

This BM has a strong value proposition. However, the introduction of demand-responsive transport in low-density areas remains to be highly dependent on the policy and procurement processes of local public authorities. Scalability can be expected, but with a slow speed of adoption and some market fragmentation.

#### Transferability Potential:



**Key Barriers:** Impeding administrative structures, procedures and routines

**Key Drivers:** Presence of an inclusive mobility agenda or vision

Findings suggest that this is the business model with highest value proposition for both the market of the study areas and other deprived settings around Europe. The main drivers that facilitate the replicability of this market segment is the presence of a progressive mobility agenda from the transport regulators. The main barrier for implementation lies in the impending administrative routines that usually create obstacles to the share use of local resources and to the organisation of transport schemes with higher levels of flexibility.

#### Representative Startups:

##### Early Stage

Nemi 

##### Growing

Tandem 

##### Mature

Shotl 

## 6.3 Recommendations for entrepreneurs and investors

The project deliverable D3.4 - Drivers and barriers of organisational frameworks aimed at delivering innovative mobility options (Chiffi 2019) identified 4 key recommendations for entrepreneurs and investors. In this respect, the analysis conducted to assess the transferability and the scalability of the HiReach business models, allows us to extend the recommendations into 7, further broken down as follows:

- **Awareness raising: recognising that transport poverty is not a market niche,**
- **Focus in areas with a strong and public agenda for inclusive transport,**
- **Adopt country managers,**
- **Pursue combined transport solutions,**
- **Look for additional funding and revenue streams,**
- **Compete or collaborate for innovative public transport and inclusive mobility services, using user-centric and mobility-as-a-service approaches,**
- **Make use of open data.**

### 1. Awareness raising: recognising that transport poverty is not a market niche

The new recommendations allow the startups to realise that to successfully grow in the transport poverty they should realise first that enhancements required for the benefit of disable persons favour also those who do not suffer from any transport impairment (Rebstock 2017). As such, the preparation and adaptation of transport solutions to vulnerable groups of users is not a market niche but rather a precondition to make the services 100% full accessible to the overall population.

### 2. Focus in areas with a strong and public agenda for inclusive transport

Secondly, when deciding to move to other settings, a key aspect that startups should be very attentive at is to look at regional policies. Findings from the transferability analysis had pointed out to the fact that being part of the local vision is the main facilitating trigger for a new business model to succeed. Startups wishing to embrace new challenges are called to build on this lesson learnt and investigate the openness of the target regions and market to inclusive transport solutions.

### 3. Adopt country managers

Thirdly, another element that maximises the chances of success is to understand the market needs very well. This will require, in most cases, local commercial representatives with a good knowledge of the field. Indeed, cultural differences still play a relevant part in the replicability process, which should not be minimised, being pointed out by the study regions as simultaneously one of the main barriers and drivers for transferability. Startups wishing to embrace new challenges in different countries or regions need, thus, to adopt country managers which could bridge the communication and cultural gap and coordinate a smooth market entrance.

#### **4. Pursue combined transport solutions**

Fourthly, entrepreneurs and investors are encouraged to develop services that are modular, are likely to be upscaled and combine different target groups. Linked with this recommendation, it should be noted that research and development of case studies has made clear that initiatives funded by a combination of public bodies are more likely to survive and thrive.

#### **5. Look for additional funding and revenue streams**

Fifthly, the transferability analysis has shown that there are some Member States where funding opportunities are scarcer (see the case of Romania) than others (as it is the case of Luxembourg). Funding opportunities available are abundant. Not only from private investors, business angels and business incubators. In Deliverable 4.3 also it was also outlined that the EC have been granting increased funding instruments to support the engagement of startups. All in all, what is important to retain is the need to create synergies between funding, so as to diminish the risk entailed in the overall investment.

#### **6. Compete or collaborate for innovative public transport and inclusive mobility services, using user-centric and mobility-as-a-service approaches**

Sixthly, as the market is opening to competitive tender for contract services, due to the end of the transition period of EU Regulation 1370/2007 on public transport and public service obligation, entrepreneurs and investors are encouraged to step in and try to leverage public transport services with their assets and (user-centric) ideas through partnerships and cooperation with transport companies and transport authorities.

#### **7. Make use of open data**

Finally, it was noted that EU data sharing policies, such as the Open Data Directive<sup>21</sup> or the Commission Delegated Regulation on real-time-traffic and multimodal travel information<sup>22</sup>, will allow a full range of transport services. To this respect, it is important to mention that HiReach has conducted desk research on open source software to assist startups and advise them in all technological matters required for building up their MVP. This effort is publicly available in the project website<sup>23</sup>. In addition, the project partners have also developed specific APIs that were not available in the market before and that were based on concrete startups needs<sup>24</sup>, the most prominent of which has been API on crowdedness and machine learning prediction.

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<sup>21</sup> Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information.

<sup>22</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R1926>

<sup>23</sup> <https://hireach-project.eu/open-software-tools-apis>

<sup>24</sup> <https://hireach-project.eu/content/hireach-innovative-software-mobility-services>

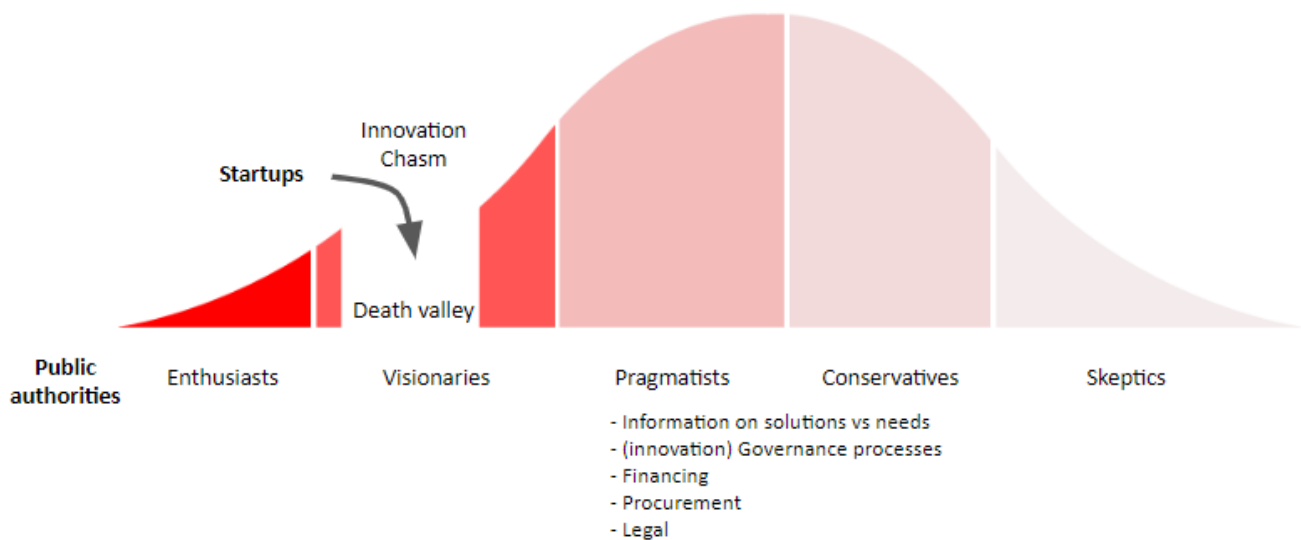
## 6.4 What's next?

Following the experience of HiReach project in setting up the HiReach Startup Lab, including the interactions with many acceleration programme organizations, the close following of the participating startups challenges, the project consortium's knowledge on the sector and the startup innovation industry, and feedback from investors, this section offers a **proposal for a further systematic European program to improve the innovation in the field of mobility for all by an effective matching and coordination of intersecting challenges between public authorities and entrepreneurs.**

### 6.4.1 Context: the innovation chasm for mobility for all innovation

The popularized *innovation chasm theory*<sup>25</sup> observes that there is a major difficulty to pass from the early adopter's step of a product (the enthusiasts and visionaries) to the early majority (the pragmatists). This fact is particularly true for mobility innovation with cities/regions as a customer or partner. Often startups manage to offer a specific service to one local authority pursuing a specific opportunity (triggered by a group of enthusiasts in the authority). As their customer is happy, the start-up founders believe themselves to have found a valuable and scalable solution, but then fail to mainstream it to other authorities, ending up in innovation Death Valley.

**Figure 10: The innovation chasm in the context of peripheric mobility**



To accelerate innovation, several city-based programmes or hackatons have arisen in cities around Europe in the last few years. City-based programmes working with startups with already developed products typically allow startups to present and work their solutions with

<sup>25</sup>Moore, G. A. (1991). Crossing the chasm – marketing a selling high-tech products to mainstream customers.

the city and other local stakeholders, and then follow an open innovation approach to further build the solutions, leading to pilots.

**It is necessary to build on startup acceleration and open innovation approaches, designing programmes that tackle the challenges of mobility innovation to groups in greater need and public sector involvement.**

### 6.4.2 Public sector innovation challenges

To remove the barriers to mobility innovation and fast-track solutions, the following challenges should be overcome:

- **Challenge 1: Public authority mobility departments struggle with innovation management:** they face multiple needs, intricate decision-making processes and legal and finance barriers; consequently, they tend to be slow adopting new solutions due to the complex nature of public body governance and particularly the urban mobility field. A new encompassing need that arises in the context of fast mobility change is the adoption of proper innovation management practises. Unless this issue is tackled, it remains very difficult to overcome the resistance to innovation. Cities and other public authorities need to tackle this challenge on three fronts:
  1. Knowledge on existing new solutions for peripheric mobility, for different contexts and needs
  2. Improving internal innovation management processes
  3. Capacity building on sustainable financing options and business models
- **Challenge 2: Start-ups are unprepared to deal with the public authority governance processes;** to sell an innovative solution to a city has at least as much to do with navigating the governance of the institution as with offering a viable mobility product. Start-ups need specialised support to cope with the city governance reality. A key challenge in the existing city-based open innovation programmes is managing a proper matchmaking between the needs of cities and the offer of start-ups. Often, start-ups leave programmes without a meaningful cooperation with the host city, and the city does not in practice benefit from the start-ups.
- **Challenge 3: The small scale of start-up city matching programmes;** with a single city host, the chance that each start-up is able to match the specifics of that city within the time period of the programme is low. The only way to improve this is to multiply the number of matching possibilities, thus a European scale programme involving multiple cities shall largely increase the odds of appropriate city-start-up matches.

### 6.4.3 Proposal for design of open innovation and acceleration programme at EU scale addressing mobility for all

#### Inspiration

We draw inspiration on two types of innovation initiatives: city-based open innovation programmes and topic specific startup acceleration programmes:

- Acceleration programmes for startups, already a standard in Europe, incubate startups under development and give them various tools to support that development during a period of 3 to 6 months; at the end of the programme, startups normally present their evolved solutions to investors. In recent years many



acceleration programmes have been created to address specific verticals, like the **HiReach Startup Lab**.

- City-based open innovation programmes are led by a city or another relevant local stakeholder and their purpose is to match start-ups with the needs of the programme host(s), develop solutions based on the startups offers, and create pilots to test the approach. Examples include Smart City Hub (Berlin), Smart Open Lisbon, Mobility Lab (Netherlands), IdeaLondon Future Mobility Programme, Connected City (Turin), along with corporate driven programmes like FIAT Smart Cities Global, Porsche Accelerator by Conector, GROW Mobility, Techstars Smart Mobility, Moove Lab, Startup Autobhan, etc.

**Table 16: Example of city-based open mobility innovation**

Smart Open Lisboa Mobility
 <p><u>SOL Mobility</u> is a 6-month open innovation programme for start-ups to develop pilot innovative solutions that can be applied in addressing mobility challenges in the city of Lisbon. The selected solutions have a one-time opportunity to get support and direct access to the city authority and key corporates for developing pilots. It features two stages:</p> <p>Stage 1 – 1-week bootcamp where start-ups discuss their solution with the city institutions and corporations to find potential matching interests</p> <p>Stage 2 – Each start-up matches with a host to develop the solution and a pilot</p> <p>Smart Open Lisboa debuted in 2016 and currently is in its 5<sup>th</sup> edition.</p>

## A programme concept and structure

To address the challenges above, we propose that an EU acceleration programme focused on mobility for all would take inspiration on the above programmes, with critical points of adaptation:

- Focus on a vertical field with common challenges – mobility for all
- An innovation *acceleration scheme* for public authorities, supporting them in a structured way to overcome their innovation barriers.
- An open call for local public authorities.
- A capacity building focus placed on the critical barriers to overcome the innovation Death Valley in this specific sector: public innovation management and governance, alternative financing and related business models, understanding of available solutions for peripheral mobility contexts.

- Having a European *scale*, with multiple participating cities/regions, increasing the probability of successful matches between public authorities and start-ups.
- Learning and trust building through bilateral experience exchange between public authorities.

Additionally, the programme could make its resources and services available on-demand to other public authorities and startups to need to address specific problems or fill knowledge gaps.

Extending the approach of the HiReach Startup Lab, the Programme would be run on an annual or bi-annual basis, an example of the structuring of the programme would include the following stages and actions:

DRAFT

	Short description	Main features and interrelations
Open calls for public authorities and startups	Open Calls for cities and start-ups and other innovative solution suppliers	Selection criteria will underpin commitment to execution and wide geographical and economic reach
Capacity building	A capacity building scheme for cities and start-ups on innovation governance, financing and innovative peripheric mobility solutions	The capacity building is key in preparing cities and start-ups for a successful matching and solution development
Problem and challenge definition, innovation plan	A through problem and challenge definition process by public authorities, including development of an innovation plan covering all governance aspects	This is a 3-month coaching process designed to overcome internal barriers to innovation
Matchmaking between startups and cities	A curated iterative matchmaking process between start-ups and peri-urban/rural areas leading to a selection of cases for deployment of innovations	The matchmaking process will be open and iterative, with physical and online interactions, to maximize probability of enduring matches
Public authority interchanges	A public authority to public authority interaction and staff exchange procedure based on the specified problems and solutions	For public authority cases where the learning from leader cities is crucial, matches between authorities will also be promoted
Solutions development and pilots	A solution development and pilot execution stage. A prize can be attributed at the end.	With continuous support by the programme coaches supporting the overcoming of critical innovation barriers in the context of peripheric mobility
Connections with investors	The connection of the programme participants with investors fitting the programme concept, generating opportunities for follow-up investments	The investors will be involved from the outset of the programme and meet the start-ups and cities at the matchmaking and Challenge award events, plus online

## 6.4.4 Process, value and results for each participating stakeholder

### **Local public authorities**

Public authorities interested in adopting innovative solutions to their mobility problems would apply for participation in the programme through an open call. The programme value for public authorities would be about having access to training and coaching and a curated access to start-ups with relevant solutions for them, with the final result of successfully adopting one or several innovations that solve concrete local needs.

The initial challenge for the participants would be to maturely define their problems, covering not only requirements but also the institutional governance barriers to the uptake of existing solutions. A practical Bootcamp for public authorities would kick-start this innovation management exercise, giving them information and tools to tackle innovation barriers while supporting their development. In the subsequent months the participants would develop the problem definition and an innovation management plan, working internally in their organisation and accessing the support of expert coaches from the Programme.

In a matchmaking event, the public authority participants would get to know all the start-ups in the Programme and have one-to-one meetings with pre-matched start-ups. Some public authorities and start-ups would agree to continue cooperating in the next stage towards a solution development and piloting. During the solution development phase, which is a combined effort of the authority with the start-up, the Programme supplies expert support through coaching.

For some public authorities, it might be concluded that an appropriate complementary or alternative match is with another public authority that is a leader in the innovation fields in question. For those cases, the Programme would also promote matches between pairs of local authorities for exchange and support between them, with the possibility for staff exchanges.

If the solution development is successful and leads to an effective cooperation, the public authority and start-up would proceed to the implementation of a pilot or definite take-up of the solution.

### **Startups and other innovative solution providers**

The programme would offer multiple value elements to scale-up startups: the opportunity to be in (curated) connection with several potential customers or partners (public authorities), a showcase to investors with a fit to this type of start-up, and the help to overcome crucial non-technical barriers of commercializing innovations with the public sector in the context of peripheric areas.

The participation of the selected startups would start with training on tackling the decision-making drivers and processes of public authorities in the field of peripheric mobility. This training would prepare them for the interaction with their potential customers or partners. The start-up would present their solution for public authorities in the Matchmaking event and start conversations with the matched entities.

During the solution development stage, the startup would have a key opportunity to understand not only the technical fit and required adjustments of their product, but also the process of decision making of the authority, while getting access to coaching from the

programme. For the startups that proceed to the pilot stage, the programme would offer them modest financial support. Both at the matchmaking event and the Challenge at the end of the programme, the startups would have the chance to show themselves to investors backed by the validation offered by the programme.

### **Investors**

Investors are interested in getting early access to startups that represent a good outlook. For this, it is crucial for them to get early and validated information about startups. The investors (with a proper fit with the type of investment and sector of the participating startups) should be involved from an early stage of the programme for consultation on their interests and views on the type of business models that are ripe for investment at that current time. Since investors like to assess startups by following their progress, it is appropriate to connect the investors to the startups and their customers/partners (public authorities) at two different points of the programme, the matchmaking phase and the final presentation.

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## Annex: Hireach Startup Lab business models and value chains

### 1. B2Ride (DE)

#### B2Ride Business Model

##### Key Partners

##### Key suppliers

- Schwarz as provider of the ridesharing/van-pooling software and 24/7 user hotline, 2 years contract, pay as you grow license model.
- Ninebot-Segway as supplier of e-scooters for rewards and mobility guarantee (<https://shop.segway.com/de-de/110/-ninebot-kickscooter-max-g30d>).
- Gocycle as supplier of electric folding bikes for rewards and mobility guarantee (<https://gocycle.com/de/models/gocycle-gx-gxi/>).
- tern as provider of folding bikes for rewards and mobility guarantee (<https://www.ternbicycles.com/de/bikes/471/byb-s11>).
- warmonbikes as suppliers of bikepogies for winter reward products (<https://warmonbikes.com/?lang=en>).
- fatboy as suppliers of e.g. lamzacs for summer reward products (<https://www.fatboy.com/es-en/lamzac>).

##### Key resources and activities

- Software is white-label and developed and maintained by its provider.
- Software is hosted by its provider, including user hotline.

##### Key partners

- DB Regio Bus as partner for B2B MaaS solution.
- DB Connect as partner for B2B mobility budget solution.
- VEOMO as partner for B2B MaaS displays.
- ChargeX as partner for smart charging stations for electric vehicles.
- Private University Seeburg Castle as partner to conduct user surveys.

##### Motivation for partnerships

- Software license model is commercially very attractive.
- Software is best available B2B ridesharing/van-pooling software on the market.
- DB Regio Bus, DB connect and VEOMO are strong partners to provide added value with MaaS and mobility budget solution. They offer B2Ride solution to their customers.
- ChargeX has great solutions for charging stations.
- Private University Seeburg Castle is a partner to develop new services within research projects. They offer B2Ride solution to their clients.

##### Key Activities

##### Value proposition

- Onboarding services for customers including project management, software configuration, analysis of commuting route to work location, workshops and training on site and online to deploy the ridesharing/van-pooling solution and unique piloting phase to achieve the critical mass of users e.g. (vulnerable) employees without or with disabilities.

- Operating services for customers to operate the ridesharing/van-pooling software for them, including weekly/monthly reporting of ridesharing/van-pooling KPIs, gamification (lotteries, leader board, rewards), communication to users and special services for vulnerable people (matching people in wheelchairs to people with adequate cars and the willingness to transport them and van-pooling services).
- Value added services and products, such as user workshops and mobility experience days, parking management, fleet management, van-pooling services, smart charging of electric vehicles, seasonal rewards.

**Distribution channels**

- Direct sales: identify and acquire companies.
- Direct sales: identify and respond to invitations to tender from authorities.
- Indirect sales: align marketing strategy and provide marketing material to partners e.g. DB Regio Bus and DB connect for indirect sales.
- Reach customers at conferences and on social media channels.

**Customer relationships**

- B2Ride provide weekly/monthly recommendations on activities to increase usage of ridesharing/van-pooling solution and align with the customer on new activities, new seasonal rewards, new services like parking management, fleet management, charging of electric vehicles.

**Revenue streams**

- Create offers
- Create and negotiate contracts.
- Respond to invitations to tender and negotiate contracts.
- Create invoices and check incoming payments.

**Key Resources****Value proposition**

- Mobility manager to lead customer projects, analyse individual needs of the customer, propose activities and services for an optimal ridesharing/van-pooling solution for the customer.
- Ridesharing application specialist to configure the software, run lotteries, evaluate leader boards and send communication to users.
- Service specialist to integrate partner services into the overall customer solution.
- Ridesharing trainer for conducting workshops and mobility days.
- Data analyst to analyse reports and recommend appropriate activities.

**Distribution channels**

- Salesman (hunter) to acquire customers and to take care of them on a regular basis (farmer).
- Ridesharing specialist to respond to tenders.
- Marketing specialist to align marketing strategy, create marketing material and present at conferences.

**Customer relationships**

- Mobility manager to discuss ridesharing/van-pooling reports with customers and align with the customer on a regular (monthly) basis or as requested by the customer.

**Revenue streams**

- Salesman to create offers, create and commercially negotiate contracts.
- Ridesharing specialist to respond to tenders and to commercially negotiate contracts.
- Lawyers to legally negotiate contracts.

- Back office administration and accounting specialist to create customer invoices, to pay supplier invoices, to maintain the bank account.
- Back office tax specialist to deal with invoices for countries outside Germany.
- Back office controlling specialist to ensure revenue stream.

## Value Propositions

### **‘Deliver to your customer’ (employers = authorities and companies and their employees)**

- A ridesharing/van-pooling solution increases the usage/efficiency of vehicles and is thereby reducing the cost of parking space and travel and at the same time avoiding emissions and traffic.
- Improving employee experience by increasing alternative mobility options in rural areas
- Strengthening corporate social responsibility, including (vulnerable) people with disabilities.
- Increasing the attractiveness of the company location in rural areas with transport poverty e.g. no or weak public transport.
- Making a positive contribution to the community and improve communication between employees traveling together in a car or van.
- Promoting networking among employees with and without disabilities.

### **Which customer's problems are you helping to solve?**

- Employers and employees have high cost of parking and business travel and at the same time producing massive emissions e.g. CO2 and traffic.
- Employers have to get sustainable in all areas e.g. energy as well as mobility.
- (Vulnerable) employees in rural areas suffer from transport poverty or are frustrated by expensive rides of public transport and have stress driving their cars through traffic jams and searching for an available parking space.

### **Which bundles of products and services are you offering to each Customer Segment?**

- Onboarding and operating services and software for a business ridesharing and van-pooling solution with special features for vulnerable people.
- Parking space reservation for driver's fleet management, van-pooling, MaaS services and departure displays, mobility budget and mobility guarantee for passengers, smart charging stations for electric vehicles, mobility experience days, electric/non electric folding bikes and seasonal rewards.
- Value added services for vulnerable people working e.g. in organisations employing people with disabilities, hospitals, authorities, production companies.

### **Which customer needs are you satisfying?**

- Lack of resource and expertise in mobility management, shared mobility, ridesharing and van-pooling, transport for (vulnerable) people without or with disabilities.

## Customer Relationships

### **Type of relationship per Customer Segments to establish and maintain**

- B2Ride 7 customers, 3 authorities and 4 companies, expect a long-term relationship with a certain degree of proximity during onboarding (first presentation, kick-off event, registration workshop, user training on site and online).
- During the annual operating phase, a regular (monthly) virtual contact is adequate to discuss proposed activities to increase usage of ridesharing/van-pooling solution e.g. customer internal marketing campaigns, organisation of mobility days, ridesharing challenges e.g. which department collects most points during a certain period of time.

### **Relationships established**

- With all 6 new customers that B2Ride already had kick-off events which during the onboarding phase.
- With the first customer in Austria, already in operating phase, B2Ride has regular E-Mail contact, sending monthly reports and recommendations to increase number of users. Additionally, virtual MS Teams conference calls to discuss and determine the next steps to restart after COVID-19 ridesharing ban and to increase the number of users of the deployed ridesharing solution, e.g. new rewards for permanent usage and collecting points above a specific number, new services like fleet management, integration of public transport departures into the existing displays showing the ridesharing departures.

#### **Integrated with the rest of our Business Model**

- B2Ride is improving their customer relationship during the monthly conference calls on reporting results, which are included into the subscription fee per user, paid for by the employer.
- B2Ride meets the customers (employers and employees = users) during on site workshops and online trainings, which are paid for €/day or €/hour by the customer.

#### **Cost of relationship**

- Only during onboarding there are cost for business trips to the customer location, but paid for by the client. There is a considerable margin on consultancy, workshops and trainings.

### **Channels**

#### **Channels to reach customer segments**

- To raise awareness (word of mouth): - Direct sales to new customers in the neighbourhood of existing clients - Indirect sales via partners like DB Regio Bus, Privatuniversität Schloss Seeburg, DB connect, Schwarz and mobility consuler - Visiting conferences, giving talks <https://b2ride.org/ueber-uns>, social media <https://www.linkedin.com/company/b2ride> and chambers of commerce and industry IHK to gain new customer contacts.
- To evaluate B2Ride value proposition: - providing testimonials, media clippings and customer references, standard B2B contract, individual B2B offer.

#### **Reach customers fast**

- Direct sales and social media: 5 customers.
- Indirect sales: one customer via Privatuniversität Schloss Seeburg and one customer via DB Regio Bus.

#### **Channel integration**

- B2Ride has contacted all chambers of commerce and industry IHK in Germany.
- During onboarding of clients, they provide B2Ride details to companies in their neighbourhood to increase their ridesharing community. After a first contact B2Ride can quickly provide a first offer.
- Partners with strong sales teams are very valuable to B2Ride, in order to identify new customers and approach them with an offer which allows to integrate services e.g. ridesharing as a specific service within a MaaS solution.

#### **Best working channels**

- Indirect sales via partners works very well

#### **Most efficient channels**

- Indirect sales via partners and social media is very efficient.

#### **Integrating with customer routines**

- Companies hold themselves accountable for sustainability, corporate social responsibility and cost reductions. That is where B2Ride wants to get in an offer value.

- The relevant managers don't have the required resources and expertise. And that's B2Ride strength.

## Customer Segments

### Creating value for

- Authorities with around 50 to several thousand (vulnerable) employees.
- Companies with around 50 to several thousand (vulnerable) employees.
- Organisations with (vulnerable) employees without or with disabilities.
- Partnerships of authorities, companies and further organisations in rural areas who want together as partners to improve the current situation of transport poverty, sustainability or corporate social responsibility.

### Most important customers

- Authorities are a great enabler to become the regional solution provider and to acquire their partners as additional customers.
- Companies with several thousand employees provide a high margin.

## Cost Structure

### Most important costs

- Salaries for mobility manager and CEO (sales, ridesharing applications, ridesharing services, marketing, data analysis, law, tax, administration, accounting, controlling).
- Licenses of ridesharing/van-pooling software.
- Business trips to customers.
- Participation at conferences and trade shows.
- Only IT infrastructure (lightweight ultrabooks, smartphones) as employees work from home.

### Most expensive key resources

- Mobility manager and in future CEO (= only shareholder today without salary).

### Most expensive key activities

- Onboarding services are very resource intensive and provided by mobility managers. There is a big opportunity to reduce cost by digitalisation with Business Process Management & Robotic Process Automation tools.

## Revenue Streams

### Which value customers are really willing to pay?

- Operating services are paid with a subscription fee per user, as annual ticket.
- Licenses for ridesharing/van-pooling software are paid per license per user.
- Onboarding services are paid per hour, typically around 60-80h.
- Workshops and trainings are paid per day or per hour.
- Hardware is paid per product, e.g. rewards, displays, charging stations.

### Pay currently for

- Subscription fee per user per year - Operating services - Software licenses.
- Onboarding services, which typically take around 60-80h.
- Workshops and trainings.
- Hardware, e.g. rewards.

### How customers currently pay

- After customers have negotiated a B2B contract and an individual offer, they send an order. Then they receive an invoice and pay within 30 days.



### How customers prefer to pay

- B2B customers want to have a B2B contract and to receive an offer, before they order, receive and pay the invoice.

### Revenue stream % of overall revenues

- Subscription fee for operating services around 50-70%.
- Onboarding services 30-50%.

### Narrative of B2RIDE Business Model

Typical **customers** of B2RIDE are authorities and companies with around 50 to several thousand employees, including vulnerable people with or without disabilities and living in rural areas.

These employers have the **problem** of high cost of parking and travel and at the same time of producing massive emissions and traffic. They are forced to get more sustainable. Their (vulnerable) employees living in rural areas suffer from transport poverty or expensive public transport or are stressed by driving their cars through traffic jams or searching for an available parking space.

B2RIDE **delivers** a ridesharing/van-pooling solution to increase the usage of vehicles immediately reducing cost of parking and travel and avoiding emissions and traffic. Corporate social responsibility will be strengthened by including (vulnerable) people with disabilities. B2Ride solution increases the attractiveness of companies in rural areas with transport poverty and improves the travel experience of employees living in rural areas. This solution helps promoting networking among people with and without disabilities.

B2Ride **offer** onboarding services including project management, software configuration and training to successfully deploy mobility solutions, achieving the critical mass of users. The operating services create great **value** for customers. B2Ride administrates the software and provide regular reports on ridesharing KPIs, gamification, communication to users and special services for vulnerable people. Additionally, the startup offer value added services and products, such as parking space reservation for driver's, fleet management, van-pooling, MaaS services and departure displays, mobility budget and mobility guarantee for passengers, smart charging for electric vehicles, mobility experience days and seasonal rewards.

B2Ride customers are **paying** operating services and software licenses with a subscription fee per user. Onboarding services are paid per hour and workshops are paid per day. Hardware is paid per product. New customers are **reached** with direct sales and indirect sales via partners. New customer contacts are gathered using social media and after giving talks during conferences. There is where B2Ride starts establishing and maintaining a long-term **relationship** with customers.

Key **partners and suppliers** are regional and long-haul public transport operators as partner for B2B MaaS solutions, providers of B2B mobility budget solutions, vendors of smart charging stations, B2B MaaS displays and of smart parking management solutions. The ridesharing/van-pooling software is provided and maintained by the key supplier. B2Ride key **resources** are the mobility managers, ridesharing application specialist and data analyst. The most important **costs** are the software licenses and the salaries.



## B2Ride Prototype of Business Model

### Key Partners

#### Key partners

- Public transport operators as partner for B2B MaaS solution, for B2B MaaS displays and for B2B mobility budget solution.
- Regional energy suppliers as partner for smart charging stations for electric vehicles.
- Universities as partner to conduct user surveys.

#### Key suppliers

- Existing provider of a global ridesharing/van-pooling software 2 years contract, pay as you grow license model.
- Supplier of e-scooters for rewards and mobility guarantee.
- Supplier of electric folding bikes and folding bikes for rewards and mobility guarantee.
- Suppliers of seasonal reward products.

#### Key resources

- Software is white-label and developed and maintained by its provider.

#### Key activities

- Software is hosted by its provider, including user hotline.

#### Motivation for partnerships

- Software license model is commercially very attractive.
- Software is best available B2B ridesharing/van-pooling software on the market.
- Strong partners to provide added value with MaaS and mobility budget solutions. They offer B2Ride solution to their customers.
- Attractive solutions for smart charging stations.

### Key Activities

#### Value proposition

- Onboarding services for customers including project management, software configuration, analysis of commuting route to work location, workshops and training on site and online to deploy the ridesharing/van-pooling solution and unique piloting phase to achieve the critical mass of users e.g. (vulnerable) employees without or with disabilities.
- Operating services for customers to operate the ridesharing/van-pooling software for them, including weekly/monthly reporting of ridesharing/van-pooling KPIs, gamification (lotteries, leader board, rewards), communication to users and special services for vulnerable people (matching people in wheelchairs to people with adequate cars and the willingness to transport them and van-pooling services).
- Value added services and products, such as user workshops and mobility experience days, parking management, fleet management, van-pooling services, smart charging of electric vehicles, seasonal rewards.

#### Distribution channels

- Direct sales: identify and acquire companies.
- Direct sales: identify and respond to invitations to tender from authorities.
- Indirect sales: align marketing strategy and provide marketing material to partners for indirect sales.
- Reach customers at conferences and on social media channels

#### Customer relationships

- B2Ride provide weekly/monthly recommendations on activities to increase usage of ridesharing/van-pooling solution and align with the customer on new activities, new seasonal rewards, new services like parking management, fleet management, charging of electric vehicles.

#### **Revenue streams**

- Create offers.
- Create and negotiate contracts.
- Respond to invitations to tender and negotiate contracts.
- Create invoices and check incoming payments.

#### **Key Resources**

##### **Value proposition**

- Mobility manager to lead customer projects, analyse individual needs of the customer, propose activities and services for an optimal ridesharing/van-pooling solution for the customer.
- Ridesharing application specialist to configure the software, run lotteries, evaluate leader boards and send communication to users.
- Service specialist to integrate partner services into the overall customer solution.
- Ridesharing trainer for conducting workshops and mobility days.
- Data analyst to analyse reports and recommend appropriate activities.

##### **Distribution channels**

- Salesman (hunter) to acquire customers and to take care of them on a regular basis (farmer).
- Ridesharing specialist to respond to tenders.
- Marketing specialist to align marketing strategy, create marketing material and present at conferences.

##### **Customer relationships**

- Mobility manager to discuss ridesharing/van-pooling reports with customers and align with the customer on a regular (monthly) basis or as requested by the customer.

##### **Revenue streams**

- Salesman to create offers, create and commercially negotiate contracts.
- Ridesharing specialist to respond to tenders and to commercially negotiate contracts.
- Lawyers to legally negotiate contracts.
- Back office administration and accounting specialist to create customer invoices, to pay supplier invoices, to maintain the bank account.
- Back office tax specialist to deal with invoices for countries outside Germany.
- Back office controlling specialist to ensure revenue stream.

#### **Value Propositions**

##### **‘Deliver to your customer – employers’**

- A ridesharing/van-pooling solution increases the usage/efficiency of vehicles and is thereby reducing the cost of parking space and travel and at the same time avoiding emissions and traffic.
- Improving employee experience by increasing alternative mobility options in rural areas.
- Strengthening corporate social responsibility, including (vulnerable) people with disabilities.
- Increasing the attractiveness of the company location in rural areas with transport poverty.

- Making a positive contribution to the community and improve communication between employees traveling together in a car or van.
- Promoting networking among employees with and without disabilities.

#### **Which customer's problems are you helping to solve?**

- Employers have high cost of parking and business travel and at the same time producing massive emissions e.g. CO2 and traffic.
- Employers have to get sustainable in all areas e.g. energy as well as mobility.
- (Vulnerable) employees in rural areas suffer from transport poverty or are frustrated by expensive rides of public transport, stress driving their cars through traffic jams and searching for an available parking space.

#### **Which bundles of products and services B2Ride offers to each Customer Segment?**

- Onboarding and operating services and software for a business ridesharing and van-pooling solution with special features for vulnerable people.
- Parking space reservation for driver's fleet management, van-pooling, MaaS services and departure displays, mobility budget and mobility guarantee for passengers, smart charging stations for electric vehicles, mobility experience days, electric/non electric folding bikes and seasonal rewards.
- Value added services for vulnerable people working e.g. in organisations employing people with disabilities, hospitals, authorities, production companies.

#### **Which customer needs are you satisfying?**

- Lack of resource and expertise in mobility management, shared mobility, ridesharing and van-pooling, transport for (vulnerable) people without or with disabilities

### **Customer relationships**

#### **Type of relationship with Customer Segments**

- Customers expect a long-term relationship with a certain degree of proximity during onboarding (first presentation, kick-off event, registration workshop, user training on site and online).
- During the annual operating phase, a regular (monthly) virtual contact is needed to discuss proposed activities, in order to increase usage of ridesharing/van-pooling solution e.g. customer internal marketing campaigns, organisation of mobility days, ridesharing challenges e.g. which department collects most points during a certain period of time.

#### **Relationships established**

- Already at kick-off events during the onboarding phase before upcoming events for registration workshops and user trainings.
- Email contact in the operating phase, sending monthly reports and recommendations to increase number of users. Additionally, virtual conference calls e.g. Google Meet, MS Teams to discuss and determine the next step to increase the number of users of the deployed ridesharing solution, e.g. new rewards for permanent usage and collecting points above a specific number, new services like fleet management, integration of public transport departures into the existing displays showing the ridesharing departures

#### **Business Model integration**

- B2Ride is improving their customer relationship during the monthly conference calls on reporting results, which are included into the subscription fee per user, paid for by the employer.
- B2Ride meets the customers (employers and employees/users) during on site workshops and online trainings, which are paid for €/day or €/hour by the customer.

#### **Cost of relationship**

- Only during onboarding there are cost for business trips to the customer location, but paid for by the client. There is a considerable margin on consultancy, workshops and trainings.

## Channels

### Channels to reach customer segments

- To raise awareness (word of mouth): - Direct sales to new customers in the neighbourhood of existing clients - Indirect sales via partners - Visiting conferences, giving talks, social media and chambers of commerce and industry IHK to gain new customer contacts.
- To evaluate the value proposition: - providing testimonials, media clippings and customer references, standard B2B contract, individual B2B offer.

### Reach customers fast

- Direct sales, social media and invited talks / visiting conferences
- Indirect sales

### Channel integration

- B2Ride has contacted all chambers of commerce and industry IHK in Germany.
- During onboarding of clients, they provide B2Ride details to companies in their neighbourhood to increase their ridesharing community. After a first contact B2Ride can quickly provide a first offer.
- Partners with strong sales teams are very valuable to B2Ride, in order to identify new customers and approach them with an offer which allows to integrate services e.g. ridesharing as a specific service within a MaaS solution.

### Best working channels

- Indirect sales via partners and social media work very well.

### Most efficient channels

- Indirect sales via partners and social media is very efficient.

### Integrating with customer routines

- Companies hold themselves accountable for sustainability, corporate social responsibility and cost reductions. That is where B2Ride wants to get in an offer value.
- The relevant managers don't have the required resources and expertise. And that's B2Ride strength.

## Customer Segments

### Creating value for

- Authorities with around 50 to several thousand (vulnerable) employees.
- Companies with around 50 to several thousand (vulnerable) employees.
- Organisations with (vulnerable) employees without or with disabilities.
- Partnerships of authorities, companies and further organizations in a rural area who want together as partners improve the current situation of transport poverty, sustainability or corporate social responsibility

### Most important customers

- Authorities are a great enabler to become the regional solution provider and to acquire their partners as additional customers.
- Companies with several thousand employees provide a high margin.

## Cost Structure

### Most important costs

- Licenses of ridesharing/van-pooling software.

- Salaries for mobility manager, CEO, salesman, ridesharing applications specialist, ridesharing services specialist, marketing specialist, data analysis specialist, law specialist, tax specialist, administration, accounting and controlling specialist).
- Business trips to customers.
- Participation at conferences and trade shows.
- Only IT infrastructure (lightweight ultrabooks, smartphones) as employees work from home.

#### **Most expensive key resources**

- Software licenses.
- Mobility managers and CEO.

#### **Most expensive key activities**

- Onboarding services are very resource intensive and provided by mobility managers. There is a big opportunity to reduce cost by digitalisation with Business Process Management & Robotic Process Automation tools.

### **Revenue Streams**

#### **Which value customers are really willing to pay?**

- Operating services are paid with a subscription fee per user, as annual ticket.
- Software licenses are paid with a subscription fee per user.
- Onboarding services are paid per hour.
- Workshops and trainings are paid per day or per hour.
- Hardware is paid per product, e.g. rewards, displays, charging stations.

#### **Pay currently for**

- Subscription fee per user per year - Operating services - Software licenses.
- Onboarding services, with typically take around 60-80h.
- Workshops and trainings.
- Hardware, e.g. rewards.

#### **How customers currently pay**

- After customers have negotiated a B2B contract and an individual offer, they send an order. Then they receive an invoice and pay within 30 days.

#### **How customers prefer to pay**

- B2B customers want to have a B2B contract and to receive an offer, before they order, receive and pay the invoice.

#### **Revenue stream % of overall revenues**

- Subscription fee for operating services around 50-70%.
- Onboarding services 30-50%.

### **B2Ride Value Chain**

#### **Primary Activities**

##### **Inbound Logistics**

The ridesharing/van-pooling software from B2Ride key supplier is a white-label cloud service. There is no inbound logistics.

Today the only hardware products B2Ride receives, stores and distributes are small numbers of bikepogies <https://warmonbikes.com/?lang=en> and lamzacs <https://www.fatboy.com/es-en/lamzac> as seasonal rewards for users. The suppliers send the products after order. After receiving the products there is a simple quantity and quality

check before they get stored (actually without cost). They are pre-packed for direct distribution to end users.

### **Operations and Production**

Processes to operate the ridesharing/van-pooling software for customers:

- Administration of the software.
- Weekly/monthly reporting of ridesharing/van-pooling KPIs.
- Conducting lotteries and leader board challenges.
- Providing winners and rewards.
- Communication to users.

Production of software and hardware products is outsourced.

### **Outbound logistics**

White-label App downloaded from Google Play and Apple Store. There is no outbound logistics involved.

The hardware products are pre-packed by the vendor for direct distribution to end users. When a user has been selected as winner of a gamification campaign, the reward products are taken out of the storage, labelled with the user's private address or the company address and sent via DHL.

### **Marketing and Sales**

Marketing:

- Creating B2RIDE flyers, B2RIDE presentations, B2RIDE shirts, providing testimonials, media clippings and customer references.
- Social media on LinkedIn and Xing.
- Homepage with call to action and information dedicated to customer segments: hospitals, authorities, companies with (vulnerable) employees without or with disabilities.
- Invited talks and visiting conferences.
- Marketing campaigns together with existing customers to gain their neighbouring companies as customers to participate in the ridesharing initiative.
- Via chambers of commerce and industry IHK in Germany.

Sales:

- Direct sales to identify and acquire customers and to create and negotiate B2B contracts and individual B2B offers.
- Direct sales to identify and respond to invitations to tender from authorities.
- Indirect sales to align marketing strategy and provide marketing material to partners.
- Indirect sales via partners with integrated services e.g. ridesharing as a specific service within a partner's MaaS solution.

### **Service**

User (employees) experience and customer (employer) satisfaction is key to the business and fundamental to increase number of users and customer loyalty. This will lead to increased revenue and profitability. Therefore B2Ride provides to their customers high quality onboarding services for employees including project management, software configuration, analysis of commuting route to work location, workshops and training on site and online to deploy the ridesharing/van-pooling solution and unique piloting phase. This allows to achieve the critical mass of users e.g. employees with or without disabilities.

- Special services for vulnerable people.
- Van-pooling services.
- Parking management services.
- Fleet vehicle services.



Value added services and products like user workshops and mobility experience days, parking management, fleet management, smart charging of electric vehicles, seasonal rewards.

## **Support Activities**

### **Firm infrastructure**

There are no company offices as all B2RIDE team members work distributed per region from home and meet during customer projects.

The only IT infrastructure are lightweight ultrabooks, smartphones and Google Suite Services. The hosting infrastructure is outsourced to a software provider, as the software is a white-label cloud service.

### **Human resource management**

The B2RIDE team is using regular virtual sessions to upskill its employees on all topics around products, processes, contracts, offers, marketing material, partners, suppliers, software features. HR tasks like payment of B2RIDE employees are outsourced to a tax law firm.

### **Software development**

B2Ride primarily uses a service provider organisation, using white-label software. They've also outsourced software development to suppliers.

### **Legal department**

The startup is dealing with large companies and authorities and needs to create and negotiate comprehensive B2B contracts. Additionally, B2Ride has to create and maintain contracts with suppliers and partners. As such, the legal department is regarded as more important than procurement. These tasks were currently outsourced to a law office.

## 2. Childfy (ES)

### Childfy Business Model

#### Key Partners

Childfy key partners are schools, academia, clubs or any type of centre that organise specific activities for kids (5-14 years old). They help to promote our service among families and build the necessary trust required for the service. Therefore, they act as an acquisition customer channel while Childfy improve the accessibility of the centres that are part of the Childfy platform. The startups is working with private and public schools (big size) in urban and rural areas (small/medium size).

During the validation exercise it was discovered that families trust in other families and that the "club approach" is preferred by many since they already have some kind of information about the other families. In addition to this, each centre has a specific account and associated page where they can organise events and promote their activities. These events can be oriented for kids or families. Childfy families will benefit from being part of the community and discover events for their kids.

Parents associations will also be a key partner to promote the use of the platform among the families interested in Childfy.

#### Key Activities

One of the key activities is creating the connection with schools, academia and clubs since they are one of the main acquisition channels for families. This requires one-to-one meetings with all the centres in order to promote Childfy platform and invite families to join the community. Offline and online marketing activities are key to make the necessary promotion of the platform among families.

Specific marketing activities directly for families are also carried out in order to promote the platform, however the "centres approach" is working better because of the trust. Online marketing campaigns in the main social media channel, including Facebook, Instagram and Google Adwords which will be used to promote the platform in different cities (Malaga, Seville, Madrid, Barcelona, Valencia).

The online content strategy necessary to generate community trust will include: events with educational experts to discuss topics like achieving a work-life balance in our society, remote working, children education, blog posts, podcast and the possibility of having an educational specific Youtube channel on sustainable solutions.

Offline marketing activities are currently limited due to Covid-19 restrictions, however community events for Childfy families are foreseen to enlarge the network of families and discuss Childfy mission and vision, as well as organize competitions, mobility challenges, fundraising activities for families, etc.

#### Key Resources

The key resources needed for the value proposition are the following:

- Early adopters: families that use and try the app during the pilot phase.
- Network of schools, academia, sport clubs provided by the hosting institution that will serve as a point of contact with many families.
- Human resources: multidisciplinary team with the necessary skills to carry out the project including:

- CTO with extensive experience as a full-stack developer and experienced entrepreneur leading with the product development.
- UX/UI designer expert responsible for the graphical design and application workflow.
- CMO responsible for the marketing department and ensuring the organisation of online/offline activities to promote the service.
- Customer service providing technical support for families when interacting with the platform.
- Business development department ensuring customer acquisition via schools, academia and clubs.

### Value Propositions

Families have problems in achieving work life balance and opportunities for children such as attending to specific extracurricular activities, sport clubs etc are limited due to their lack of time and availability. Childfy created a community of families based on their centres where they children go to. Families don't necessarily know each other so Childfy acts as a connector. Some families might be already sharing trips but many feel that they are constantly asking for a "favour" and they will be willing to pay for the service using a platform.

Childfy brings transparency into the system so families can easily track their kids and get notified before and after the trip takes place. Time is a problem for families so the optimisation routing system combined with the real-time location based notification system is also an enormous added value for families.

### Customer relationships

It is important to establish a close relationship among the families that are part of Childfy platform by generating a very active community with the support of Childfy team. Families will be supported by the team via a specific channel provided for this purpose as part of the app. Families will be invited to rate the service and provide comments and feedback for families offering the service and the ones using it.

Families offering rides will be highlighted in the platform since they will be making the dreams of the kids come true. A trip to an extracurricular activity can be a great opportunity for our kids to develop a new skill and for personal growth. Childfy will make the experience of travelling with kids even more pleasant because they will be able to travel with their friends in the same car. Childfy will use social media channels to generate and share content that are useful for families as well as basic tools to make their life easier. All these costs will be included as marketing associated expenses and will take part of the initial investment since the community aspect is key for the project.

### Channels

Childfy is active in several social media channels including: Facebook, LinkedIn, Twitter and Instagram. They are reaching their followers organically, especially on Facebook and Instagram where families are more active. An online marketing campaign is foreseen for the official product launch in September 2020.

Thanks to the HiReach pilot host, Childfy managed to reach the educational centers, building more trust and confidence towards the brand, and acting as a connector with many families interested in Childfy services. This is currently the main customer acquisition channel together with the parent's associations. These two channels are the ones that are working best at the moment and most cost-efficient.

In the case of private academies and clubs, they are being contacted directly. Another channel that is currently being used is the information form available in the Childfy website that allows for families to join the Childfy community.

### Customer Segments

There are several profiles of families with kids between 5- 16 years old interested in the service:

- Families in which both parents are working and have limited time and little support from family (grandparents etc.).
- They are willing to pay for the service and looking for a solution.
- Separated/divorce families (70% of families with kids in Spain). Parents usually live far from each other and there is lot of travelling involved: to the school, extracurricular activities etc.
- Single parent families.
- Unemployed mothers / fathers that are looking for a job.
- Relatively young mothers or fathers who are continuing their studies (and the schedule may coincide).
- Families in which their children go to different educational centers or to extracurricular activities that are not matching in time and place.

The other customer segment includes the B2B profile: schools, academies and clubs with more than 100 registered kids.

### Cost Structure

The fixed cost includes the IT infrastructure required to run the platform in terms of hardware and software. GraphHopper is currently used for routing and directions with the associated fixed cost depending on the number of requests. An alternative open source solution will be adopted depending on the number of users. All the development is currently done in house by a small team of developers based on open source solutions.

Marketing costs online/offline to promote the platform are one of the key resources and activities in the project.

The insurance cost will be charged to the families as part of the 15% Commission.

Legal advice cost is also foreseen to make sure that the business fulfils all the data protection regulations and the legal aspects of the business are well covered.

### Revenue Streams

Two sources of revenue streams have been considered and explored: from one side families willing to pay for the service and schools/clubs/academia. **Families** are willing to pay for the platform to connect with other families but overall, for all the functionalities that bring trust and transparency in the process such as the real-time location-based notification system for keeping track of their kids and optimising their travelling times. Payments will be done directly via the platform and a 15% commission will be taken for each transaction.

**Schools/clubs/academia** will pay a monthly subscription fee based on the number of registered families. They will be able to organise and promote events and activities via the platform and get visibility among the families.

### Narrative of Childfy

Childfy offers a carpooling solution for families contributing to achieving work life balance and creating a network of families. Childfy provide a location based real-time notification

system ensuring route optimisation and providing all the functionalities for parents to keep track of their children at any moment. The business model is based on a B2C with families paying a fee for each trip and B2B schools and clubs pay a monthly subscription fee based on the number of users.

## Childfy Prototype of Business Model

### Key Partners

Childfy key partners are schools, academia, clubs or any type of centre that organise specific activities for kids (5-14 years old). They help to promote the service among families and build the necessary trust required. Therefore, they act as an acquisition customer channel relevant for improving the accessibility of the centres that are part of the Childfy platform.

During the validation exercise it was found that families trust way more other families and that the "club approach" is preferred by many since they already have some kind of information about the other families.

In addition to this, each centre has a specific account and associated page where they can organise events and promote their activities. These events can be oriented for kids or families. Childfy families will benefit from being part of the community and discover events for their kids.

Parents associations will also be a key partner to promote the use of the platform among the families interested in Childfy.

### Key Activities

One of the key activities that Childfy is currently undertaking is creating the connection with schools, academia and clubs since they are one of the main acquisition channels for families. This requires one-to-one meetings with all the centres in order to promote the platform and invite families to join the community. Offline and online marketing activities are key to make the necessary promotion of the platform among families.

Specific marketing activities directly for families are also carried out in order to promote the platform. However the "centres approach" works better because of the trust. Online marketing campaigns in Childfy social media channels such as Facebook, Instagram and Google Adwords are relevant to promote the platform.

The online content strategy to generate community includes: events with educational experts to discuss topics like achieving a work-life balance in society, remote working, children education, blog posts, podcast and the possibility of having an educational specific Youtube channel on sustainable solutions.

Offline marketing activities are currently limited due to Covid-19 restrictions, however community events for Childfy families are foreseen to enlarge the network of families and discuss Childfy mission and vision, as well as organise competitions, mobility challenges, fundraising activities for families, etc. Traditional media communication channels such as

local TVs, newspapers, radio will be also used to promote the services. In addition to this, Childfy will promote its solution using bus advertisement among others.

## Key Resources

The key resources needed for maximising value proposition are the following:

- Network of schools, academia, sport clubs provided by the hosting institution that serve as a point of contact with many families;
- Human resources: Childfy has a multidisciplinary team with the necessary skills to carry out the project including:
  - CTO with extensive experience as a full-stack developer and experienced entrepreneur leading with the product development.
  - UX/UI designer expert responsible for the graphical design and application workflow.
  - CMO responsible for the marketing department and ensuring the organisation of online/offline activities to promote the service.
  - Customer service providing technical support for families when interacting with the platform.
  - Business development department ensuring customer acquisition via schools, academia and clubs.

## Value Propositions

Families have problems in achieving work life balance and opportunities for children such as attending to specific extracurricular activities, sport clubs etc are limited due to their lack of time and availability. Childfy created a community of families based on their centres where they children go to. Families don't necessarily know each other so Childfy acts as a connector. Some families might be already sharing trips but many feel that they are constantly asking for a "favour" and they will be willing to pay for the service using a platform.

Childfy brings transparency into the system so families can easily track their kids and get notified before and after the trip takes place. Time is a problem for families so the optimisation routing system combined with the real-time location based notification system is also an enormous added value for families.

## Customer relationships

It is important to establish a close relationship among the families that are part of Childfy platform by generating a very active community with the support of Childfy team. Families will be supported by the team via a specific channel provided for this purpose as part of the app. Families will be invited to rate the service and provide comments and feedback for families offering the service and the ones using it.

Families offering rides will be highlighted in the platform since they will be making the dreams of the kids come true. A trip to an extracurricular activity can be a great opportunity for our kids to develop a new skill and for personal growth. Childfy will make the experience of travelling with kids even more pleasant because they will be able to travel with their friends in the same car. Childfy will use social media channels to generate and share content that are useful for families as well as basic tools to make their life easier. All these costs will be



included as marketing associated expenses and will take part of the initial investment since the community aspect is key for the project.

## Channels

Childfy is active in several social media channels including: Facebook, LinkedIn, Twitter and Instagram. This allows to reach private educational centers and academies/clubs directly using a network of Childfy business developers, as part of a commercial strategy. Childfy website will be available in different languages with information about how private schools and academies can join Childfy network and for families to download and use the app. Public schools and parents' associations will be contacted via the education administration authority in the respective country.

## Customer Segments

There are several profiles of families with kids between 5- 16 years old interested in the service:

- Families in which both parents are working and have limited time and little support from family (grandparents etc.).
- They are willing to pay for the service and looking for a solution.
- Separated/divorce families. Parents usually live far from each other and there is lots of travelling involved: to the school, extracurricular activities etc.
- Single parent families.
- Unemployed mothers / fathers that are looking for a job.
- Relatively young mothers or fathers who are continuing their studies (and the schedule may coincide).
- Families in which their children go to different educational centers or to extracurricular activities that are not matching in time and place.

The other customer segment includes the B2B profile: schools, academies and clubs with more than 100 registered kids.

## Cost Structure

The fixed cost includes the IT infrastructure required to run the platform in terms of hardware and software. GraphHopper is currently used for routing and directions with the associated fixed cost depending on the number of requests. An alternative open source solution will be adopted depending on the number of users. All the development is currently done in-house by a small team of developers based on open source solutions.

Marketing costs online/offline to promote the platform are one of the key resources and activities in the project.

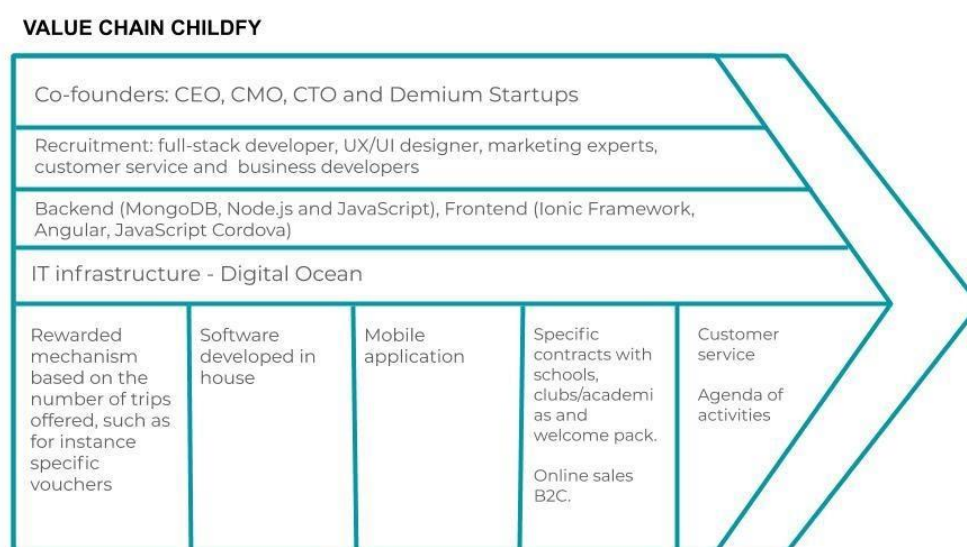
The insurance cost will be charged to the families as part of the 15% Commission.

## Revenue Streams

Two sources of revenue streams have been considered and explored: from one side families willing to pay for the service and schools/clubs/academia. **Families** are willing to pay for the platform to connect with other families but overall, for all the functionalities that bring trust and transparency in the process such as the real-time location-based notification system for keeping track of their kids and optimising their travelling times. Payments will be done directly via the platform and a 15% commission will be taken for each transaction.

**Schools/clubs/academia** will pay a monthly subscription fee based on the number of registered families. They will be able to organise and promote events and activities via the platform and get visibility among the families.

## Childfy Value Chain



## Primary Activities

### Inbound Logistics

Families offering the trips will be paid via the platform and encouraged to continue using it thanks to a rewarded mechanism based on the number of trips offered, such as for instance specific vouchers to enjoy family activities and special discounts.

### Production

The software is developed in house based on open source technologies and it is 100% property of Childfy. The UX/UI design has been also carried out by Childfy members using Figma software and constantly updated based on the feedback provided by users. Childfy uses agile development methods for developing the platform and have an internal ticketing system for the team to report and keep track of all development the issues.

### Outbound logistics

The product consists of a mobile application that will be available for both iOS and Android operating systems. There is a company account in Google Play Store and Apple Store in order to be able to publish and promote the app so the final users can download it from their phones. The description of the app in the stores will be curated by a professional copywriter. App Store optimisation actions will be often carried out in order to rank higher in the store.

## Marketing and Sales

A partnership with schools/clubs/academies will be made through the signature of a specific contract with them in order to allow them to be included in the app (price will be based on the number of users and pay on a monthly basis). Each partner will receive a welcome package with specific information about Childfy service and a vinyl sticker. This will serve as a proof that the centre is supporting families to achieve a work life balance while promoting a sustainable transport service. Online sales will take place in the case of peer to peer or families offering/requesting Childfy services.

## Service

A specific customer service will be provided for technical support for families when interacting with the platform via email. In addition to this, an extra service providing news and activities will be offered via Childfy thanks to a partnership with La Diversiva, an online magazine for families in Malaga Province with more than 50.000 monthly visitors: <https://ladiversiva.com/>.

## Support Activities

### Firm infrastructure

Childfy has a very flat structure with a distributed team with most of the team members working from Malaga city. There are 4 co-founders with different roles: CEO, CTO, CMO and Demium Startups SL <https://demium.com/> (one of the biggest incubations programme in Europe). The office is located in Malaga city centre provided by Demium.

### Human resource management

Talented staff is recruited using LinkedIn platform and based on avast network of experts and connections all over Europe. The selection process consists on different steps: an online or face to face interview and if successful a probationary period up to 3 months is offered to the candidate. In addition to the CEO, CTO and CMO roles that are also co-founders of the company, there are the following staff categories:

- Developers with extensive experience in product development.
- Professional copywriter to produce professional engagement quality content to educate, inform, persuade and then sell.
- UX/UI designer expert responsible for the graphical design and application workflow.
- Marketing experts responsible for the marketing department and ensuring the organization of online/offline activities to promote the service.
- Customer service providing technical support for families when interacting with Childfy platform.
- Business developers ensuring customer acquisition via schools, academia and clubs.

### Technology development

An entire UX/UI was developed based on the feedback from families using Figma software. A mobile app was developed for Android and iOS. The backend is based on MongoDB, Express and Node.js with the main coding language in JavaScript. The frontend is a hybrid mobile app for iOS and Android developed using Ionic Framework, Angular, JavaScript Cordova and a PWA (Progressive Web App). The API used for routing and optimisation is based on an open source solution called GraphHopper identified by the Polytechnical University of Bucharest as part of HiReach project: <https://hireach-project.eu/api/273>.

## Procurement

Childfy does not procure services with the exception of the IT infrastructure which is Digital Ocean, providing the cloud scalable infrastructure to run the platform and an internal

software project management tool. There are two types of contract with the clients: B2C pay as you go model and B2B with a monthly subscription based on the number of users.

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### 3. Hoop (ES)

#### Hoop Business Model

##### Key Partners

Hoop's main key partners are companies, Universities, Hospitals, City Halls and other mobility platforms (carsharing, motorbikesharing, mobility aggregators).

The key suppliers are merchandising retailers, and the coworking space.

The key resource Hoop acquires from partners is users. Hoop builds a win-win relationship where the startup help them to achieve their emission saving goals and increase their employees' wellbeing. In exchange, Hoop reaches its final customer.

The key activity that the startup partners perform is fostering carpooling within their stakeholders. The motivation for partnerships is to reach large segments of potential users through a straight and efficient channel, at a low cost.

##### Key Activities

Hoop's main activities for delivering its value proposition are:

- Product development: App development.
- Business development: b2b relations.
- Marketing: marketing and communication for successful launchings.
- Sustainability management: monthly reporting for b2b partners.

Hoop's main activities for our distribution channels are:

- Business development: to reach the final user through partnerships with large corporates and institutions.
- Marketing: reaching the final user through b2b and b2c channels, engaging them.

Hoop's main activities for revenue streams are:

- User acquisition.
- User recurrency.

##### Key Resources

Key resources for the value proposition are:

- Native mobile app for Android and iOS.
- Network of partnerships.
- Marketing campaigns.
- Financial resources.

Key resources for the distribution channels are:

- Monthly sustainability reports measuring impact of our initiative to each of our partners
- Financial resources for marketing campaigns.
- Sales team.

Key resources for the customer relations are:

- Sales team
- Customer support team
- Marketing campaigns

Key resources for the revenue streams are:

- App payments platform

## Value Propositions

Hoop allows people to drastically change their mobility experience by joining a community of shared values, where citizens can share rides and get to meet new people, save money, gain time and reduce mobility emissions by leaving their cars at home.

The company offers B2B2C partners monthly sustainability reports to measure the positive impact of their initiative and provides them with all the communication strategy and materials so they don't have to make any communication effort.

## Customer relationships

- B2B partners: monthly reporting, personalised communication plan for launching and fostering carpooling within its stakeholders.
- B2C users: follow up, motivation, support when something goes wrong.

## Channels

- Companies, universities, city halls, hospitals' channels: email, physical presence, webinars, videos.
- B2C: Email marketing, social media marketing, media, word of mouth and referral (this one is the most cost-effective and works better, followed by b2b channels).

## Customer Segments

- B2C: Citizens living in cities and their peripheries with/without a car, who need to move around the metropolitan area and are familiar with other shared economy platforms.
- B2B: Corporates, Universities, Municipalities, Shopping Centers, etc. They attract large numbers of people on a daily basis and need to reduce their mobility emissions as well as improving their stakeholders' wellbeing.

## Cost Structure

- Salaries 70%
- Marketing 20%
- Office rental 10%

## Revenue Streams

The only current revenue stream is a commission per use, taking a 10% of the payment that passengers make to drivers through our app.

## Narrative of your Business Model

Hoop was born to empower people with opportunities to change their world, and decided to start by carpooling since it has a great potential to change the world and the mobility habits, from individual to collective. This is why Hoop is now a mobile app that connects people so they can share their everyday rides in the city. Hoop partners with companies, universities, city halls, and hospitals, to reach as many potential users as possible. Hoop also carry out B2C marketing campaigns to acquire users as fast as possible. All in all, the main resources are based on human talent, being 60% of the company a full-time team of software developers, and another 40% leading the business development, marketing and financial areas.



## Hoop Prototype of Business Model

### Key Partners

- When it comes to going international, key partners will be local B2B partners.
- Furthermore, it would be interested to partner with other mobility operators, transportation or automobile companies, and selling a white labelled solution for large multinational corporations.
- The key resources to obtain from partners would be funding and user acquisition.
- Partners help to settle in new markets and grow as a company.
- Motivations for partnerships are to become first movers in the international market as well as implementing carpooling in as many cities as possible.

### Key Activities

Since Hoop plans to replicate their current model in different cities, the key activities would be the same. Hoop could be adding some new activities such as white labelling the current product, developing an API (already in process, and integrating into a mobility operators' platform).

### Key Resources

Country managers to lead international expansion and local business developers to add new partnerships, as well as customer service. Financial funds to support the expansion.

### Value Propositions

The value proposition would be the same, and for those new strategic partnerships Hoop would be adding a new strategic business into their portfolio, with a promising growth and great scalability.

### Customer relationships

These wouldn't change.

### Channels

Channels would be the same, B2B partners and B2C campaigns.

### Customer Segments

Hoop would maintain their current customer segments and add new ones such as mobility operators, automobile companies, and regional governments.

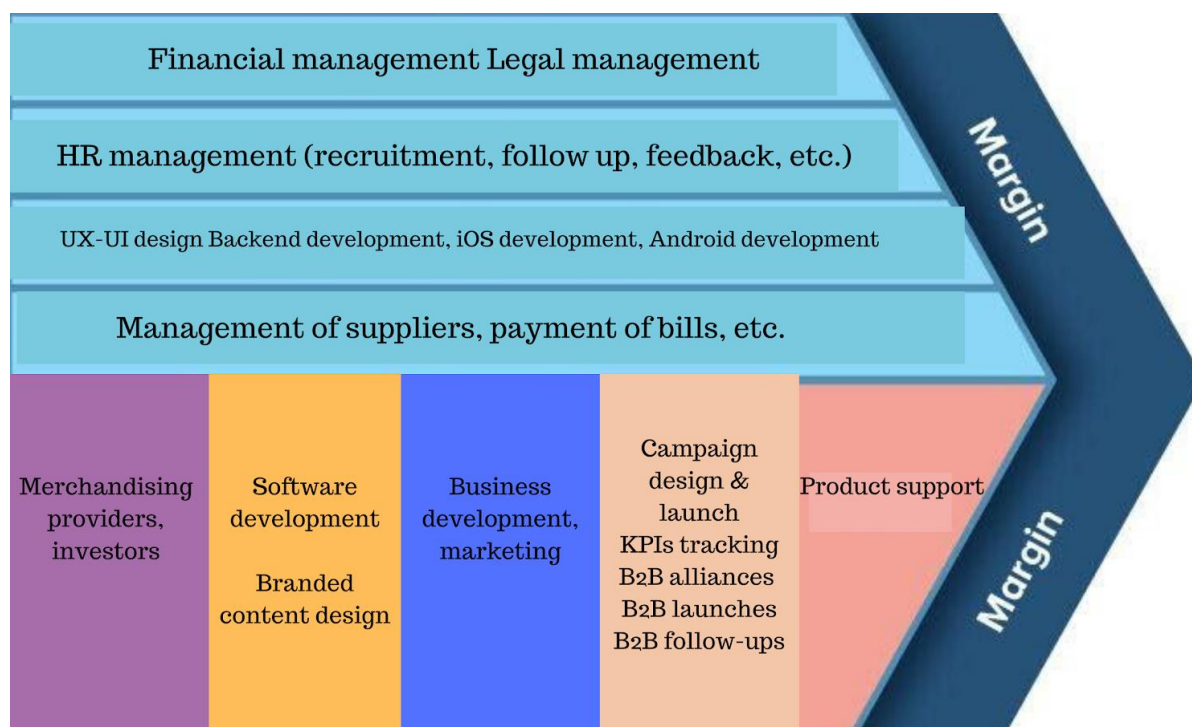
### Cost Structure

The cost structure would not really change, but it would scale to the needs of different growth stages.

### Revenue Streams

New revenue streams would come from selling a white labelled technology or from large agreements with mobility operators or automobile companies.

## Hoop Value Chain



### Primary Activities

#### Inbound Logistics

Merchandising providers, investors.

#### Production

Software development and branded content design.

#### Outbound logistics

Business development, marketing.

#### Marketing and Sales

- Campaign design & launch.
- KPIs tracking.
- B2B alliances.
- B2B launches.
- B2B follow-ups.

#### Service

Product support  
Customer support  
B2B client relations

### Support Activities

#### Firm infrastructure

Financial management and legal management.

#### Human resource management

HR management (recruitment, follow up, feedback, etc.).

**Technology development**

UX-UI design, backend development, iOS development and Android development.

**Procurement**

Management of suppliers, payment of bills, etc.

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## 4. CityMaaS (UK)

### CityMaaS Business Model

#### Key Partners

Public/Private Transport organizations:

- Transport authorities.
- Municipalities.

Vehicles operators:

- Bus/Coach: Valpi.
- Rail.
- Metro/Underground.

Supplier Providers:

- Google/open street map/trip advisor.
- Valpi/Municipal.
- Private accessibility data providers
- Outsourced Software development agency.

#### Key Activities

- Embedding deep mapping technology for Valpi in a form of API/Widget.
- Embedding CODIE – SDK for personalized digital experience for digital products of Valpi.
- CityMaaS Assist App providing data validation.

#### Key Resources

- Data Scientist.
- CityMaaS Assist App providing data validation.

#### Value Propositions

- Universal travel information platform.
- Provides personalized journey/information.
- Help digital product to be inclusive of disabled people.

#### Customer relationships

- Co-create with the specific travelers in the Porto/east Porto regions.
- Automatic service via embedded service for pilot.
- Data collection for analysis.

#### Channels

- City Municipals.
- Bus operators.

#### Customer Segments

- Bus Operators: Valpi.
- Transport operators: rails/metro/Taxi.
- City Municipals.

### Cost Structure

- Research & tech localisation (£ 10k).
- Technology maintenance (£ 2k/months).
- Sales costs (£).
- Travel/administrative cost (£ 2k).

### Revenue Streams

- Pilot revenue (12 million journey a year).
- SaaS with 3 tier pricing – monthly subscriptions (Monthly API).

### CityMaaS Prototype of Business Model

#### Key Partners

Public/Private Transport organisations:

- Transport authorities (Inclusive travel).
- Municipals (serving all citizen).

Vehicle operators – (efficient operation for better profit margin):

- Bus/Coach: e.g. Valpi.
- Rail.
- Metro/Underground.
- Taxies.

Key Supplier:

- Data providers - Mapbox/open street map/trip advisor.
- Client own database – Routes/schedules.
- Outsourced Software development.
- Microsoft (Azure).

#### Key Activities

- Produce white label bus app providing real time location/ personalised journey planning /Online ticketing & Payments with CODIE embedded.
- Target private bus companies 1st & enter procurement process with Municipals together with bus companies.
- Monthly meetings with clients for feedbacks.
- Business development in private and public transport companies.

#### Key Resources

- Data Scientist/Software Engineers/Project management/UX/UI Designer, plus tech stack to support them.
- Business development manager.
- Customer success manager.
- Funding & Resources to support the team, travel, & business activities.

#### Value Propositions

- Help client's customers to avoid time wasting/ have a better bus journey.
- Help clients to gain more customers by being inclusive and personalised.

- Communicate directly with customers.
- Help client to run the bus company efficiently by providing real time data (dashboard) & automatic online ticketing and payments.

### Customer relationships

- Monthly maintenance & commission on ticket sales.
- Project partnership to build out more unique features for clients.
- Monthly meetings/calls post deployment to ensure customer success.

### Channels

- Through Pan-EU HiReach project and its networks (most cost effective).
- Mobility conferences.
- Targeted advertising and business development.
- LinkedIn Networks.

### Customer Segments

- Bus Operators, e.g. Valpi.
- Other Transport operators: rails/metro/Taxi.
- City Municipals.

### Cost Structure

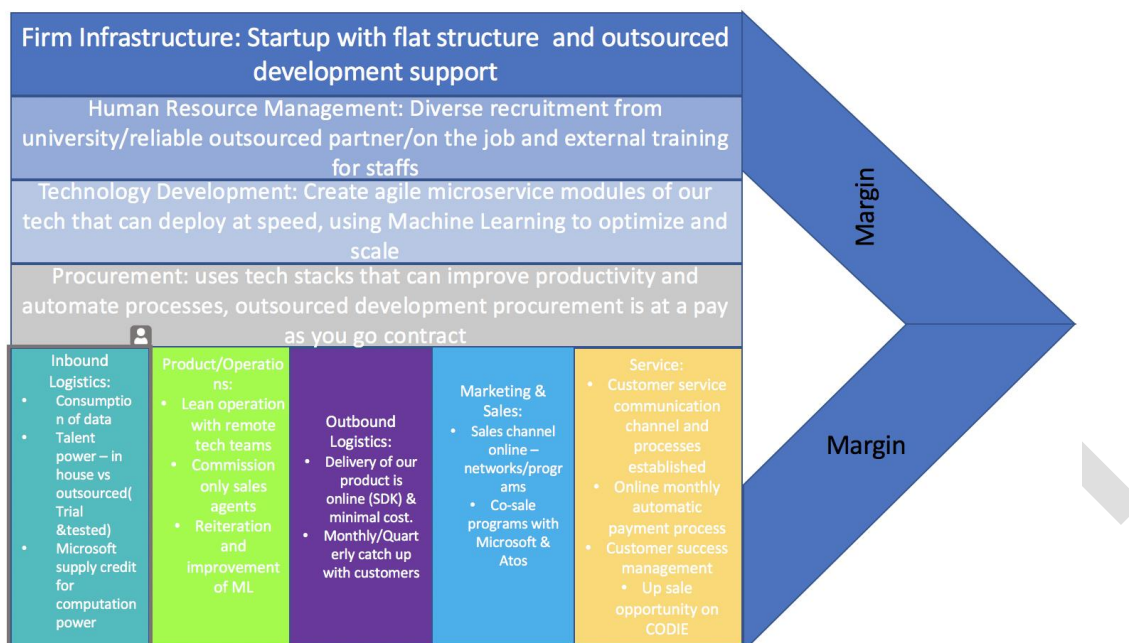
- Variable costs:
  - UX/UI Design (£1k).
  - Software development (£5- £10k/month).
  - Technology maintenance (£2k/months).
  - Project management (£5k/project).
- Fixed Costs:
  - Sales/Travel/admin cost (£4k).
  - Office & Overhead (£3k).

### Revenue Streams

- Development fees depends on the features required – (£1k - 10k / feature)
- Monthly Maintenance depends on API calls (£3k/monthly)
- Commission on the only ticketing & payments (5%) (preferred to pay)



## CityMaaS Value Chain



### Primary Activities

#### Inbound Logistics

- Well defined employee growth path.
- Great relationship with outsourced development (trial & tested).
- Consumption of data (CODIE – real time interaction data/ live locations data).
- Relationship with Microsoft who is currently providing CityMaaS thousands of credits for computation power.

#### Production/Operations

- Lean operation with remote tech teams.
- Building microservice module enable agile product and scalability.
- Commission only sales agents.
- Re-iterated and circular improvement of CityMaaS product using Machine learning due to automation.
- KPI on real time monitoring & data visualization.

#### Outbound logistics

- Delivery of the product is online via SDK & minimal cost.
- Monthly/Quarterly catch up with customers.

#### Marketing and Sales

- Sales channel online – networks/programs.
- Mobility conference – speaking opportunities in those conferences.
- Co-sale programs with Microsoft & Atos (ISV/ IS) as channel distribution of CityMaaS products.

#### Service

- Customer service communication channel and processes established.
- Online monthly automatic payment process.
- Customer success management.

- Up sales opportunity on CODIE or vice versa.

### **Support Activities**

#### **Firm infrastructure**

- Startup with flat structure & diverse talents and outsourced development support.

#### **Human resource management**

- Diverse recruitments from university/reliable outsourced partner/on the job and external training for staffs.

#### **Technology development**

- Create agile microservice modules of our tech that can deploy at speed, using Machine Learn technique to optimise and scale.

#### **Procurement**

- Use of tech stacks that can improve productivity and automate processes. Outsourced development procurement is at a pay as you go contract.

## 5. Dreamwaves (AT)

### Dreamwaves Business Model

#### Key Partners

Dreamwaves has partners in different areas: suppliers/hardware, R&D, marketing and usability research. Headset developers such as Bose and Sony are key partners both to supply the devices as well as to enable us to use headset sensors (availability and support of SDKs to interface the sensors).

The acoustics research institute (ARI) and the city of Vienna as partners for R&D. Together with the ARI, Dreamwaves develops algorithms for spatial audio rendering, specifically better individualisation of head-related transfer functions (HRTFs) which are critical for spatial audio realism. The city of Vienna provides high quality and high accuracy models of the city (both street view as well as point clouds). This enables Dreamwaves to conduct high quality research in world scale localisation within the city which is crucial for intuitive augmented reality.

Finally, the Austrian Association in support of the blind and visually impaired (Hilfsgemeinschaft - who are also Dreamwaves host) and the Austrian Institute for Technology (AIT) are the key partners for usability research. The Hilfsgemeinschaft will also support in marketing activities. The Hilfsgemeinschaft puts Dreamwaves in direct contact with users very easily and they also assist in the conduction of usability experiments. The technology experience lab at the AIT have a long-standing experience in usability studies and together with them Dreamwaves is capable of investigating users' requirements and needs and evaluate prototypes and technology.

#### Key Activities

##### Software development:

- Setting up the development infrastructure (online repositories, servers, etc) and the actual coding of the app.

##### Usability experiments:

- Conduction of experiments with users in order to understand challenges and specific needs and make sure that the product developed by Dreamwaves has the required impact.

##### R&D:

- Conduction of research in the field of computer vision, machine learning and sensor fusion to develop a better localisation algorithm. Together with the partners from ARI, Dreamwaves conducts research also on spatial audio.

##### Distribution:

- Dreamwaves app will be distributed through the app store and the web planner app will reside in a server. The app store has all the mechanisms of distribution in place so by leveraging this well-established marketplace the users will be able to easily install and pay for the app.

##### Customer relationships:

- It is very important to keep a close relationship with the customer base. The formation of a community is of high value not only to market the app but specially to educate users and as an easy platform for customer support. In the latter case, the main idea is also that the

community can help each other by solving the most important questions. Therefore, community management is one of the most important activities.

## Key Resources

To create and offer value proposition, the following resources are needed:

- Human resources to carry out R&D, for the software development, for the usability research, and for the support activities related to running the company.
- Data resources. Dreamwaves strongly rely on good mapping data, which is acquired from an external company (Mapbox). They also provide pedestrian routing services. Moreover, real-time public transport data is needed, which is also acquired from an external company (TripGo).
- IP resources are needed in order to create the augmented reality mobile application. Dreamwaves acquires this directly from Apple by means of the ARKit SDK. The terms in the SDK automatically provide licensing rights for the IP. Moreover, Dreamwaves has developed their own IP which was secured with a patent application.

To reach the market, it is also necessary:

- Human resources for community building / marketing and sales.
- Financial resources for marketing.

## Value Propositions

The main value proposition is an easy and safe navigation using audio only. The users from the target group are not able to achieve independent mobility. Dreamwaves offer them a mobile navigation app and a web planner app to help users tackle that challenge and become independent.

Each of the subgroups from the target group have the global benefit of a better mobility. Specifically (see customer segments later for reference), group a) would benefit from an easier and faster mobility doing the tasks they already do; group b) has the benefit of saving money (this group uses the taxi a lot for instance) and being better included in regular life. Possibly, this is the group which will gain access to employment as typically they are younger and the possibility to be independent will open up this possibility; group c) will have mainly the benefit of more self-confidence, more possibility of maintaining or improving health condition. They would in general be older and having the possibility for instance to go out for walks around the city can have an impact in both physical and mental health.

## Customer relationships

As mentioned in the key activities section, building a community (not only in person but through a web portal) is one of the most important ways of keeping a relationship with the customers in this business segment. A significant number of blind and visually impaired people rely on associations for help and guidance in a number of issues, from mobility training to workshops on how to use home appliances. Dreamwaves plans to build an online web portal where the community can virtually gather and help each other creating a knowledge base of questions and answers to common problems. This will also reduce costs for technical support as answers to most common problems (bug X is solved with update Y) in the portal can eliminate the need for a dedicated support.

Other than that, again the association can function as excellent physical channel to educate and help solving problems with the app, once again helping to reduce the cost.

In this regard, the startup has created relationships with association in various countries (Austria, Spain, Netherlands, Italy) in order to create a network of supportive multipliers. One very important relationship with the target group is co-creation. It is something that it has been done and will keep doing continuously, in order to develop a good relationship with the target segments and lead to a much higher quality of the product. Finally, blind and visually impaired still rely a lot on direct support. Therefore, an option in the app will allow them to provide direct support either through phone or chat with a person. As feature is costly, it will require a higher monthly fee.

## Channels

Despite common perception, a large number of blind and visually impaired people can be reached through digital platforms. Facebook for instance is an excellent channel to reach these users. The advent of the smartphone radically changed people's lives. Right now, the startup is mostly reaching people the "old fashioned" way. The association (in this case the pilot host during the HiReach acceleration programme) puts Dreamwaves in contact with their users. But this will not work everywhere as in each country people have different ways to interact with associations. In Austria for instance, there is only a small percentage of the total B&VI people in the associations. On the other hand, in Spain, the percentage is much higher. Finally, a good way to reach B&VI people is through surrogates i.e. their friends and family. Here, one can use traditional channels (such as advertisement) too. It is still unclear which channels work best and this investigation is part of Dreamwaves activities in the future.

## Customer Segments

The company target group are blind and visually impaired people of all ages, who aim for independent mobility. Within this larger group, there are three different segments: a) fully independent people who use current navigation products to assist them in their mobility; b) people that wish to be independent but do not dare to navigate on their own as they know they will get too tired or are afraid they will fail; c) people who claim they do not need to be independent because someone will help them. Each of these subgroups has their specific challenges and therefore needs. Group a) can already do everything but would greatly benefit from more precise localisation as GPS inaccuracy is a great hindrance. Additionally, a holistic solution is also required as they often have to switch between several apps while on the way. Group b) additionally needs much better user interfaces because their main reason for not being independent are difficulties using the apps and guidance cues they provide (hence our intuitive spatial audio guidance). Group c) needs additional personalised care and assistance to overcome the fear of using technology to lead an independent life. The most important requirement for this group is reliability.

## Cost Structure

The most important fixed costs are personal costs i.e. for app development, computer vision research, community building, etc. Other relevant fixed costs include server infrastructure, office and telecom and IT and development hardware.

The most important variable costs are user support and APIs used. Dreamwaves has used Mapbox for mapping and routing and, after a free tier, there will be a monthly fee proportional to number of users and number of requests per month. In the same way, TripGo,

the API used for public transport routing, has a variable cost proportional on monthly requests.

Personal costs i.e. the real cost of developing the app, are currently the most expensive fixed costs. The costs associated with maintaining customer relationships (e.g. community building) will increase, though not linearly, with the number of users.

## Revenue Streams

The important parameters that hold value in our product are **localisation accuracy** and features offered such as **ability to plan in advance**, **store favourites**, get **specialized routes (e.g. include public transports, noise free route)** or get **on/off boarding assistance**.

To generate revenue, a recurrent revenue model with different monthly subscription rates, including a free option (freemium model) will be employed. The rates depend on the services offered and these are well connected with the each of the features that hold value. Dreamwaves will offer different levels of customer support as well as different levels of localisation accuracy and object detection or other features.

More accuracy and object detection translate into more expensive subscriptions. This is in line with the customer expectation of higher costs for premium features. The initial price points will be: 1) Free for the basic navigation, 2) 5,99 Euro/month for a version with high quality accuracy corrections, and 3) 19,99 Euro/month for object detection and description and a super-premium version including direct tech support for 69,99 Euro/month.

## Narrative of Dreamwaves Business Model

Dreamwaves is developing an intuitive audio navigation system. The key value proposition of their app is that people can understand where they need to walk to, in the most natural and intuitive way, simply by following virtual sounds. There is no need to look at the map or interpret instructions. Main customers are blind and visually impaired people. The MVP was developed in a co-creation relationship with a number of people from this group. Dreamwaves plans to establish a community of users where they can easily discuss challenges with the product as well as share good stories with others. The app will be sold through the Apple Appstore. Dreamwaves will earn money with a freemium model where users can use a limited version of the product for free and pay a monthly fee for premium features. To create the value proposition, the startup will focus intensively on user research, software development and technical research in order to create a great product. The most important resources are the team members but also excellent mapping and infrastructure data is required. Most of the company's costs are related with human resources. A partnership with blind and visually impaired associations has been established, in order to have a close contact with the target group. The startup strongly believes that an intuitive navigation can have a big impact in blind and visually impaired people's lives.

## Dreamwaves Prototype of Business Model

### Key Partners

Valuable partners for a more generic use of the app are:

- Municipalities: as customers and holders of data for cities.
- MaaS companies: holders of data, ticketing services.
- Bike delivery companies: they get safer and faster rides, and Dreamwaves get their product in the hands of a lot of users.



- Shared mobility companies (e.g. eScooters): their customers get safer and easier rides, and Dreamwaves get their product in the hands of a lot of users
- Headset/hearable companies: Dreamwaves provides an app which is a great use case for their hardware. They can give in turn exposure to their customers or a share of revenues.

### Key Activities

Key activities to scale the business model to other segments are:

- Software development: carrying out integration of Dreamwaves base technology with other platforms such as eScooters, MaaS services, etc
- Problem solving: coming up with new solutions to specific customer needs
- Community creation: creating and maintaining different customer bases

### Key Resources

Both the resources needed to scale the delivery of the value proposition and the company's revenue streams do not significantly differ from the ones Dreamwaves has nowadays. In terms of value proposition, it is important to investigate and carry out the software development to adapt the product to the use cases (e.g. for a bike ride, there will be technical adjustments needed in order to deliver the same value). On the other hand, significant additional resources are needed to reach and maintain (channels and relationships) new customer segments. These are financial and human resources (i.e. for advertisement campaigns and to create and grow customer relationships).

### Value Propositions

The main value proposition of our product is an easier navigation i.e. going from place A to place B in the easiest way possible. There are many use cases where the technology can improve mobility deprived groups. In that sense we can use it to:

- Walk a route without the need to interpret complicated instructions or look at a map.
- Easily find out which public transport to take, be directed at doors, and be warned when to get off.
- Ticketing services: because the user is always localised, one can know when did he boarded and got off the bus and charge the ticked price automatically. There would be no need to buy a ticket just get on and off.
- The same for shared scooters or cars. A user could simply go on the street and grab an eScooter, ride and drop it off. The price would be calculated automatically.

The fact that people could move about in any transport mode, knowing where to go helps all groups that feel insecure and is very convenient for everyone.

### Customer relationships

As is the case for channels, the biggest challenge to scale the startup technology across different groups is not the technology itself but the way relationships with customers are reached and maintained. The most obvious group for scaling the app are elderly people due to their similarities in terms of needs with visually impaired people. This similarity might not be apparent but is what it was discovered through focus groups. In that sense, building a community, keeping relationships through elderly support centres and developing relationships with family members (children) is crucial. And again, a co-creation relationship is of utmost importance.

Other segments can have more automated customer relationships. And the importance for these segments (bikers, eScooters) is customer retention. A focus on keeping people engaged with the product is needed by showing them how their lives are really simpler and/or safer (i.e. comparing how many bike kilometres they have ridden this month versus last month to create the positive feeling that the app is helping).

## Channels

Even though the base technology can be used in many use cases, channels and customer relationships are the big challenge. Depending on the specific use case, a number of different channels and channel types are required. In case of elderly people, an approach similar to the visually impaired would be appropriate since these users share some common traits (less tech affine, insecure). So here, simple social media (Facebook), retirement of elderly community centres and family members would be good channels.

Bike riders could be reached either through web sales and marketing but also through other mobility apps from the municipalities. The same for eScooter or shared car user cases. Dreamwaves service can be integrated in their app and offered from them.

Overall, the ability to target a specific market segment must be measured considering whether it would be easy to scale the app or whether there would be a need for a totally different approach in reaching customers.

## Customer Segments

An intuitive mobility solution can help several groups of people:

- Elderly, who are insecure about mobility. Impact: more independence.
- Bike, scooter, riders, who can /should not look at a map while riding, sacrificing time (stopping to look at the map) of safety. Advantage: less accidents, faster rides, more people riding (a lot of people feel unsafe riding in a city).
- People with several other disabilities (e.g. cognitive). Impact: more independence.
- General population who would simply benefit from the convenience of having it easier.

These different groups have different levels of "pain" but an intuitive solution is always an advantage.

## Cost Structure

Apart from the costs of developing an app which could serve all groups, the main cost which comes into scaling to different groups / use cases is on the customer acquisition and customer relationship / retention. In the case of elderly people, most of the activities are highly personal therefore very cost intensive. Activities would include personal assistants, the creation of a community and co-creation which need human resources.

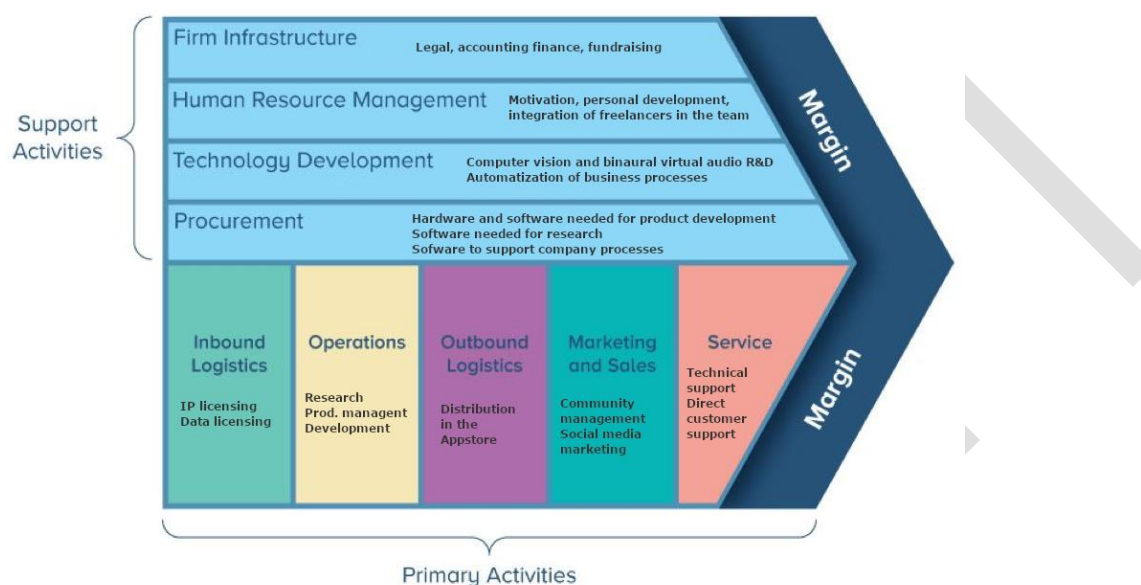
The case for more automated customer relationships would consume less resources. The activities lie more on understanding customers' needs and motivations (higher cost in the beginning) and then the creation of the automated structures (e.g. app rewards for certain achievements) to ensure engagement.

## Revenue Streams

Typically, customers will be willing to pay for a product that truly saves them time or make their lives easier (the two are generally connected). So, for some groups (elderly), a freemium model such as for the blind people, can make sense. For other use cases, like easier access to public transports, one possible revenue stream are municipalities paying a

monthly fee so that the inhabitants of the city have better and more sustainable mobility. If more people use bikes and public transport, the impact on the city will also be cleaner air, less traffic jams, etc which is also a positive economic impact for the city. Finally, bike delivery services can also benefit from the fact that their riders have safer and more efficient deliveries so one possibility is that these delivery companies would pay a monthly fee so all their riders have access to better mobility.

## Dreamwaves Value Chain



## Primary Activities

### Inbound Logistics

The product is software only, so the main components that are necessary to acquire are IP and data. In this case the startup has used a freely available SDK to develop augmented reality (ARKit, the IP licensing is automatically done). As for data sources, there is a need for mapping data and public transport data. This data is obtained from external companies (Mapbox, TripGo). These external sources are currently free but they will cost after a certain usage threshold is reached.

### Production

The conversion of the “inbound goods” into a product is done in three parts:

- **Research:** investigating which technology methods are suitable to best implement sensor fusion between purchased parts (ARKit) and smartphone sensors. This fusion creates a lot of value in the product as it leads to a more precise app. User research to learn about user specific challenges when using navigation apps and user interface in general. This last part is of especial importance as the primary target customers (blind and visually impaired) have very specific needs. A proper user interface, adapted to people's needs also adds a high value to the product.
- **Product management:** translate the research findings into product features and managing the software development process.
- **Development and deployment:** the software development process itself. After developing, there is an automated way to build the product. The product entails two

components a mobile and a web app. Both of these are developed directly on online repositories (bitbucket and gitlab) which have an automated deployment chain. Therefore, when it is necessary to deploy a new version, the process simply needs to be triggered. This saves deployment costs.

### **Outbound logistics**

The product will be distributed through the Apple Appstore. The Appstore offers all mechanisms to seamlessly install applications in the customers smartphones and well as to process payments from customers. In the case of the web app, it is running on a server and publicly accessible, so it does not need to be installed.

Currently the app is under tests on the TestFlight section of the Appstore.

### **Marketing and Sales**

Marketing and sales are one of the big areas that need investment. Reaching our customers is not trivial and there is a need to find creative ways to do so. Until now, the focus has been on non-scalable activities to raise awareness. These included giving talks, attending conferences and meetups, creating connections to blind associations. This awareness helped in raising the perceived value of the product. In the future, a lot of effort will be put in a direct connection with customers in a first phase and ultimately on building a community. Effort will be put in developing a group of "ambassadors" who will not only endorse our product but will be able to help the community when needed. The final goal will be to reach a point where the community is mostly digital and as self-sustained as possible.

### **Service**

Customer support is of extreme importance. There is a need to respond quickly to errors and bugs and to define a way to automatically collect relevant information. Failures in the product could have unpleasant consequences and a quick and effective support is needed to give the customers the safety and reliability sensation which is required in a navigation product.

## **Support Activities**

### **Firm infrastructure**

Since Dreamwaves is an early stage startup, there is a relatively simple firm infrastructure. Nevertheless, the startup aim to cover all aspects needed to keep the company running:

- Legal: the company is a limited liability company (in German GmbH) and therefore all the company founding contracts, shareholder structure and all other legal aspects are covered by professional legal counselling.
- Accounting: again, there is a professional accountant implementing the startup yearly statements, generating employee salary sheets, social contributions statements, etc.
- Finance: time is allocated for strategic financial management as this is extremely important. There is cash inflow from several different sources and as the startup grow, inflow from private funding will also be needed. It is therefore important to ensure presence in fundraising activities that cover not only the current burn-rate but also the burn-rate needed at each stage of the company, always with a focus on the long-term goals.
- Fundraising: when required and also given existing deadlines, time is allocated for fundraising. Public grants have very specific deadlines, therefore this activity is scattered in time depending on those. In subsequent stages, it will be important to focus intensively on private fundraising (business angels, VCs).

**Human resource management**

The team is a critical element for a startup. With such small teams, each new element has a very high (positive or negative) impact on the whole team and therefore on the performance of the startup. Therefore, there is a need on the one hand to ensure that every current team member is motivated, happy, and working on its area of expertise and passion to ensure maximum efficiency. Dreamwaves work a lot with freelances and there is a need to guarantee they feel part of the internal team and not only as subcontractors. This effort allows motivating and ensuring that the freelancers are willing to collaborate in line with Dreamwaves internal development infrastructure, guaranteeing a smooth and efficient development. Finally, acquiring new team members is crucial and therefore it is important to pay especial attention when scouting for new talent.

**Technology development**

Being a high-tech startup, a large part of the company efforts is focused on research and development. The product requires technology developments from two main areas: computer vision and localisation methods and, binaural virtual audio. Both of these have a significant contribution to the quality of the product. These developments are done internally as well as through collaborations (i.e. for binaural virtual audio a project with the acoustics research institute in Vienna is in place).

Apart from that, technology is also employed to automatise business processes (e.g. automatising financial statements to different projects instead of manual processing).

**Procurement**

There is a need to find and buy hard and software in order to develop the product and keep the company running. Examples of hardware material purchased for development are:

- Smartphones for the continuous development and testing of new features.
- Hearables both for testing as well as research of head-tracking strategies.
- New AR computing platforms such as smart-glasses for research into future use cases.
- Server and graphics card hardware for machine learning research.

Some software needs also to be purchased for development:

- Matlab for computer vision and sensor fusion research.
- Audio production software for sound design.

Software needed to buy for company infrastructure:

- Cloud storage (ex. Sync.com) and collaboration platform (ex. Trello or Atlassian tools).

## 6. Lamiloo (DE)

### Lamiloo Business Model

#### Key Partners

Lamiloo's business model is based on a two-sided platform business model based on crowdsourcing of existing resources and digitally supported workflows. In the logistics part of the platform, Lamiloo brings together the customer's needs for drug deliveries with independent bike couriers, as the full provider of the transport service. The platform approach makes the business model asset-light and therefore quickly scalable.

#### Key Activities

- Development and operation of GUI, Backend and App.
- Development of an intelligent staffing algorithm for optimal route planning and job distribution among the riders.
- Coordination and organization of the key partners.
- Direct sales in the B2B segment.
- Quality management for riders: checking the punctuality, Work safety, efficiency.

#### Key Resources

- People to build product (Sales, Rider Operations, Book Keeping and Contract Mgmt.).
- Cash investment to cover OPEX and CAPEX.

#### Value Propositions

Through integration into the processes of the pharmacy and intelligent route planning, Lamiloo can provide same-day delivery within 3 hours of ordering. In addition, Lamiloo offers a plannable time window delivery. Through efficient bundling of deliveries, speed advantages of bicycle couriers in urban areas and an intelligent route planning algorithm, Lamiloo can realize comparatively low delivery costs.

#### Customer relationships

- Direct Sales and Customer Service.
- Currently testing different sales approaches: Direct Sales and Sales with partner such as wholesalers and bigger pharmacy cooperation's.
- Currently we have Customer acquisition cost from approx. 500-1000 EUR per Customer, driven by the time allocated to schedule and execute sales meetings.

#### Channels

- Direct sales or pharmacies chains/cooperation's.
- Currently only direct sales.

#### Customer Segments

There are about 20,000 registered pharmacies in Germany, 3,000 of them in cities with more than 500,000 inhabitants (own calculation based on ABDA). As of today, every German pharmacy makes an average of 12.6 deliveries to customers every day, mostly by pharmacy staff or the pharmacist himself. In relation to the first target group - 3,000 inner-



city pharmacies - this results in a volume of 36,000 deliveries per day. This will be addressed by Lamiloo in the first step.

With the introduction of the e-prescription in July 2020, the number of deliveries will also increase significantly from mid-2020.

### Cost Structure

- HR Expenses for: founding Team, sales, operations, bookkeeping and development team.
- Rider Acquisition Costs: Equipment, promotion, referrals expenses.
- Cargo Bikes: Rent, licenses (for CRM, contract management, workforce management and office).

### Revenue Streams

Lamiloo charges pharmacies a fee per order of 6-7 EUR. Lamiloo acts as an intermediary between pharmacies and bicycle couriers and is paid a percentage of the delivery fee (planned 30%) for this mediation service. The independent bicycle couriers are paid per completed order. As entrepreneurs they are interested in completing as many orders as possible per hour. This pay-per job model is very efficient for reasons of capital commitment, since the variable costs are only incurred when Lamiloo generates revenue.

As a further component of the pricing, a monthly fee of 100-150 EUR per pharmacy is also charged, which covers the costs for the initial connection and the service level agreement.

## Lamiloo Prototype of Business Model

### Key Partners

- Pharmacy chains / Wholesalers.
- Local pharmacies.
- Online pharmacies.

### Key suppliers

- Rider networks.
- Recruiting in academic ecosystem.
- Data companies.

### Key resources

- Market access.
- Work force.

### Key activities

- Doing direct sales.

### Motivation for partnerships

- Over best in class customer experience to target group.
- Staying competitive.
- Income from flexible working model.

### Key Activities

#### What key activities do your value proposition require?

- Developing GUI, backend, App for Rider.
- Building rider network and guide riders.

- Running operations.

**What key activities do your distribution channels require?**

- Setting up partnerships with pharmacy chains.
- Preparing sales decks for sales reps of partner.
- Preparing online onboarding and webinar sessions.

**What key activities do your customer relationships require?**

- Setting up multilingual customer service.
- Setting up customer ticketing system.

**What key activities do your revenue streams require?**

- Setting up legal documents adjusted to international requirements.
- Setting up clear legal framework for employment status and billable units for riders.
- Setting up scalable bookkeeping and contract management processes.

## Key Resources

**What key resources do your value proposition require?**

- Technological talent to build scalable platform in central unit.
- Operations and sales team (if not done by partner) abroad.

**What key resources do your distribution channels require?**

- Local responsible person in country of expansion

**What key resources do your customer relationships require?**

- Central multilingual customer service agency

**What key resources do your revenue streams require?**

- Legal consulting
- Legal entity to operate in country

## Value Propositions

Through integration into the processes of the pharmacy and intelligent route planning, Lamiloo can provide same-day delivery within 3 hours of ordering. In addition, Lamiloo offers a plannable time window delivery. Through efficient bundling of deliveries, speed advantages of bicycle couriers in urban areas and an intelligent route planning algorithm, Lamiloo can realise comparatively low delivery costs.

## Customer relationships

- Direct Sales and Customer Service.
- Currently testing different sales approaches: Direct Sales and Sales with partner such as wholesalers and bigger pharmacy cooperation's.
- Currently Customer acquisition costs from approx. 500-1000 EUR per Customer, driven by the time allocated to schedule and execute sales meetings.

## Channels

If applicable local pharmacies or pharmacy chains

## Customer Segments

Same as the Business model

## Cost Structure

Central:

- HR Expenses for: founding Team, sales, operations, bookkeeping and development team.

- Rider Acquisition Costs: Equipment, promotion, referrals expenses.
- Cargo Bikes: Rent, licenses (for CRM, contract management, workforce management and office).

Decentral in countries:

- HR Expenses for: sales and operations
- Rider Acquisition Costs: Equipment, promotion, referrals expenses.
- Cargo Bikes: Rent

## Revenue Streams

Same as in the business model. Maybe adjusted due to local salary level and Lamiloo charges pharmacies a fee per order of 6-7 EUR. Lamiloo acts as an intermediary between pharmacies and bicycle couriers and is paid a percentage of the delivery fee (planned 30%) for this mediation service. The independent bicycle couriers are paid per completed order. As entrepreneurs they are interested in completing as many orders as possible per hour. This pay-per job model is very efficient for reasons of capital commitment, since the variable costs are only incurred when lamiloo generates revenue.

As a further component of the pricing, a monthly fee of 100-150 EUR per pharmacy is also charged, which covers the costs for the initial connection and the service level agreement.

## Lamiloo Value Chain

### Primary Activities

#### Inbound Logistics

- Sourcing of Riders.
- Sourcing of equipment needed to do operations.
- Vehicles.
- Helmet.
- Bags.

#### Operations

- Onboard and select riders.
- Training of riders.
- Forecasting demand.
- Tracking KPIs.
- Claim Management.
- Customer Service.
- Quality Management.

#### Outbound logistics

- Not applicable.

#### Marketing and Sales

- Direct Sales and Customer Service.
- Currently testing different sales approaches: Direct Sales and Sales with partner such as wholesalers and bigger pharmacy cooperation.
- Currently customer acquisition costs approximately 500-1000 EUR per customer, driven by the time allocated to schedule and execute sales meetings.

#### Service

- Customer Service.

### Support Activities

#### **Firm infrastructure**

- Central organization in Germany with German legal entity e.g. GmbH.
- Decentral entities in countries according to local regulation.

#### **Human resource management**

- Hiring Talent for development of scalable platform.
- Rider sourcing locally organized via online and university marketing.

#### **Technology development**

- Key activity as the scalable platform is the backbone of the business model.
- Backend Dev: Algo, Database, Forecasting, KPI Tracking, APIs.
- Frontend Dev: Mobile App Development, APIs, GUI Dev and UI/UX Testing.

#### **Procurement**

- Not a central unit as there aren't any physical goods to deliver value.
- HR is the procurement focus, as Lamiloo is in the service space.

## 7. Neobility (RO)

### Neobility Business Model Description

#### Key Partners

Neo.Delivery acts as a service provided directly to Companies and NGOs in need of delivery services to reach customers and target groups. However, the model in reality represents a highly managed marketplace, with several layers of control and incentive on our side to make sure we meet requirements of the Customers.

Demand in this setup is the Companies and NGOs in need of deliveries, while Supply are the drivers making the deliveries themselves.

The host company during the HiReach exercise was "Help Autism" - an NGO addressing the autistic children vulnerable group. They needed a more reliable way of supporting their target than just using volunteers, while also needing to free up their time for other services. However a delivery service was needed that can handle large volumes of deliveries in an efficient manner with a low price point.

To achieve the service a Key Resource is the driver base, which can be find from existing gig-workers - such as drivers working on a mix or Ridesharing or Delivery platforms. Based on the vehicle profile and their equipment base they can access different types of deliveries - volume, type of parcel etc.

To make sure a large base service covers all situations, Neobility directly book a number of drivers on a per-hour basis (competitive market-wise), while filling the overhead with free-floating drivers paid directly per delivery. In the first segment the risk was on the startup side and also a high margin (might be negative, might be 60%+), while with the second Neobility share the risk and reward (20% commission for the startup, effort-based revenues for them). The startup also employed different schemes for bonusing the drivers to cover for edge-cases - like bad weather and extreme demand.

#### Key Activities

Neobility promise their customers low delivery cost with a fast delivery time, plus flexibility to choose from different mixes of the two traits. For this, it is necessary to rely on the core algorithms making the parcel groupings as efficiently as possible, ever improving the network effort. One of the main activities is provide an ever-evolving routing algorithm to the network of customers and drivers.

For customers also traditional lead-generation is employed, but the most important metric is actually retention and NPS/reputation.

Main KPIs to monitor in order to assure the model is sustainable and profitable:

- network load (enough drivers onboard? if not, increase bonuses).
- average parcel grouping per km (good enough demand density and distribution?).
- average pickup and drop-off times vs delivery distance (happy customers?).
- revenue per driver per hour (happy drivers?).

#### Key Resources

A key resource in this business is the network of drivers and the skill of managing it. Thus, the operational team is essential in managing the number of drivers allowed to join based on demand. As the system grows the amount of data generated will become a key

differentiating factor in the logistics optimisation business. It can be anticipated that demand and routing will offer a prediction-based algorithm.

### Value Propositions

Neobility cater to the low-cost rapid urban delivery market, promising a flexible mix of speed and cost, while at the same time higher revenues for the Drivers. To achieve this Neobility rely on parcel aggregation on common routes - the packages sharing cost for each km going in tandem, as well as the time of the driver making the delivery.

This means that initially the model will not be sustainable until critical mass is achieved. For the initial period Neobility relies on a scheme of bonuses to offset undelivered promise (high revenues) for the Drivers.

As the density and gross volume of deliveries increases, the model becomes highly profitable for all parties - allowing neobility to increase revenues for drivers, decrease the cost for companies or just increase their own margins, based purely on the market circumstances.

### Customer relationships

As a marketplace, Neobility face the need to create and engage relationships with both supply and demand. In general they are partly done manually (key-accounts and customer care personnel) as well as automated.

On the driver side, they want to ensure maximum efficiency of effort vs revenue, so main focus is on engaging them when the platform needs them and solving any issues they might have in due time. However, because of market specificity (gig workers) there is a high churn rate, so a continuous pipeline of supply needs to be built-into the business.

On the customers side, the market is a limited one and highly sensitive to quality of service. Hence a more personal approach is required, but only on treating the limit-cases. Satisfaction can be measured also via KPIs and when needed key-accounts need to provide support.

Cost-wise any manual/personal interaction is not free. However, under high-quality service levels will not incur such interactions. In summary, if the Customers try to reach us to report problems, Neobility will be happy to be there for them to talk with them and to pencil in the cost as a customer development cost and a lack of production readiness. Its benefits largely outweigh the cost perceived.

The service is a straight-forward and highly needed one for the customer segments and while provided at a nominal quality level while delivering on the initial promise, not much engagement from the company is needed to keep the customer happy.

### Channels

A chat (Intercom), email and voice (phone lines) support for both drivers and customers was embedded, to collect feedback and catch problems early. In general the phone was the most efficient one for high-value customers, while chat lines were left open for smaller clients. Feedback is very important so it is important not to constraint it.

### Customer Segments

Neobility try to approach all customer segments in need of real-time urban deliveries. The system is built in a flexible format balancing cost and delivery time to make it useful for as many customers as possible. 3 main customer segments were identified - although most will sometimes go cross-segment during a normal delivery day:



- ultra-urgent (hot food delivery mostly).
- fast - under 2h (non-perishable items ordered with "now" option).
- normal - under 4h (NGOs, ecommerce with same-day delivery, various support services involving delivery).

Because food is the main factor in the urban landscape, all the cars with whom the company works have thermal bags that are used when required.

### **Cost Structure**

In a normal business stream a commission on revenue made by the drivers is due. However, reaching critical mass is not easy, and navigating high-demand times is also a challenge. To achieve nominal services during those times Neobility is subsidising the service, making this the biggest challenge and cost they face.

Generating inbound leads for customers also has a cost attached, however retention/LTV for Companies is large so that cost will be offset by quick revenues.

Drivers leads are also a cost, so there is a need to insure they use the platform long enough to make the lead acquisition worth it. This will be a function of revenues generated for them compared to market rates, so until critical mass is achieved it will be based on bonuses provided.

Also supporting the development team until scale is reached will make this fixed cost a large burden, but will also create the base value for the company.

### **Revenue Streams**

Having their goods delivered is a basic need for any ecommerce, local business or NGO supporting multiple vulnerable groups. Several services exist and they cater to those needs. The base model is to take a commission of 20% from the overall GMV, while acknowledging that the road to making that profitable will endure subsidising costs for the lack of demand density. The delivery cost is paid by the Companies and collection is to be made automatic. The Companies have credit cards attached to their accounts and at given intervals - time or threshold aggregated cost - Neobility debit the cards automatically. Neobility highly prefer this method because the collection cost is near 0, while risk Neobility take of customer default is marginal as well.

There are also companies that prefer to be invoiced manually and collection to be made via bank transfers. As Neobility need to establish a trust relationship, the startup will initially allow this to selected companies, while removing the option in the future.

The commission Neobility take from the GMV is the sole revenue stream at this moment. While only providing business to NGOs Neobility must make a profit to support the efforts. In a mix of NGO and Commercial businesses, Neobility choose to defer their commission to support the NGOs, while the business can earn from the rest of the customers.

### **Narrative of the Business Model**

Neobility believe that urban mobility sits at the heart of business and life in the city, and even more-so in the Covid situation. So Neobility mean to help businesses and NGOs keep operations as close to their target groups as possible with an accessible delivery platform. Neobility bring together available drivers on hyper-optimised routes to aggregate real-time deliveries on common routes to optimize cost and time. Of this newly created value we take a commission helping the startup to grow the platform and improve the service further.

## Neobility Prototype of Business Model

### Key Partners

Neo.Delivery, the product of Neobility, acts as a service provided directly to Companies and NGOs in need of delivery services to reach customers and target groups. However the model in reality represents a highly managed marketplace, with several layers of control and incentives to make sure Neobility meet requirements of the Customers.

Demand in this setup is the Companies and NGOs in need of deliveries, while Supply are the drivers making the deliveries themselves. As such, a Key Resource is the driverbase, which is found from existing gig-workers - such as drivers working on a mix of Ridesharing or Delivery platforms.

Based on the vehicle profile and their equipment base they can access different types of deliveries - volume, type of parcel etc.

To make sure a large base service covers all situations, Neobility directly book a number of drivers on a per-hour basis (competitive market-wise), while filling the overhead with free-floating drivers paid directly per delivery. In the first segment the risk was on the startup side and also a high margin (might be negative, might be 60%+), while with the second Neobility share the risk and reward (20% commission for the startup, effort-based revenues for them). The startup also employed different schemes for bonusing the drivers to cover for edge-cases - like bad weather and extreme demand.

### Key Activities

Neobility promise their customers low delivery cost with a fast delivery time, plus flexibility to choose from different mixes of the two traits. For this, it is necessary to rely on the core algorithms making the parcel groupings as efficiently as possible, ever improving the network effort. One of the main activities is provide an ever-evolving routing algorithm to the network of customers and drivers.

For customers also traditional lead-generation is employed, but the most important metric is actually retention and NPS/reputation.

Main KPIs to monitor in order to assure the model is sustainable and profitable:

- network load (enough drivers onboard? if not, increase bonuses).
- average parcel grouping per km (good enough demand density and distribution?).
- average pickup and drop-off times vs delivery distance (happy customers?).
- revenue per driver per hour (happy drivers?).

### Key Resources

A key resource in this business is the network of drivers and the skill of managing it. Thus, the operational team is essential in managing the number of drivers allowed to join based on demand. As the system grows the amount of data generated will become a key differentiating factor in the logistics optimisation business. It can be anticipated that demand and routing will offer a prediction-based algorithm.

### Value Propositions

Same as described in the Business Model.

### Customer relationships

Same as described in the Business Model.

## **Channels**

Same as described in the Business Model.

## **Customer Segments**

Same as described in the Business Model.

## **Cost Structure**

Same as described in the Business Model.

## **Revenue Streams**

Same as described in the Business Model.

## **Neobility Value Chain**

### **Primary Activities**

#### **Inbound Logistics**

As Neo.Delivery operates as a marketplace, inbound logistics for means making sure supply of service is enough - meaning delivery drivers. This relates to all the operations required to recruit, activate, keep loyal operating drivers. It also means making sure supply is within parameters, not too few drivers (upset Customers) nor too many (to little revenue per driver, one faces imminent driver churn).

The logistics involve driver marketing - done by the marketing department - as well as key-accounts for fleets and driver support services.

The actual logistics part resides in the setup formed by the marketing-sales-infrastructure scheme. Once a driver/fleet is onboarded the infrastructure suite takes over ensuring as many automated processes as possible: driver application and driver account to access service, get notified about demand levels, monitor revenues and bonuses etc. Fleets can access a specific dashboard setup for bulk management of drivers.

#### **Production**

Production may refer to the central routing algorithm. The core algorithms make sure all the processes are automated. This is the most complex part of the business since it needs to be done in a timely manner and the levels of complexity makes it difficult to evaluate by humans post-factum. Several KPIs are monitored to ensure that the process is within parameters at all times and operations personnel are always monitoring and able to intervene.

#### **Outbound logistics**

Outbound logistics to the overall user journey for a Customer - from lead to onboarding and then onto the tech suite that will manage all processes for him. This means the module allowing for orders to be placed, situations mitigated, invoicing, collection etc - everything automated.

#### **Marketing and Sales**

Marketing supports both supply and demand sides with specific actions. While target groups are different, the key mechanism in generating the leads is the same. Converting the leads rests with the Supply and Demand departments respectively.

The marketing process in general can be automated by online marketing systems to generate inbound leads. PR is also a useful tool, be it less predictable or scalable. The Sales

department can also generate its own outbound leads via research - with some support from marketing research.

While the marketing can and should be as automated as possible in terms of lead generation - and hence the one department can focus on both sides - the Sales (closing) needs to be split in two different departments. Main reason for this is the fact that the Driver/Fleets and Customers profiles are inherently different and require different sales cycles, engagement techniques and account management levels. The two sales departments are responsible for their own KPIs and in tandem can ensure the marketplace stays within the tolerance interval set out by the load capacity levels.

### **Service**

In our specific marketplace case service is more envisioned as a feedback-loop for customer happiness/NPS. This can be done automatically with reviews and periodic questionnaires, but also through cold-monitoring of main KPIs.

## **Support Activities**

### **Firm infrastructure**

As any company, basic firm infrastructure must be assured to make sure all departments are working efficiently. Administrative and financial controlling are probably the most important as they ensure everyone is on budget and does not run into any blockers. However, a special interest was given to the BI aspect of the business, that can give cross-department insight and also monitor overall health of the business or indicate early weaknesses built into the process.

### **Human resource management**

HR in the generic sense would only provide workforce for the core business activities - support services and development. The most widespread HR needs lies in the Supply (drivers) department; however, this is a specific process that must be handled as Sales rather than employment of workers, so it resides in the Supply department and is seen as a pure Sales and Engagement process.

### **Technology development**

Tech is the core department supporting all requirements to scale processes (Sales, Marketing) as well as build the Core and External-facing product suites. In order to maximise resources there is only one Tech department providing resources for all the above services. This still requires a large suite of specialised developers ranging from mobile to frontend, backend and developers - but they are all split between tasks coming from both core and support departments.

### **Procurement**

There is no real procurement supply-line required. In essence the company will aim to be as little asset-focused as possible, so having such a dedicated department is discouraged.

## 8. Mobito (BE)

### Mobito Business Model

#### Key Partners

In HiReach pilot, Mobito develops a Bus Operator Performance evaluation mechanism for the Municipality of Valongo, delivered through a City Terminal. Specifically, Mobito generates KPIs reflecting the SLAs of the City and the Bus Operator. To that end the startup needs to receive information from both the City itself (Transportation department) and live location data from the Bus Operator. This allows to log the mobility accessibility information associated with individual busses (compatibility with wheelchairs) and bus routes. This way Mobito can derive which areas are well served and which are under served from a mobility accessibility perspective. Moreover, it was decided to incorporate a geolocation fencing and include associated alerts in the City Terminal. For this development Mobito is partnering with HiReach Developmental resource. As a next step, Mobito is including contextual data such as traffic data towards the resolution of disputes between City and Operator. For that it is necessary to partner with traffic data providers such as HERE. In order to reach more clients the startup is partnering with an external middleman that can serve as broker relationships with city clients. Finally, Mobito also builds partnerships that can be used to pursue European tender programs through consortiums.

#### Key Activities

Mobito has been developing in house a data platform enabling the ingestion and management of external data. Every time new data sources are integrated, there is a need to carry out a manual integration with given providers. In the mid-term, it is important to invest in the development of automation tools that help this integration and / or provide manuals for external providers to integrate on their own. In order to reach more clients, the startup needs to nurture sales channels, build on relationships and pursue collaborations. This involves creating marketing content for the company and building a strong brand in the space of Smart City Solutions. At the same time, it is necessary to create leads and nurture the company branding by participating in key industry events. Some scaled outbound campaigns have already been engaged enabling to reach out to 1,000 leads using marketing tools (phantombuster and LinkedIn Sales Navigator) disseminating a survey and nurturing business relations.

#### Key Resources

There is a need of a strong technological team of developers and data engineers to develop the platform's specifications. It is also important to have a marketing budget to deploy sales channels. It is necessary to find time to attend key industry events and the presentation material to feed sales and marketing channels. A strong website converting visitors into leads is also necessary.

#### Value Propositions

The City terminal enables Mobito customers to leverage the power of data and to make data-driven decisions. Customer usually lack the infrastructure and expertise to integrate city data (e.g. bus operator gps signal) and build on this an operator evaluation

mechanism. The City terminal resolves this problem by aggregating mobility data in one place and offering the right visualisation and management tools.

### **Customer relationships**

City clients are required to nurture the customer relationship, understand the dynamics of internal departments and cater to their needs. Moreover, in order to scale to more cities, it is important to activate industry sales channels, as described above. Getting a sales lead from external resources can cost up to 20% of revenue.

### **Channels**

See above.

### **Customer Segments**

In the HiReach Pilot, Mobito is working with the Municipality of Valongo. In general, the City Terminal addresses the need of European Cities with an above average mobility maturity.

### **Cost Structure**

The most important cost is the cost of personnel: 77%. The remaining cost is split between data infrastructure costs (still very modest at <400euros / month), office expenses, travel expenses and marketing costs.

### **Revenue Streams**

We charge our City Terminal an annual subscription fee adjusted for the size of the city and local tendering rules. We see charging our City users 35,000Euros per years.

### **Narrative of the Business Model**

Mobito recognises the mobility ecosystem to be a mess of too many uncoordinated single solution providers and disorganized data flows. This way benefits of using data are obstructed and cities struggle to understand mobility needs and habits Mobito addresses this with two complementary products:

- A B2G City Terminal that helps cities take control of their data and make data-driven decisions. The HiReach pilot falls under this category,
- A B2B Data Marketplace that facilitates the exchange of mobility data. The complementarity of the Mobility Terminal and the Mobility Data Marketplace is at the core of the competitive moat and the value proposition of each offering. The data Marketplace offers a direct channel of data to the City Terminal and vice versa. To enable this virtual wheel Mobito is building partnerships with data suppliers, platform tools and sales channels and investing internally in the development of the underlying platform infrastructure supporting these two products.



## Mobito Prototype of Business Model

### Key Partners

To enable the network effects of the City Terminal and the Data Marketplace, Mobito is building partnerships with data suppliers, platform tools and sales channels and investing internally in the development of the underlying platform infrastructure supporting these two products.

### Key Activities

Populate the Data Marketplace with data in select data categories and attract the right demand. Develop the right intelligence on top of integrated data to serve the City client needs. Adopt the right data schemas and standards to facilitate a seamless consumption of data. Become compatible with given data sources to create easy input flows of external data. Develop our branding as a key data provider and a key smart city solution provider.

### Key Resources

There is a need of a strong technological team of developers and data engineers to develop the platform's specifications. It is also important to have a marketing budget to deploy sales channels. It is necessary to find time to attend key industry events and the presentation material to feed sales and marketing channels. A strong website converting visitors into leads is also necessary.

### Value Propositions

The City terminal enables Mobito customers to leverage the power of data and to make data-driven decisions through a cloud platform. This creates economic value for the city. On the consumption side of the Data Marketplace Mobito provides reliable, accurate and dynamic data. Whereas the main competitors mostly act as an intermediary and connect data vendors with data consumers, Mobito integrate data from their vendors into a platform in a standardised way. This allows Mobito to provide better quality checks and discovery mechanisms to end-data consumers.

On the supply side, Mobito provides automation mechanisms for seamless listing and data monetisation. They offer targeted exposure to registered users and the ability to generate more revenue by being part of Data Feeds. A variety of data upload methods are acceptable, enabling businesses to place their data in only a few clicks. Finally, Mobito enables data placement discoverability by using the right meta-tags.

### Customer relationships

City clients are required to nurture the customer relationship, understand the dynamics of internal departments and cater to their needs. Moreover, in order to scale to more cities, it is important to activate industry sales channels, as described above. Getting a sales lead from external resources can cost up to 20% of revenue.

Data suppliers need to see that they are generating revenues through the platform. Data consumers need to be able to access the data they need in Mobito's platform in the right way serving their goals. This incentivises Mobito to work closely with data consumers and understand their data needs so that the right listings in the Data Marketplace can be created.

## Channels

Creating marketing content for the company and building a strong brand in the space of Smart City Solutions. At the same time, Mobito create leads and nurture the company branding by participating in key industry conferences and events. Mobito also take part in co-creation projects and accelerators that allow to connect with business partners.

## Customer Segments

The initial target market includes businesses that are spending money on exchanging mobility data to cover their needs (mobility operators, connected service providers, consultancies) and Cities that invest in the connectivity of urban mobility.

## Cost Structure

The most important cost is the cost of personnel: 77%. The remaining cost is split between data infrastructure costs (still very modest at <400euros / month), office expenses, travel expenses and marketing costs. As the company scales, it is important to consider enabling another key Cost of Goods Sold: Data Purchasing Costs, to further populate the platform with the right data supply and build data coverage in key categories.

## Revenue Streams

Mobito charges an annual subscription fee for businesses and Cities to access to the Mobility Terminal. Data Management functionality subscription amounts to 30,000€ per annum. In order to calculate that fee, Mobito considers the profile of businesses and the size, local governance rules (e.g. tender rules) of Cities.

The company pricing strategy for the Data Marketplace involves monetising on both sides of the platform. On the data supply side, a freemium subscription model is offered with three tiers. This is driven by a strategy that prioritises populating the supply side of the platform. This way companies are allowed to start placing data in Mobito marketplace and experience the benefits of monetising them for free while Mobito clearly lay out a "premium" offering that involves a subscription fee. The startup is intending to use particular platform tools and customer-support options to push users to higher subscriptions. The three tiers are charged as follows:

1) free, 2) 2,000 €/month, 3) 4,000 €/month

On the consumption side of the platform, Mobito charges a commission on top of the transaction value of the data exchange. This commission averages at 10%, again on the low side of data marketplaces' commissions. The unit of exchange by which platform transactions are charged is per # of API requests and data volume metrics.

## Mobito Value Chain

### Primary Activities

#### Inbound Logistics

This is most relevant for Mobito in populating their Data Marketplace with supply. To do this Mobito is tapping into Open Data and integrating private data. To create a sales channel of import data, the company is also partnering with businesses in the installation of hardware sensors and retaining first access to generated data.

**Production**

This involves converting input data into standardised formats.

**Outbound logistics**

This involves creating the right Marketplace listings, making data easily available through visualisation tools and search engines. This also involves serving intelligence and the functionalities of our City Terminal with the right visualisation tools.

**Marketing and Sales**

Creating marketing content for the company and building a strong brand in the space of Smart City Solutions. At the same time create leads and nurture the branding by participating in key industry conferences and events.

**Service**

The City Terminal helps cities leverage their city's data to make data driven decisions and create economic value.

On the consumption side of the Data Marketplace, Mobito provides reliable, accurate and dynamic data. Whereas the competitors mostly act as an intermediary and connect data vendors with data consumers, Mobito integrate data from vendors into a platform in a standardised way. This allows Mobito to provide better quality checks and discovery mechanisms to end-data consumers.

On the supply side, Mobito provides automation mechanisms for seamless listing and data monetisation, offering targeted exposure to registered users and the ability to generate more revenue by being part of Data Feeds. A variety of data upload methods are accepted, which enable businesses to place their data in only a few clicks. Finally, Mobito enable data placement discoverability by using the right meta-tags.

**Support Activities****Firm infrastructure**

Product development is organised around a scrum methodology. Product manager creates user stories which are orchestrated by the Scrum master.

**Human resource management**

Mobito introduced OKRs to align business with product vision and track their product and milestones.

**Technology development**

The energy of the technology team is clearly focused on cherry-picking the right tools and technologies, combining them in the most optimal way in order to support the complex and large-scale integrations that the Mobito platform targets to support. Team members having diverse and multi-year experience on all aspects of software design and development and on the data engineering domain have the proven experience to identify which tools to utilise in order to introduce the right balance between development and computational speed, ease of new features introduction and platform long-term maintainability.

**Procurement**

This has to do with all the business development Mobito do in partnering with external middlemen that can broker relationships with city clients, building partnerships that can be used to pursue European tender programs through consortiums, and collaborating with sensor providers to onboard their clients as data suppliers.

## 9. Nemi (ES)

### Nemi Business Model

#### Key Partners

Key partners for the deployment of the pilot in the south of Italy are the Region of Puglia, which is pilot host, and TRT, a consultancy specialised in mobility that is actively involved in research and planning, and Ferrovie del Sud Est, a national railway and bus operator.

The Region of Puglia is the public organism responsible for funding public transport systems in the region. In the first stage of collaboration, they provided Nemi with a number of studies and data sets of the mobility in the region. Such information allowed the team to understand the challenges in mobility that the region is facing and to evaluate the potential benefits of our solution in specific areas of the region of Puglia.

TRT has been helping to reach local stakeholders through their vast contact network, with whom nemi has explored the possibilities for setting up a pilot service. As a result, an agreement was reached to set up a pilot with Ferrovie del Sud Est during summer 2020.

Ferrovie del Sud Est is, at the same time, customer and a key partner and supplier, because it wouldn't be possible to provide a service to the final user without their resources. They will supply the vehicle and the driver/s in order to operate a bus service to connect the train station of Gagliano del Capo with the surrounding villages and towns. Nemi will also work with them to design the characteristics of the service.

#### Key Activities

Key activities include:

- Gathering the requirements and specifications of the service. First, there is a need to learn about all the requirements of the service to make sure that the solution is adequate for it. Then, one must gather all the information of the service that is needed to operate it through Nemi software, such as number and location of the stops, possible itineraries, schedules, availability of seats in the vehicle (including wheelchair users), possibilities of booking in advance, etc.
- Assessing the need for extra developments in the software components and implementing them. Some changes in Nemi's platform might be needed in order to meet all the requirements. For instance, having online ticketing and payment functionalities might become a requirement in future projects with FSE, but was discarded for the pilot due to the complexity of developing and implementing them before the summer. Translation of the front-end components into Italian is also needed.
- Implementing the service in Nemi's platform. Once all the specifications of the service are clear, it is time for Nemi to start implementing the service in the platform: virtual stops are created, and all the possible itineraries are drawn, introduce the schedules, and register the vehicle and the driver/s.
- Providing training to the team involved in the operation of the service: driver/s, call centre operator/s, operations manager/s and agent/s, etc. Nemi teaches them the behaviour of their system and trains them on the use of the different software components.
- Testing the service. Prior to the launch of the service, Nemi coordinates with the operator to run a few field tests while checking that the behaviour of all the software components is correct.

- Providing technical support to the operator. In case anything unexpected regarding the software happens during operations, Nemi provide technical support in order to solve the issue in the shortest possible time.

### Key Resources

These are the key resources to successfully run the pilot:

- Servers and cloud services for storing all the data related to the software tools and the operation of the service, such as the user database.
- Front-end developers, who will make changes on the user and driver apps to have them translated for the Italian market, and back-end developers, who will make changes on the back office and will solve bugs and other software-related issues.
- Specific information and data about the service that is going to be deployed, for example, the exact coordinates of the stops and the vehicle's maximum capacity.
- Mobile networks that ensure real-time communication between all the software components. This is essential, for example, for being able to track the vehicle's real-time position from the back-office tool.
- A vehicle, preferably a minibus, that will provide the transport service.
- Drivers that will be available for providing the service within the operational schedule.
- A mobile device, such as a smartphone or a tablet, that will be installed in the driver's cockpit and will have installed the driver app. This app displays all the information that the driver needs to perform the route designed for the expedition.
- Communication channels where users can reach the operator for queries and suggestions regarding the service.

### Value Propositions

The HiReach pilot customer, which is, wants to first test the convenience of the solution for operating its first/last-mile bus services connecting train stations with surrounding towns, and then experience the benefits of the operating model in low-demand scenarios. For that reason, the pilot will be split into two phases. In a first phase, the bus service will cover coastal locations around the train station of Gagliano del Capo during the months of July and August, when a higher demand from visitors is expected. In a second phase, when the demand becomes lower, the service will move towards the interior, to connect the station with inner surrounding towns.

In areas with lower population density and lower demand for mobility, regular bus services are inefficient —because they travel many kilometres without picking up or dropping off any passenger, wasting users' time and public transport providers' resources— and ineffective —because they consist of long routes with low frequency and limited coverage due to time constraints. As a consequence, in these areas (like the inner areas that the second phase of the pilot is targeting) people either have no access to public transport or many are offered a public bus service which cannot satisfy their needs, leaving them with no affordable alternative to private means of transport.

With Nemi, public transport lines with very little demand are improved. They are normally very difficult to sustain and cannot provide a convenient service. Nemi's demand-responsive transport solution benefits, on one hand, the operator by increasing the efficiency of its services through the optimisation of all the resources involved in their operation —vehicles, energy, money and time—; and, on the other hand, the end users by offering shorter travel times and higher frequency, as well as better access to public transport. The latter is possible because, unlike regular services, which are tied to a fixed



route even if there is no demand for all of the areas covered at a specific time, demand-responsive services can skip parts of the route without demand, making it possible to increase service area and reach a greater amount of people without lowering frequency.

### Customer relationships

Nemi offer the operator a Software as a Service (SaaS) kind of relationship. The conditions of this relationship are agreed through a contract which specifies the technical characteristics of the software that is provided, the conditions of the technical support, and the price that the operator must pay for benefitting from Nemi's solution. The contract is tied to a specific version of the software, which means that any improvements in the software can cause a revision of the conditions of the contract.

The expectations of the operator in regard to the provision of the service include aspects such as real-time monitoring of the operations, guaranteed minimum time of availability of the solution during the contract, access to historical data of the service through a visualisation and reporting tool, channels and tools for two-way communications with users, responsive technical support in case of software failure, and responsive reaction to incidences on the road that force changes in the definition of the service, to mention a few. FSE initially expected Nemi solution to manage online ticketing and payments as well, which are features that many operators might expect to have; and that is why Nemi is going to incorporate them in a future solution.

Public authorities which are ultimately responsible for the provision of the service also expect from this tool to be able to provide specific data from the operation, such as the total kilometres travelled by the vehicle. This information is used to calculate the amount of funding that the operator must receive to cover for the expenses of the operation. In the case of the pilot, the Puglia Region is the public authority that requests this information for funding the bus service.

Lastly, end users expect from their interaction with the user app a general smooth experience, that allows them to easily make reservations for one or more passengers at a convenient time. They also want to have a communication channel or, at least, contact details available to report any issues with the app or send their queries. Their personal data must be safely stored and treated, and they must be informed about such procedures at the moment of signing up for the service. When using the service, they also expect to be picked up exactly where indicated by the app, and to be informed with enough notice of the proximity of their destination stop.

### Channels

The first contact with FSE was through a channel that is usually of great help to reach new customers: a contact network, provided in this case by HiReach. From the perspective of the customer, being reached through someone they know, trust or with whom have worked, makes them feel more reassured about the convenience of working with the provider that is interested in reaching them. This makes it a desirable model for both parts. Once the commercial relationship has started, the channels used for communicating with the customer are usually email, phone call and even instant messaging. The latter gives us fast means of communication that is especially effective in case of incidences in our software or the operation of the service.

It is also relevant to visit them personally from time to time, to see how they're interacting with the platform and what suggestions they have for improving it. This strategy is especially effective for the latter, collecting feedback from your customer that you wouldn't receive



otherwise (for example, from the driver, the person who interacts for the longest period of time with our solution). And, even though sometimes it is a costly way of keeping contact with customers because of distance, it was found that the customer appreciates the effort and that it strengthens the relationship with them.

### Customer Segments

Customers are transport operators; but they are not the only ones for whom value is being created. In many cases, they are licensed to operate transport services for which public authorities are ultimately responsible. This licensing contract indicates the costs that the public authority must reimburse to the operator, which are mainly based on the kilometres travelled by the vehicles providing the service. In such case, the reduction of kilometres travelled enabled by Nemi's solution benefits public authorities through a great cost reduction. This is why Nemi also work with them to design the features of the software components, such as the reporting tool, and consider them a key partner.

In those cases where the transport operator is not providing a public transport service and, thus, such service is not subsidised by any public authority, the solution benefits the operator through a reduction of their operational costs (fuel savings and lower maintenance). This is the case of the service that is going to be deployed during the first phase of the pilot, connecting mainly coastal locations to the train station. For the second phase of the pilot, the service will cover inner locations surrounding the station and will be subsidised by the competent public authority, the Region of Puglia.

Lastly, even though there is no monetary transaction with them, end users also benefit from Nemi solution through shorter travel times, higher frequency and/or greater coverage. They pay the price of the ticket, which is entirely kept by the transport operator if the service isn't public, and partially kept if it is.

### Cost Structure

The cost structure is composed of:

#### **Personnel cost**

- This is the most important cost, and it is mostly dedicated to software developers (the most expensive profile within the team). A significant part of the personnel cost comes from the software development that is subcontracted, and, to a lesser extent, the branding activity carried out by a marketing agency. The key activities impacting personnel costs that are most expensive are related to the changes in the back-end and front-end software that must or might be applied with every unexpected software issue, new functionality, or new service. An example of the latter is the changes in the front-end that will have to be made for the pilot in Italy (new language). Other key activities that have a significant cost are those related with the implementation of a new service in the platform, which takes from a few hours to a few days depending on the complexity of the service.

#### **Cost of servers.**

- To be able to host software and all the data that the services which operate through Nemi's platform generate, there is a need to pay for storage capacity in one or several servers. This is a relatively low cost compared to the personnel cost, but it must be taken into consideration when deciding the price of the monthly fee.

### Revenue Streams

The revenue currently comes from two sources:

- A set-up fee that is charged for implementing the service in the platform and for integrating the platform's components in the hardware of the vehicle/s which will operate the service.
- A monthly fee that is charged for the use of the platform, its maintenance and Nemi's technical support.

In the case of the pilot, the set-up fee will be covered by the funding received from HiReach. Otherwise, FSE is willing to pay for both the set-up fee and the monthly fee.

The most important source of revenue for the sustainability of our business model is the monthly fee that is charged every operator, since the set-up fee is a one-time revenue and is not sustained over time.

In the near future, it is important to incorporate two more activities which will be additional sources of revenue:

- Planning of new services, looking at different sets of data from an area to decide about the location of stops, the possible itineraries between stops, the schedules, etc.
- Business intelligence, using the data that is been generated by a service to suggest improvements in the design of the service and the way it is operated.

### **Narrative of the Business Model**

Nemi makes public transport in low-density areas feasible by providing transport operators with a software solution that enables flexible bus services. Providing regular bus services in low-density areas is very costly and does not properly tackle challenges such as making public transport accessible for as many people as possible and providing a good alternative to private means of transport, making it a flawed model from both the public administration's and the user's point of view.

This is possible with Nemi software solution for enabling flexible bus services. With every new service, Nemi work with the competent public authority to set up a range of stops and expeditions in a territory. Whoever wants to use the service, must make a trip request through the user app, indicating origin and destination stop, and the time of the trip. Nemi then optimises the route to serve only the stops that were requested, saving thus kilometres travelled and emissions.

Since public administrations pay transport operators for the cost of every kilometre travelled, this means Nemi is making economically feasible bus services that wouldn't exist otherwise. It is also replacing existing inefficient bus lines, reducing their cost and thus giving public administrations the possibility to expand the service with the same budget. For the end users this translates into having a new stop closer to them or more expeditions in a day.

The costs of making changes and developments in Nemi's platform with every new service are covered by the transport operator through a set-up fee and a maintenance fee. If the service is not publicly subsidised, the operator benefits directly from the cost reduction enabled by the startup solution; if the service is publicly subsidised, the operator benefits from implementing the solution by becoming more competitive in public tenders, which are increasingly requesting demand-responsive transport services.

## Nemi Prototype of Business Model

### Key Partners

The key partners for the development of the activity are:

- Public administrations. They are ultimately responsible for the provision of public transport services. They regulate the conditions under which transport services are operated and provide the funding for doing so. They can range from regional public organisms and transport authorities to municipalities and associations of them.
- Transport operators. They're at the same time customers and a key partner and supplier, because it wouldn't be possible to provide Nemi's service to the final user without their resources. They supply the vehicle and the driver/s. Nemi also work with them to design the characteristics of the service.
- Mobility consultancies. They can help Nemi to reach local stakeholders in foreign markets through their contact network and participate in public tenders.

### Key Activities

Key activities include:

- Analysing geographical, sociodemographic, and mobility data of a specific area to effectively plan the design and implementation of a new flexible bus service.
- Gathering the requirements and specifications of the service. The latter includes number and location of the stops, possible itineraries, schedules, availability of seats in the vehicle (including wheelchair users), possibilities of booking in advance, etc.
- Assessing the need for extra developments in the software components to meet all the requirements and implementing them.
- Implementing the service in the platform: creating the virtual stops, generating and drawing all the possible itineraries, introducing the schedules, and registering the vehicle and the driver/s.
- Providing training to the team involved in the operation of the service: driver/s, call centre operator/s, operations manager/s and agent/s, etc.
- Testing the service, which involves coordinating with the operator to run a few field tests while Nemi check that the behaviour of all the software components is correct.
- Providing technical support to the operator, in case anything unexpected regarding Nemi's software happens during operations.

### Key Resources

These are the key resources to successfully run a service:

- Servers and cloud services for storing all the data related to the software and the operation of the service, such as the user database.
- Front-end developers, who make changes on the user and driver apps, and back-end developers, who make changes on the back office and solve software issues.
- Specific information and data about the service that is going to be deployed, for example, the exact coordinates of the stops and the vehicle's maximum capacity.
- Mobile networks that ensure real-time communication between all the software components. This is essential, for example, for being able to track the vehicle's real-time position from the back-office tool.
- A vehicle, preferably a minibus, that will provide the transport service.
- Drivers that will be available for providing the service within the operational schedule.

- A mobile device, such as a smartphone or a tablet, that will be installed in the driver's cockpit and will have installed the driver app.
- Communication channels where users can reach the operator for queries and suggestions regarding the service.

### Value Propositions

In areas with lower population density and lower demand for mobility, regular bus services are inefficient — because they travel many kilometres without picking up or dropping off any passenger, wasting users' time and public transport providers' resources— and ineffective — because they consist of long routes with low frequency and limited coverage due to time constraints—. As a consequence, in these areas people either have no access to public transport or many are offered a public bus service which cannot satisfy their needs, leaving them with no affordable alternative to private means of transport.

With Nemi, existing public transport lines with very little demand are improved. The demand-responsive transport solution benefits, on one hand, the operator by increasing the efficiency of its services through the optimisation of all the resources involved in their operation —vehicles, energy, money and time; and, on the other hand, the end users by offering shorter travel times and higher frequency, as well as better access to public transport.

### Customer relationships

Nemi offer the operator a Software as a Service (SaaS) kind of relationship. A contract specifies the technical characteristics of our software, the conditions of the technical support, and the price that the operator must pay for benefitting from this solution.

The expectations of the operator in regard to the provision of the service include aspects such as real-time monitoring of the operations, access to historical data of the service through visualisation and reporting tool, channels and tools for two-way communications with users, and responsive technical support in case of software failure, to mention a few.

Public authorities which are ultimately responsible for the provision of the service expect specific data from the operation, such as the total kilometres travelled by the vehicle (used to calculate the amount of funding to cover for the expenses of the operation).

Lastly, end users expect from their interaction with the user app a general smooth experience, that allows them to easily make reservations for one or more passengers at a convenient time. They also want to have a communication channel or, at least, contact details available to report any issues with the app or send their queries.

### Channels

The first contact with potential customers takes place through different channels:

- Contact network. Nemi is well positioned in the local market thanks to the contact network, and steps are being made to expand this network to other parts of the world.
- Specialised events. They gather a good number of key stakeholders of the mobility sector and are a great opportunity for making new connections.
- Social media. Marketing activities on social media are also an effective way to increase the visibility of Nemi and reach people with interest in the company solution.

Once the commercial relationship starts, the channels used for communicating with customer are usually email, phone call and even instant messaging. The latter provides a fast means of communication that is especially effective in case of incidences in the software or the operation of the service. It is also important to visit clients personally from

time to time, to see how they're interacting with the platform and what suggestions they have for improving it.

### Customer Segments

Customers are transport operators; but they are not the only ones for whom value is being created. In many cases, they are licensed to operate transport services for which public authorities are ultimately responsible. This licensing contract indicates the costs that the public authority must reimburse to the operator, which are mainly based on the kilometres travelled by the vehicles providing the service. In such case, the reduction of kilometres travelled enabled by Nemi's solution benefits public authorities through a great cost reduction. This is why Nemi also work with them to design the features of the software components, such as the reporting tool, and consider them a key partner.

In those cases where the transport operator is not providing a public transport service and, thus, such service is not subsidised by any public authority, the solution benefits the operator through a reduction of their operational costs (fuel savings and lower maintenance). This is the case of the service that is going to be deployed during the first phase of the pilot, connecting mainly coastal locations to the train station. For the second phase of the pilot, the service will cover inner locations surrounding the station and will be subsidised by the competent public authority, the Region of Puglia.

Lastly, even though there is no monetary transaction with them, end users also benefit from Nemi solution through shorter travel times, higher frequency and/or greater coverage. They pay the price of the ticket, which is entirely kept by the transport operator if the service isn't public, and partially kept if it is.

### Cost Structure

Same as in the Business Model description.

### Revenue Streams

The revenue currently comes from two sources:

- A set-up fee that is charged for implementing the service in the platform and for integrating the platform's components in the hardware of the vehicle/s which will operate the service.
- A monthly fee that is charged for the use of the platform, its maintenance and Nemi's technical support.

The most important source of revenue for the sustainability of the business model is the monthly fee that is charged to every operator, since the set-up fee is a one-time revenue and is not sustained over time.

In the near future, Nemi wants to incorporate two more activities which will be additional sources of revenue:

- Planning of new services, looking at different sets of data from an area to decide about the location of stops, the possible itineraries between stops, the schedules, etc.
- Business intelligence, using the data that is been generated by a service to suggest improvements in the design of the service and the way it is operated.



## Nemi Value Chain

### Primary Activities

#### Inbound Logistics

These are the streams that feed the activity of Nemi:

- Cloud services. They include all the online services that host the software and allow Nemi to store all the data that the platform generates, such as the user database. Storage capacity, stability and security are critical features for our operations.
- Development services. Nemi subcontract part of the development efforts with companies that are specialised in providing back-end and front-end software developers who can work full-time for a specific project. The CTO coordinates them and manages the work flow.
- Data. It is an essential part of the planning and implementation phases of the flexible bus services. When designing and planning a service, we need geographical, sociodemographic and mobility data of the area where the service is going to be deployed. This data is provided by the public administration that is responsible for the provision of the service, usually regional authorities. In order to implement the designed service in our platform, there is a need to have all the specific information of the characteristics of the service, such as number and location of the stops, possible itineraries, schedules, possibilities of booking in advance, etc.
- Vehicles and drivers. They are the other essential resource in order to deliver the solution to the end users. They are supplied by the transport operator.

#### Production

Nemi carries out the following production activities:

- Development of the software back-end. Before the first service was deployed, Nemi had to make a huge development effort in order to have the software components that back the operations ready for successfully delivering a flexible bus service to end users. This effort included the creation of the route optimisation algorithm, which picks the shortest possible route that serves all the requests computed by the platform. Now that the initial phase is over, software development is still as essential when one face technical issues and when new features need to be developed.
- Planning of flexible bus services. When the customer does not have a clear idea of the flexible bus service that it wants to implement, it is possible to conduct an analysis of the target area to decide the characteristics of the future service. Nemi can also work with the operator to develop some of the initial ideas that they might have for the service, such as the location of some of the stops or the operating schedule.
- Implementation of flexible bus services in the digital platform. The planning phase is followed by the implementation phase, in which virtual stops are created, and all the possible itineraries are draw, generating the schedules, and registering the vehicle and the driver/s.

#### Outbound logistics

These are the activities and resources that make it possible to deliver the services:

- Development of the software front-end. The front-end is composed of all those tools aimed at customers and end users for interacting with Nemi solution: the back-office for operators, the app for drivers, and the app for users. The back-office is a web-service where the operator can track and manage the operations of all the flexible bus service enabled by Nemi solution. Among other features, it gives access to the full list of registered users, allows to make reservations for them if needed, gives access to the definition of all services in



operation (stops, possible routes, schedules, assigned drivers and vehicles, etc.), and it displays historical data from operations. The driver app guides the driver through every expedition and displays complete information of the route to be executed, including the list of stops to be made and the number of people who are hopping on and off at each of them. The user app allows citizens to book seats on vehicles which are operating different demand-responsive lines by indicating origin, destination and time of their desired trip. The available options are shaped by the virtual stops and schedule previously defined for the service, and approximate pick-up and drop-off times for the selected stops are provided. The user is communicated the final time shortly before the start of the expedition.

- App store services. These are the services that allow Nemi to upload the apps online and have them available for download from Android and iOS mobile devices.

### **Marketing and Sales**

These are the marketing and sales activities:

- Engaging with potential customers, by attending specialised events in the mobility sector. This is how Nemi met their first customer, a bus operator.
- Making use of a contact network. Nemi is very well positioned in the local market thanks to a contact network, resulting of working in the sector for many years. Expansion is in place, with the help of participation in programmes like HiReach.
- Posting on social media. This activity aims at increasing the visibility of the company and also engaging with people in the mobility sector.
- Participating in events and activities. This activity also increases our visibility and allows to increase knowledge of the sector and the contact network
- Proactively offering opportunities for testing the solution. Nemi is constantly seeking opportunities for running pilots, because it is a great way of letting a potential customer test the solution with little cost and no commercial commitment. During the Covid-19 outbreak, Nemi approached a few operators offering them the possibility to test the solution to transform some of their bus services with low demand into flexible bus services at no cost for as long as the confinement lasted.

### **Service**

- Training. Before launching the service, Nemi provides training to all the people involved in the operation of the service: driver/s, call centre operator/s, operations manager/s and agent/s, etc.
- Technical support. It includes answering technical queries from customers regarding the use of tools or the way they manage the operation of flexible bus services, answering queries from end users regarding technical issues with the app, and solving software-related issues.
- Development of new features. Nemi is constantly improving the software components with new functionalities. For instance, it was recently launched a data visualization tool which is integrated in the back office and allows the operator to create graphs and download data sets of different variables of their services.
- Business intelligence. This service consists of using data that has been generated by a service to run an advanced analysis and suggest improvements in the design of the service and the way it is operated. An example of this is creating a heat map with the most used stops and itineraries to decide if some stops must be relocated.

## Support Activities

### Firm infrastructure

- Strategic management: designing a roadmap for the company in the short-, mid- and long-term, deciding which activities and products to develop within the company, identifying market niches, making cost and revenue estimations, etc.
- Administrative handling: accounting, generation of invoices, handling of paperwork, completion of online signup processes, purchase orders, trip bookings, application of quality organizational management processes, etc.
- Financial management: creation of a financial plan, with the expected economic resources that the company will have available and the costs that it will incur.
- Workspace: provision and maintenance of an infrastructure that is adequate for developing the company's activity.

### Human resource management

- Recruiting processes to ensure a balance between workload and size of the team.
- Training activities. There are two types of training activities in the company: external and internal. External training refers to the completion of courses to ensure that the team's knowledge is in line with the sector and market that the company is targeting. Internal training refers to the quality management activities that are run within the company to ensure that all our processes comply with certain quality standards.
- Quarterly meetings, where the manager of each business unit within the company presents the projects that the unit has been working on for the past quarter of the year.
- Employee reviews. These reviews are organized annually with each employee and are used to recognise their good work, point out the areas where they can improve, offer them new challenges and reward their good performance.

### Technology development

- Internal IT platform for accessing shared files, reporting worked hours, registering expenses, making purchase orders and marking personal holidays. It was created by one of our team members long ago, who now manages it and makes improvements.
- Creation of the tool for managing flexible bus services as an R&D project within the company. The tool was developed within a European project in collaboration with the Metropolitan Area of Barcelona, which helped to define its functionalities. The architecture of the tool is built with microservices, which makes it very flexible when it comes to adding new modules (such as a payment module).

### Procurement

The fact that the solution was initially developed with the Metropolitan Area of Barcelona, a public authority responsible for the provision of public transport services, has put Nemi in a good position in the eyes of public transport operators within the local market. This adds to the fact that Nemi already had a wide contact network in the sector as a result of many years of experience working in the field with different consultancy and technological projects, which has allowed to reach other public organisations such as the biggest association of municipalities in Catalunya.

## 10. Tandem (UK)

### Tandem Business Model

#### Key Partners

The key government partner is the Northamptonshire County Council, the key transport commissioner within Northamptonshire. The key motivations for forming this partnership include i) the convening power of the Council for other stakeholders' support Tandem may need ii) the Council's potential to pay for the deployment of the service and iii) the Council's legitimacy in helping to market this service to passengers. The key resources and activities flow naturally from these motivations:

- Provision of funding for Tandem's services.
- Marketing support for Tandem's services.

Key supplier partner are local taxi companies in Northamptonshire, notably two of the top-rated local taxi companies, Simply Cabs in Wellingborough and Blue Corner Cars in Rushden. The key motivation is to acquire a reputable set of drivers and vehicles to be able to offer Tandem's service of turning local taxis into shared micro-buses. As such:

- The key resources provided are vehicles and drivers.
- The key activity is the provision of journeys for passengers, enabled by Tandem's promotion of the service, including enabling tech where relevant.

Tandem may also need to engage the housing developer Vistry Homes over the course of the project, both to understand how the number of residents may evolve over time, as well as to obtain their potential support in helping to promote our service to the residents of Stanton Cross.

#### Key Activities

Northamptonshire County Council is interested in experimenting with new possibilities around demand-responsive transport (DRT) services, which have the potential to deliver an agile, cost effective solution to complement traditional bus options. The goal is to pilot this service in 2020 and potentially replicate it on other routes if successful.

To provide such a service, the key activities that Tandem needs to provide include:

- Provision of a tech platform to enable bookings, payments, vehicle tracking etc.
- The formation of relationships with reliable supply-side taxi partners in the area.
- The logistical design of the route e.g. operating hours, stops, pricing.
- Marketing of the route via partners like the Council, as well as direct to consumer marketing efforts e.g. leaflets, Facebook ads targeted at Stanton Cross residents.
- Ongoing customer service operations once launched.

#### Key Resources

The key resources required to support the aforementioned activities include:

- Staff for technology development.
- Staff members with relevant expertise who allocate a portion of their time focused on business development relationships e.g. with the taxi companies, with the Council.
- Staff members with relevant expertise who allocate a portion of their time focused on marketing efforts e.g. the design and distribution of marketing collateral such as Facebook ads, physical leaflets etc targeted at Stanton Cross residents.

- Staff members with relevant expertise who allocate a portion of their time focused on operations and customer service e.g. ensuring that bookings are correctly taken and communicated to taxi companies, troubleshooting if something goes wrong e.g. if a driver is late.
- Funding – both the revenue that comes from provision of services, as well as upfront funding e.g. grants, equity funding needed to fund staff until the business becomes sufficiently profitable.
- Technology – development of a front-end and back-end tech stack to facilitate interactions with stakeholders and ultimately make the business scalable.

## Value Propositions

Tandem is delivering value to three different groups of customers/stakeholders:

### Northamptonshire County Council

- They are looking for a high-quality service to be provided to help transport residents of Stanton Cross to Rushden Lakes, but also need to ensure that the service is cost-effective given constrained local authority government budget for transportation. Value provided:
  - Provision of reliable transport in the form of a demand-responsive transport service, through partnership with local taxi companies, and which is booked in advance by passengers
  - No costs are incurred if the services are not being used (other than a very small set up fee)
  - The key driver of the level of subsidy required is the number of passengers per vehicle.
    - The higher the overall number of passengers, the higher the likelihood of passengers sharing, but the likelihood of sharing is also determined by:
      - The frequency of service offered
      - The types of use cases amongst Stanton Cross residents for Tandem's services i.e. higher likelihood of sharing if passengers travelling to work or for leisure on weekend evenings, versus shopping throughout the week.
    - This is likely to increase over time as new homes are occupied at Stanton Cross (i.e. the cost per passenger is likely to fall over time).

### Passengers

- They are looking for affordable and reliable ways to get to Rushden Lakes, either for work purposes or to access shops and other services in the development. Value provided:
  - Provision of a high-quality, reliable service that is also tech-enabled (e.g. allowing passengers to book easily from the comfort of their home with a computer)
  - Subsidy from the Council (to guarantee a minimum profit margin) ensures we can price more competitively for the end-passenger

### Local taxi companies

- Want to increase the volume of their work to help grow their business. Value provided:
  - Access to work generated by Stanton Cross service provided by Tandem.

## Customer relationships

- With Northamptonshire County Council the relationship was established in late 2019/early 2020 and became formalised as HiReach host following the withdrawal of

the initial host. This is not a costly relationship to maintain – they expect semi-regular updates on the progress of our work, but this can be communicated via phone and email, especially during the current lockdown period. They are integrated well with the rest of our business model in two particular ways:

- a) other local authorities are potential Journey Generators too, so working with NCC helps to identify best practices for engagement.
- b) the initial base of operations in general (including many other Journey Generators Tandem is targeting) is in Northamptonshire, so they may be useful in making other introductions as well.
- With Passengers – as part of the next phase of the pilot, Tandem intends to begin contacting more passengers who live in Stanton Cross. From the startup general operations in Wellingborough, there is a sense of the expectations when it comes to affordability and reliability, but Tandem would like to conduct further user research. Once a customer comes online, the cost of maintaining the relationship is relatively low.
- With Taxi companies – Tandem have already formed relationships with two taxi companies in the Northamptonshire area, who we are using for other services (e.g. the transportation of employment agency workers), as well as this specific Stanton Cross opportunity. The relationship is not costly to maintain, provided that sufficiently high volumes of work can be sent their way.

### Channels

- 1) Northamptonshire County Council – Tandem engage with their principal contact at the Council via their preferred methods of phone and email which are both cost-efficient means of engagement (once to twice a month).
- 2) Passengers – Tandem intend to form the relationships through direct channels e.g. targeted Facebook ads, but also through indirect means e.g. promotion of the service through partnerships such as the Council's map of all local transport services and ultimately integrating with local MaaS platforms. This will be monitored over time to see which channels are most cost-efficient.
- 3) Taxi companies – Tandem formed the initial relationships through a combination of phone calls and in-person visits, and since then engage through a combination of technology tools (e.g. taxi booking software) and emails/phone calls when needed. Tandem ensure that bookings are sent in advance so that they have sufficient notice to secure the required drivers and vehicles. The Stanton Cross work would not involve any significant deviation from current routines

### Customer Segments

Tandem is creating value for the three following segments:

- Northamptonshire County Council – are looking for a high-quality service to be provided to help transport residents of Stanton Cross to Rushden Lakes, but also need to ensure that the service is cost-effective given constrained local authority government budget for transportation
- Passengers living in Stanton Cross – are looking for affordable and reliable ways to get to Rushden Lakes, either for work purposes or to access shops and other services in the development
- Local taxi companies - Want to increase the volume of their work to help grow their business



Although there are early adopters within each of the segments (e.g. Simply Cabs and Blue Corner Cars from the taxi companies), all three of the customer segments are important in the overall value proposition that Tandem is aiming to deliver.

### Cost Structure

The most critical costs (and the associated activities/resources) are with:

- Staffing costs – i) R& D for engineering team members ii) operations/customer success - These roles play a key part in ensuring high-quality customer service and management of daily operations (e.g. bookings) for both passengers and other partners e.g. the local taxi companies
- Fares paid to taxi partners. As services reach scale, Journey Generators play a key role in 'underwriting' services. i.e. covering the gap between the fares paid by passengers and the cost of the taxis paid to drivers / local transport providers. However, it is crucial to emphasise that no costs are incurred when no passengers have booked.
- Other costs include: a) other HQ staff, b) sales/marketing costs, cc) general admin spend (e.g. finance/accounting software), d) payment processing fees and server infrastructure costs

Because Tandem does not own the vehicles, the company incur relatively few capex costs. Standard office equipment and supplies for the project are accounted for in this category with straight line depreciation applied.

### Revenue Streams

The main source of revenue will be from passengers who use Tandem service – for the initial route (Stanton Cross to Rushden Lakes), the company will charge an initial unit price of about £4.10 for a single one-way fare, £6.90 return. £24 weekly pass (capped at two journeys per day).

This is based on an understanding of the equivalent fares to access Rushden Lakes from Wellingborough on standard bus services.

The goal is that the service is sufficiently valuable to the passengers that they will over time use Tandem as their default mode of transport when travelling along the provided routes, and hence take multiple journeys every week, if not every day.

Plan is for Journey Generators like Northamptonshire County Council and employment agencies to 'underwrite' the cost of journeys so that if the fares collected from a journey across a week fall below a break-even level, that loss is covered. They also have the option to subsidise passenger fares.

The unit price will vary as Tandem adds additional routes and may, ultimately, vary according to a variety of factors from distance travelled to time of day to how flexible somebody is on leaving time. This will be developed in partnership with the academic partners. Tandem will remain committed to ensuring the service can be relied on for every day journeys by customers, including those on low incomes.

Tandem wants to strike an effective balance between being able to nudge customer behaviour, whilst also borrowing many of the best elements from traditional public transport. i.e. keeping prices consistent on a day-to-day basis, but also encouraging people to e.g. leave slightly earlier if it increases the chances of Tandem being able to match more passengers into the same vehicle.



## Narrative of the Business Model

Tandem turns local taxis into shared shuttles to get to work or other key locations. Tandem's technology enables passengers to pay for just their seat in the vehicle - creating a new affordable transport option. They are matched with other passengers whose journey overlaps within the same 'corridor of demand'. The journeys are fulfilled by local transport providers (taxi and minibus companies) who are paid a set fare regardless of passenger numbers, which helps them grow their business by reaching passengers who would not have made this journey if it had involved paying for a full taxi. Services are then underwritten by Journey Generators (public transport authorities or private sector employers/agencies) - they cover the difference between if the average income from passenger fares drops below the amount paid to the transport providers. Journey Generators value our service because there are zero costs when no passengers are travelling, so high quality services can be introduced without large financial risks. Supply can be scaled up and down easily thanks to the local transport providers' fleets.

Tandem's core costs relate to building technology and business development. They reach passengers through a B2B2C model i.e. through their Journey Generator partners. Tandem reach new Journey Generators through networking and conferences. The aim is to increasingly partner with public transport authorities.

The customer service and operations functions can be retained by Tandem, or (especially outside the UK) given to a local operator (e.g. the local transport provider) with Tandem's technology and consultancy to grow the service.

## Tandem Prototype of Business Model

### Key Partners

One key set of partners are the Journey Generators e.g. local government, or employers, or employment agencies – who play the key role as anchor of Tandem services in each location. They act as 'underwriters' – providing initial financial guarantees as Tandem's services build up to scale. They also play a role in identifying the demand, as well as supporting with marketing and promoting the service. As such, the key resources and activities are as follows:

- Provision of funding/underwriting for Tandem's services.
- Identifying locations with the need for a Tandem service.
- Marketing support for Tandem's services.

Key supplier partners are local taxi, minibus and coach companies in each location. The key motivation is to acquire a reputable set of drivers and vehicles to be able to offer Tandem's service of turning local taxis into shared micro-buses. As such:

- The key resources provided are vehicles and drivers.
- The key activity is the provision of journeys for passengers, enabled by Tandem's promotion of the service, including enabling tech where relevant.

### Key Activities

To provide a set of demand-responsive services, the key activities that Tandem provides are as follows.

In all cases:

- A tech platform to enable the booking of and payment for a single seat in a vehicle, allocation of passengers to vehicles, passenger onboarding, vehicle/passenger tracking and more.

(Optional) Where required:

- The formation of relationships with reliable supply-side taxi partners in relevant areas like Northamptonshire.
- The logistical design of the routes e.g. operating hours, stops, pricing.
- Marketing of the route via partners like local authorities, employment agencies as well as direct to consumer marketing efforts where relevant.
- Ongoing customer service operations once launched e.g. troubleshooting if issues with booking.

### Key Resources

The key resources required to support the aforementioned activities include:

In all cases:

- Staff members with relevant expertise who allocate a portion of their time focused on technology development e.g. building of a website, building of a mobile app as relevant, building of potential APIs for integrated with taxi providers' software
  - Staff members with relevant expertise who allocate a portion of their time focused on business development relationships e.g. with the taxi companies, with Journey Generators
- (Optional) Where required:
- Staff members with relevant expertise who allocate a portion of their time focused on marketing efforts e.g. the design and distribution of marketing collateral such as Facebook ads, physical leaflets etc targeted at passengers and potential Journey Generators.
  - Staff members with relevant expertise who allocate a portion of their time focused on operations and customer service.
  - Funding – both the revenue that comes from provision of services, as well as upfront funding e.g. grants, equity funding needed to fund staff until the business becomes sufficiently profitable.
  - Technology – development of a front-end and back-end tech stack to facilitate interactions with stakeholders and ultimately make the business scalable.

### Value Propositions

Tandem is delivering value to three different groups of customers/stakeholders:

1) Journey Generators – are looking for a high-quality service to be provided to help create new transport options. Value provided:

- Provision of reliable transport in the form of a demand-responsive transport service through partnership with local taxi companies, and which is booked in advance by passengers or the Journey Generators.
- No costs are incurred when services are not being used (other than a very small set up fee).
- The key driver of the level of subsidy required is the number of passengers per vehicle. The higher the overall number of passengers, the higher the likelihood of passengers sharing, and the lower the subsidy required. i.e. as services become more widely used, required subsidies will actually fall.

2) Passengers – are looking for affordable and reliable ways to get to their destinations either for work, education, leisure or social purposes. Value provided:

- Provision of a high-quality, affordable, reliable service

3) Local taxi companies - Want to increase the volume of their work to help grow their business. Value provided:

- Access to work generated by Tandem, including journeys that would not take place if priced at a 'whole car' price.
- Demand often concentrated in off-peak periods in many cases

### Customer relationships

- 1) Journey Generators – Tandem has developed initial relationships with both employment agencies and local authorities. These are not costly relationships to maintain – they expect semi-regular updates on the progress of Tandem work, but this can be communicated via phone and email. Increasingly management information on Tandem's services will be shared with Journey Generators through our online dashboard.
- 2) Passengers – From current operations there is a sense of the expectations of affordability and reliability, but one would like to conduct further user research. Once a customer comes online, the cost of maintaining the relationship is relatively low. Depending on the route, the cost of initial acquisition, however, may be higher.
- 3) Taxi companies – These relationships are not costly to maintain, provided that sufficiently high volumes of work can be sent their way.

### Channels

- 1) Journey Generators – Tandem engaged via their preferred methods of phone and email which are both cost-efficient means of engagement. The more costly investments are related to acquisition costs e.g. in-person visits to their premises to form relationships, or paying for promotion through third parties/conferences etc.
- 2) Passengers – Tandem intend to form the relationships through direct channels e.g. targeted Facebook ads, but also through indirect means e.g. promotion of the service through partnerships such as Journey Generators. Tandem intend to monitor over time which channels are most cost-efficient
- 3) Taxi companies – Tandem formed the initial relationships through a combination of phone calls and in-person visits, and since then engage through a combination of technology tools (e.g. taxi booking software) and emails/phone calls when needed. Tandem ensure that bookings are sent in advance so that they have sufficient notice to secure the required drivers and vehicles.

### Customer Segments

Tandem is creating value for the three following segments:

- Journey Generators – are looking for a high-quality service to help create new transport options for passengers in their community or workforce (e.g. employers / agencies want to ensure staff can get to work).
- Passengers – are looking for affordable and reliable ways to get to their destinations either for work, education, leisure or social purposes.
- Local taxi companies - Want to increase the volume of their work to help grow their business.

Although there are early adopters within each of the segments (e.g. Simply Cabs and Blue Corner Cars from the taxi companies), all three of the customer segments are important in the overall value proposition that Tandem is aiming to deliver.

## Cost Structure

The most critical costs (and the associated activities/resources) are with:

- Technology development and support costs. Where this role is played by Tandem, there are also costs associated with: Staffing - e.g. operations/customer success - These roles play a key part in ensuring high-quality customer service and management of daily operations for both passengers and other partners e.g. the local taxi companies
- Fares paid to taxi partners. As services reach scale, Journey Generators play a key role in 'underwriting' services. i.e. covering the gap between the fares paid by passengers and the cost of the taxis paid to drivers / local transport providers. However, it is crucial to emphasise that no costs are incurred when no passengers have booked.
- Other costs include: a) other HQ staff, b) sales/marketing costs, c) general admin spend (e.g. finance/accounting software), d) payment processing fees and server infrastructure costs.

Because Tandem does not own the vehicles, the company incur relatively few capex costs. Standard office equipment and supplies for the project are accounted for in this category with straight line depreciation applied.

## Revenue Streams

The main source of revenue will be from passengers who use Tandem service – Tandem will generally price to be competitive with local bus fares, or ideally less.

The goal is that the service is sufficiently valuable to the passengers that they will over time use Tandem as their default mode of transport when travelling along the provided routes, and hence take multiple journeys every week, if not every day.

Plan is for Journey Generators like Northamptonshire County Council and employment agencies to 'underwrite' the cost of journeys so that if the fares collected from a journey across a week fall below a break-even level, that loss is covered. They also have the option to subsidise passenger fares.

The unit price will vary as Tandem adds additional routes and may, ultimately, vary according to a variety of factors from distance travelled to time of day to how flexible somebody is on leaving time. This will be developed in partnership with the academic partners. Tandem will remain committed to ensuring the service can be relied on for every day journeys by customers, including those on low incomes.

Tandem wants to strike an effective balance between being able to nudge customer behaviour, whilst also borrowing many of the best elements from traditional public transport. i.e. keeping prices consistent on a day-to-day basis, but also encouraging people to e.g. leave slightly earlier if it increases the chances of Tandem being able to match more passengers into the same vehicle.

## Tandem Value Chain

### Primary Activities

#### Inbound Logistics

- Ongoing maintenance of relationships with taxi partners e.g. identifying potential areas of operational streamlining, checking on their general satisfaction of experience of working with Tandem.

#### Production

Technology to:

- Enable booking and payment.
- Group passenger bookings into shared vehicles.
- Communicate bookings to taxi partners.

**Outbound logistics**

- Confirmation and execution of bookings to customers.

**Marketing and Sales**

- Shortlisting of Journey Generator partners – prioritise on basis of potential ability to pay, social impact and # of linked passengers.
- Business development/outreach to shortlisted Journey Generator partners.
- (Where relevant) creation and distribution of marketing collateral to passengers as relevant.

**Service**

- Customer service support (if not provided locally).
- Identification and implementation of potential operational improvements (e.g. request in changes to frequency of service, locations of stops etc.).

**Support Activities****Firm infrastructure**

- Regular line management + whole team check-ins/updates.
- Book-keeping.
- Administration e.g. monthly payroll.

**Human resource management**

- Identification of key roles for organisation.
- Recruitment of key roles.
- Training, coaching, and performance management of staff.

**Technology development**

- Development of front-end technologies e.g. user interface for booking.
- Development of back-end technologies e.g. pricing and sharing algorithms.
- Integration with APIs as relevant e.g. taxi partners' booking software e.g. Icabbi.
- Licensing of third-party software tools as needed (e.g. Amazon Web Services, payment processing).

**Procurement**

- Shortlisting of potential taxi company partners – prioritise on basis of reputation/reviews, as well as nature of fleet (e.g. # of vehicles/drivers available, different sized vehicles available).
- Business development/outreach to shortlisted taxi company partners to form agreements to supply drivers and vehicles for Tandem.

## Document History

Version	Date	Author/Editor	Description
0.1	20/09/2020	Vasco Reis and André Freitas (TIS)	First consolidated draft
0.2	22/09/2020	Massimo Moraglio (TUB)	First review
0.3	25/09/2020	Vasco Reis and André Freitas (TIS)	Updated version after first review
0.4	29/09/2020	Simone Bosetti and Silvia Maffii (TRT)	Second review – QA
0.5	30/09/2020	Simone Bosetti (TRT)	Final version