PRO-E-BIKE

Promoting electrical bikes and scooters for delivery of goods and passenger transport in urban areas

READ ME: An Introduction to Business Models

WP 5

D.5.1 - 9 business models for successful transport of goods and passengers services with E-bikes

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An Introduction to Business Models

There is no generally accepted definition of the term **business model** (BM). Diversity in the available definitions poses substantive challenges for delimiting the nature and components of a model and determining what constitutes a good model. Although the business model term has been referred to as architecture, design, pattern, plan, method, assumption on statement, a business model is always a simplification of the complex reality. A business model is the architecture for the product, service and information flows, which includes a description of the various business actors and their roles and a description of the potential benefits for the various business actors and a description of the sources of revenues.

In a more recent perspective, a business model is a description of the roles and relationships among a firm’s consumers, allies and suppliers and that it identifies the major flows of the product, information and money, as well as the major benefits to participants.

Moreover, a business model is a description of a complex business regarding its structure, the relationships among structural elements and identifying how this business will respond to the real world.

Furthermore, a business model is like a story that explains how an enterprise works. “Business models describe or prescribe more specifically how resources are combined and transformed in order to generate value for customers and other stakeholders, and how a value generating company will be rewarded by its exchange partners that receive value from it.”

More recently, Osterwalder and Pigneur (2010) mentioned that “A business model describes the rationale of how an organization creates, delivers, and captures value.”

This report focuses on WPS of PRO-E-BIKE project, which objective is to build successful business models of urban transport services of passengers, freight and for provision of services using e-bikes.

Successful business models are key to ensure the competitiveness and financial viability of a service and, therefore, its long term sustainability.

Osterwalder’s business model theoretical framework was the chosen approach to use on the WPS. A business model canvas is presented which outline the rational of how an organization creates, delivers, and captures value. They define nine building blocks for the model.

However, since PRO-E-BIKE project is related to E-Bikes, it was considered that Osterwalders’ approach was insufficient to fully understand the motives that could lead a company to shift from conventional to electric vehicles.

For instance, if there is no urban policies, the private investment in non-pollutant vehicles and noise reduction equipment will not happen because it usually represents an increase on transport costs for companies. Moreover, this increase in costs do not increase their profit unless there are environmental regulations and/or circulation restrictions policies.
Accordingly and following the approach of the EU co-funded research project TURBLOG, another block was added to the business model named “Internalisation of externalities”.

Figure 1 shows the adapted business model canvas that will be used to define successful BM in PRO-E-BIKE. This business model characterisation is very complete but at the same time very simple to understand and use. That was the reason why it was chosen to explore the business model in E-Bikes market according to this view.

Following those 10 key blocks, the report will demonstrate how 9 companies using E-bikes developed their BM to success and the lessons learned. Moreover, it represents the main elements of a business model and how they are interacting to tell us the company soul.

The 9 BM presented in this report are the following:

1) Kindergarten de Bieënkorf (Netherlands);
2) Bike.Pop (Portugal);
3) Transport of elderly/disabeld people (prototype);
4) La Petite Reine (France);
5) Youlog (Italy);
6) TNT Express (Belgium);
7) TXITA (Spain);
8) Camisola Amarela (Portugal);
9) Soltra (Spain).

The ten building blocks are briefly described as follows.
Customer Segments (CS)

Customers comprise the heart of any business model. Without (profitable) customers, no company can survive for long. In order to better satisfy customers, a company may group them into distinct segments with common needs, common behaviours or other attributes. An organisation serves one or several Customer Segments and there are different types. Here are some examples: mass market, niche market, segmented, diversified and multi-sided markets.

Most of the 9 BM presented has diversified customers segments, in order to satisfy a larger number of people and to give more people the opportunity to know their innovative business. Regarding the BM of passengers’ services, usually a niche market is served, as it is the example of the Kindergarten De Bieënkorf or the transport for elderly/disabled people (please see section BM for passengers).

Value Propositions (VP)

Value Proposition is the reason why customers turn to one company over another. It solves a customer problem or satisfies a customer need. Each value propositions consists of a selected bundle of products and/or services that caters to the requirements of a specific customer segment.

Value proposition creates value for a customer segment through a distinct mix of elements catering to that segment’s needs that may be quantitative, such as price, or qualitative, for instance design.

Several and different value propositions were found in initiatives and companies that uses E-bikes for transport of passengers, freight, or mixed services, such as:

- **Green image of the company.** The use of E-bikes improves the image of the company compared to the use of fossil fuelled vehicles. It is less polluting and makes less noise, all of which is appreciated by many customers (e.g. Camisola Amarela);
- **Bike used for advertisement.** They put the logo of their company on the vehicle as well as advertisements. In this way, it can be used as a riding billboard (e.g. TXITA, BIKE.Pop);
- **Less space needed.** It is easier to find a parking spot for an E-bike than for a car. This saves also time and parking costs;
- **Good for health.** Although an E-bike is electric powered, it is still much better for the health of people than doing nothing. Without pedaling, the engine stops;
- **Good for the environment.** Air and water pollution associated with gas-powered vehicles are almost non-existing for E-bikes. Only the power plants used for charging the battery emit polluting gases but the energy could be produced with renewable energy sources;
- **Faster than other transport modes.** In urban areas an E-bike could be faster than a car, adding time that can be used for the job that needs to be done;
- **Cheaper in purchase and use.** An E-(cargo)bike or scooter is cheaper in purchase compared to a car. Maintenance costs are also considerably lower;
- **Cheaper in insurance and road taxes.** Insurance costs of an E-(cargo)bike are significantly lower and no road taxes need to be paid;
- **Larger space.** With an E-cargobike, the weight and volume that can be transported is larger than at a conventional bike;
- **Larger range.** With an E-(cargo)bike, longer distances can be covered than with a conventional bike;
- **Fun to ride.** In general people enjoy riding a bike more than driving a car, as well as that it takes less energy than driving a conventional bike. This is visible in TXITA, Camisola Amarela for instance;
- **No problems with time windows for urban delivery.** Increasingly, trucks and vans can only enter the cities during specific time windows. These restrictions are not applied to E-bikes, increasing flexibility and as a result more efficient and competitive. This can also lead to higher customer satisfaction;
• No problems with low emission zones. Increasingly, trucks and vans can only enter in the city center with very clean engines. These restrictions are not applied to E-(cargo) bikes and E-scooters;
• No driving license needed. Personnel do not need to have a driving license to use E-bikes. This increases the flexibility to assign staff. Disabled and young people can be easier assigned, as the example of SOLTRA case.

Channels (CH)

Communication, distribution, and sales channels comprise a company’s interface with customers. Channels are customer touch points that play an important role in the customer experience.

Channels have five distinct phases, which are awareness, evaluation, purchase, delivery and after sales. Each channel can cover some or all of these phases. Channels can be distinguished between direct or indirect, as well as between owned and partners’ channels.

In almost 9 BM presented in this report, the E-bikes are an important part of the channels’ company. Conventional channels, such as telephone, email or website are present in all BM. Some of them mentioned other channels such as social network and worth of mouth.

Customer Relationships (CR)

A company should clarify the type of relationship it wants to establish with each customer segment. Those relations may be driven by the following motivations: customer acquisition, customer retention and boosting sales.

Several categories of customer relationships can be distinguished, which may co-exist in a company’s relationship with a particular customer segment. They are: personal assistance, dedicated personal assistance, self-service, automated services, communities and co-creation.

The majority of the companies presented in this report offers a personal assistance to their customers. This is an important aspect when new and innovative services come to market and customers do not have fully confidence in such service. By a dedicated or personal assistance, companies are ‘giving the face’ to their product or service in order to provide confidence to their customers. This is particular relevant when transporting children and/or elderly and disabled people. In fact, it is extremely important when transporting any person.

Revenue Streams (R$)

If customers comprise the heart of a business model, revenue streams are its arteries. A company must ask itself For what value is each customer segment truly willing to pay? Successfully answering that question allows the firm to generate one or more revenue streams for each customer segment.

This building block is one of the most particular ones, since there are several ways to generate revenue streams: asset sale, usage fee, subscription fees, lending/renting/leasing, licensing, brokerage fees and advertising.

This is particular visible in the 9 BM, in which different ways of generate revenues streams are present even in the same BM. The 9 examples shows that innovative businesses struggle for the sustainability of their company, but besides it is possible to maintain a profitable business, the final result is worth it.

Key Resources (KR)

Every business model requires key resources which allow an enterprise to create and offer a value
proposition, reach markets, maintain relationships with customer segments, and earn revenues. Different key resources are needed depending on the type of the business model.

Key resources can be physical, financial, intellectual or human.

All of the 9 BM presented physical resources, such as facilities and vehicles and human resources. Some of them offer consultancy services. For that intellectual resources are needed, since they sell their know-how. This is the particular case of TXITA or Bike.Pop (please see section BM of Passengers and Mixed services).

Key Activities (KA)

Every business model calls for a number of key activities and these are the most important actions a company must take to operate successfully. Like key resources, they are required to create and offer a value proposition, reach markets, maintain customer relationships, and earn revenues.

Key activities differ depending on business model type and can be categorised as follows: production, distribution or supporting activities.

The majority of the BM presented in this report are related to distribution. However, in some of them those activities are not the part of the core business of the company. This is the case of the Kindergarten De Bieënkorf and Bike.Pop (please see section BM for passengers).

Key Partnerships (KP)

Companies make partnerships for many reasons, and partnerships are becoming a cornerstone of many business models. Companies create alliances to optimise their business models, reduce risk, or acquire resources.

Four different types of partnerships can be distinguished: strategic alliances between non-competitors, strategic partnerships between competitors (coopetition), joint ventures to develop new business and buyer-supplier relationships to assure reliable supplies.

The examples provided in this report demonstrate the importance of having key partners when implementing innovative solutions provides social, and environmental benefits to the society. Moreover, some examples demonstrate how their business contribute to the local economy. Those gains are not measured by economic values, and key partners such as municipalities can boost or support those businesses.

Moreover, some business concepts were only effectively implemented because they were sustained by public administration policies, which provided availability of warehouse spaces or accessibilities and, in some cases, financial incentives, resulting in partnerships with the municipality or other government administrations as is the case of La Petite Reine (Please see section of BM for freight).

Cost Structure (C$)

This building block describes the most important costs incurred while operating under a particular business model. Creating and delivering value, maintaining customer relationships, and generating revenue all incur costs. Such costs can be calculated relatively easily after defining key resources, key activities, and key partnerships.

Cost structures can have the following characteristics: fixed costs, variable costs, economies of scale and economies of scope.

Usually, variable costs are related to staff, maintenance costs, electricity (instead of fuel), IT systems while fixed costs are related to facilities rental, insurance costs, return over the invested capital and taxes and other duties.
Comparing to the investment in conventional vehicles, the purchase costs of E-bikes, insurance costs and maintenance costs are lower. Moreover, there is no fuel costs and no road taxes.

For instance, large courier companies such as TNT deliver their parcels at an urban distribution centre (UDC), from where it is distributed by a local distribution company, mostly with electric vehicles, including electric (cargo) bikes. If more courier companies make use of the same UDC, economies of scale through bundling can be realised.

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**Internalisation of Externalities (IoE)**

Logistic companies have no incentive in engaging for sustainable solutions, because the costs they are responsible for are partly being supported by the whole society, as externalities.

By applying this business model canvas, a weakness was faced related to the lack of reference to externalities which is a very relevant effect of urban (freight) transport that cannot be ignored. Therefore, the business model was adapted to include a 10th building block to cover externalities generated.

Apart from environmental benefits, most of the BM presented in this report shows a genuine social responsibility.

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**Cycle Mobility/ Logistic Profile Concept**

According to TURBLOG project, urban mobility involves the movement of both people and goods. In most cities, those who are responsible for urban transport policy and planning have traditionally paid more attention to the movement of people and less attention to the movement of goods. This is particular truth in businesses using conventional vehicles. But regarding the market of passengers using E-bikes in Europe, there is more successful examples regarding freight deliveries than transport of people by E-bike.

Furthermore, freight market is inherently far more complex than passenger market. There are multiple reasons, of which one may highlight the diversity of freight, regarding shape, size and nature. As such and in order to bridge this gap, in the PRO-E-BIKE project the analysis of the freight market is more relevant than the passenger market.

In this sense, another concept will be introduced to a fully understanding on the successful presented 9 cases, which is the Logistic and Mobility Cycle profiles.

The concept of logistic profile (LP) was initially developed in Macário et al (2007) which is based on the hypothesis that it is possible to identify, for some well-defined areas inside a city, reasonably homogeneous groups of logistic needs, based on three key points: the urban characteristics of the area, the requirements of the logistic agents (i.e., the requirements concerning the type of delivery), and the characteristics of the products being transacted. The logistic profile of a given urban area is thus defined by the interaction of these three key aspects.

Furthermore, according to Macário (2013) in the areas of the city in which LPs can be defined, it will be possible to adjust urban logistic services which will optimise the consumption of the involved public and private resources such as space and vehicles, in function of the needs of the different market segments. Several variables are used to qualify the logistic profiles.

Please note that those variables were adapted from TURBLOG project to be in line with E-bikes characteristics. Those variables can be combined in an array of different LPs, but the objective with this deliverable (D5.1) is more to stress that it is possible to match different logistic services to specific logistic profiles than getting a list of profiles.
The concept of cycle mobility profile is rather similar to the logistic profile whose main difference is in one of the three key points. The totally different dimension is the one related to the passenger’s characteristics instead of product characteristics (Figure 2). The purpose of the definition of logistics/cycle mobility profiles is to identify what the features are that best suit the conditions to the definition of the profiles. For each of these features a scale was set, as described in the following sections.

The Cycle mobility profile is defined by the characterization of the features presented in Table 1, Table 4 and Table 4 while the Logistic profile is defined by the features presented in Table 1, Table 2 and Table 4.

Figure 2: Cycle Mobility/Logistic Profile (Source: adapted from Macário et al., 2007)
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Table 1: City area features criteria

<table>
<thead>
<tr>
<th>Features</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1 Commercial density</td>
<td>Low: &gt;30% Commercial face to residencies/services/industry; Medium: 30% to 70% Commercial face to residencies/services/industry; High: &gt;70% Commercial face to residencies/services/industry</td>
</tr>
<tr>
<td>1.2 Homogeneity</td>
<td>Low: Several types of services and products; Medium: Mix of residential areas with offices and commercial stores; High: Cluster of one type of service or similar products</td>
</tr>
<tr>
<td>1.3.1 Orography</td>
<td>Hilly; Segregated; Severe climate</td>
</tr>
<tr>
<td>1.3.2 Infrastructure</td>
<td>Between hilly and flat; Shared; Mild climate</td>
</tr>
<tr>
<td>1.3.3 Climate</td>
<td>Flat; No existent</td>
</tr>
<tr>
<td>1.4 Bike culture</td>
<td>In Favor; Neutral; Against</td>
</tr>
<tr>
<td>1.5 Restriction applied</td>
<td>Yes: Off-peak hours, week days; No</td>
</tr>
<tr>
<td>1.6 Logistic accessibility</td>
<td>Bad: Bad level of access between the shop and the parking (e.g. no loading bays); High level of traffic congestion (Commercial speed &lt; 3km/h); Reasonable: Some specific measures considering logistic needs (e.g. loading bays non-exclusive); Reasonable (High on peak hours); Good: Transport network suited for the logistic needs (e.g. exclusive loading bays); Low (Fluid traffic - commercial speed &gt;12km/h)</td>
</tr>
<tr>
<td>1.7 Pavement</td>
<td>Comfortable; Need some adjustments; Irregular and in poor conditions</td>
</tr>
</tbody>
</table>

Table 1 presents the classification of the city area features. For the identification of the logistic profile, seven city area features were considered: 1) commercial density; 2) homogeneity; 3) conditions, based on the orography, existent infrastructure and climate; 4) bike culture including safety, drivers respect to cyclists, police benevolence, bike parking conditions and availability and bike repair stations; 5) Restrictions applied, for example time windows for deliveries; 6) logistic accessibility including existence of measures implemented considering logistic needs and on the traffic congestion; and 7) Pavement conditions, since it could be important when cycling.
The products’ characteristics have a major influence on how the deliveries are made, especially considering the easiness of handling and the conditions on how the product must be delivered (for example, type of packaging, temperature needs, fragile products, and so on), so they are closely connected to the deliveries profile. Table 2 presents the classification for the features considering the products’ characteristics.

In the same way, Table 3 presents the characteristics of passengers, which is regarding the type of passengers and if they have special needs.

### Table 2: Product characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Easiness of handling</td>
<td></td>
</tr>
<tr>
<td>2.1.1 Size</td>
<td>Difficult</td>
</tr>
<tr>
<td>2.1.2 Weight</td>
<td>Fits in a cargo bike</td>
</tr>
<tr>
<td>2.1.3 Holding conditions</td>
<td>Heavy Packages (off-size, off-shape...)</td>
</tr>
<tr>
<td>2.2 Special conditions</td>
<td></td>
</tr>
<tr>
<td>2.2.1 Fragility</td>
<td>Special needs</td>
</tr>
<tr>
<td>2.2.3 Perishability</td>
<td>Valuable products, frozen products, etc...</td>
</tr>
<tr>
<td></td>
<td>Fragile</td>
</tr>
<tr>
<td></td>
<td>Perishable</td>
</tr>
<tr>
<td>2.3 Perishability</td>
<td></td>
</tr>
<tr>
<td>2.4 Special conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special needs</td>
</tr>
<tr>
<td></td>
<td>Open packages, if food handled at ambient temperature, chilled, etc...</td>
</tr>
<tr>
<td></td>
<td>Might have special needs</td>
</tr>
<tr>
<td></td>
<td>Not perishable</td>
</tr>
<tr>
<td>2.5 Perishability</td>
<td></td>
</tr>
<tr>
<td>2.6 Special needs</td>
<td></td>
</tr>
<tr>
<td>2.7 Perishability</td>
<td></td>
</tr>
<tr>
<td>2.8 Special needs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No special needs</td>
</tr>
</tbody>
</table>

### Table 3: Passengers’ characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Type of passenger</td>
<td></td>
</tr>
<tr>
<td>2.1.1 Kids</td>
<td></td>
</tr>
<tr>
<td>2.1.2 Adults</td>
<td></td>
</tr>
<tr>
<td>2.1.3 Persons with reduced mobility</td>
<td></td>
</tr>
<tr>
<td>2.1.4 Animals</td>
<td></td>
</tr>
<tr>
<td>2.2 Special needs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Which?</td>
</tr>
<tr>
<td></td>
<td>Safety belts, trailer, wheelchair ramp or storage, etc...</td>
</tr>
</tbody>
</table>
For the deliveries profile, it is important to know the demands of the client in terms of urgency of deliveries. This will determine the frequency of the deliveries, and, together with the amounts to be delivered (number of units per shop, number of shops, etc.), explain how the deliveries are made. Another relevant information is how are the routes established. Are they fixed or unknown? There are planned deliveries or the routes are defined at the moment? Deliveries are made in the early morning, after hours or no special schedule are needed? (Table 4).

### Table 4: Agents profile criteria

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Urgency of deliveries</td>
<td>Immediate</td>
</tr>
<tr>
<td></td>
<td>During the day</td>
</tr>
<tr>
<td></td>
<td>Next day</td>
</tr>
<tr>
<td>3.2. Frequency of deliveries</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Several a week</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Several per day</td>
</tr>
<tr>
<td>3.3. Routes</td>
<td>How many routes?</td>
</tr>
<tr>
<td>A) fixed origin/unknown destination</td>
<td>Number of stops</td>
</tr>
<tr>
<td>B) unknown origin/unknown destination</td>
<td></td>
</tr>
<tr>
<td>C) fixed origin/fixed destination</td>
<td></td>
</tr>
<tr>
<td>3.4 Planned deliveries</td>
<td>Route defined at the moment</td>
</tr>
<tr>
<td></td>
<td>Pre-established route</td>
</tr>
<tr>
<td>3.5 Special delivery schedule</td>
<td>After hours deliveries</td>
</tr>
<tr>
<td></td>
<td>Early morning (8 -10 a.m.)</td>
</tr>
<tr>
<td></td>
<td>No special schedule</td>
</tr>
</tbody>
</table>
Conclusions

From the analysis of different examples of successful urban business models using E-bikes, it is possible to conclude that most of the innovative business concepts presented rely on partnerships other than the typical buyer-supplier relationship, with the expectation to improve performance (efficiency) and accessibility of their services as core value propositions as well as to improve their green image and contribute to a better environment. In this way, they internalise the externalities and value their positive contribution to society.

Moreover, some business concepts were only effectively implemented because they were sustained by public administration policies, which provided availability of warehouse spaces or accessibilities and, in some cases, financial incentives, resulting in partnerships with the municipality or other government administrations (e.g. La Petite Reine). In order to meet the municipal environmental requirements and restrictions and also looking towards improving service performance, some companies developed joint ventures to develop these new services (e.g. La Petite Reine and TXITa that developed the tricycle needed for its business with a local manufacturer).

In several cities, tricycle couriers are more and more common and some urban consolidation centres use electric cars to do the last-mile deliveries. The concept of a mobile depot that is loaded outside the city and driven into the city to be the base point for the last-mile deliveries, however, is completely new.

When city authorities imposes a congestion charge on the use of conventional vehicles, this will support the use of low/zero emission alternatives.

Moreover, in the case of TNT Express, it is stressed the importance of the logistics profile concept. Since they did not have taken different freight profiles of the urban area into account, they do not fit their business model accordingly. The mix of parcels in the urban area, such as amount, size and proximity influences the suitability of the concept.

The business model canvas shows business models at a point in time. But most companies’ business models are under constant pressure to change. There are a lot of facts that contribute to that such as innovations in technology, changes in the law, competitive moves, or shifts in consumer tastes. In response to those changes, companies totally revamp their business models in a wide variety of ways. A good example of that is TXITa that have been continuously adapting their business model and offering different services to different customers to maintain their profitability.

Regarding the case of Bike.Pop they are a successful BM, however their service of pedicabs is not the core of their business. There are still a lot of barriers, such as the car culture. The costs are still very high, regarding the maintenance and purchase of the vehicles and no incentives to be an environmental-friendly company.

And finally, SOLTRA and also Bike.Pop shows the importance of partnerships with the Municipalities/Councils in this type of project, as well as to support groups with social integration difficulties.

Those cases are good examples of companies using innovative solutions and how they overcome barriers to maintain their business profitable.
References


10 TURBLOG (2011), Transferability of urban logistics concepts and practices from a worldwide perspective. Deliverable 2: Business Concepts and models for urban logistics*

Successful Business Models using E-bikes for transport of passengers

This report focuses on WP5 which objective is to build successful business models of urban transport services using e-bikes.

Successful business models are the key to ensure the competitiveness and financial viability of a service and, therefore, its long term sustainability.

According to D2.1, there are three different types of professional use of E-bikes, i.e.

- E-bikes for passenger transport;
- E-bikes for freight transport;
- E-bikes for the provision of services.

This section is related to successful business models for transport of passengers.

In this respect, E-bikes can be used in various forms:

- As a taxi (rickshaw, e-scooter taxi);
- As a cargo-bike for transporting children at childcare centres;
- As a special service for elderly/disabled people.

According to empirical studies, it is most likely that E-bikes will have their greatest potential in urban areas, successfully facing problems like congestion and limited access areas due to environmental zones or delivery period restrictions1. However, there is an uncertainty in which of the existing markets for bike and car shipments that will be entrenched by E-bikes, or even if a new market for this vehicle can evolve.

The demonstration of successful business models is a step forward trying to help answering how far E-bike use will be fostered in the market such as B2C deliveries, micro-consolidation or even for transport of passengers. In addition to that, several European countries are using E-bikes for postal deliveries.

Using the canvas approach developed by Osterwalder, the main elements of 3 successful business models of passengers' transport services are presented below. Those BM canvas shows how the 10 key blocks are interacting to tell us the company’s soul. Moreover, in this section it is presented one BM for each category: 1) rickshaw taxi; 2) transport of children in a childcare and 3) transport for elderly/disabled people. The latter case is presented as a prototype, inspired in a health care centre in Noord-Brabant (NL) that brings people in a wheelchair to the railway station with a special bicycle, which is able to connect the wheelchair to the bicycle easily.

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Successful Case: Kindergarten De Bieënkorf – Wijhe, Netherlands

**Brief Description**

De Bieënkorf is a childcare centre located in Wijhe, a village of 7.000 people in The Netherlands. They provide childcare services for children from age 0 to approximately 12 years old.

In February 2012 they bought a cargo-e-bike called ‘Go Cab’ of Van Raam, which is a dedicated e-cargo-bike for transportation of children, specifically to be used by childcare centres.

The Go Cab is used for short distance trip with up to 8 children to/from school, for shopping, for fun trips, and so on. In July 2013, the Go Cab was still in use and the employees of the childcare centre were very enthusiastic about it.

Moreover, it is much easier to put 8 children into the Go Cab than into 8 child seats in the car and for the children the Go Cab gives a much better ‘experience’ about the touch and feel of being outdoor than being transported by a van.

The Go Cab allows a door to door transportation and it is extremely easy to drive because it is even lighter than a normal bike. Besides that, it is also very easy to manoeuvre.

**Business Model**

Regarding the value proposition, with the utilisation of the Go Cab, the childcare was able to convey a deeply care and concern for the planet and well-being of the children. Moreover, introducing the Go Cab allowed to extend their mobility options for staff and children in an economical and environment friendly way and also to improve children’s’ experience, a better one compared to the van. Therefore, the relationship with children is more personal.

The childcare centre moved from the village centre to a more peripheral location and walking to the village centre was no longer an option. Since they already have two vans, the alternative would be to buy another van. Instead they bought the Go Cab. The e-cargo-bike provided them with the freedom to do all kinds of small trips without too much difficulty. The purpose of this initiative was to have a reliable and economical transport service for the children attending the childcare centre.
### De Bieënkorf Business Model Canvas

<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Key activities</th>
<th>Value Proposition</th>
<th>Customer Relationships</th>
<th>Customer segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go Cab provider (Van Raam)</td>
<td>Transport of children from/to school</td>
<td>Better image (compared to car)</td>
<td>Personal</td>
<td>Children (From 0 to 12 years old)</td>
</tr>
<tr>
<td></td>
<td>Transport of children in fun trips</td>
<td>Extend mobility options in an economical and environmentally friendly way</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improve children’s’ experience</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key resources</th>
<th>Internalising Externalities (regarding Go Cab)</th>
<th>Channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child centre, educators and staff &amp; vehicle (1 Go Cab)</td>
<td>Less emissions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Better quality of Life</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost structure</th>
<th>Revenue Streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go Cab costs were € 11,600 (including maintenance contract, advertisement, extra battery, rear view mirror, VAT)</td>
<td>Increase demand (more parents registering their kids) due to a better image and branding</td>
</tr>
<tr>
<td>Reduction of operational costs (no gasoline, no insurance)</td>
<td></td>
</tr>
</tbody>
</table>
Furthermore, by introducing the Go Cab, they internalise the externalities by contributing to a better quality of life and reducing emissions, passing those values to the children.

By introducing the Go Cab, they reduce the operational costs since no gasoline nor insurance are needed. Total costs of Go Cab were € 11,600, including maintenance contract, advertisement, extra battery, rear view mirror and VAT. Their key activity with the Go Cab is to transport children from/to school and from/to other activities, such as trips for fun, shopping and other. Therefore, the Go Cab provider was a key partner to the success of this new service BM.

The customers are children between 0 and 12 years old. Therefore, the revenue streams are expected to increase with an increase in demand, i.e. more parents registering their kids due to a better image and branding.

The key resources are educators and other staff, the child centre, and the Go Cab.

The current battery allows for 25 km electric support. This is sufficient for their current activities, but a longer range would be easier.

**Agent needs**

The routes are pre-defined from/to school with a defined schedule. Routes defined at the moment are also needed when there is outside activities such as shopping or fun trips.

**City area features**

Wijhe is a village of 7,000 people in The Netherlands. Like every cities in Netherlands, the terrain is flat and very suitable for cycling. The bike culture is totally in favour. Regarding the climate, although the Van Raam Go Cab has a cover against rain and wind, in the winter it might be too cold for very young children.

**Passengers’ characteristics**

Regarding the safety of children, special seat-belts are needed which should not just go around the waist, but also around the shoulders for more stability. Rear view mirror is very good to get a clear overview on what happens behind the e-cargo-bike rider, especially when transporting children.
Successful Case: Bike.Pop, Lisbon, Portugal

**Brief Description**

The Bike.Pop is a pioneer project of the Cultural Cooperative called POST which aims to promote and disseminate bicycle as a means of transport. The Bike.Pop pedicab is the first legal bicycle rickshaw service in Lisbon offering a broad selection of tours and services. Their services are mainly for tourists as well as for Lisbon residents. They sell the idea that the modern pedicab is one of the solutions for congested hyperactive cities. Leaving no dirt neither making noise. Moreover, their proposed service is to travel at a relaxed speed which lets customers breath deeply while perceiving the surroundings.

They also see their two rickshaws as the seed which will grow in the next years. They believe that changes are coming and necessary. They mentioned: “It’s time to people organize collectively and take their future into their hands. This is our way – when the need for pedal-powered community-based transport arises we are ready.”

Besides touristic tours, they also have different services, such as for weddings, birthdays or other events. Customers can either book a ride directly or order a voucher as a present. The pedicabs are also available to advertisement, since the vehicles are always moving and attracting a lot of attention. The two vehicles, the Velocab rickshaw and the Maxpro rickshaw are both equipped with an electrical motor with 250 W of power to help them climb the hills of Lisbon.

**Business Model**

The value proposition of Bike.Pop is the sustainable mobility promotion as well as to share bike culture and a cooperative life style. With the support of Lisbon Municipality, through a programme called BIP-ZIP, they opened the Bike.Pop store. The programme was to intervene in priority neighbourhoods, such as Intendente, a poor and degradated zone of Lisbon’s downtown. Besides Lisbon Municipality, other municipalities or local councils are also key partners of the project, since the idea is to spread their concept in different neighbourhoods. Brompton, the folding bicycles’ supplier is an important key partner, since they share the costs with them in order to have their showroom in Bike.Pop store. Largo Residências, which is a social-cultural project, is also a partner. Their café is just next door and customers of Bike.Pop can drink a tea while waiting for their bike repair.
### Bike.Pop Business Model canvas

<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Key activities</th>
<th>Value Proposition</th>
<th>Customer Relationships</th>
<th>Customer segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipality of Lisbon</td>
<td><strong>Core business:</strong> Mobility consultancy Bike repair Bike rental/sales Courses/workshops/ activities <strong>Seasonal activities:</strong> Touristic tours/Transport of passengers in special days/ Advertisement</td>
<td>Sustainable mobility promotion To share bike culture and cooperative life style</td>
<td>Differentiated Close to customers</td>
<td>3 different segments: 1) Local people with low purchasing power 2) Educated people with high purchasing power 3) Pro-bike people/activists</td>
</tr>
<tr>
<td>Other municipalities/Local councils</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bikes’ supplier (Brompton)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Largo Residências (Social-cultural project)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free bike Magazine</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Jornal Pedal (Journal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portuguese Life/ Independent Home (2 other local projects)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Key resources
- Office, 2 shops, warehouse
- Bikes and Pedicabs
- Know-how
- Human resources: 3 collaborators full-time; 8 in events/activities
- The environmental footprint of E-bikes is compensated

#### Internalising Externalities
- Better quality of life to people by using environmentally friendly modes as bikes

#### Channels
- Word of mouth
- Social networks/social media, website, telephone, email
- Pedicabs

#### Cost structure
- Facilities rental/ Investment in Know-how/ stock/ Investment in Pedicabs

#### Revenue Streams
- Bike repairs (35%)/ Product sales -accessories, components and bikes (20%)/ Events (30%)/ Courses & workshops (5%)/ Consultancy & Advertisement (10%)
Free bike magazine and a journal called Jornal Pedal are also partners of the project as well as two other important projects of this neighbourhood: Portuguese Life and Independent Home.

Regarding the key activities, the core business is mobility consultancy, bikes' repairs, bikes' rental and sales, courses, workshops, events and activities related to bicycles. Besides the core business, they offer seasonal activities with Pedicabs, such as touristic tours, transport of passengers in special days or as taxi and advertisement in the vehicles. Besides, 2 shops, including the one in Intendente zone, they also have a warehouse. Their resources are not only physical, as they also have the know-how and continuously invest in training courses to improve their resources. Human resources are variable: 3 full time collaborators and 8 when needed, especially during events, workshops and other activities. Bicycles and pedicabs are also their key resources.

They create a proximity relation with customers, as well as differentiated since 3 different customers segments they serve: 1) local people with low purchasing power; 2) educated people with high purchasing power and 3) pro-bike people and activists who are always present during their events and activities. The most used and important channel is the word of mouth, as well as media, social networks, the website, telephone or email. As mentioned before, Brompton share their costs, which are related to facilities rental, investments in Know-how and in Pedicabs. Moreover, there are some costs associated to stock logistics.

To balance their business models, their revenue streams are distributed as follows: Bicycle repairs - 35%; Product sales which are accessories, components and bicycles - 20%; Events -30%; Courses & workshops - 5%; and Consultancy & Advertisement - 10%.

Bike.Pop internalise the externalities by incentivising a better quality of life to people through the promotion and use of environmentally friendly modes as bicycles and E-bicycles. The batteries of E-bikes are an important externality. However, electric vehicles can be more sustainable from an environmental and economic perspective; if three main requirements are met: improvement of battery technology, an eco-driving attitude and an environmental friendly electricity mix.²


Lisbon is characterized by an irregular terrain, with a historic district with its “seven hills”. Its topography, the various types of pavement, the presence of tram rails, and the behaviour of car drivers - associated with the sense of unsafe circulation – are some of characteristics of the routes.

To overcome the hills, they use two types of Pedicabs electrically assisted. However, as the vehicles loose autonomy with weight and steep slopes, usually they try to move in the flat zones of the city. They are interested in homogeneous zones in terms of population, such as neighbourhoods that attracts young people.

Although the climate in Lisbon is not severe, the transport of passengers is seasonal, since the climate is a key factor in attracting people to this kind of service.

Passenger’s characteristics

There are no special needs for products or passengers as long as they fit at Pedicasbs.

Agent needs

Their service is by booking, so no special schedule is needed.
Hypothetic Case: Transport for elderly/disabled

Brief Description

Since there is some providers such as Van Raam (a producer of ‘special bikes’, located in Varsseveld, The Netherlands) to the special market of transport of elderly or people with special needs, it seems that there is some potential in this type of services using adapted electric bicycles.

In Mingen (Germany), for instance, a bus transport of elderly people was replaced by a connected ‘duo-bike’, where one employee can cycle with 3 elderly people to nearby destinations. This service was previously done with a minibus.

Another example is a health care centre, in Noord-Brabant (Netherlands) that brings people in a wheelchair to the railway station with a special bicycle, which is able to connect the wheelchair to the bicycle easily.

Business Model

A Business Model provides a coherent description (qualitative) of the way company captures value for stakeholders in a competitive marketplace and earns profits (quantitative). Every Business Model serves a specific company within a specific context.

Nevertheless, prototypes of BM may be fit for several situations. The following BM prototype is a partially built business model, with empty building blocks, that should be customized later on, accordingly with the specificities of the situation.

The value proposition is to deliver a special service with a different experience more close to people needs, in this case for elderly and disabled people. This business will internalise externalities by contributing to reduce the emissions as well as to contribute to a better quality of life along with social inclusion of elderly and disabled people.

One of the objectives of the PRO-E-BIKE project is to build understanding and raise confidence in E-bike technology amongst target groups, in order to change their behavior.

Since the market for transport of elderly and disabled people by E-bikes is not sufficient wide-spread in Europe, the following business model prototype aims to be presented at PRO-E-BIKE for public awareness. It is expected that the presentation of this business model could contribute to foster this special market.
### Business model prototype canvas

<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Key activities</th>
<th>Value Proposition</th>
<th>Customer Relationships</th>
<th>Customer segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>Transport of elderly and/or disabled people</td>
<td>To deliver a special service with a different experience more close to people needs</td>
<td>Special and personal</td>
<td>Elderly and/or disabled people</td>
</tr>
<tr>
<td>Home care centres</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social services institutes</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Key resources</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualified human Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical: special vehicles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Know-how</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Internalising Externalities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less emissions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Better quality of life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social integration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Channels</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone, internet website, Face to face contact with the person who drive the bicycle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cost structure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be filled accordingly the specific situation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Revenue Streams</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be filled accordingly the specific situation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The customers will be elderly or disabled people and their families. The relation with customers should be very special and personal, since those people need to feel their humanity and dignity trying to live as normally as possible.

Key partners in this type of BM could be hospitals, home care centres or other institutes, such as social services.

The key resources will be the special vehicles, know-how and qualified human resources to deal with elderly and disabled people the best way possible.

Besides conventional channels, such as telephone, internet, those special vehicle will allow a face to face contact between customers and the person who drive the bicycle.

Cost structure and revenue streams are two building blocks that should be filled in according to the specificities of each case.

Lessons learned & good practices

Regarding the kindergarten case, they showed a very positive experience since both employees and children are using the e-cargo-bike.

Moreover, their contract with the Go Cab provider offers them full repair and maintenance service which was highly appreciated.

In addition to that, they had experienced very positive reactions from the general public which leads to the positive image of the business model of the childcare centre.

A lesson learned was regarding the batteries. It is important to make good rules about charging the battery after use. The childcare centre has an extra battery, which can be easily swapped. Moreover, the Go Cab has one small extra battery on board, in case of ‘emergency’.

To improve their experience and facilitate the use of E-cargo-bikes, they mentioned that the local authorities of Wijhe (Netherlands) should take actions in the following areas:

• Make sure that poles on bicycle lanes do not block the way for E-cargo-bikes (opening between poles should be sufficiently wide);

• When E-cargo-bikes become popular, there should be sufficient parking places for those vehicles;

• Financial support from local authorities could speed up the adoption of E-cargo-bikes. An investment of nearly 12,000 euro is significant. For the same costs or even lower a second-hand van can be bought.

In the case of Bike.Pop it has a successful BM, however their service of Pedicabs is not the core business. There are still a lot of barriers, such as the car culture, in Portugal. The costs are still very high, regarding the maintenance and purchase of the vehicles and no incentives to be an environmental-friendly company.

And finally, Bike.Pop shows the importance of partnerships with the Municipalities/Councils in this type of project, as well as to support groups with social integration difficulties.
Successful Business Models using E-bikes for transport of freight

This report focuses on WP5 which objective is to build successful business models of urban transport services using e-bikes.

Successful business models are the key to ensure the competitiveness and financial viability of a service and, therefore, its long term sustainability.

According to D2.1, there are three different types of professional use of E-bikes, i.e.:

• E-bikes for passenger transport;

• E-bikes for freight transport;

• E-bikes for the provision of services.

This section is related to successful business models for freight transport. E-bikes are especially adequate to the transport of freight, since they allow transporting more freight than a conventional bike. Additionally, they are much more flexible and versatile than the traditional small vans.

Several European parcel companies are gradually redesigning their logistical structures, where more and more E-bikes are being used. However, the logistical process with E-bikes is totally different in terms of weight carried and maximum distances travelled. According to empirical studies, it is most likely that E-bikes will have their greatest potential in urban areas, successfully facing problems like congestion and limited access areas due to environmental zones or delivery period restrictions. In addition, there are costs to consider, including:

• Traffic flow/congestion issues: caused by traffic levels, traffic incidents, inadequate road infrastructure, and poor driver behaviour;

• Transport policy-related problems: vehicle access restrictions based on time and/or size/weight of vehicle and bus lanes;

• Parking and loading/unloading problems: loading/unloading regulations, fines, lack of unloading space, and handling problems;

• Customer/receiver-related problems: queuing to make deliveries and collections, difficulty in finding the receiver, collection and delivery times requested by customers/receivers.

Therefore, there is an uncertainty in which of the existing markets for bike and car shipments that will be entrenched by E-bikes, or even if a new market for this vehicle can evolve. The demonstration of successful business models is a step forward trying to help answering how far E-bikes use will be fostered in the market such as B2C deliveries, micro-consolidation or the demand for high-quality logistics services such as same day delivery. In addition to that, several European countries are using E-bikes for postal deliveries.

Using the BM approach developed by Osterwalder, the main elements of 3 real successful business models of freight transport services are presented below- La Petite Reine (Paris, France), YouLog (Milan, Italy), and TNT Express (Brussels, Belgium). Those canvas show how the 10 key blocks are interacting to tell us the company’s soul.

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**Case of success: La Petite Reine, Paris & Bordeaux, France**

**Brief Description**

La Petite Reine is a company which developed an original delivery service for densely populated urban environments using cargocycles or electrically powered tricycles with a container at the front or at the back. La Petite Reine means “the little queen” in French, a familiar nickname for bicycles. It was founded in 2001, in Paris, and since then expanded to other cities such as Bordeaux, Rouen, Dijon, Geneva, and Lyon in September 2010. It makes around 2,500 deliveries every day for companies such as DHL, ColiPoste, Monoprix, Dannon. La Petite Reine experiment was considered a good practice since it used an Urban Logistic Space (ULS) provided by the City of Paris. It was also a very innovative experiment at that time, for the reason that it invented the cargocycles.

La Petite Reine maintained a fleet of around 75 cargocycles for hire on demand by businesses that needed to make small to medium-sized urban deliveries over a distance up to 30 km. Each cargocycle can carry about 180 kg of merchandise in its 1,400 litre cargo space. Weighting is only 80kg.

La Petite Reine was founded on the basis that while 80% of its market concern parcels less than 30kg, a little van weighting more than a tonne is oversized regarding the real needs of the company. Cargocyles were favoured over regular vans, since usually the average load is no more than 100 kg for a complete route of seven hours and vans generate pollution, congestion and double parking.

La Petite Reine operates from the city centre. In Paris, La Petite Reine is located in two Urban Logistic Spaces. One located in an underground parking close to the Louvre museum since 2003 and another located in an underground parking on the left bank since 2010.

In Bordeaux (2005) a specialist on urban goods transport operator set up an urban distribution centre (UDC) outside Bordeaux city centre. The aim was also to reduce the number of delivery vehicles entering in the city, through the consolidation of goods at the UDC facility. The consolidated loads were delivered using electrically assisted tricycles and small electric vans. Those vehicles were allowed to access and deliver goods in the pedestrian centre.

Since the implementation of the UDC and delivery of consolidated loads, the number of delivery vehicles accessing Bordeaux city centre has been reduced and this has led to a reduction in the CO₂ emissions associated with delivery activity. Bordeaux is a city with large pedestrian flows, therefore the environment for pedestrians has also improved through reduced numbers of delivery vehicles and air quality improvements.

La Petite Reine started its activity of parcel collection and deliveries mainly as a subcontractor to major express delivery companies, such as DHL, FedEx or Chronopost. These companies discovered that tricycles could be better fitted to cities than vans. An example was the company Ciblex, which started to work with La Petite Reine in 2006, with four tricycles replacing six ciblex vans.
### La Petite Reine Business Model canvas

#### Business Model

<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Key activities</th>
<th>Value Proposition</th>
<th>Customer Relationships</th>
<th>Customer segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight transport operators (such as DHL, FedEx, Chrono post)</td>
<td>Pick-up and delivery of goods</td>
<td>A new image of logistic activities, with a city-friendly vehicle</td>
<td>Personal</td>
<td>B2B &amp; B2C</td>
</tr>
<tr>
<td>Municipality of Paris (to developed the first Parisian ULS)</td>
<td>Offers advertising on the side and rear panels of the vehicle</td>
<td>More efficient service for last mile deliveries</td>
<td>Each day, 3,000 business or home locations are being served by the 40 drivers of La Petite Reine</td>
<td>Express deliveries were the main market segment (96%) at the beginning (DHL, FedEx and Chronopost)</td>
</tr>
<tr>
<td>LOVELO (the tricycle manufacturer)</td>
<td>Manufactures its own cargocycles and sells/rents them</td>
<td>Social integration</td>
<td></td>
<td>Letters and parcels for express courier companies (with the possibility of advertising on cargocycles)</td>
</tr>
<tr>
<td><strong>Key resources</strong></td>
<td><strong>Internalising Externalities</strong></td>
<td><strong>Channels</strong></td>
<td><strong>Customer segments</strong></td>
<td></td>
</tr>
<tr>
<td>Office, ULS/UDC</td>
<td>Less congestion, emissions</td>
<td>Subcontractor to major express delivery companies, the communication channel was those delivery companies</td>
<td>B2B &amp; B2C</td>
<td></td>
</tr>
<tr>
<td>Employees &amp; vehicles</td>
<td>Better environment for pedestrians</td>
<td></td>
<td>Express deliveries were the main market segment (96%) at the beginning (DHL, FedEx and Chronopost)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air quality</td>
<td></td>
<td>Letters and parcels for express courier companies (with the possibility of advertising on cargocycles)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Job creation</td>
<td></td>
<td>Parcels delivery for mail orders and e-commerce businesses</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Parcels delivery for local shops</td>
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<td></td>
<td></td>
<td></td>
<td>Fresh product deliveries</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost structure</th>
<th>Revenue Streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rental of the Urban Logistics Space (€4000/year); employees’ wages / cargocycles’ cost</td>
<td>Receive from goods pick-up and delivery, advertisement and sells/rental of cargocycles</td>
</tr>
</tbody>
</table>
La Petite Reine developed the first Parisian Urban Logistic Space (ULS) together with the City of Paris in order to be able to use tricycles for final deliveries in the centre of Paris. Another key partner was the tricycle manufacturer, LOVELO which worked closely with La Petite Reine since the beginning of the service. Currently, it is a subsidiary of the company itself.

The key activity is to receive parcels from different companies before the morning peak hour and consolidates the parcels by routes and destinations. Besides pick-up and delivery of goods, La Petite Reine also offers advertising on the side and rear panels of the vehicle. Moreover, the company manufactures its own cargocycles and then sells/rents them.

Their value proposition is a new image of logistic activities, with a city-friendly vehicle.

Their customers are B2B and B2C. Each day, 3,000 business or home locations are being served by the 40 drivers of La Petite Reine. Express deliveries were the main market segment (96%) at the beginning (DHL, FedEx and Chronopost).

In 2010 the core business was letters and parcels for express courier companies (with the possibility of advertising on cargocycles) as well as parcels delivery for mail orders and e-commerce businesses. In addition, parcels delivery for local shops and fresh product deliveries were also their customers. Since La Petite Reine started as a subcontractor to major express delivery companies, the communication channel was those delivery companies.

How they get their resources was an important aspect of La Petite Reine BM. The City of Paris provided a 600m² space located in an underground parking close to the Louvre museum. This space used to be a gas station. A bid for tender was organized to allocate the logistic space, in which it was mandatory to organize a new logistic service based on tricycles. La Petite Reine won the bid and opened its first urban terminal in 2003.

The involvement of the municipality was twofold: 1) to provide public space at a low cost, since the cost is comparable to real estate costs for logistics facilities in suburban locations. Furthermore, the price was even reduced during the experimental phase; and 2) to finance a two year assessment study. Therefore, from 2003 to 2006, the City of Paris applied a low price on the rental of the ULS (€4000/year) and since 2007, the price applied has been 60€/m²/year.

In May 2003, La Petite Reine started its operations with eight employees, including five drivers, one mechanic, one manager and one operations’ supervisor. The permanent increase in the number of employees and vehicles reached 18 employees and 19 vehicles, in June 2005.

The revenue streams are dependent of each cargocycle which delivers 70 parcels per day in average. About 3,000 locations are served every day. Besides that, La Petite Reine also offers advertising on the side and rear panels of the cargocycle being another source of revenues.

Finally, by avoiding 600,000 tonnes-km, they generated savings of 89 TOE. Additionally, they avoided emissions of 203 tonnes of CO₂ and 84 kg of particles, besides the reduction of noise pollution.

Furthermore, 50 jobs were created in Paris in seven years with a constant growth rate of job creation. The majority of those jobs are now occupied by poorly educated people, while at the beginning the drivers were mostly students or people wanting a side job. An interesting fact is that the employee doing the maintenance work on the bikes is a disabled worker. In 2009, La Petite Reine joined Ares Group, a company specialized in “integration employment” or social employment processes, dedicated to the disabled or to people who have been out of the job market for a long time. More recent, 13 drivers work under this integration programme, managed by a dedicated team of social workers which supports them while at work. Those facts contributed to the internalisation of externalities.
In Bordeaux, since the implementation of the UDC and delivery of consolidated loads, the number of delivery vehicles accessing city centre reduced and this also led to a reduction in the CO2 emissions associated with delivery activity and improved the environment for pedestrians by reducing the numbers of delivery vehicles. Finally, air quality improvements were also achieved.

**Logistic Profile**

**City area features (Paris)**

Paris has a very high commercial density. There are some specifically dense commercial areas in the centre. Commercial areas are mostly retail. Around 350,000 deliveries or pick-ups occurred every day in the Paris’ streets. The bike culture is currently in favour and there are no parking difficulties with tricycles. A very important factor is that cargocycles are allowed to circulate in bus lanes, bike lanes as well as reverse traffic bike lanes.

Congestion is in fact better over the years because of local policies to reduce traffic. Furthermore, there are restrictions for heavy transport accessing the city centre and a full accessibility to pedestrian areas with tricycles, which makes those vehicles competitive.

**City area features (Bordeaux)**

Bordeaux city centre is a busy commercial area, with large numbers of retail shops and stores, and a heavy flow of pedestrians. As a result, delivery vehicle access is restricted, with vehicles not permitted to enter streets within the city centre after 10:00. In this sense, delivery vehicles deliver before 10 a.m. with the morning period characterised by large numbers of vehicles. In 2000, a large-scale construction project associated with a tramway was initiated in the city centre, causing disruption to both general traffic, and to goods transport.

**Product characteristics**

A refrigerated vehicle model was introduced in 2010, which allowed fresh product deliveries as well as medical products.

**Agent needs**

The frequency of deliveries is high. Each cargocycle delivers 70 parcels per day in average, which means that a total of 1,000,000 parcels are delivered every year.

---


**Brief Description**

**YouLog** is a company that provides delivery services for GLS Enterprise in Milano area. GLS Enterprise is a subsidiary of General Logistics Systems B.V. (headquartered in Amsterdam). GLS realizes reliable, high-quality parcel services for 220,000 customers in Europe, complemented by logistics and express services. The fleet of the YouLog Company is comprised of 150 diesel vans, and since March 2014, the fleet is enriched with 4 electric bicycles (E-bikes) for last mile delivery of letters and small parcels in Milan downtown area.

The introduction of the service by E-bikes required certain changes in the logistics, as well as development of new consolidation centres. Urban consolidation centre for the operation of E-bikes (Area C) was set. A van delivers parcels and letters from the extra-urban consolidation centre to the urban consolidation centre, from which the deliveries are done to final costumer by E-bike. The operation of the van is optimal in wider Milan area, while the operation of e-bike is optimal in the inner city area.\(^5\)

The preliminary results show that one E-bike on average performs 57 deliveries per day. This means each E-bike performs an average of 1,001 deliveries, per month. The daily distance covered by one E-bike is on average 22 km, while the weight of the cargo delivered each day is on average 35 kg. Average speed of the e-bike is around 19 km/hour.

Delivery operated by E-bikes enables fast service in some areas where a van would be much slower or it would not be able to operate. In this case, YouLog have substituted two vans with four E-bikes. Not only those two bikes are faster than a van but the cost of the delivery is also somewhat lower. Two bikes can also make more deliveries than one van, however the time for deliveries is longer for two E-bikes (5 hours each, representing 10 hours together), and the operation with E-bike requires additional person for delivery.

**Business Model**

YouLog establishes partnerships between competitors. YouLog is subcontracted by GLS for delivering activities in Milan area and other towns such as Verona and Mantova while OroBici is a messenger that delivers by E-bike in Bergamo. Their key activities are delivers of letters, envelopes and small parcels. Moreover, they manage GLS depots by receiving parcels from GLS HUB and consolidate the parcels by routes and destinations.

Regarding key resources, they have the following physical resources: Big consolidation center (15 km from Milano); urban consolidation center for E-bikes closer to the city centre; an office (Cernusco); warehouse and office (Verona); distribution networks; points of sale; 150 vehicles – diesel vans and trucks and 5 electric bicycles.

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\(^5\) The figure represents the consolidation centres in E-bike delivery (Source: Poliedra (Lia, F.))
**YouLog Business Model Canvas**

<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Key activities</th>
<th>Value Proposition</th>
<th>Customer Relationships</th>
<th>Customer segments</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLS</td>
<td>Delivers of letters, envelopes and small parcels</td>
<td>Delivery on time offering reliable performance</td>
<td>Collaborative</td>
<td>Segmented</td>
</tr>
<tr>
<td>OroBici</td>
<td>Management of GLS depots</td>
<td>New sustainable service</td>
<td>Online tracking</td>
<td>Private and companies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key resources</th>
<th>Internalising Externalities</th>
<th>Channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidation centres; depots; warehouse and points of sale; employees and vehicles (vans, truck and E-bikes)</td>
<td>Less CO₂ emissions</td>
<td>Internet /telephone</td>
</tr>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Cost structure</th>
<th>Revenue Streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent of vehicles and facilities; employees’ wages; running and maintenance costs of vehicles</td>
<td>Customers pay for the service</td>
</tr>
</tbody>
</table>
In the beginning of April, the number of E-bikes will increase to 9 with an electric assistance to pedaling, and five/six hour of autonomy. In terms of human resources YouLog relies on 1 employee and 150 collaborators.

Regarding **costs**, YouLog presents the following fixed costs: the rental of offices, buildings, etc; leasing costs for part of the fleet (30 vans in which part is owned by distributors); running and maintenance costs per vehicle more insurance; 150 employees’ wages; E-bike rental fee (around 200 €/E-bike); and E-bikes operation cost around 50 €/month (20 € maintenance more 30 € insurance).

YouLog’s **value proposition** is delivery on time (96% of deliveries are on time) offering a reliable service. Their new sustainable service is also contributing to their value and they are planning to have a logistic platform just using electric vehicles.

Regarding **externalities**, YouLog is replacing diesel vans, which contributes to the improvement of the urban air quality. By introducing 10 clean and silent vehicles (electric Vehicles) in Milan, CO₂ emissions will be avoided. Moreover, 4 E-bikes replace 2 vans which contribute to lower impact on congestion.

Their **customers** are private clients and companies and **revenue streams** are related to delivery service. Their **relation** with them is collaborative since they find the best solution for them. Moreover, customers can tracking online the goods being transported. The **channels** are telephone and internet.

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**Logistic Profile**

**City area features**

Commercial density and homogeneity in Milano city centre is medium. There is a high concentration of commercial activities in the centre but a significant number of residents as well. The city centre is characterised by a mix of residents and offices, commercial stores to which the service is at disposal. Regarding orography and climate conditions, almost terrain is entirely flat and the climate is mild. There are no severe weather restrictions to use E-bikes. Bike culture is neutral, but becoming more and more in favour. There is approximately 140 km of bike lanes in Milan. Moreover, Milan municipality is promoting the use of bike to movements into the city. Several bike shops have been established to rent a bike. Repairs and maintenance are managed directly by the Municipality. E-bikes can run through down town without restriction, however helmet is required. The speed limit for E-bikes is 20 km/h. The recent introduction of a congestion charge in the area increases the cost of delivery in the city centre with traditional vehicles. Logistics accessibility is bad, since there is high volume of traffic and narrow streets in downtown makes difficulties to park. Pavement is irregular, in some areas, and in poor conditions.

**Product characteristics**

The products are easy to handle, since it is mostly light letters of small size. However, bicycle riders need to keep the backpack always with them to avoid thefts or tampering. Moreover, no special needs since no fragile products and no valuable products are carried.

**Agent needs**

Deliveries are immediate. They have some parcel to be delivered within 12 a.m. The frequency is high, each E-bike delivers an average of 57 letters/parcels per day. Regarding routes, Youlog has divided Milan downtown into 20 micro zones (considering 11,5 square km the extension of the total area). Each bike covers 5 micro zones. The origin is the depot but the destination change every day. Moreover, by introducing of 4 E-bikes, other zones of Milan outside downtown will be covered. An average of 22 km is travelled with one E-bike per day. They perform deliveries to offices, commercials and residents (especially due to e-commerce increases in the last couple of years).
Lessons from an unsuccessful case: TNT Express, Brussels, Belgium

Brief Description

TNT Express is a provider of express parcel deliveries, with many pick-up and deliveries in urban areas. The majority of their operations took place in inner cities. In this context, TNT tested the use of a mobile depot (MD) in Brussels, being one of STRAIGHTSOL demonstrations. This experiment has demonstrated their willingness to make their last mile deliveries more environmentally friendly and less affected by congestion.

The mobile depot, which is a trailer with a loading dock and warehousing facilities, was moved between the TNT Express’ hub in the outskirt to a predefined parking area in the city, every day.

Last-mile deliveries and pick-ups were carried out with cargo bikes or small electric cars, from there to final destination.

According to the project⁶, the business model canvas (bellow) undoubtedly showed that TNT Express did not have to change its entire business model for the demonstration. Their aim was to fit the new solution within their existing value proposition and key activities. New activities were outsourced to a subcontractor, the Ecopostale.

Business Model

The key activities of TNT Express are deliveries and pickups, carried out by tricycles instead of conventional vans. The goods are sorted and loaded/unloaded onto the tricycles at the mobile depot. As mentioned before, the mobile depot is a converted trailer, which is driven daily from the TNT express hub to a parking place in the city. For these activities and resources, TNT Express needed three new key partners: the zero emissions courier service provider, the owner of the parking space and the manufacturer of the mobile depot. With those changes, the need for conventional vehicles, van drivers and fuel in the city has decreased. TNT also needed a different distribution of personnel since handling freight at mobile depot also need human resources.

The value proposition of TNT is to deliver in the shortest time possible, on time and in perfect condition. With the use of electric tricycles for the last mile, the service becomes environmentally friendly in the city, since those vehicles are emissions free. The negative externalities regarding environment and traffic decreased by substituted conventional vehicles by tricycles. Besides avoided emissions, it also contributed to less congestion in the city.

⁶ STRAIGHTSOL (2014). D5.3 Business models for innovative and sustainable urban-interurban transport
### TNT Express business model canvas

<table>
<thead>
<tr>
<th><strong>Key Partners</strong></th>
<th><strong>Key activities</strong></th>
<th><strong>Value Proposition</strong></th>
<th><strong>Customer Relationships</strong></th>
<th><strong>Customer segments</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Brussels Capital Region&lt;br&gt;Ecopostale</td>
<td>Deliveries and pickups by tricycle&lt;br&gt;Transport of MD&lt;br&gt;Handling at MD</td>
<td>Shortest delivery time possible&lt;br&gt;Delivery on time and in perfect conditions</td>
<td>Both short term &amp; long term relationships are established&lt;br&gt;Focus on specific client needs</td>
<td>B2B &amp; B2C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Key resources</strong></th>
<th><strong>Internalising Externalities</strong></th>
<th><strong>Channels</strong></th>
<th><strong>Cost structure</strong></th>
<th><strong>Revenue Streams</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile depot (MD)&lt;br&gt;Electric tricycles&lt;br&gt;Employee for handling MD&lt;br&gt;Place for charging&lt;br&gt;Less fuel</td>
<td>Less emissions&lt;br&gt;Less space occupancy</td>
<td>Telephone, internet website, face to face contact with delivery person</td>
<td>Investment in mobile depot, insurance, space, personnel, tricycles&lt;br&gt;Variable costs for subcontractors&lt;br&gt;Increase in costs (because of handling of MD)</td>
<td>Typically the receiver does not pay TNT (this is done by the sender, which is the TNT’s customer). It is dependent on volume, frequency, destinations. TNT Express and the customer jointly agree the price. No increase in revenues with the MD.</td>
</tr>
</tbody>
</table>
The customer segments and the relationship with them do not change after the implementation of the mobile depot, since TNT Express aims its operations at the B2B and B2C market. However, the channels partially changed, as some deliveries were carried out by the mobile depot and tricycle. Nevertheless, the customer has no influence on the transport mode that is used.

Costs are incurred mostly because of the mobile depot and the property. Moreover, subcontractors’ costs changed as cargo bikes perform in a different way in terms of range and costs. There are also additional costs for the movement of the mobile depot, which is done twice a day. Conversely, revenue streams did not changed on short term. In the long term, the revenues could rise if more and more senders could value the fact that TNT Express aims to do deliver in an environmentally friendly way.

The last bid for tender placed by the City of Paris in 2009 for a new ULS received five different propositions, three of them based on the use of tricycles. This is an important key factor since the growth of La Petite Reine was linked to its capacity to operate from a central city location. This could be the major limit of the business model.

The founder and manager of La Petite Reine (Gilles Manuelle) understood that his company needed to differentiate their services from the newcomers and decided to emphasise the social employment’s aspects of La Petite Reine, in 2009. This social involvement was also decisive in the decision process of the City to funding the use of the new ULS at Saint Germain l’Auxerrois to La Petite Reine.

To counterbalance the relatively high transport prices of La Petite Reine, they offer an outstanding service adding a real added value, which is the environmentally friendly image of the cargocycle as well as the social service provided towards the disabled and the long term unoccupied workers.

Technical improvements still need to be made on cargocycles in order to have less costly maintenance on the tricycles, especially on the wheels.

Regarding YouLog, the introduction of the service by E-bikes have required certain changes in the logistics, in particular the development of new consolidation centres.

In the case of TNT Express, they have learned various lessons that are relevant for the implementation of the concept in the future.

First, the concept was found not financially viable. The expenses increased considerably and there were no increased revenues. Therefore, the mobile depot had no financial value at that moment and that place. However, there were non-financial benefits such as the improved image, because of innovative and environmental friendly character and the social benefits in terms of emissions, noise and safety.

Since they did not have taken different freight profiles of the urban area into account, they do not fit their business model accordingly. The mix of parcels in the urban area, such as amount, size and proximity influences the suitability of the concept.

Another option is to make the MD a local office which will add value for customers. Since the MD solution is not cost effective, there are two options: 1) reduce costs for the MD, for instance a simpler box that is only used to transport and store parcels, or 2) use the MD as a facility in order to create value for customers as a small local office, where customers can pick up deliveries and bring parcels themselves.
Successful Business Models using E-bikes for mixed services (passengers and freight)

This report focuses on WP5 which objective is to build successful business models of urban transport services using e-bikes.

Successful business models are the key to ensure the competitiveness and financial viability of a service and, therefore, its long term sustainability.

According to D2.1, there is three different types of professional use of E-bikes, i.e.

• E-bikes for passenger transport;
• E-bikes for freight transport;
• E-bikes for the provision of services.

This section is related to successful business models of mixed services.

Several European-based parcel companies (DHL, UPS and FedEx) are gradually redesigning their logistical structures, where more and more E-bikes are being used. The logistical process with E-bikes is totally different in terms of weight carried and maximum distances travelled. However, for smaller distances they are proving to be more efficient than a car and/or a van in some parts of the inner-cities, with lower operating costs as well as lower purchase costs.

According to empirical studies, it is most likely that E-bikes will have their greatest potential in urban areas, successfully facing problems like congestion and limited access areas due to environmental zones or delivery period restrictions. Gruber et al. (2014) also states that there is an uncertainty in which of the existing markets for bike and car shipments that will be penetrated by E-bikes, or even if a new market for this vehicle can evolve.

The demonstration of successful business models is a step forward trying to help answering how far E-bikes use will be fostered in the market such as B2C deliveries, micro-consolidation or the demand for high-quality (logistics and passengers) services such as same day delivery or e- rickshaw taxis. In addition to that, several European countries are using E-bikes for postal deliveries and other uses.

Using the canvas approach developed by Osterwalder, the following section presents the main elements of a business models in mixed services and how they are interacting to tell us the company soul. Following this generalization of a BM for provision of services, it is presented 3 real successful business models in this category.

The first successful case study is TXITA, which have been continuously adapting their business model and offers different services to different customers. Besides offering a service of taxi-bike and tours around Donostia, they are also known for last mile deliveries, training and education, consultancy and for selling and rental of E-cargo-bikes. The second one, is Camisola Amarela, the first couriers by bicycle in Portugal which also transport people in specific events. And the last case SOLTRA, which was created in Leon city, with the main objective to create jobs for people with disabilities, allowing them to participate in the efforts of companies and institutions to generate wealth.
TXITA, the first Spanish company offering a system for distribution of goods by cargo bike. The company offered a new service tailored to urban reality with innovative and sustainable vehicles, since 2006 by offering a service of taxi-bike and tours around Donostia. They called themselves as Sustainable Transport Activists. Their service facilitate an evolutionary leap to urban logistics by improving operations with zero CO$_2$ emissions.

In 2007 they used their vehicles as unconventional outdoors to advertisement. One year after, they were offering courses to people teaching how to use bikes in urban areas. In 2009, they started to use their cargo-TXITA for last mile deliveries in San Sebastian and just one year after they become manufacturers of cargo bikes and started to sell and rent their cargo tricycle.

In 2011, they offered training and counselling to support new entrepreneurs and finally, in 2012 they tried something really innovative by offering a service called TXITA sound system which was their vehicles equipped with a mobile megaphone.

Their successful business model is very interesting since they are continuously being adapted in order to maintain their company sustainable and profitable. Their key to success is “Improving the quality of life and sustainability in Donostia. Performing and promoting urban transport of goods and people in an environmentally friendly way, in order to consolidate a case of success to other municipalities”.

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### TXITA Business Model Canvas

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<tr>
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<th><strong>Key activities</strong></th>
<th><strong>Value Proposition</strong></th>
<th><strong>Customer Relationships</strong></th>
<th><strong>Customer segments</strong></th>
</tr>
</thead>
</table>
| Freight transport operators  
Subcontractor for last/first mile transport services  
Other companies with similar interests (taking advantage of synergies)  
E-bike manufacturer (with whom started one joint venture) | Taxi service  
Advertisement  
Education & training  
Last mile deliveries  
Manufacturer (Sells & Rentals)  
Consultancy  
Innovative services (mobile sounds) | Promoting urban transport of goods and people in an environmentally friendly way | Personal assistance  
Focus on specific client needs | B2B & B2C  
Parcel deliveries  
Deliveries for courier companies with advertisement  
Citizens in general |

<table>
<thead>
<tr>
<th><strong>Key resources</strong></th>
<th><strong>Internalising Externalities</strong></th>
<th><strong>Channels</strong></th>
</tr>
</thead>
</table>
| Office  
Employees & vehicles  
Know-how | Savings in energy (vehicle-km) and emissions (pollution and noise)  
1 cargo e-bike saves the use of 1 van, which has impacts in congestion  
Better quality of life | Own direct (sales force/web force); own indirect/own stores  
Partner indirect (partner stores/wholesaler)  
Informal |

<table>
<thead>
<tr>
<th><strong>Cost structure</strong></th>
<th><strong>Revenue Streams</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure, employees’ wages, cargobikes</td>
<td>Deliveries, new products (cargo bikes) and services (taxi, training, mobile sounds), advertisement, consultancy</td>
</tr>
</tbody>
</table>
They use all types of resources since they use vehicles, they develop courses for users on using e-bikes, make available the use of taxi bikes in the summer, they use the e-cargo bikes for campaigns and for publicity. Their costs are practically fixed. It doesn’t matter the activity the costs are the same. Their relation with customers are very close since they offer personal assistance to people in all their activities: taxi service, training, advertisement, innovative services, and so on. The customers segments are multi side market, since they work for different companies. They are a white brand with no exclusivity. Their customers are supermarket companies, freight transport operators and even environmental foundation such as Gupost, Eroski/ SD Logistica, Cristinaeana, SEUR and Bidera. The channels are own direct (marketing companies/ sales force/web force); own indirect/own stores; indirect (partner stores/wholesaler) and informal. They use several ways to generate revenue streams through deliveries, new products (cargo bikes) and services (taxi, training, mobile sounds), advertisement, and consultancy. Finally, they internalization of externalities is due their savings in energy (their cargo-tricycle have made 84,444km between 2010-2014 which means 101,332,8 km saved by a vehicle with fossil fuel) and 29,538,51 kg of CO2 emissions saved (2010-2014). One cargo e-bike substitutes one van which has impact on congestion. At last, as they occupy less space, they give to the citizens more urban space and streets are more livable.

Logistic Profiles

City area features

The commercial density in San Sebastian is medium and also their homogeneity. Different areas in the city with different types of services (areas dedicated to industry, technology companies). In the inner city there are also several types of commercial activities and residents. The orography is between hilly and flat, the infrastructure is shared. In particular, they have a special permit to use every infrastructures even in pedestrian zones. The climate is mild, however it rains a lot. The culture in San Sebastian is in favour of bikes, although there are also some conflicts between pedestrian and bike users. There are bike parks, but not safe ones. Annually, around 15000 bikes are stolen in San Sebastian. San Sebastian need more safe parking for bikes. Regarding repair stations, there are specialized shops but not repairs shops as there exists for cars. In San Sebastian there are several restriction for entering in some areas of the city (time windows), however the e-cargo bike do not have the restrictions. The logistics accessibility are good within the city. However, to arrive in the city the logistics are actually bad, since the airport is far away, and train stations are separated from the road. The level of congestion is low during the weekdays, but congested during the weekend since they are very close to the French border and French people come to visit the city. Finally, the pavement is comfortable.

Product characteristics

Regarding their products to deliver, the easiness to handle is difficult. For instance, they do not delivery liquid because it is too heavy. The cargo must be appropriate to the vehicle (bike). For instance they are able to deliver washing machines. They deliver different kinds of boxes with different weight. Moreover, they might have special needs when deliver yogurts (for instance).

Agent needs

Regarding agent needs, their deliveries are usually during the day with high frequency every day (120 stops per day). Normally their routes are fixed with fixed origin and destination. They have both, pre-established routes and routes defined at the moment. No special schedule is needed. They have their own schedule, with no special particularity.
Case of success: Camisola Amarela – Lisbon, Portugal

Brief Description

Camisola Amarela, meaning yellow jersey, was founded in 2009 by Pedro Ventura and is the first bike messenger service of Portugal, nowadays making cycle logistics and express operations with normal and cargo bikes. Implemented the last mile concept in the city of Lisbon, using two warehouses in the entrance of the city centre.

They won the Green Project Award and have been distinguished in the European mobility week by the CícloTurismo Federation both in 2010, promoting among the companies and in the city a growing sustainability sense and energy efficiency by changing old processes by new ones equally effective.

For the PRO-E-BIKE an electrical cargo bike and scooter were introduced to the daily routine of the company with the first one used in cycle logistics and the second for deliveries in the outskirts of the city.

Business Model

Their value proposition is efficient, sustainable and environmental-friendly deliveries as last mile. They offer express deliveries in any part of Lisbon, including outskirts, in the shortest time possible, between 1 and 4 hours. They chose the vehicle (conventional bike, E-scooter or E-cargo-bike) depending on type of order, weight and distance. Their service is differentiated and with quality. In this sense, their key activities are courier services and last mile deliveries. Although the core business is delivery of freight, they also participated in some events with a tricycle for transport of passengers.

Their key partners are big companies in freight transport sector where they are part of their logistic chain in last/first mile. Apart from big companies, Camisola Amarela has also conventional courier companies as partners. Lawyers, communication and advertisement companies are partners since they exchange services and they recommend the services offered by Camisola Amarela to their clients, which are potential customers of Camisola Amarela itself. Companies of E-commerce and B2C are also key partners. Interesting to mention their special partnership with a bike repair shop (Rícicla) and a vegan restaurant (Grémio). Their contact center is located in 24 de Julho Street, where anyone can repair their bicycle or eat a vegan meal.

Customers are satisfied with their service, and general public are happy to see their positive impact on roads.
### Camisola Amarela Business Model Canvas

<table>
<thead>
<tr>
<th><strong>Key Partners</strong></th>
<th><strong>Key activities</strong></th>
<th><strong>Value Proposition</strong></th>
<th><strong>Customer Relationships</strong></th>
<th><strong>Customer segments</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight transport operators (e.g. Jet Express, DHL)</td>
<td><strong>Core business:</strong></td>
<td>Efficiency in last mile deliveries</td>
<td>Direct and personal contact</td>
<td>B2B &amp; B2C</td>
</tr>
<tr>
<td>Conventional courier companies</td>
<td></td>
<td>Express deliveries shortest delivery time possible</td>
<td>Differentiated service</td>
<td>Freight companies, lawyers, designers, communication companies, E-commerce</td>
</tr>
<tr>
<td>Lawyers</td>
<td><strong>Other activities:</strong></td>
<td>Sustainable activity</td>
<td></td>
<td>Different distribution channels depending on customer type</td>
</tr>
<tr>
<td>Communication and advertisement agencies</td>
<td></td>
<td>Service of good quality</td>
<td></td>
<td>General public</td>
</tr>
<tr>
<td>Companies B2C of E-commerce</td>
<td></td>
<td>Environmental-friendly image</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RECICLA (Bike repair shop)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grémio (Vegan restaurant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Key resources</strong></th>
<th><strong>Internalising Externalities</strong></th>
<th><strong>Channels</strong></th>
<th><strong>Revenue Streams</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact centre; Depot space; Employees &amp; eco-vehicles</td>
<td><strong>Corporate Responsibility</strong></td>
<td>Telephone, Email</td>
<td>The invoices are payable with thirty (30) days.</td>
</tr>
<tr>
<td></td>
<td><strong>Less congestion, emissions</strong></td>
<td>Website and their own image (Yellow shirt) and worth of mouth</td>
<td>Their revenues are 60% due to courier services and 40% due to last mile deliveries</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Cost structure</strong></th>
<th><strong>Revenue Streams</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact centre space rent (shared with Grémio and RECICLA) / vehicles</td>
<td></td>
</tr>
<tr>
<td>Rent of space in a depot (variable depending on needs)</td>
<td></td>
</tr>
</tbody>
</table>
Moreover, customers are willing to pay more for their value proposition. Not only because they do not pollute the city but also because they do not contribute to congestion. They have all types of customers segments from general public to large and medium companies such as Jet Express, DHL that outsource their services to last mile deliveries. Different channels of distribution depending on customers types.

Besides, 8 employees and the contact center, they also use two warehouses in the entrance of the city centre, depending on needs. (E-)bikes and (E-)cargo-bikes are also key resources. A normal (E)bike can transport 4Kgs with dimensions of 50×30×1 (cm) and a (E)cargo bike can transport 70×50×50 (cm) and 10 times the weight of a normal bike. Their economical sustainability is guaranteed by the reduction of cost of rental facilities since they share those fixed and variable costs (facilities rental, electricity and other expenses inherent in an office) with Grémio and Recicla. They do not pay a fixed amount of money to store goods, since they pay depending on their needs. Their relationship with customers are direct and differentiated.

Besides the normal channels, such as telephone and internet page, they have a lot of attention when circulate in Lisbon’s streets. The Yellow shirt riding a bike is visible to all and awakens curiosity. Their revenues are 60% due to courier services and 40% due to last mile deliveries. The invoices are payable with thirty (30) days.

Finally, regarding externalities, they have a corporative responsibility by contributing to a better environment. Besides less potation they contribute to less cars in the city center.

Logistic Profile

City area features

Lisbon is the capital of Portugal where about 550,000 people live. The city is characterized by a high volume of traffic, both from the periphery to the centre and within the city. The commercial density in Lisbon downtown is high. There are a great number of freight vehicles due to the distribution process resulting in congestion, noise, air pollution and in a degradation of quality of life in historical area. Freight vehicles unload freight in pedestrian spaces. In 2012, there were 7 000 freight vehicles on an average day entering and exiting downtown area. There are two peak periods, between 10 and 12 a.m. and between 2 and 6 p.m. with 750 and 550 movements per hour respectively. The majority of the vehicles are not heavy trucks staying in this area less than 30 minutes (65%) and 40% staying less than 15 minutes. Therefore, deliveries by E-(cargo)bike is much more efficient than van or truck.

Lisbon is also known by an irregular terrain, with a historic district with its "seven hills". Its topography, the various types of pavement, the presence of tram rails, and the behaviour of car drivers which in many cases are associated with the sense of unsafe circulation, are some of characteristics against cycling. However, with municipal investments in cycle infrastructures (bike lane network or parking areas for bikes), the number of cyclists have been increasing. However the accessibility by bicycle to the whole city is not yet guaranteed. Although the mild climate and the orography in downtown be favourable (between hilly and flat), the pavement conditions are poor. There is reduced emissions zones and bicycle culture need to be developed.

Product characteristics

Products are reasonable to handle and might have special needs.

Agent needs

They deliver immediate with a medium level of frequency. The number of stops is variable and with no special schedule.

1 Tis.pt (2012, 2013) - Estudo de Logística Urbana para a Zona Piloto da Baixa, Lisboa
**Case of success: SOLTRA, Soluciones Integrales, Leon, Spain**

**Brief Description**

**SOLTRA, Soluciones Integrales** was created in Leon city (Spain) in 2001. The main objective of the company is to create jobs for people with disabilities, allowing them to participate in the efforts of companies and institutions to generate wealth. To promote tourism in order to know the city from an environmental perspective and to promote sustainable mobility among citizens, 3 rickshaws are in use. The rickshaws allow promoting tourism in the city through a new system that focuses on urban sustainability, encouraging saving and energy efficiency, and social integration of people with a mild disability. This initiative started in 2013 and has been given the name 'Ciclotour Leon'. Moreover, the units allow the transport of persons with reduced mobility. Besides the rickshaws, they also have e-cargobikes that allow to run the streets of the city in an agile, fast and efficient way, making parcel distribution including mailshot, materials for activities and other.

Leon city council has supported this initiative because of its innovative, sustainable character and because its support to groups with social integration difficulties.

**Business Model**

Their **value proposition** is to increase the level of awareness of citizens in environmental and sustainable development, raise awareness revealing urban mobility responsible action, encouraging active participation and awareness of employment opportunities for people with disabilities.

Leon City has different options to be visited, such as tour guides, tourist train, carriage or visitors own means, but this new initiative promotes it with two specific routes with tours of one hour duration each. Routes are historic and modern. Besides the transport of passengers, they have also vehicles for the transport of freight to small companies. The company has a range of **key activities**, from vending to catering, but only the transport with rickshaws and E-cargo-bike are relevant in this case. With such a wide range of services, they serve several **customers segments**: companies, municipalities, associations, clinics and banks. Regular **channels** are used, website, telephone and email. Regarding **revenues**, advertisement in the shipping container of E-cargo-bikes can contribute to pay implementation costs. **Key resources** are physical (facilities and vehicles) and human, which also represent their **costs**.
### SOLTRA Business Model canvas

<table>
<thead>
<tr>
<th>Key Partners</th>
<th>Leon City Council</th>
<th>Gureak Group</th>
</tr>
</thead>
</table>

| Key activities                                              | Transport of passengers in touristic routes |
|                                                              | Delivery of small parcels, letters, goods |
|                                                              | Vending, catering, logistics, distribution, etc. |

| Value Proposition                                          | New system that focuses on urban sustainability, encouraging saving and energy efficiency, and social integration of people with a mild disability |
|                                                            | E-bikes are fast, safe and effective transport |

| Key resources                                               | Physical resources – vehicles and office |
|                                                            | Human resources - employees |

| Internalising Externalities                                 | Less pollutant emissions |
|                                                            | Energy saving and efficiency |
|                                                            | Improved conditions for universal accessibility |
|                                                            | Inclusion and social integration |

| Customer Relationships                                      | Personal |
|                                                            | |

| Customer segments                                          | Companies |
|                                                            | Municipalities |
|                                                            | Associations |
|                                                            | Clinics |
|                                                            | Banks |

| Channels                                                    | Telephone, Email, website |

| Cost structure                                              | With facilities, vehicles and human resources |

| Revenue Streams                                            | Advertisement in shipping container of E-cargo-bikes can contribute to pay implementation costs. |
The most important **partners** were the Leon city Council and the Gureak Group (leading to generation of employment for with disabilities) which started this business initiative.

Finally, the **externalities** that were internalized with this business are the reduction of pollutant emissions in historic and modern areas of the city, energy savings and efficiency, improved conditions for universal accessibility and inclusion and social integration of workers.

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**Logistic Profile**

**City area features**

A special authorization by Local Government was needed to circulate with rickshaws and E-cargo-bike. The great advantage was the access of those vehicle to historical center of the city, which are restricted to motor vehicles following the local regulation ‘Ordenanza de regulación del tráfico en el Casco Histórico’.

In Leon city the climate factor plays an important role, so winter is expected to be dispensed with the use of rickshaws or decrease it.

Moreover, the use of electric tricycles is still limited by its recent implementation. However, in the season of warm weather it is expected that the number of users increases because of the influx of tourists in summer.

**Product/Passengers characteristics**

There is no separate infrastructure for e-bikes.

**Agent needs**

There are two pre-established routes with tours of one hour duration each. Routes are historic and modern.

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**Lessons learned & good practices**

The business model canvas shows business models at a specific point in time. However, most companies’ business models are under constant pressure to change. A lot of facts contribute to those changes such as innovations in technology, changes in the law, competitive moves, or even shifts in consumer tastes. In response to those changes, companies totally renovate their business models through varied ways. A good example of that is TXITA that have been continuously adapting their business model and offering different services to different customers to maintain their profitability.

Regarding Camisola Amarela’s business model, it is interesting to notice how important key partners are. Besides exchange of synergies and services, they are also good channels by recommended their service to clients. Worth of mouth is an important channel as well as their brand image.

The green image of the company is appreciated by many customers and they do not hide how they love to ride a bicycle.

Finally, the last case, SOLTRA shows the importance of partnerships with the Municipalities/Councils in this type of project, as well as to support groups with social integration difficulties.

Moreover, from the analysis of those successful urban business models using E-bikes, it is possible to conclude that most of the innovative business concepts presented rely on partnerships other than the typical buyer-supplier relationship, with the expectation to improve performance (efficiency) and accessibility of their services as core value propositions as well as to improve their green image and contribute to a better environment. In this way, they internalise the externalities and value their positive contribution to society.

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