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STUDY ON INNOVATIVE BUSINESS MODELS

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1. Executive Summary

Business models in sustainable mobility have evolved in the last decade at a dramatic pace, as a combination of a broader range of factors including social and behavioural change, competition and opening of service markets, sustainability driven public policies, technology and digitalization.

For the specific purpose of the study, a detailed analysis approach has been elaborated, based on parameters such as flexibility, sharing and digitalization, in order to build an innovative mobility business models database.

14 different business models have been analysed in detail. These consider the main characteristics of existing and planned mobility solutions in the pilot regions involved in the SHAREPLACE project, as well as by the characteristics of the innovations sketched and co-designed within the six living labs activities.

The in depth analysis of main business models has been developed according to the business model canvas concept: the main outcomes of the database on innovative mobility business models built for the project will be used to develop customised business models for the co-designed innovative services representing the core of the pilot activities within the project.



2. The evolution of mobility as it faces new challenges

Business models in sustainable mobility have evolved in the last decade at a dramatic pace, due to a combination of a broader range of factors including social and behavioral change, competition and opening of service markets, sustainability driven public policies, technology and digitalization.

Concerning social and behavioral change, main trends highlight on one side a potential decrease for the traditional car dependency, especially concerning more urbanized areas, as well as a higher multimodal use of mobility options. Flexibility remains a main requirement for appealing mobility services, combined with a good attitude to sharing where those options are available.

In terms of competition and opening of service markets, starting from public transport the market structure of mobility services is progressively changing. On one side, in several countries legislations have introduced to different extents some level of competition for the market, according to the enforcement of Regulation (EC) No 1370/2007, due by the end of 2019. More relevant, new mobility services such as car/bike/motorbike/scooter sharing, demand responsive transport, ridesharing and other peer-to-peer services are entering the mobility market with a specific focus on urban and metropolitan areas, thanks to the role of technological enablers and operational innovations, with the support of new policy approaches.

Concerning sustainability driven public policies in particular, the EU approach is twofold, focusing on improving the quality of life and strengthening the economy, by promoting sustainable urban mobility initiatives as well as sustaining the take up of clean and energy efficient vehicles in the market.

As already mentioned, technology and digitalization processes play a fundamental role as enablers in the development of the mobility market, contributing to the creation of new value propositions and solutions, and consequently to the development of new business models often based on a broader range of revenue streams.

The following paragraph will highlight the main trends related to the abovementioned factors that are affecting mobility innovations, in order to set the stage for the selection and analysis of business models.

2.1. Social and behavioural change

In general, as in many other sectors, also the mobility sector develops more and more service-oriented products. Mobility requirements changed and the industry tries to meet these demands with new services and products. There is a demand for mobility solutions that meet exactly the needs of the customer that are also flexible, affordable and can be adapted to a wide range of needs at any time. The possession of one's own vehicle is increasingly perceived as a restriction of personal freedom or as unsustainable. Especially for the Internet generation or the so-called generation Y, today's 18-34-year olds, intangible values such as independence, flexibility and individuality seem more desirable.

Furthermore, urbanization is a main factor, which changes mobility needs and the functioning business models. A declining demand in the rural areas, villages and small towns and higher agglomeration in urban areas have resulted in very diverse requirements. If the population figures in rural areas continue to decline, the costs for municipalities and citizens will rise, as fixed costs remain the same and even rise proportionately.

But the behavioural dynamics do not only affect the demand side. Collaborative consumption models foster the growth of a new subject, the so called "prosumers", who can act as consumers and producers within the same market. Crowdsourced production requires a more active role of users in order to collect input for the design of more demand responsive services, while co-design and co-creation exercises actively engage stakeholders in the planning and production phase. Peer-to-peer markets are integrating and, in some cases, competing with traditional production and consumption models.



2.2. Competition and opening of service markets

The business model of a traditional transport provider can be described in a pretty simple way: to either own or lease vehicles, sell tickets and carry out the transport. In some cases, routes may be tendered and then operators based on the contract. Fares must cover the costs unless they are subsidized, as is the case of many public transport operators. Currently this is undergoing a major shift as markets become less regulated, new players and new concepts emerge, subsidies are limited, and operators are becoming more and more mobility providers. Nowadays, ownership of vehicles and other infrastructure becomes less relevant as many operators rely on platforms, leaving the act of transportation to others, sometimes even private individuals.

Connected to the behavioral change dynamics and supported by the technological development, a range of new market-oriented services, often competing with traditional scheduled and subsidized transport, emerged in most densely populated areas. The challenge of planners, regulators and policymakers is on one side to support a better integration of different modes of transport into multimodal chains and integrated concepts (see Mobility as a Service described below), in order to allow a more efficient use of resources. On the other side, the challenge is to export the benefits of technological and operational innovations in the sharing economy environment outside of their “comfort zone”, which are the most densely populated areas. In order to do this, sustainable business and financing models will play a fundamental role.

2.3. Sustainability driven public policies

As air quality deterioration and climate change phenomena became central to the political agenda at global, EU and national level, the sensitiveness to these issues increased among citizens, in particular in metropolitan and urban areas, and rapidly spread across EU regions.

An important milestone in transport planning represents the development and issuing of the Guidelines for Sustainable Urban Mobility Plans in 2013, the first European planning concept for sustainable urban mobility.

Since then, a large number of cities and urban areas have developed their plans according to this methodology, integrating participative approaches and evaluation approaches to the planning process.

Nonetheless, innovations in technologies, business models, societal developments etc. require a substantial revision and extension of the original approach, in particular by developing thematic guidance for specific trends such as electrification of transport, digitalization and Mobility as a Service, automated transport, etc.

The ongoing preparation of a new set of guidelines will reinforce the role of innovations in the sustainable mobility planning process, requiring a broader knowledge of the new markets as well as of the emerging business models in order to profitably integrate all the available resources in new plans which are able to improve the quality of life of citizens through mobility.

2.4. Technology and digitalization

Digitalization of mobility, together with societal and behavioral changes described above, has accelerated the trends towards a sharing economy, which is bound to play an essential role in the future of sustainable mobility. Vehicles sharing, ride-hailing, demand-responsive transport and other flexible and shared modes are increasing their presence in the urban landscape.

Furthermore, new technologies, like connected and automated vehicles (CAV), Internet of Things (IoT), Blockchain and Industry 4.0 which combine modern information and communication technologies with industrial production, are already well advanced in terms of mobility and will chance the sector even more.



As new mobility providers and new players are entering the market and bringing new business models with them, existing players are struggling to adapt to technological innovations and remain competitive on the mobility market.



3. Review and analysis of innovative business models

Business models in transportation are traditionally divided between product oriented and service-oriented business models.

Concerning product-oriented business models, OEMs (Original Equipment Manufacturers, automotive) represent the main actors. The model is based on the sales of vehicles, integrated with a range of supporting vehicle related services (after sale, maintenance, etc.).

A second range of business models deals more specifically with mobility services, and can be classified in two further categories:

- a) mobility service/ use-oriented business models, such as vehicle sharing, fleet management, ridesharing, etc.
- b) mobility service/ result-oriented business models, including public transport services, taxi and hire car with driver, etc.

Although this classification is very comprehensive and allows to map all the existing mobility related business models, for the specific purpose of the project and of the study a more detailed approach has been elaborated, based on variables such as flexibility, sharing and digitalization, in order to build an innovative mobility business models database.

3.1. Criteria of classification and approach

Flexibility in the provision and use of services and sharing of the means of transport represent the basic criteria of the classification approach.

Different degrees of flexibility characterize transport services, from the highest level represented by the use of a private vehicle to the constraints of scheduled services.

In parallel, a mapping exercise needs to consider that not all the services are at the same stage concerning the role of technologies (in particular ICT) as enablers of new and more composite use schemes. For this reason, a third variable for the mapping is represented by different technological frontiers, describing different technological development and endowment levels: in general, for mobility we could observe how technological innovation enables the development of services aiming at overcoming the traditional trade-off between sharing and flexibility, bringing towards new generations of integrated services combining the two aspects.

The following graph provides an example of mapping of mobility services according to the elements described above.

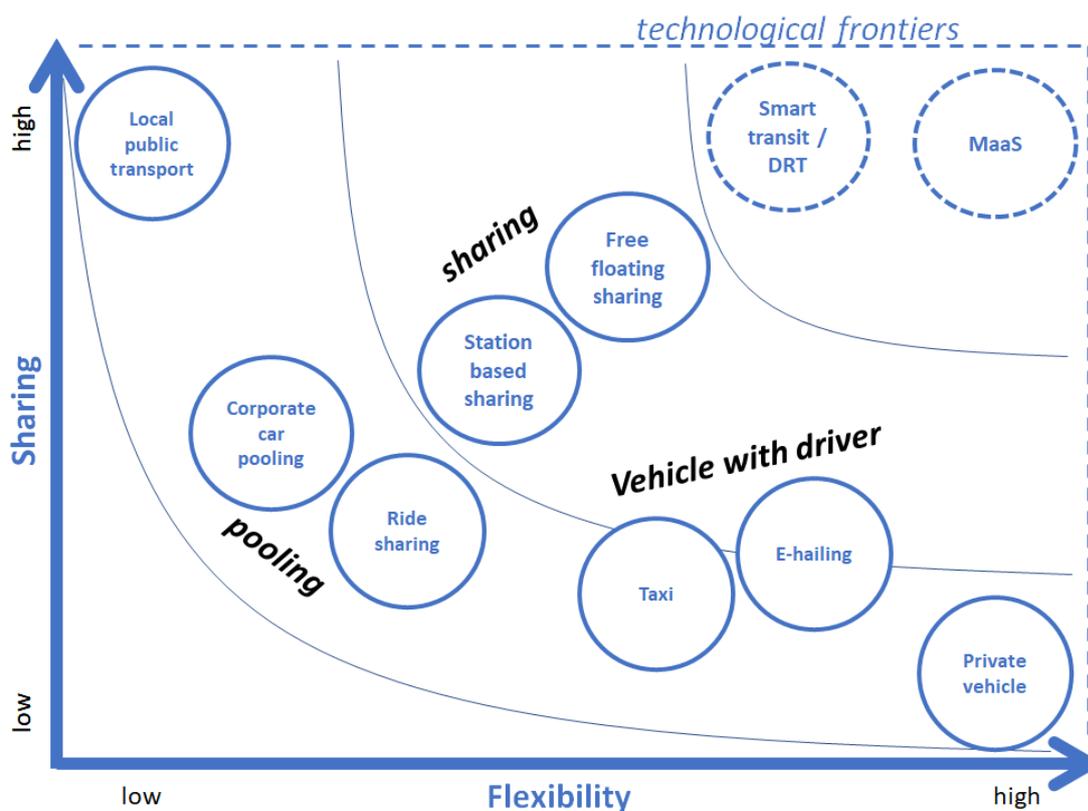


Figure 1: Mapping mobility services

The following table provides a classification of mobility service models according to the prevailing characteristic (shared/ flexible).

Service models	
Shared	Flexible
Local Public Transport	Private vehicle
Bike Sharing	Car Rental
Car Sharing	Taxi/ e-hailing
Motorcycle sharing	Demand Responsive Transport (DRT)
Scooter sharing	
Ridesharing/Carpooling	

Figure 2: Service models in mobility

Moreover, within the digitalization process different business and operational approaches foster the adoption of different digital models. In the following table three useful definition are provided, according to literature, classifying digitalization models followed by innovative services in mobility.



<i>Digital models</i>		
Digital Matching Services (DMS)	Transportation Networking Companies (TNC)	Mobility as a Service (MaaS)
Digital Matching Services (DMS), four criteria*: 1) the use of advanced technologies in order to allow peer-to-peer transactions; 2) the use of rating systems in order to feed new forms of trust between strangers; 3) the possibility for workers to choose their working time flexibly; 4) the use of workers' own assets.	Transportation Networking Company (TNC)**: an organisation whether a corporation, partnership, sole proprietor, or other form...that provides prearranged transportation services for compensation using an online-enabled application (app) or platform to connect passengers with drivers using their personal vehicles	Mobility as a Service (MaaS)*** is the integration of various forms of transport services into a single mobility service accessible on demand. To meet a customer's request, a MaaS operator facilitates a diverse menu of transport options, be they public transport, ride-, car- or bike-sharing, taxi or car rental/lease, or a combination thereof.
<small>*US Economic and Statistics Administration, (2016) Digital matching firms: a new definition in the sharing economy</small>	<small>** California Public Utilities Commission (2012)</small>	<small>***MaaS Alliance (2019)</small>

Figure 3: Digitalization models for mobility

The selection of innovative business models for the analysis has been made considering the main characteristics of existing and planned mobility in the pilot regions involved in the SHAREPLACE project, as well as by the characteristics of the innovations sketched and co-designed within the six living labs activities.

The following paragraphs will provide an in depth analysis of main business models according to the business model canvas: the main outcomes of the database on innovative mobility business models built for the scope of this project will be used to develop customised business models for the co-designed innovative services representing the core of the pilot activities within the project.



3.2. Models and examples

In the following paragraphs, a group of relevant innovative mobility services classified according to the above described methodology is provided, using the business model canvas approach.

For each definition of mobility services an exemplary business case is used as reference.

example	definition	Service		Digital		
		Shared	Flexible	DMS	TNC	MaaS
ShareNow	free floating car sharing	Yellow				Light Blue
Share'Ngo	free floating e-car sharing	Yellow				
Alto Adige Car Sharing	station based car sharing	Yellow				
BikeMi	station based bike sharing	Yellow				Light Blue
Mobike	free floating bike sharing	Yellow				
eCooltra	free floating e-motorcycle sharing	Yellow				
Lime	free floating e-scooter sharing	Yellow			Light Blue	
blablacar	ridesharing		Yellow	Blue		
Mytaxi	e-hailing, taxi based		Yellow	Blue		
Shotl	DRT platform		Yellow	Blue		
Uber	matchmaking vehicles with driver		Yellow		Blue	
Flixbus	matchmaking bus services	Yellow			Blue	
drivy	peer to peer car sharing	Yellow				
Whim	multimodal travel platform	Yellow	Yellow			Light Blue

- Prevailing service model
- Digital model
- Connected to the digital model

Figure 4: Models and examples fo innovative mobility business models

The “digital model” classification refers to those services that are not necessarily defined as pure transport services, but rather digital platforms.

The “connected to digital model” classification identifies those services that can be strategically linked to other pure digital platforms but can be still classified as transport services (e.g. a car sharing linked to a proprietary MaaS platform).

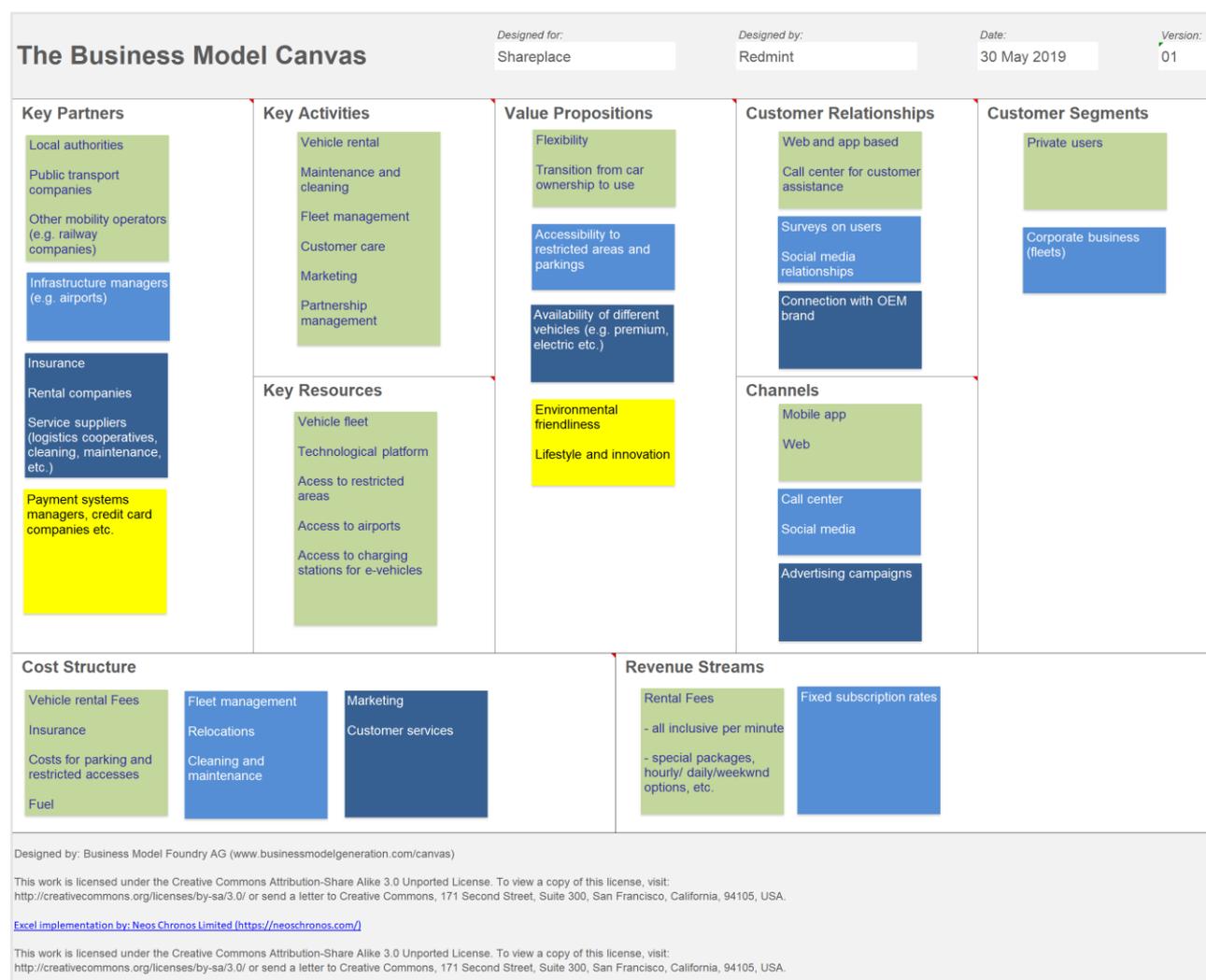
Services with no reference to digital models in the table still rely on digital technologies for their operations, but do not fall in any of the three pure digital models described.



3.2.1. Free floating car sharing

example	definition	Service		Digital		
		Shared	Flexible	DMS	TNC	MaaS
ShareNow	free floating car sharing					

3.2.1.1. Business model canvas



3.2.1.2. Specific features and notes

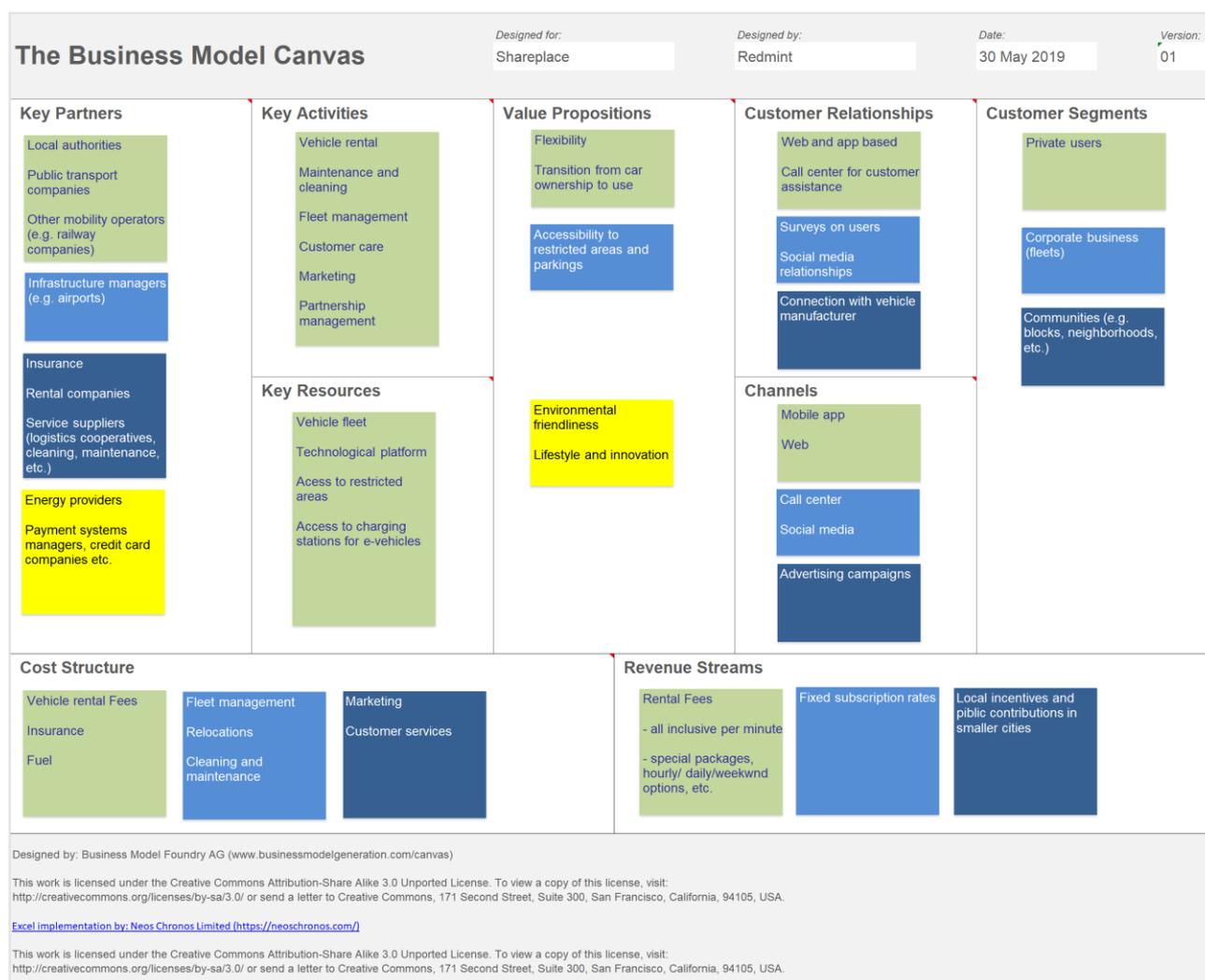
The specificities of these globally spread business models mostly rely on the strong relationship between the car sharing company and the OEM (car manufacturer) providing the vehicles. Characteristics of the model are broad EU and global presence, strong positioning within the “Mobility as a Service” markets. The example chosen is based on the sharing of different vehicles, including e-cars, in order to provide a broad range of option to the user. Other companies initially relied of fleets based on one or two types of vehicles; at present, the trend seems to go towards a general differentiation of the fleet. Other providers offer also a cargo vehicle option. In some cases, due to city regulations, the described model can be based on electric vehicles.



3.2.2. Free floating e-car sharing

name	definition	Service		Digital		
		Shared	Flexible	DMS	TNC	MaaS
Share'Ngo	free floating e-car sharing					

3.2.2.1. Business model canvas



3.2.2.2. Specific features and notes

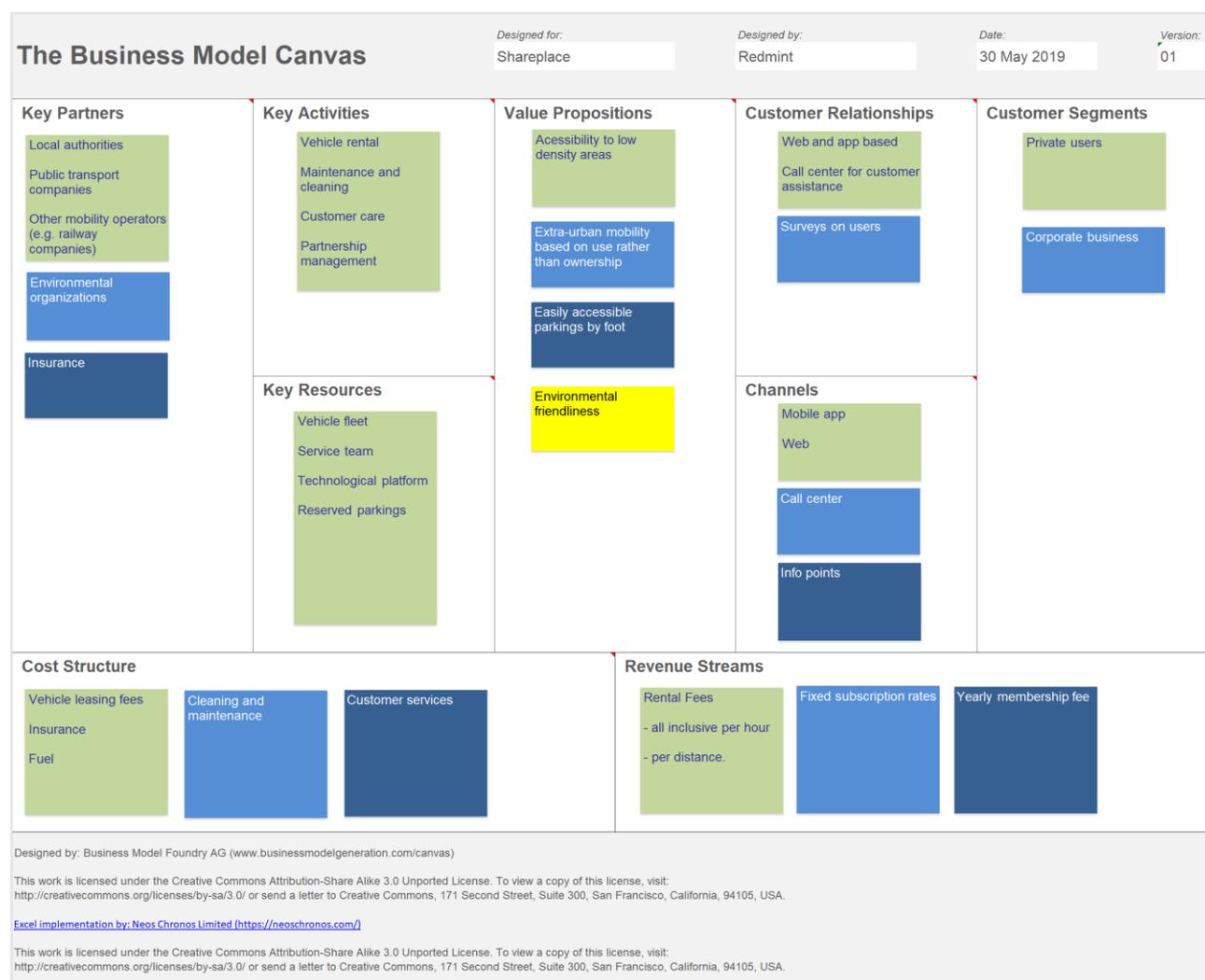
The use case chosen is based on electric quadricycles and represents the first case of full electric free floating car sharing in Italy and in Europe. Unlike other cases (e.g. car2go in Madrid), the full electric choice is not regulation driven but represents one of the main characteristics of the value proposition. A very relevant competitive advantage is represented by the absence of fees for parking and access to restricted areas. This balances on the other side relevant competitive disadvantages related to the recharging times of electric vehicles, that make a share of the fleet unavailable during the service time and makes logistics relocation operations more complex and costly. The approach of e-car sharing business models is in general based on a higher stage of sustainability, which envisages not only the use of carbon free technology but also faces social challenges by developing solutions dedicated to communities.



3.2.3. Station based car sharing

name	definition	Service			Digital	
		Shared	Flexible	DMS	TNC	MaaS
Alto Adige Car Sharing	station based car sharing					

3.2.3.1. Business model canvas



3.2.3.2. Specific features and notes

Differently from the previous cases the described model (example based in Italy's border region Trentino Alto Adige), characterised by a lower degree of flexibility in the use, shows lower operational costs related to logistics and relocations, reflecting also in the internalization of human resources (part of the personnel in the free floating models is typically hired through cooperatives). Revenue streams include a yearly fee; moreover, the fee is calculated hourly and/or by distance, due to the rather extra-urban use. In general, for this operational model a key factor is represented by the interactions with other transport providers, in particular synergies with regional railways. The specific case of a bordering regions is particularly interesting for the synergies developed with neighbouring countries service providers.



3.2.4. Station based bike sharing

name	definition	Service			Digital	
		Shared	Flexible	DMS	TNC	MaaS
BikeMi	station based bike sharing					

3.2.4.1. Business model canvas

The Business Model Canvas

Designed for: Shareplace Designed by: Redmint Date: 30 May 2019 Version: 01

<p>Key Partners</p> <ul style="list-style-type: none"> Local authorities Public transport companies Environmental organizations Advertising business 	<p>Key Activities</p> <ul style="list-style-type: none"> Bike and e-bike rental Maintenance and cleaning Fleet management Customer care Partnership management 	<p>Value Propositions</p> <ul style="list-style-type: none"> Easy accessibility to the city Reduction of travel Mobility based on use rather than ownership Affordability Environmental friendliness 	<p>Customer Relationships</p> <ul style="list-style-type: none"> Web and app based Call center for customer assistance Surveys on users 	<p>Customer Segments</p> <ul style="list-style-type: none"> Private users
<p>Key Resources</p> <ul style="list-style-type: none"> Bike and e-bike fleet Service team Technological platform Docking stations Service vehicles for relocations 		<p>Channels</p> <ul style="list-style-type: none"> Mobile app Web Call center Info points 		
<p>Cost Structure</p> <ul style="list-style-type: none"> Bikes cost Insurance electricity Cleaning and maintenance Relocations Customer services 			<p>Revenue Streams</p> <ul style="list-style-type: none"> Rental Fees - all inclusive per single trip plus extra minutes Advertising (mainly at docking stations) Yearly membership fee 	

Designed by: Business Model Foundry AG (www.businessmodelgeneration.com/canvas)

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Excel implementation by: Neos Chronos Limited (<https://neoschronos.com/>)

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3.2.4.2. Specific features and notes

The value proposition of the service based in Milano (IT) relies in particular on the affordability: in fact, besides the yearly fee, any trip below 30 minutes is free. The specific business model is based on revenue streams for advertising that cover the investment cost for bicycles and infrastructure. The advertising company is the strategic actor providing the service in collaboration with the local public transport provider, benefitting of advertising spaces. The localization of the docking stations is capillary on the territory and integrated to the public transport network.



3.2.5. Free floating bike sharing

name	definition	Service			Digital	
		Shared	Flexible	DMS	TNC	MaaS
Mobike	free floating bike sharing					

3.2.5.1. Business model canvas

The Business Model Canvas

Designed for: Shareplace | Designed by: Redmint | Date: 30 May 2019 | Version: 01

<p>Key Partners</p> <ul style="list-style-type: none"> Local authorities Investors Bike manufacturers e-commerce players 	<p>Key Activities</p> <ul style="list-style-type: none"> Bike and e-bike rental Maintenance and cleaning Fleet management Customer care Partnership management Bike design 	<p>Value Propositions</p> <ul style="list-style-type: none"> Quality of city life Reduction of traffic and congestion Flexibility in mobility Last mile solutions Affordability Environmental friendliness 	<p>Customer Relationships</p> <ul style="list-style-type: none"> Web and app based QR code scan and ride concept Riding community Gaming 	<p>Customer Segments</p> <ul style="list-style-type: none"> Citizens Tourists 	
<p>Key Resources</p> <ul style="list-style-type: none"> Bike and e-bike fleet Service team Technological platform Geo-localization system Data 		<p>Channels</p> <ul style="list-style-type: none"> Mobile app Web Scan and ride Social media 			
<p>Cost Structure</p> <ul style="list-style-type: none"> Bikes cost Platform Insurance Energy Cleaning and maintenance Fleet management and relocations Customer services 			<p>Revenue Streams</p> <ul style="list-style-type: none"> Rental Fees - all inclusive per single trip, pre paid Refundable registration costs Advertising Data to third parties 		

Designed by: Business Model Foundry AG (www.businessmodelgeneration.com/canvas)

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3.2.5.2. Specific features and notes

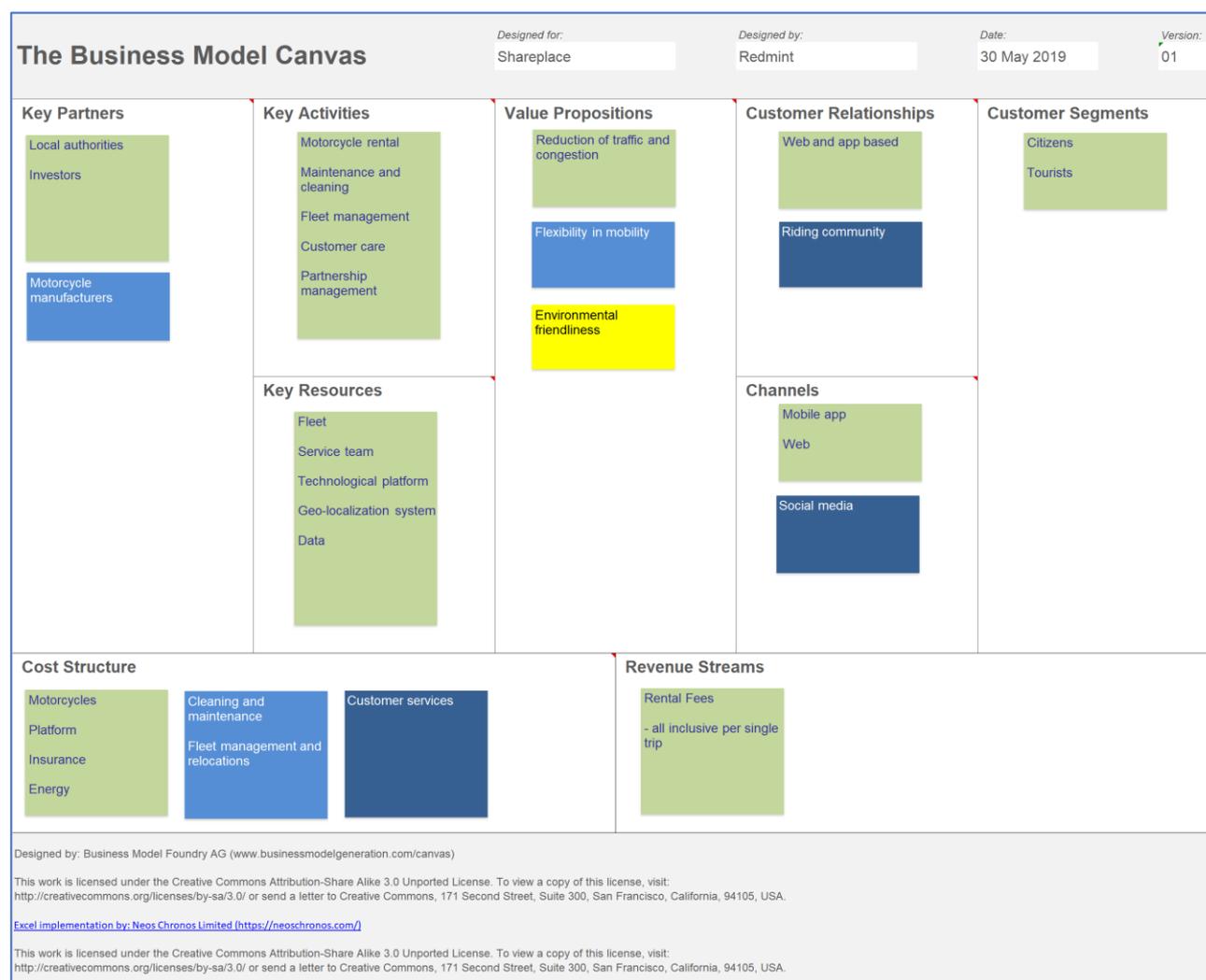
The described model is applied at global level. Compared to the station-based models, the free floating approach is generating a high volume of data that can be used for business intelligence and marketing purposes by third parties. The model is developed in strong synergies with the e-commerce sector and has in customer profiling and data collection one of its main strengths. The business strategy is based on the assumption that a capillary system can lower the average cost of logistics and relocation, and at the same time generate additional revenues through data.



3.2.6. Free floating e-motorcycle sharing

name	definition	Service		Digital		
		Shared	Flexible	DMS	TNC	MaaS
Scoot	free floating e-motorcycle sharing					

3.2.6.1. Business model canvas



3.2.6.2. Specific features and notes

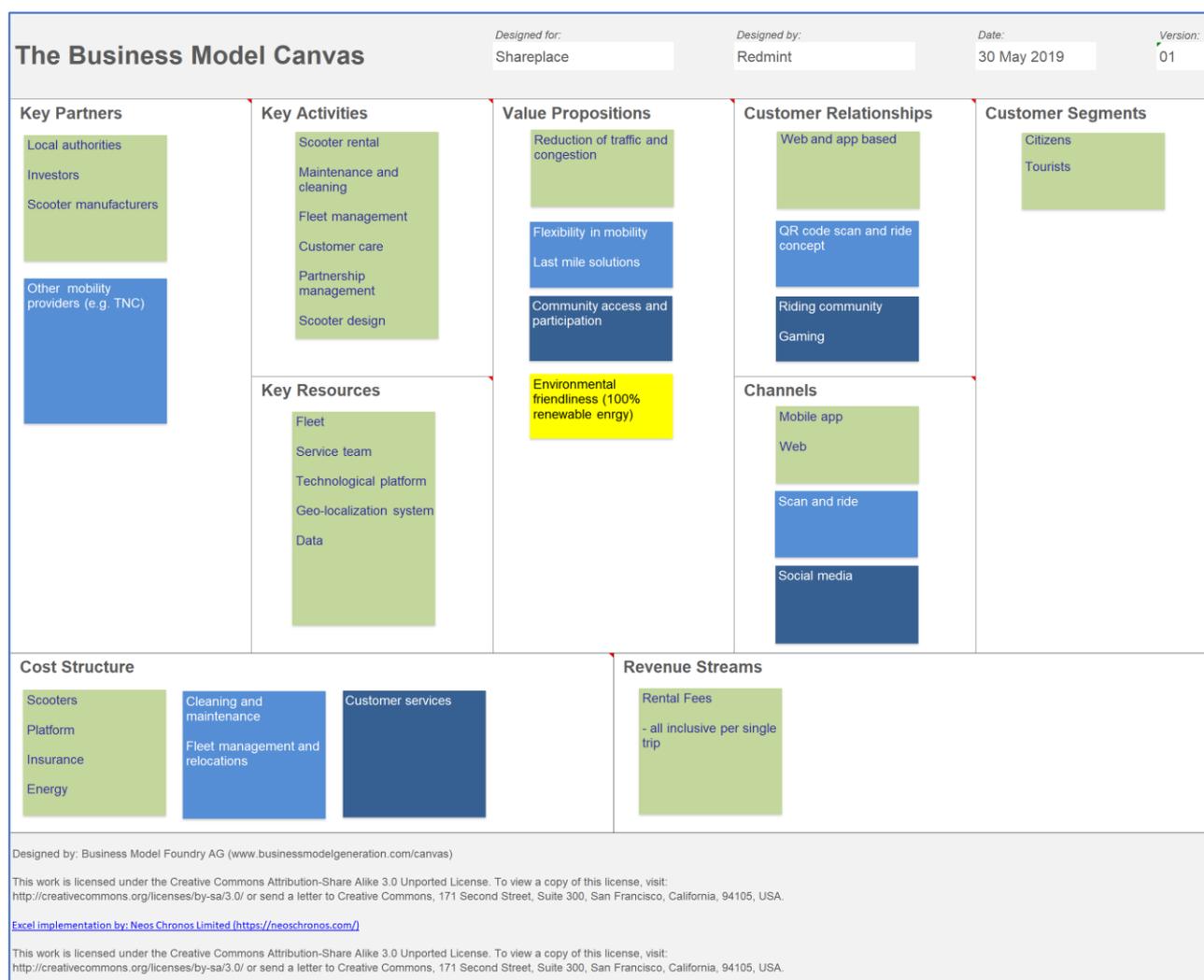
The third example of free floating models is based on e-motorcycles. Thanks to the favourable urban characteristics and regulations, some cities in Europe (especially in Spain and Italy) have developed a competitive market. Business models rely mainly on fees, as customers represent a niche compared to bike sharing services: fees are similar to the car sharing ones, while investments and operational costs are lower. Compared to electric car sharing, operations are made easier by battery swapping for recharging. In terms of intermodality, bike sharing has a higher degree of complementarity with scheduled services, while motorcycles often compete with public transport.



3.2.7. Free floating e-scooter sharing

name	definition	Service			Digital	
		Shared	Flexible	DMS	TNC	MaaS
Lime	free floating e-scooter sharing					

3.2.7.1. Business model canvas



3.2.7.2. Specific features and notes

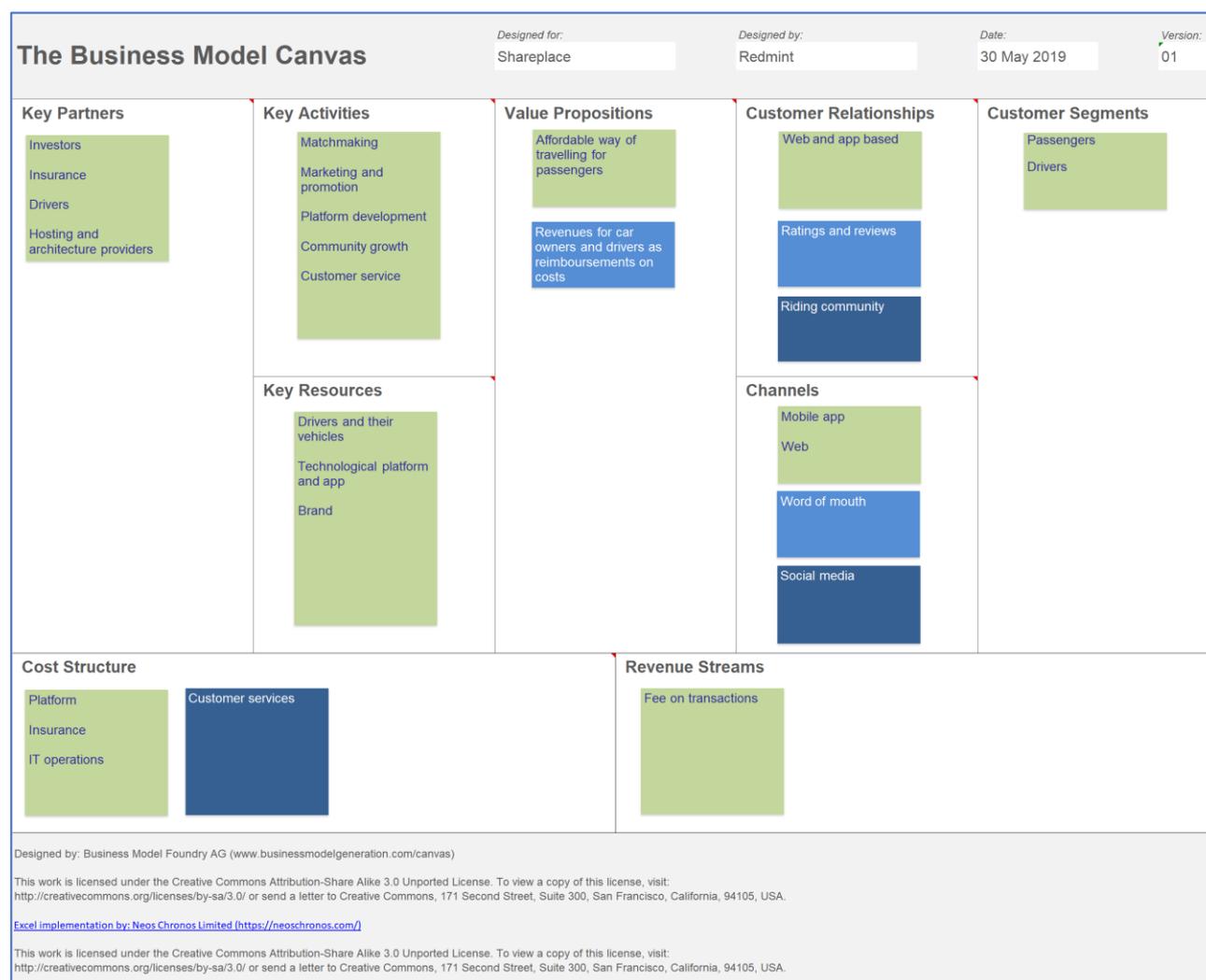
The e-scooters business model is quite similar to the e-motorcycle. It is difficult at the moment to detect more specific key elements since the business is very new and the applications are heterogeneous according to different national and city regulations on traffic. However, the analysis of operation and business models show some similarities also to the free floating bike sharing, especially concerning the role for the last mile connection in multimodal trips. Moreover, these services are strategically linked to private mobility (car ownership or even better transportation networking companies) since they can be physically integrated.



3.2.8. Ridesharing

name	definition	Service			Digital	
		Shared	Flexible	DMS	TNC	MaaS
blablacar	ridesharing					

3.2.8.1. Business model canvas



3.2.8.2. Specific features and notes

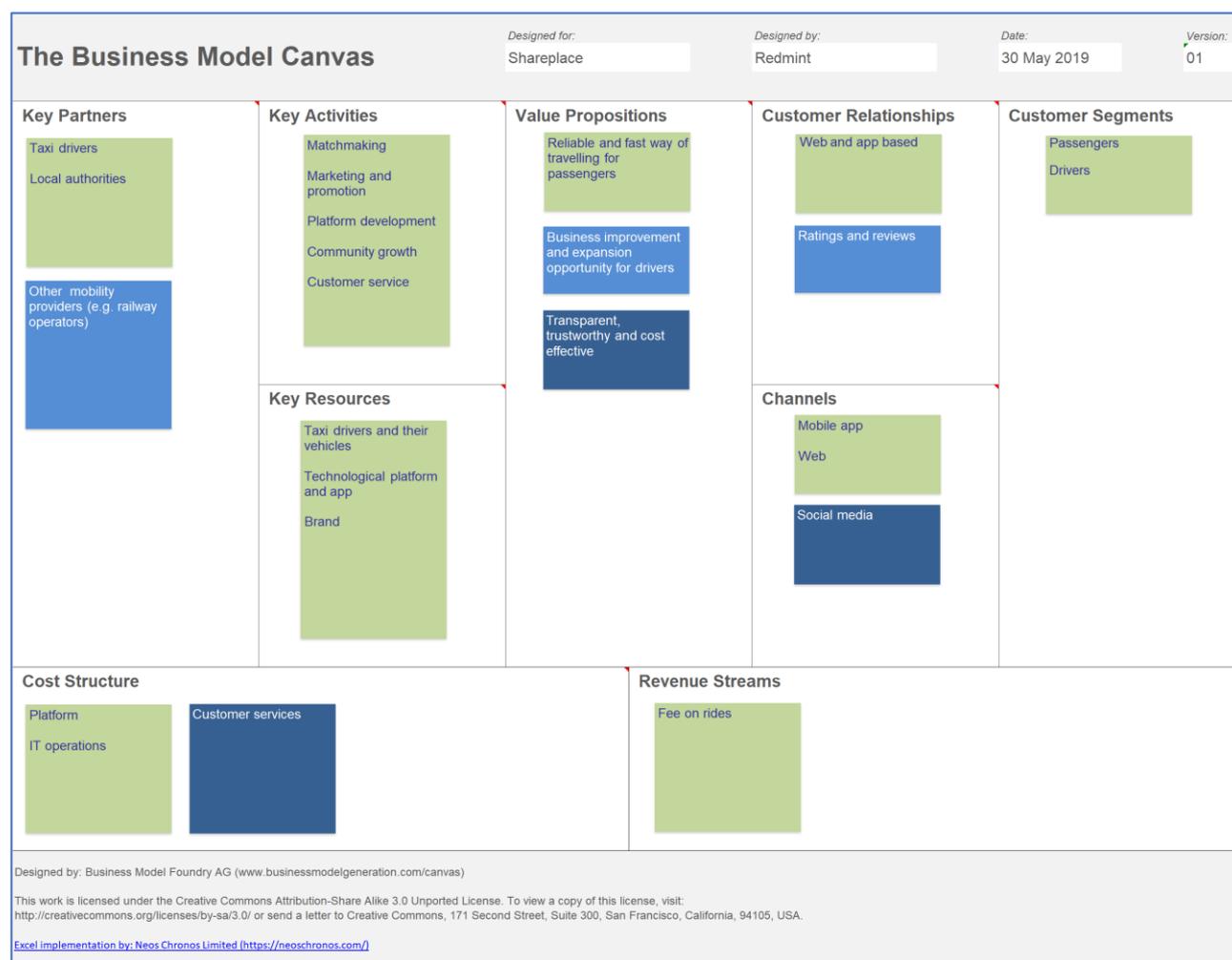
Ridesharing is a digital matching service where the revenues are based on a fee per ride. The model relies on external assets for operations and does not run the transport service. Scalability and network expansion are key feature of the model. The service is designed for long distance trips, however, some experiments for adapting it to short distance in low demand areas are in place: the so called blabla lines for commuters. This new operational model is in general coherent with the existing business models, but incentives (monetary and non-monetary) to users must be considered in order to foster the take-up and support a better integration with scheduled services.



3.2.9. E-hailing

name	definition	Service			Digital	
		Shared	Flexible	DMS	TNC	MaaS
Mytaxi	e-hailing, taxi based					

3.2.9.1. Business model canvas



3.2.9.2. Specific features and notes

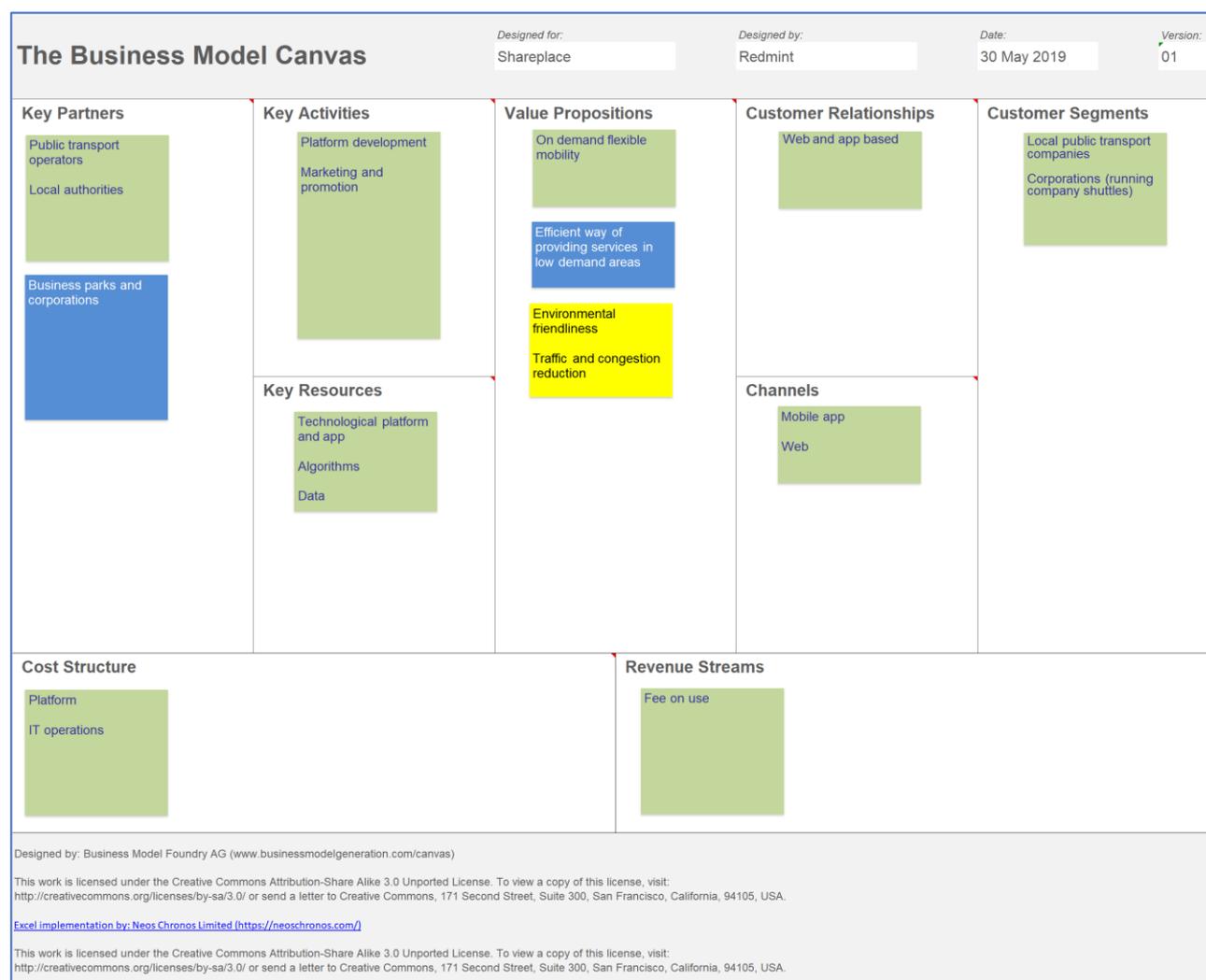
The described model is the second case of digital matching service, focusing on the taxi market. An interesting feature of the business model is the potential of integration with public transport, made easier by the use of a steady fleet of drivers. Experiments in this sense could be run by involving specific categories of professional drivers in low demand areas. In order to develop such services, regulatory barriers must be overcome in several regions and new professional figures must be identified (e.g. specific licenses for low demand areas under different in some cases experimental, regulation).



3.2.10. DRT platform

name	definition	Service			Digital	
		Shared	Flexible	DMS	TNC	MaaS
Shotl	DRT platform					

3.2.10.1. Business model canvas



3.2.10.2. Specific features and notes

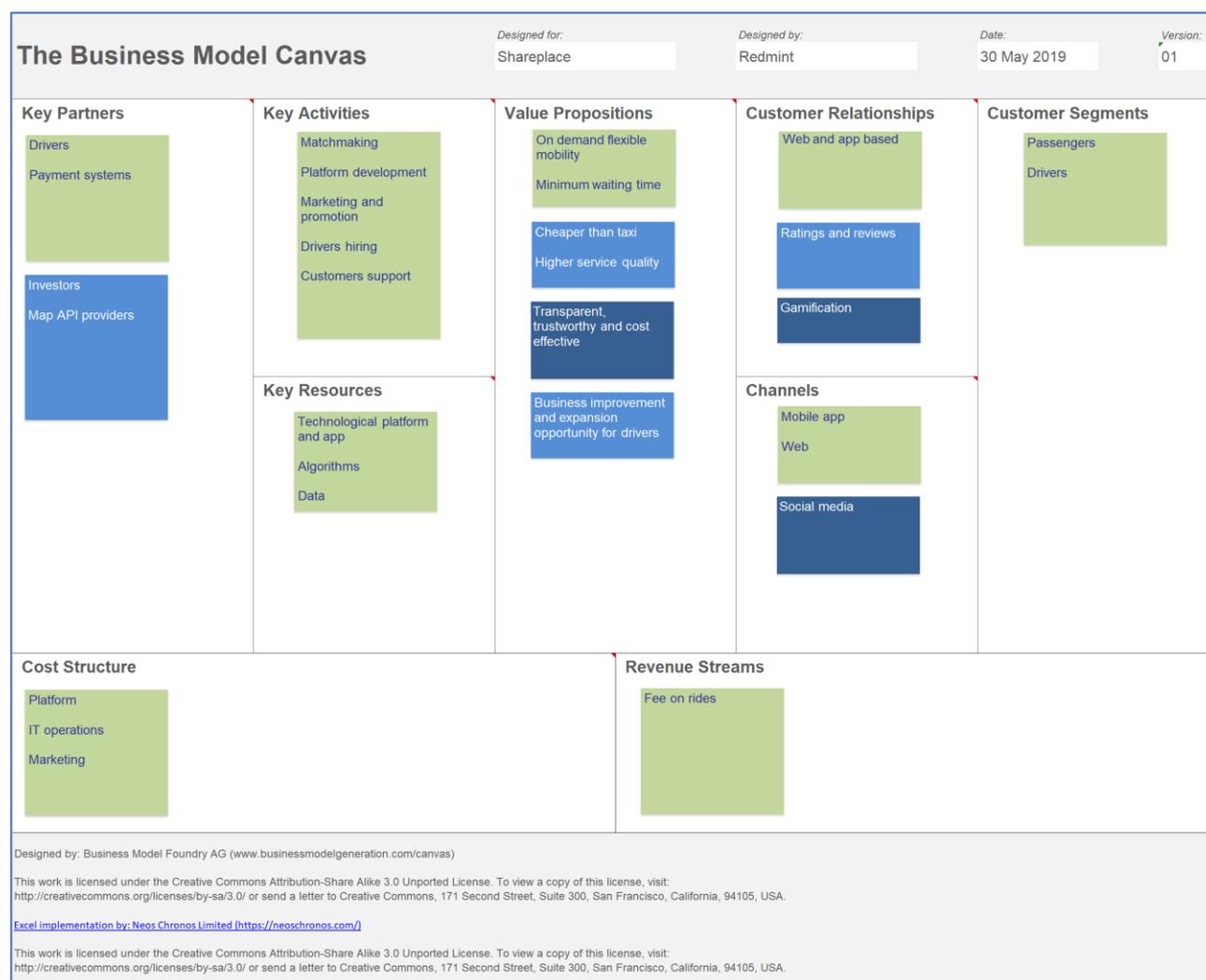
The model is based on the B2B provision of a platform for DRT operations, in order to allow flexible services in specific contexts and potentially integrated with scheduled ones. The business model aspects interesting for SHAREPLACE are related to the creation of a mobility digital ecosystem and will be investigated further during the development of the transnational service hub output.



3.2.11. Matchmaking vehicles with driver

name	definition	Service			Digital	
		Shared	Flexible	DMS	TNC	MaaS
Uber	matchmaking vehicles with driver					

3.2.11.1. Business model canvas



3.2.11.2. Specific features and notes

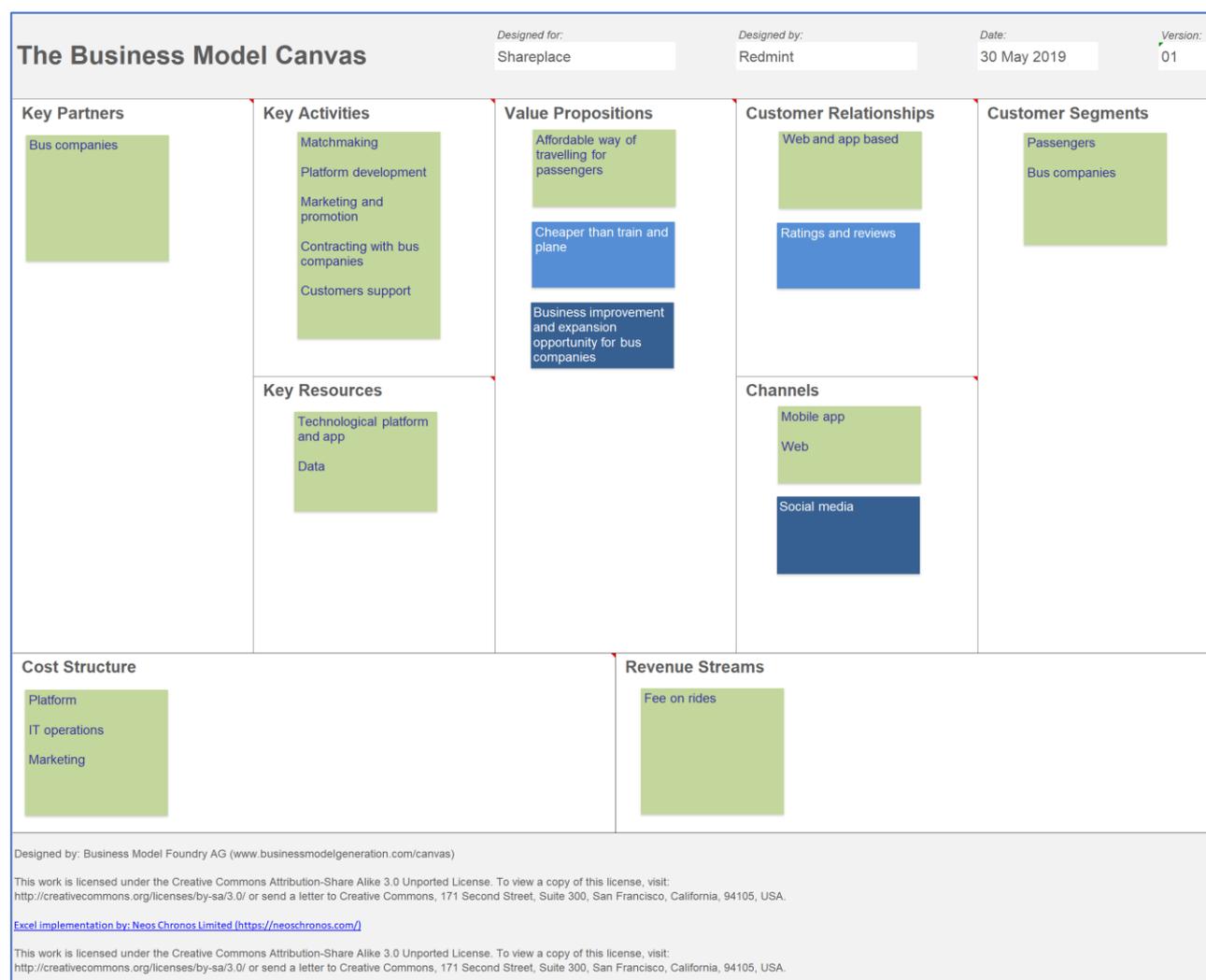
There has been large debate whether Uber could be considered a digital matching service or a transportation networking company, with several cases in Europe opting for the second definition. The model applies mainly to hire car with driver services (pus some trials in the taxi market). No peer-to-peer applications are allowed so far; as for the e-hailing case, experiments in low demand areas would require specific derogations in order to identify professional categories that could experimentally test the platform in low demand areas.



3.2.12. Matchmaking long distance buses

name	definition	Service			Digital	
		Shared	Flexible	DMS	TNC	MaaS
Flixbus	matchmaking bus services					

3.2.12.1. Business model canvas



3.2.12.2. Specific features and notes

The business model is similar to the previous one and focusing on long distance trips. Although no applications to local transport is envisaged, the growth of the regional and medium-long distance bus trips might play an important role in the improvement of accessibility along Ten-T networks.

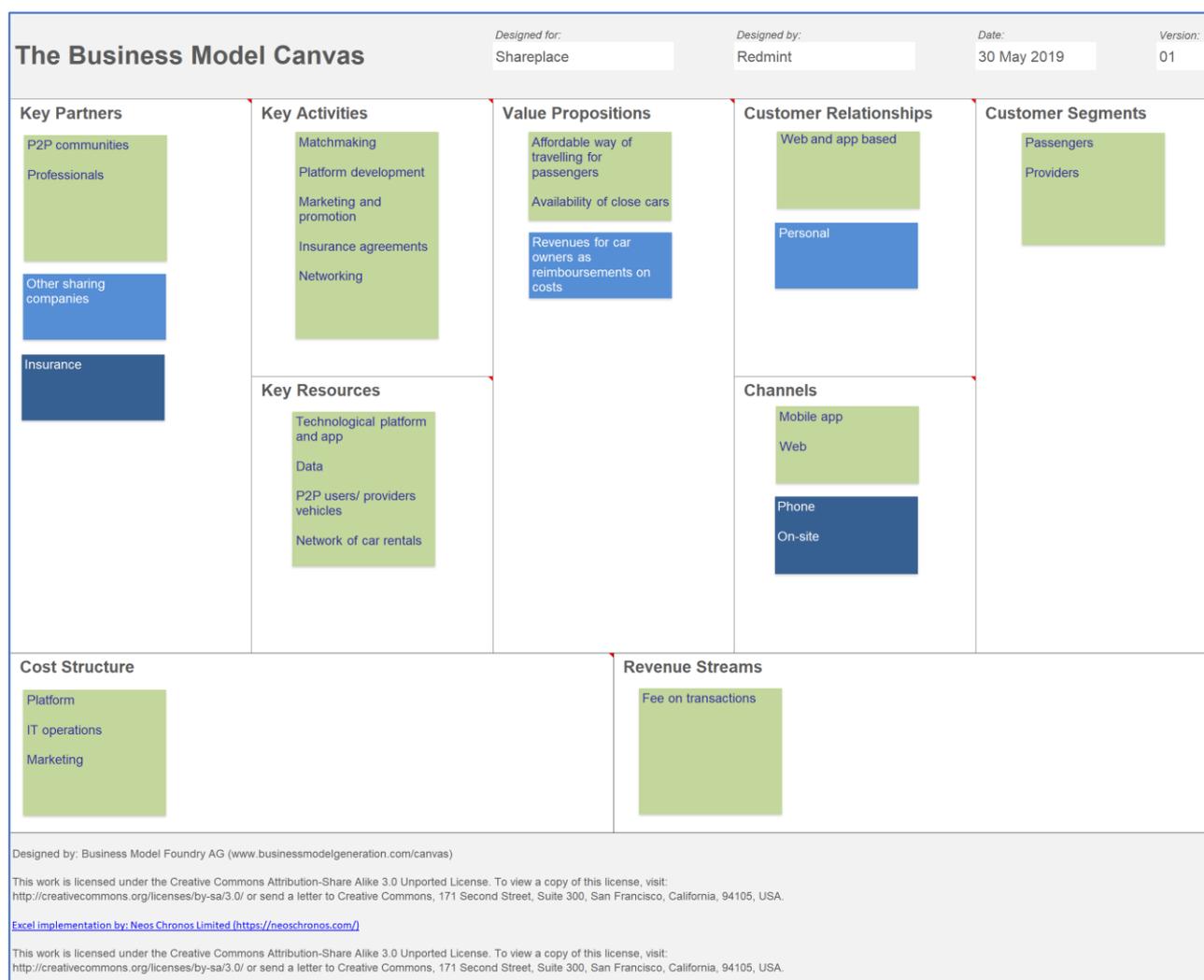
The service puts together different bus operators into a common network, creating new transport offers. The interesting aspects of the business model are its networking potential and the possible integration within mobility digital ecosystems.



3.2.13. Peer-to-peer car sharing

name	definition	Service		Digital		
		Shared	Flexible	DMS	TNC	MaaS
drivy	peer to peer car sharing					

3.2.13.1. Business model canvas



3.2.13.2. Specific features and notes

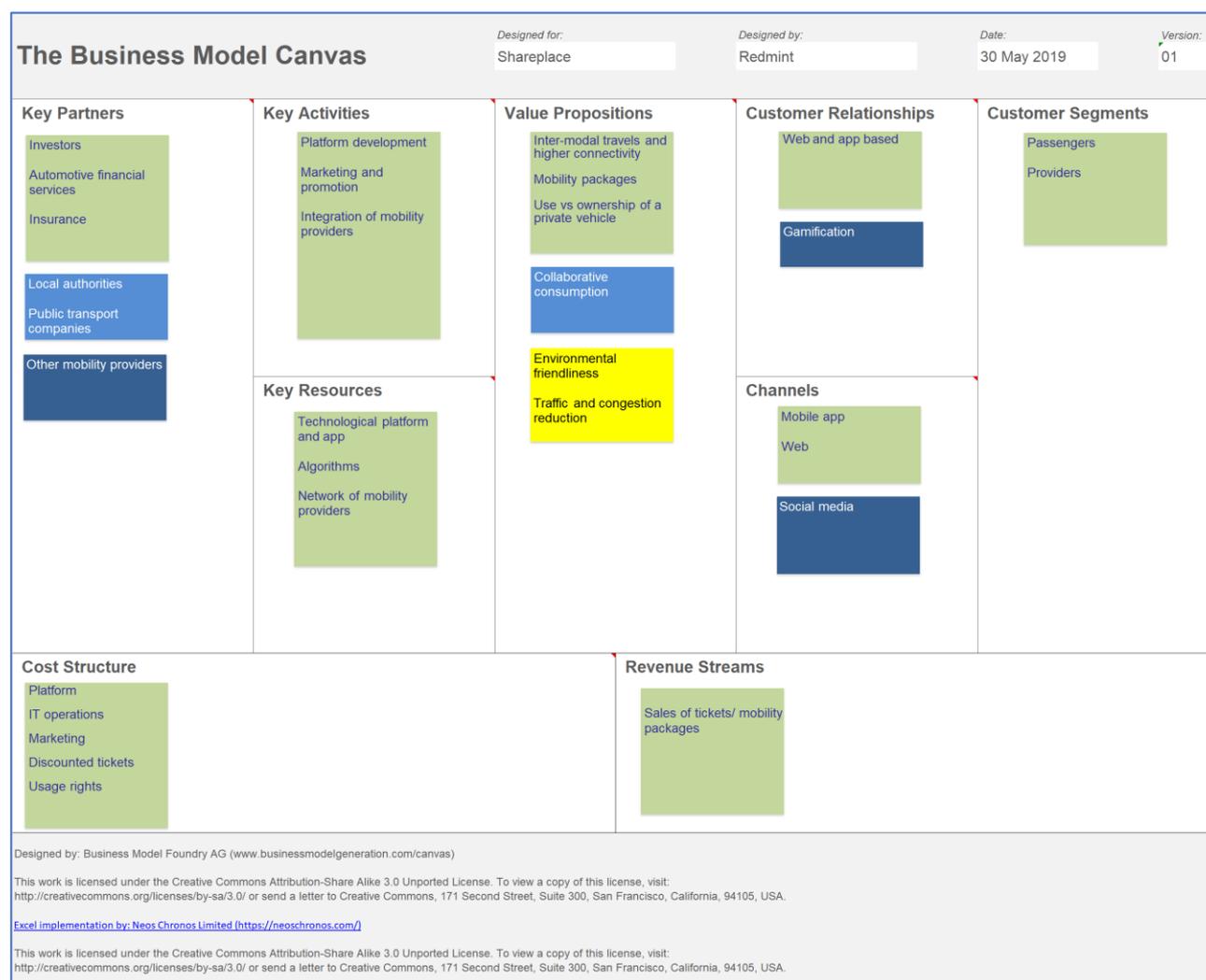
Peer-to-peer car sharing represents an opportunity for integrating existing networks both in urbanized areas, where car ownership is likely to be overtaken by more sustainable consumption models, as well as in low demand areas, where the lack of scheduled and other mobility services leaves business opportunities to more shared options. In some cases, regulatory issues are slowing the testing of this new form of mobility; from the SHAREPLACE point of view, P2P represents a good option in order to integrate existing networks and sustain the creation of mobility communities.



3.2.14. MaaS ecosystem (IT business oriented)

name	definition	Service		Digital		
		Shared	Flexible	DMS	TNC	MaaS
Whim	multimodal travel platform					

3.2.14.1. Business model canvas



3.2.14.2. Specific features and notes

MaaS applications can be developed according to different business approaches. According to the SHARPLACE principles, the eco-systemic one has been chosen for the analysis. In order to make the system effective, the design of innovative services and the digitalization process of existing ones must follow common rules in order to build an ecosystem where integration is possible. The analysis of the MaaS business model contributes to the delivery of the transnational service hub project output, as well as to the development of the pilot activities related to multimodal planning.



4. Conclusions

The main objective of the business models analysis was the identification of elements useful for the development of effective and innovative business approaches in order to sustain the development of innovative co-designed services and provide guidelines for their sustainability in the long run.

Each category of the business model canvases can provide useful insights for the development of sustainable business models supporting innovation in mobility services with specific reference to the SHAREPLACE approach.

Looking at key actors involved in the analysed services, we can highlight the role of local authorities not only for regulated services, but also in case of market services and platforms. Secondly, in many cases emerging business are developing collaborations with other mobility service providers (in particular local public transport under different shapes: as customers, partners for multimodal transport, service providers. In the case of digital matching services and transportation networking companies part of the customers (bus companies, taxi and other drivers) are listed as key actors. The presence of insurance companies among the key stakeholders suggests the increasing relationships among different sectors. The development of a collaborative environment seems to be a pre requirement for the development of innovative mobility services.

Concerning activities and resources, it is easy to notice the relevance of marketing and promotion, partnership management, as well as the central role of platforms and their maintenance and development, requiring a strong degree of interactions among services in terms of data availability and exchange. Long term competitive advantages come from the development of innovations such as robust algorithms and networks with customers and suppliers.

Value propositions are mainly concentrating among four main key concepts: environmental friendliness, flexibility, cost effectiveness and quality of life.

As expected, customer relations and communication channels strongly refer to digitalization and, in several cases, social media, relying on a more active role of customers in interacting with the services. In this case, especially when dealing with user groups with different skills and attitudes especially in peripheral and low demand areas, it is very important that innovative sustainable services are designed for customers and supported by multi-channel communication in order to guarantee user friendliness and to accompany the digital transition guaranteeing high levels of inclusiveness.

Coming to the analysis of costs and revenues, it is worth to mention that most of the analysed models have been applied so far mostly in densely populated context, urban and metropolitan. In these environments, business models have evolved in order to reach a break-even point under competitive conditions.

There is a fundamental discrepancy between the operational and business potential of shared, flexible and digital services in low demand areas. Looking at the main cost and revenue elements and business strategies of the analysed services, a few recommendations can be made in order to create the conditions to guarantee the economic viability of new solutions:

- creating the conditions for digitalization and service integration; data availability and integration, collaboration and fair competition ground in order to attract players lowering entrance barriers;
- innovating the regulatory framework in order to support innovations able to generate social benefits (e.g. allowing light licensing options for drivers in digital matching services in remote areas);
- fostering the development of P2P solutions on community basis;
- providing incentives to citizens committing to more sustainable mobility options, both as final users and service providers (e.g. prosumers);



- developing integrated planning approaches, shaping public subsidies for the different cost-effective solutions able to match the requirements of the demand.

As mentioned, the lessons learnt within the analysis of the business models presented in this study and briefly summarized in these conclusions will represent the basis on which new dedicated business models for the co-designed services in the pilot regions will be elaborated. Pilot innovation in particular focus on DRT, carpooling services and integrated multimodal trip planning options as pre requirement for MaaS ecosystems. The outcomes of the analysis will also support the identification of requirements for service providers entering the market on a later stage, in order to guarantee long term sustainability to the tested innovations.



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