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Building a Mobility Marketplace: Via Verde's Strategic Expansion into Private Parking, EV Charging, and P2P Car Rentals.

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BUILDING A MOBILITY MARKETPLACE: VIA VERDE'S STRATEGIC EXPANSION INTO PRIVATE PARKING, EV CHARGING, AND P2P CAR RENTALS.

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Abstract: This thesis examines Via Verde's possible strategic expansion into four mobility marketplace services addressing evolving urban mobility needs in Portugal: Private Company Parking Rentals, Peer-to-Peer (P2P) Parking Rentals, P2P Electric Vehicle (EV) Charging Rentals, and P2P Car Rentals. Employing a mixed-methods approach, including quantitative surveys and qualitative interviews, the study evaluates the market potential and operational feasibility of such services leading to a final strategic recommendation and financial plan, which positions Via Verde as a pioneering leader in integrated and sustainable mobility solutions.

Keywords: *Private Company Parking Rentals, P2P Parking Rentals, P2P EV Charging Rentals, P2P Car Rentals, Mobility Marketplace, Shared Economy, Sustainable Urban Mobility, Via Verde.*

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1. Introduction

The rapid evolution of urban mobility demands innovative solutions that address the increasing challenges posed by urbanization, environmental sustainability, and technological advancements. Via Verde, a pioneer in electronic toll collection in Portugal, has successfully expanded its portfolio beyond tolling services to encompass a wide range of mobility offerings, including parking solutions, EV charging, and multimodal transport systems. Building on its strong brand reputation and established technological infrastructure, the company is uniquely positioned to lead the development of a holistic mobility marketplace.

This thesis explores Via Verde's strategic expansion into four interconnected mobility services: private company parking, Peer-to-peer (P2P) parking or private residential parking, P2P electric vehicle (EV) charging, and P2P car rentals. These services align with emerging consumer trends emphasizing sustainability, convenience, and shared economy models while addressing critical gaps in Portugal's mobility infrastructure. By leveraging underutilized assets such as corporate parking lots, residential parking spaces, and private EV chargers, Via Verde can contribute to a more efficient and sustainable mobility ecosystem.

The research adopts a mixed-methods approach, combining quantitative surveys and qualitative interviews to assess market demand, user preferences, and operational feasibility. The findings aim to provide actionable insights for Via Verde to position itself as a comprehensive mobility platform, fostering customer loyalty and capturing new revenue streams.

Through this investigation, the thesis aims to evaluate how Via Verde's expansion into private company parking, P2P parking rentals, P2P EV charging, and P2P car rentals can address unmet market needs, enhance its competitive position, and drive sustainable urban mobility.

By focusing on the practical and strategic implications of these services, this study provides actionable recommendations for positioning Via Verde as a leader in the evolving mobility marketplace.

2. Literature Review

2.1 Company Overview: Via Verde

Founded in 1991, Via Verde pioneered electronic toll collection (ETC) systems in Portugal, evolving from a tolling infrastructure provider to a comprehensive mobility service provider (*Appendix 1*). Initially, the company focused on facilitating seamless highway tolling with the introduction of free-flow toll systems, allowing drivers to traverse the nation's motorways without stopping. According to the company, Via Verde currently serves over 5.1M onboard units (OBUs) and has 3.4M customers, achieving what it reports as an 86.3% market share in highway tolling services (Via Verde, 2024).

Over the years, Via Verde has expanded its service portfolio beyond tolling to address a wide range of mobility needs, both for private (B2C) and corporate (B2B) clients. These services include on- and off-street parking, fuel payments, EV charging stations, and multimodal transport solutions like ferries and public transportation (*Appendix 2*). Via Verde states that its strategic vision emphasizes customer convenience and sustainable mobility, positioning itself as a leader in this transition (Via Verde Annual Report, 2024).

The company’s operating income for the first half of 2024 highlights its continued reliance on toll services while showcasing its diversification into non-tolling services. Out of the total operating income of €393.2M EUR, approximately 97.6%—was generated from toll services. The remaining €9.4M EUR, accounting for 2.4%, originated from other services such as on- and off-street parking, EV charging stations, and multimodal transport solutions. These non-tolling services represent the company's commitment to diversifying its revenue streams, which

aligns with its strategy of shifting from a toll-centric to a comprehensive mobility provider model (Brisa Concessao Rodoviaria, 2024).

According to Via Verde, its innovation extends into digital services, leveraging smartphone technology to act as an OBU clone, simplifying payment processes across multiple mobility services. The company is actively shifting from a car-centric to a person-centric mobility facilitator, providing a comprehensive service ecosystem that supports the transition from private vehicle use to public and shared mobility (Via Verde Annual Report, 2024).

Figure 1: Via Verde Ecosystem

The company's strategic evolution is driven by its commitment to sustainability, the digitization of services, and the creation of value-added services for both individuals and businesses. Via Verde's ambition is to continue expanding its service portfolio, integrating private EV charging station rentals, parking solutions, and P2P car rentals, positioning itself as a comprehensive mobility platform that connects private and shared resources for a more sustainable and efficient future (Via Verde Annual Report, 2024).

2.1 EV Charging

2.1.1 Electric Vehicles Market in Portugal

The EV market has seen significant growth in both Portugal and Europe over the last few years, driven by government incentives, environmental concerns, and technological developments, however, it has faced challenges. The EV market in Europe is facing a period of mixed outcomes - while battery electric vehicles (BEVs) are showing steady growth, plug-in hybrid

electric vehicles (PHEVs) are having difficulties maintaining them. Nonetheless, the trend toward electrification is evident (Observatory, 2024), with an expected compound annual growth rate (CAGR) of 11.15% over the next five years (Statista, 2024). Furthermore, Europe's Green Deal – part of the NextGenerationEU Recovery Plan – has imposed a set of proposals to encourage consumers and suppliers to transition to electric mobility, alongside financial incentives and new regulations (European Commission, 2023).

Portugal has shown a consistent upward trend regarding EV sales throughout the years, showing a 10% growth in the first half of 2024 compared to the previous year (Platini, 2024), and an expected compound annual growth rate of 16.5% over the next five years (Statista, 2024). Moreover, from January to September 2024, partially or fully EV accounted for almost half of the car purchases of the year (ACAP, 2024).

This evolution and continuous progress can not only be explained by the general growing awareness of climate change in the country but also the several policies aligned with the EU's goal of carbon neutrality, such as the "*Roteiro para a Neutralidade Carbónica 2050*", which includes subsidies for EV purchases and reduced taxes, among other benefits for those who choose to transition into electric mobility (RNC2050, 2018).

2.1.2 Infrastructure Development

Infrastructure is crucial for the EV market's growth, supporting the use of electric alternatives. In Portugal, efforts to expand charging infrastructure have been significant. MOBI.E, the public company overseeing electric mobility, has installed over 5,000 public EV stations by 2024, with 1,900 being fast or ultra-fast stations, making up 37% of the national network. Additionally, energy consumption has risen by 80%, reflecting increased usage of the new charging terminals (Platini, 2024).

Although the network has increased, challenges remain, specifically regarding the location of these recharging points. The pace of installation will need to be higher in order to satisfy the

continuous growth of EV users. In this sense, there is a need for more available charging stations that connect the country from one point to another. To address this issue, MOBI.E has launched an international competition to spread installation to 62 different municipalities. Along with this initiative, the government has also introduced financial support - up to 80% of the purchase price - for condominiums and organizations that invest in charging stations, as well as electrical installation assistance for each parking space (Kadiri, 2024), hoping to encourage residential spaces to incorporate charge points across the country.

In addition, private EV charging stations are also present in some urban areas, as the increasing number of EV owners drives the number of private stations to increase as a solution for some.

As the market for EVs continues to grow, there's a clear opportunity to widen Via Verde services to capture this segment of the market. Via Verde is already inserted in this market, offering a simplified payment service for EV users to charge their cars in public charging stations across Portugal. However, a P2P experience, where clients would rent out their private charging stations and home charge cables aligned with Via Verde's payment system, could be an innovative way of growing stronger in the market (Via Verde Electric, 2024).

2.1.3 Key Players – Companies and Platforms

The EV market in Portugal has experienced significant growth in recent years, with continued expansion expected as EV adoption rises, and infrastructure improves. Key players in this ecosystem include energy suppliers, operators, and integrated platforms. Energy suppliers play a vital role by providing electricity to EV users. Notable examples include EDP, which offers public and private charging points and home charging stations; GALP, focusing on an extensive network across highways and urban areas; and PRIO, which prioritizes affordable EV chargers at fuel stations nationwide. Furthermore, operators manage the installation and maintenance of charging stations, ensuring their functionality and reliability. In Portugal, several operators

work in collaboration with MOBI.E, including CEPSA, EDP, GALP, and MEO Energia, among others (MobiE, 2024).

Integrated platforms like Via Verde and Miio Electric simplify EV station payments, typically requiring a CEME (Comercializadores de Electricidade para a Mobilidade Elétrica) card linked to an energy supplier contract. While convenient for residents, this system is less accessible to non-residents, like tourists (PRIO, 2024). These platforms allow EV users to access charging terminals via their CEME details. However, there is a gap for those without supplier contracts, and a universal access method is needed. Miio Electric and Via Verde are the main platforms attempting to bypass the CEME card system (Miio, 2024).

Regarding private charging stations, PlugShare is working to encourage private charger owners to list their chargers for public use (PlugShare, 2024). However, the platform faces challenges, as there are no "residential" charging points available, likely due to a lack of trust in the brand and insufficient support for owners to facilitate the process.

In this sense, Via Verde's brand recognition, aligned with the already developed payment system (Via Verde Electric, 2024), could connect the gap between privately owned charging points and the public EV users who are in need, making it a leader in this market segment.

2.1.4 Accessibility

In Portugal, the majority of EV stations used by the population on a daily basis are public charging points, installed by operators and supplied by energy distributors. These are available once the EV user presents their CEME card or proceeds with the authorized payment via one of the virtual platforms mentioned previously.

Moreover, the growth of the electric mobility market has also created a need for more infrastructure. As the installation of public EV charging stations is increasing, the purchase of private options is also a growing trend , either owned by an individual EV user or by a company, for the use of its employees. It is becoming more and more common for corporations to install

EV chargers into their private car parking, for customers and employees. It is expected that most private charging stations are located in major urban centers or coastal areas, following the same patterns as the public ones; Lisbon, Porto, and Algarve are the regions with the most stations, while at the same time, rural and interior areas are the least equipped (MobiE, 2024).

As it was stated, the biggest challenge regarding charging points is the availability of public stations, due to the lack of connecting charging points and the vast number of EV circulating. For this reason, the rental of private stations for members of the public, in a P2P platform, presents an opportunity to bridge the gap between regions with high EV adoption and areas where infrastructure is needed.

2.1.5 Regulations and Policies

Portugal's robust growth in the EV market and its infrastructure demonstrates a proactive approach to adopting sustainable transportation. In order to maintain this trend, the Portuguese government has launched several incentives and regulatory frameworks through the "*Incentivo à Mobilidade Elétrica*" program. The incentives involve a full exemption from vehicle tax in the purchase of a 100% EV, as well as a €4,000 EUR incentive if the car's value doesn't exceed €62,500 EUR, among other encouragements. In the case of hybrids and plug-in hybrids, a 40% or 75% tax reduction applies, respectively, provided that some conditions are met.

For company cars, the same conditional incentives apply, with an additional exemption from stand-alone corporation tax, and 100% VAT deduction for zero-emissions vehicles and a reduction for plug-in hybrids.

Moreover, to maintain and grow the rate of adoption of electric mobility, as well as stability in charging prices, there is financial support in the cost of each charge in the value of €0.19 EUR (MobiE, 2024).

Regarding infrastructure, as mentioned previously, the Portuguese government has launched an initiative to support the costs of installing public charging stations – up to 80% of the sum, to a maximum of €800 EUR per station in condominiums and organizations (Kadiri, 2024).

2.1.6 Stakeholders

In the context of the EV market, several stakeholders are involved, each participating and playing a different but crucial role in the ecosystem. These include EV users, who are the primary users of both private and public charging stations and are ultimately the target audience for the proposed service, their needs drive the demand for charging solutions. Energy providers and station operators, such as E-REDES, REN, EDP, and PRIO, among others, also constitute the stakeholders, as they provide electricity and maintenance services for the charging infrastructure. Correspondingly, charging platforms like MOBI.E, Miio, and Via Verde, along with others, are stakeholders in this matter. These companies provide ways of accessing public chargers through their payment system. Furthermore, the Portuguese government and regulatory agencies, such as DGEG (*Direção Geral de Energia e Geologia*), are also considered stakeholders, as they hold the power to create further policies or incentives, to expand or limit the use of EV and to affect the infrastructure around charging.

For Via Verde, engaging stakeholders and building strong partnerships is essential to ensuring the success of a P2P charging station platform, creating a seamless, trusted service that meets users' needs and drives the adoption of electric mobility.

2.1.7 Opportunities for Via Verde

The rapid growth of EV in Portugal creates a valuable opportunity for Via Verde to expand their services even further in the EV charging market. As the adoption of EVs increases year by year, the number of EV charging stations should also increase, however, the infrastructure growth is not keeping pace with the purchase of vehicles, meaning there will be a lack of accessible public charging terminals.

In this sense, the use of privately owned charging spots for the members of the public could be a solution to this challenge. By creating a P2P service in Via Verde's app, the company could increase its number of clients, as well as grow the use of its payment system, already integrated in the access of public EV charging stations. In addition, by leveraging its established and trusted brand, Via Verde can guarantee a secure service for both the renter and the occupant, while supporting the decentralization of charging stations and enhancing its customer loyalty with sustainable mobility trends.

2.2 Private Parking in Portugal

2.2.1 The Need for Private Parking Solutions

The shortage of parking spaces in urban areas of Portugal, particularly in cities like Lisbon and Porto, has become a pressing issue. With 7.2M registered vehicles in 2022 (Pordata, 2023) and 79.5B vehicle-kilometers (vkm) covered in 2023 (STATSlab, 2024), urban congestion and environmental degradation have intensified. In Lisbon, in 2018 approximately 370,000 vehicles entered the city daily, adding to the 200,000 vehicles owned by residents, which underscores the high demand for parking spaces (Raposo, 2023). Surveys indicate that 46% of journeys in Lisbon are completed using private vehicles, highlighting the reliance on cars and the consequent pressure on parking infrastructure (Upper Project EU, n.d.).

Via Verde has identified significant user stress associated with parking challenges, with 62% of drivers expressing consistent anxiety about finding parking spaces. Furthermore, 68% report particular difficulty during rush hours, emphasizing the urgency for improved parking solutions in urban areas like Lisbon and Porto (Via Verde Marketing Plan, 2024).

The limitations of public parking infrastructure further exacerbate these challenges, making the search for more efficient, sustainable parking solutions a priority for both city planners and policymakers (European Commission, n.a.). Renting underutilized parking spaces in both residential and commercial areas has emerged as a practical and environmentally friendly

solution. This approach optimizes existing infrastructure, reduces the need for new construction, and mitigates urban congestion (Fava, Bouzguenda, & Alalouch, 2019). By aligning with these trends, businesses and homeowners can contribute to sustainable urban growth while also benefiting financially from shared parking models.

2.2.2 Private Company Parking

The market for offering private business parking spaces to the wider public is growing as companies with large real estate holdings recognize the potential to monetize underused spaces. Office buildings, hotels, and retail centers can rent their parking spaces during off-peak hours, generating additional revenue while alleviating congestion in city centers (Shoup, 2021). Studies suggest shared parking models are emerging as a key solution in urban mobility, particularly in commercial districts with high parking demand (EPA, 2022).

Insights from the Via Verde marketing report suggest that leveraging technology to enhance convenience, such as real-time parking availability and payment options, significantly reduces user anxiety and idling emissions. Via Verde's expertise in integrating digital systems with parking services provides a strategic advantage over less digitalized competitors, especially in off-peak hours when parking spaces in office buildings and retail centers are underutilized (Via Verde Marketing Plan, 2024).

Technological platforms such as Parkimeter and Parclick enable private companies to manage and rent out parking spaces efficiently, offering businesses a way to optimize their underutilized assets (Parkimeter, n.a.). These platforms allow users to pre-book parking, reducing the time spent searching for available spaces, which also contributes to lowering emissions from vehicles idling in traffic. Furthermore, as businesses increasingly prioritize sustainability, shared parking models not only provide financial benefits but also contribute to environmental goals by reducing traffic and optimizing resource use (Fangyuan, et al., 2020).

For a company like Via Verde, the entry into this sector could leverage its existing infrastructure and technological expertise. Offering a seamless parking management system to businesses would position Via Verde as a key player in reducing congestion and emissions in urban areas while creating new revenue streams (EPA, 2022).

2.2.3 P2P Parking Rental

The concept of P2P parking or private residential parking being rented out to the public mirrors the approach used in company parking but applies to underutilized spaces in residential buildings or private homes. Residential areas in cities like Lisbon and Porto face similar challenges, where parking is scarce, and residents struggle to find secure and convenient parking solutions (Samaranayak & Gunawardana, 2022). As urban populations continue to grow, particularly with the influx of foreign nationals into cities (Statista, 2024) the pressure on residential parking has intensified.

A critical insight is that homeowners in residential areas often hesitate to adopt parking rental services due to limited awareness of their benefits. A user-friendly platform, highlighting income potential while addressing security concerns (e.g., access codes or surveillance systems) can drive adoption in this segment. Via Verde's platform could integrate features such as dynamic pricing and advanced booking systems to attract this demographic, addressing the 46% of users who currently plan their parking routes in advance (Via Verde Marketing Plan, 2024). While parking in residential areas may be limited, some properties have private spaces that are not fully utilized, particularly during specific hours or by residents who do not use their vehicles daily. Platforms like Parkopedia allow homeowners to rent out these unused spaces, providing flexibility for both owners and drivers in need of P2P parking (Parkopedia, n.d.).

Additionally, private residential parking models align with sustainability efforts by reducing the need for constructing new parking facilities, which limits the environmental impact of urban expansion (Institute for Transportation & Development Policy, 2022). Like in commercial

sectors, pre-booking of residential parking spaces through digital platforms streamlines parking, minimizing traffic caused by drivers searching for available spaces (Wang, Wang, Zhang, Hu, & Peng, 2024).

For Via Verde, entering the P2P parking market presents a potentially significant opportunity. With its established brand and extensive customer base, Via Verde could provide a platform that not only addresses urban mobility challenges but also allows residents to benefit from underused parking assets, aligning with broader sustainability goals.

2.2.4 Key Players

The private parking market in Portugal is rapidly evolving, with increasing competition fueled by the rise of digital platforms that offer businesses and individuals the ability to monetize underutilized parking spaces. International players like Parkimeter, Parclick, and Parkopedia have established a strong presence by providing users with the ability to find, book, and pay for parking spaces via mobile apps and websites. These platforms streamline the parking process through real-time data, booking capabilities, and integrated payment systems, which significantly reduce the time drivers spend searching for parking and help alleviate traffic congestion, ultimately lowering emissions (Wang, Wang, Zhang, Hu, & Peng, 2024).

Key insights indicate that competitors like Parkimeter and Parclick focus heavily on geographic coverage and pricing transparency to attract users. Via Verde's ability to integrate tolling and parking services uniquely positions it to capture a market currently underserved by standalone parking apps. By offering seamless digital integration between on-street and off-street parking, Via Verde can differentiate itself in this crowded market. (Via Verde Marketing Plan, 2024)

In addition to simplifying parking operations for providers, they meet the growing demand for convenience from businesses and individuals, leveraging data analytics and Internet of Things (IoT) technologies to optimize parking space utilization and improve urban mobility (Shuhua, Chuanwang, & Nian, 2024). The comparative evaluation of these platforms is summarized in *Figure 2: Competitive Profile Matrix of Key Players in the Private Parking Market* which highlights their strengths and weaknesses across key factors such as ease of use, geographic coverage, pricing, real-time data integration, and B2B customer focus. (*Appendix 3*)

Factors	Weight	Parkimeter	Parclick	Parkopedia	SpotHero
Ease of Use	0,2	4	4	3	5
Geographic Coverage	0,15	5	4	5	3
Pricing	0,15	3	4	4	4
Real-Time Data & IoT	0,25	4	3	5	4
B2B Customer Focus	0,25	4	5	4	3
Total Score		**4**	**4**	**4,2**	**3,8**

Figure 2: Competitive Profile Matrix of Key Players in the Private Parking Market

While international platforms like SpotHero, Parkopedia, and Parclick dominate the market, domestic players such as Parkimeter have also made significant inroads. Parkimeter, though originally from Spain, has expanded across Europe and focuses on integrating short- and long-term parking solutions, particularly in high-traffic urban areas and tourist-heavy locations (Parkimeter, n.a.). These platforms compete on key factors like ease of use, pricing, and geographic coverage, targeting both B2B and B2C customers. With the global digital parking market projected to reach $ 44.9B USD by 2032 (SNS INSIDER Strategy & Stats, 2024), this competitive landscape is expected to intensify.

To stand out in this highly competitive environment, Via Verde could leverage its strong brand recognition, existing customer base, and technological infrastructure to offer a differentiated service. Unlike its competitors, Via Verde is in a unique position to integrate parking services with its established tolling and mobility solutions, creating an all-encompassing platform that covers parking, mobility, and payment in one system. This would provide a significant competitive edge in the increasingly crowded private parking market.

2.2.5 Stakeholders

Several key stakeholders influence the success of private parking solutions in Portugal. These include private property owners, who can benefit from monetizing underutilized parking spaces; local governments, aiming to reduce urban congestion and emissions; and technology providers who offer platforms to facilitate booking and managing parking spaces. Other important stakeholders include drivers seeking convenient and secure parking options, or key commercial stakeholders (e.g. hospitality groups, retail centers and corporate entities) particularly those in high-demand areas, who can exploit parking solutions as an additional revenue stream, enhancing both customer convenience and business profitability (Shoup, 2021).

For Via Verde, building strong partnerships with these stakeholders will be crucial to the success of its possible private parking services. Engaging with local governments can help promote the benefits of reducing congestion and emissions while collaborating with technology providers can enhance the user experience for both property owners and drivers. Additionally, ensuring customer satisfaction through ease of use, security, and accessibility will be key to maintaining a competitive edge in this market.

Figure 3: Competitive Profile Matrix of Key Players in the Private Parking Market

2.2.6 Regulations and Policies

Via Verde's expansion into private parking must navigate several regulatory challenges, including tax implications, liability concerns, and government regulation. Renting out parking

spaces could subject property owners to income tax under Portuguese tax laws, as income from renting out property is considered taxable and must be declared in annual income tax returns (PWC, 2024). This tax requirement could deter participation due to the reduction in net income for property owners. To address this, Via Verde could consider providing resources or partnering with tax advisors to help property owners understand and navigate tax compliance or even lobby for tax incentives to make participation more attractive.

Concerns over liability, such as property damage or theft, may also discourage owners from renting their spaces. Via Verde could mitigate this by offering insurance or liability coverage as part of the service, reassuring both property owners and users. Furthermore, government regulations may limit the fees that property owners can charge for parking. For instance, some municipalities in Portugal regulate parking fees to prevent excessive pricing and ensure affordability, particularly in high-demand urban areas (EMEL, n.a.). Via Verde would need to ensure that its pricing models comply with these local regulations while remaining competitive.

2.2.7 Opportunities for Via Verde

The growing demand for efficient parking solutions in both commercial and residential sectors is driving the need for digital platforms that can streamline parking management, reduce congestion, and lower emissions. As cities focus on improving mobility and sustainability, these platforms are becoming key tools to optimize parking availability, enhance driver convenience, and support environmental goals.

In Via Verde marketing analysis, nearly half of non-users of parking services identified the "lack of geographic coverage" as a barrier. Expanding the service to additional municipalities and integrating predictive parking features can address this gap. The planned "*Parking Helper*" tool, launching in 2025, aims to provide pre-booking capabilities and parking predictions, which could significantly enhance user adoption and satisfaction (Via Verde Marketing Plan, 2024).

For Via Verde, this evolving market presents a significant opportunity. With its established brand recognition, large customer base, and expertise in digital payment systems and real-time data integration, Via Verde is uniquely positioned to capitalize on this shift. By developing an integrated platform that not only manages parking availability but also combines mobility services and payment systems, Via Verde can expand its offerings beyond tolling. This would allow the company to offer a seamless, all-in-one solution for parking, addressing user convenience, reducing traffic, and supporting sustainability initiatives. In doing so, Via Verde could create new revenue streams while cementing its role as a key player in shaping the future of urban mobility in Portugal.

2.3 P2P Car-Rental

2.3.1 Introduction to the P2P Economy

The emergence of the P2P economy represents a significant shift in traditional economic models. The previous need for established institutions to regulate and meditate transactions between sellers and buyers, controlling the entire transaction process, has now been replaced in some industries by digital platforms, that facilitate the sharing, buying, and selling of products and services directly between parties (Fors, Nuur, & Randia, 2023).

The also so-called sharing economy (SE) is used to open access to under-utilized resources, creating new opportunities for economic activity and resource efficiency (Ganapati & Reddick, 2018). The SE industry has shown continuous growth, with its valuation increasing from $14B USD in 2014 to a projected $335B USD by 2025 (Wadlow, 2020).

2.3.2 Different Car Rental Models Throughout Time

What is now referred to as the "*Traditional Car Rental*" model (Bieszczat & Schwieterman, 2012) emerged in the USA around the 1910s. The introduction of this business model transformed the tourism sector in the US by offering customers a greater degree of freedom

compared to the previously common practice of hiring unmarked cars with bilingual drivers, who also served as tour guides for city visits and excursions (Pinheiro & Santos, 2009).

The traditional car rental model functions through established entities situated in centralized locations like airports and city centers, that manage a fleet of vehicles for short-term rental purposes (up to 30 days under Portuguese law, after which agreements become long-term rentals or leases (Pinheiro & Santos, 2009)). These companies generate revenue primarily through rental fees and the sale of various add-on services, such as complementary devices or insurance coverage (Coelho, 2019).

The traditional model has been characterized by many challenges: high overhead costs associated with fleet maintenance, limited availability, and geographic constraints (Shaheen & Cohen, 2012), while also having the additional need to involve a contractual agreement each time a vehicle is rented, adding to the complexity of operations (Oliveira, 2018).

In the late 20th century, carsharing emerged as an alternative to traditional car rentals, offering temporary vehicle access without ownership. By allowing consumers to rent vehicles for a shorter period and with fewer location restraints, it addressed two of the main limitations of the conventional rental model (Shaheen & Cohen, 2012). Access to said vehicles is done through a mobile app or website, utilizing a keyless approach that enhances convenience, efficiency, and security by eliminating the need for physical keys (Heineke, Kloss, Möller, & Wiemuth, 2021). The carsharing model has undergone several innovation cycles, with "*one of the more prominent innovations*" being the P2P car sharing/car rental (Shaheen, Martin, & Bansal, 2018) which extends beyond the traditional car sharing model.

The P2P model allows individuals to leverage information technology to share their vehicles with others in their area through a marketplace, enabling them to list their cars for rent and handle the bookings directly (Shaheen, Martin, & Bansal, 2018). This business model redesign

impacts the market by offering consumers alternatives that move away from the highly rigid and controlled traditional B2C model (Nansubuga & Kowalkowski, 2021).

The table below provides a comparison of the three models across various categories:

Category	Traditional Car Rental	Carsharing	P2P Car Rental
Ownership of the Vehicle	Vehicles are owned and managed by the rental company.	Vehicles are owned by a centralized service provider or cooperative.	Vehicles are owned by individual car owners.
Location	Centralized locations such as airports, city centers, or rental offices.	No specific locations, generally accessible spots within urban areas.	Spread out locations based on individual owner availability.
Flexibility	Limited flexibility, often requiring a return of the vehicle to the pick-up location.	Highly flexible with some services offering one-way rentals (i.e. leave the car at the user's destination).	Moderately flexible, but dependent on owner's requirements for return locations.
Vehicle Access	Pick up from a fixed rental office, with the paperwork required for processing.	Instant access via an app or website (keyless).	Access is coordinated with the owner (it can require an in-person meeting).
Cost Structure	Charged on a daily or weekly basis, with extra costs for mileage or insurance.	Charged by the minute or hour, with a usage-based pricing	Charged per day or for longer durations.
Booking Process	Booked via website, app, or in-person at the rental office.	Booked through an app or website, with automated access guaranteed.	Booked through an app or website, with coordination between owner and renter.

Figure 4: Rental cars model comparative table

2.3.3 P2P Car Rental Market

As previously mentioned, the P2P car rental market is highly profitable and competitive, with strong projected growth and long-term sustainability.

In 2023, P&S Intelligence measured the market revenue generated to be around $2.5B USD, while predicting it to reach over $7.2B USD in 2030, with an average annual growth rate of 15.8% from 2024 to 2030 (P&S Intelligence, 2023).

The market is growing steadily, driven by low costs, convenience, and increased supply as more individuals list cars for rent. Orion Market Research (2024), reports growth from 2.3M users and 350K vehicles in 2013 to 12M users and 7M vehicles by 2020, with projections of both figures reaching 36M by 2025.

2.3.4 Key Players in the P2P Carsharing Market

The global market features numerous competitors; however, certain players distinguish themselves through their significant market presence and extensive reach.

Turo, regarded as the market leader (P&S Intelligence, 2023), was one of the first players in the market. Founded in 2009, it revolutionized the car rental industry by allowing the service of car owners to rent out their vehicles to others. Operating in several countries, including the US, Canada, the UK, and France, Turo capitalizes on its pioneering status by leveraging its extensive experience and a continually growing base of consumers and vehicles. Additionally, Turo presents itself as the most practical and enjoyable option in the market, prioritizing a highly user-friendly app and a seamless booking process, significantly enhancing the overall user experience (Edwards, 2023). Getaround is another prominent player in the P2P carsharing market, operating in major US cities and across Europe, including France, Germany, Spain, Austria, Belgium, and Norway. Its model emphasizes convenience through a keyless entry system, enabling renters to unlock cars via smartphone. This technology is achieved through the installation of the device *Getaround Connect*, which integrates with the car's locking and ignition systems and is equipped with GPS, cellular connectivity, and keyless entry technology, allowing the car to communicate with Getaround's app (Nansubuga & Kowalkowski, 2021).

A third major competitor in the market is the Dutch company SnappCar, which operates a car-sharing model similar to Getaround, allowing users to rent vehicles via an app with keyless access. However, SnappCar sets itself apart by focusing on community building and promoting sustainable practices, positioning itself as part of a movement to reduce the number of cars on the road. The company claimed that from its creation in 2011 until April 2024, its services had contributed to saving around 1,73B tons of CO2 (Lykiardopoulou, 2024).

2.3.5 The P2P Carsharing Market in Portugal

The P2P car rental Portuguese market, in comparison to the overall European and North American market, is highly undeveloped.

The traditional car rental industry in Portugal is highly successful, generating approximately €254.5M EUR in 2023, with an expected annual growth rate of 2.9% in the coming years. The market structure is also highly concentrated, with Hertz and Europcar holding around 54% of the market as of 2024, while several smaller firms share the remainder (Statista, 2024). This concentration of dominant players highlights the challenges of entering such a market with high barriers to entry. On the other hand, the P2P car rental Portuguese market, in comparison to the overall European and North American market is highly undeveloped, with Bookycar being the only noticeable player. Through Bookycar's marketplace, users can either share their cars as hosts or rent vehicles. While the current total vehicle availability is limited in the major cities on the mainland, there is a noticeably substantial presence on Madeira Island (Bookycar, 2024).

2.3.6 Stakeholders

The P2P Car Rental Market comprises three main stakeholders: the marketplace provider (i.e. the service provider), the car host (i.e. the seller), and the one who rents and uses the vehicle (i.e. the end customer) (Fraiberger & Sundararajan, 2017).

The marketplace provider oversees platform development and maintenance, customer support, listing management, transaction processing, insurance, risk management, compliance, and legal tasks. Revenue is typically generated through a commission model, taking a percentage of each rental fee from the car host (Shaheen & Cohen, 2012).

The vehicle owner is responsible for providing the vehicle, with all the correct information attached to it, maintaining it in the correct conditions, ensuring the following of legal procedures, and having direct contact with the renters. Car hosts earn money by charging renters

a rental fee for the use of their vehicle, from which the marketplace provider deducts their commission before the host receives the remainder (Bardhi & Eckhardt, 2012).

The renters are the final client of the process. Responsible for communicating with the vehicle owners regarding the rental of the vehicle, providing all the necessary information, and complying with the platform's rules and local traffic laws (Hamari, Sjöklint, & Ukkonen, 2016). Renters pay the agreed rental fee directly to the car host via the marketplace platform.

Besides the aforementioned players, insurance providers play a key role in this market by partnering with marketplace providers to offer comprehensive coverage for vehicle owners and renters during rentals. They handle claims, support in cases of accidents, damages, or theft, and ensure compliance with local insurance regulations for car rentals (Shaheen & Cohen, 2012; Bardhi & Eckhardt, 2012). The costs for these services are often incorporated into the rental fee, though renters may also have the option to purchase additional coverage directly through the platform. This setup helps mitigate risks for all parties, providing financial protection to both car hosts and renters in the event of accidents or damages (Bardhi & Eckhardt, 2012).

An additional stakeholder group comprises the regulatory authorities, whose responsibility is to enforce laws and regulations applicable to the car rental industry.

2.3.7 Regulations and Policies

Entering the P2P car necessitates compliance with specific laws and regulations that impose restrictions on various participants in the process.

In Portugal, the P2P car rental market remains relatively untapped, meaning that much of the applicable legislation, bar some particularities, is derived from the regulations governing traditional car rental companies.

The vehicles used have to adhere to standards of quality and safety similar to a traditional rent-a-car service, where there's the need to understand insurance coverage needs and if the vehicle in question complies with local and national transportation laws, as per Decreto-Lei, n. º

47/2018, of 20th of June. Considering the P2P Marketplace can't impose regular security checks on the vehicles it doesn't own, in contrast to regular car rentals, which own the car fleets, it relies on individual owners to maintain their vehicles, which can lead to variability in vehicle conditions (PYMNTS, 2019).

Adding to this, due to the use of an online marketplace to trade services, the data protection of every individual involved in the transaction is also highly enforced. Under Lei n. º 58/2019, de 8 de Agosto, it is necessary to implement robust data protection measures and conduct systematic processes to identify and minimize the data protection risks of a project for activities that pose high risks to individuals' privacy.

2.4 Conclusion: Via Verde's Path to Becoming a Holistic Mobility Provider

Via Verde's transformation from a tolling company to a comprehensive mobility service provider is well underway. By expanding into private EV charging, parking solutions, and P2P car rentals, Via Verde can address critical gaps in Portugal's mobility infrastructure while promoting sustainability. Leveraging its strong brand, established customer base, and technological expertise, Via Verde is poised to become a leader in the mobility market, offering integrated services that support the transition to a more sustainable and connected future.

3. Methodology

This section outlines the research design, data collection methods, and analysis techniques used to investigate Via Verde's expansion into a digital mobility marketplace. The mixed-methods approach combines quantitative and qualitative data collection to provide a holistic view of the mobility needs in urban settings.

3.1 Research Method and Data Collection

Via Verde's expansion involves complex considerations around urban mobility, stakeholder collaboration, and user needs. Given the multifaceted nature of these objectives, this study employs a mixed-methods approach, which combines quantitative and qualitative data to capture both broad trends and in-depth stakeholder insights (Creswell, 2014). This practical, real-world approach is ideal for a Problem-Based Learning (PBL) framework, as it reflects the real needs of a real company, ensuring the research is both actionable and relevant. Additionally, this approach is fully supported by Via Verde, which is critical to ensure that the research findings can be effectively implemented to meet the firm's objectives in urban mobility and infrastructure. The pragmatic paradigm sustains this research, allowing for flexibility in methods and emphasizing practical solutions to real-world problems (Burke Johnson & J. Onwuegbuzie, 2004).

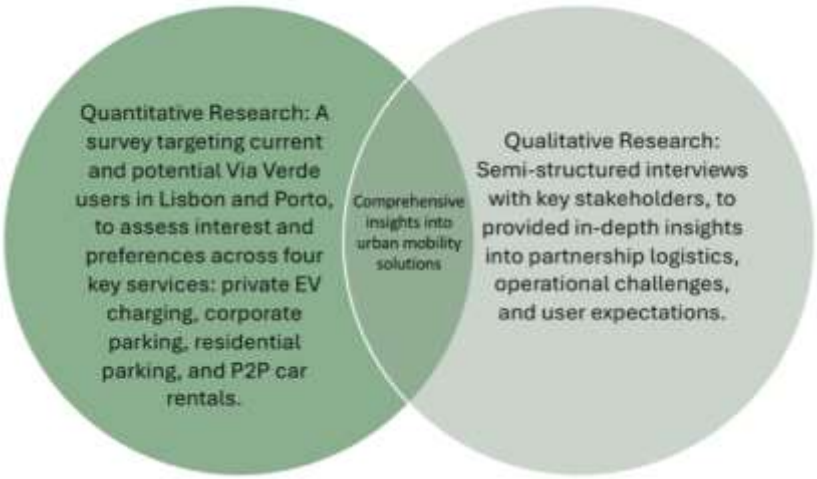


Figure 5: Overview of Mixed Methods Approach in Research Design

3.1.1 Research Method: Survey

To gather quantitative insights, a survey was conducted to assess user interest and preferences across Via Verde's services, including private EV charging, corporate parking, residential parking, and P2P car rentals. The survey targeted both current and potential Via Verde users in Lisbon and Porto who own cars, aiming to quantify demand for these services and capture

broader trends in urban mobility needs. Additionally, the survey evaluated user trust in Via Verde as a provider, exploring whether its existing reputation aligns with user expectations for these new offerings. (*Appendix 4 & 5*)

Using Google Forms, the survey combined closed-ended questions for quantitative analysis with open-ended questions to collect qualitative insights. Closed-ended questions identified clear trends in user preferences, while open-ended questions provided a deeper understanding of user concerns, expectations, and trust in Via Verde's brand. The survey was distributed in both Portuguese and English to ensure accessibility across diverse user segments. To ensure the survey's relevance and reliability, a pre-test was conducted with a small sample of users, which helped refine question clarity and ensure alignment with the study's objectives.

The survey was sent to approximately 550 participants, achieving a response rate of around 55%, with 305 usable responses. This robust dataset offers valuable insights into user needs and preferences, guiding actionable recommendations for Via Verde's new services.

Figure 6: Steps of Survey Design and Distribution

3.1.2 Research Method: Interviews

Alongside the successful survey, semi-structured interviews were conducted to gain in-depth insights into the challenges and opportunities related to Via Verde's expansion into new mobility services. These interviews targeted key stakeholders, including potential partner companies, competitors, corporate and municipal stakeholders, and customers. A total of 12 interviews were conducted, ensuring diverse perspectives were captured. Semi-structured interviews were chosen for their flexibility, allowing respondents to share unique perspectives while maintaining a consistent framework. This approach enabled the collection of nuanced insights

that complement the survey findings, providing a well-rounded basis for actionable recommendations. (*Appendix 6*)

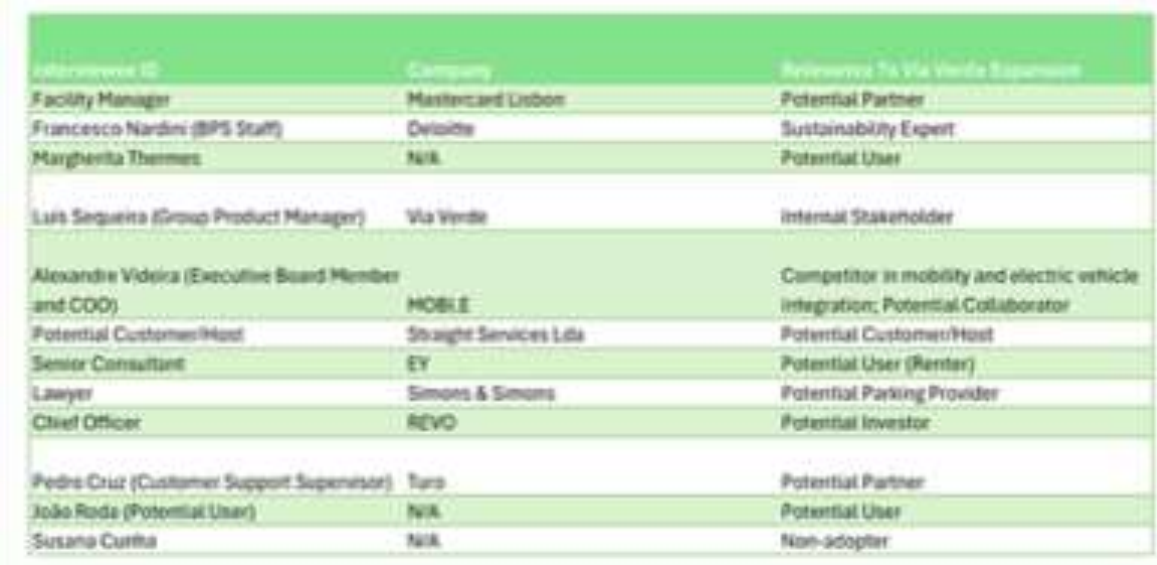
3.2 Sampling Criteria and Selection

Survey Sampling: The survey employed purposive sampling to target current and potential Via Verde users in Lisbon and Porto who own cars, as they represent the primary market for the new services. Unlike random sampling, which would include a broader range of users, purposive sampling allows for a more focused analysis of the intended user base, enhancing the relevance of findings for this project's objectives.

Interview Sampling: For interviews, purposive sampling was again used to select participants based on their expertise and relevance to Via Verde's services, it focuses on stakeholders most likely to use or be impacted by the services. Interviewees were selected from:

- **Potential Partner Companies** with underutilized parking spaces, to discuss collaborative models and incentives.
- **Competitors** in digital mobility and P2P rental spaces, to understand industry challenges and evolving best practices.
- **Corporate and Municipal Stakeholders** involved in urban mobility planning, aligning with Via Verde's sustainability goals.
- **Customers**, including current and potential Via Verde users, to gain insights into their mobility needs, preferences, and willingness to adopt new services.

This structured sampling approach ensured each interview provided actionable insights, directly contributing to the development of Via Verde's strategic expansion framework.



Facility Manager	Mastercard Lisbon	Potential Partner
Francesco Nardini (BPS Staff)	Deloitte	Sustainability Expert
Margherita Themmen	N/A	Potential User
Luís Sequeira (Group Product Manager)	Via Verde	Internal Stakeholder
Alexandre Videira (Executive Board Member and COO)	MOBI.E	Competitor in mobility and electric vehicle integration; Potential Collaborator
Potential Customer/Host	Straight Services Lda	Potential Customer/Host
Senior Consultant	EY	Potential User (Renter)
Lawyer	Simons & Simons	Potential Parking Provider
Chief Officer	REVO	Potential Investor
Pedro Cruz (Customer Support Supervisor)	Turo	Potential Partner
João Roda (Potential User)	N/A	Potential User
Susana Cunha	N/A	Non-adopter

Figure 7: Overview of Stakeholder Profiles

3.3 Validity and Reliability of Data Collection Tools

Validity was ensured by drawing survey and interview questions from established frameworks in mobility research and adapting them to reflect Via Verde's specific service offerings. A pre-test of the survey and interview guides was conducted with a small sample of target users and stakeholders to confirm clarity, coherence, and alignment with the study's objectives.

Reliability was strengthened by:

- **Standardizing interview questions** across participants to maintain consistency while allowing for adaptive follow-ups.
- **Triangulating** survey results with interview findings to corroborate insights and mitigate potential biases, providing a multi-perspective view on the demand and feasibility of these services.

3.4 Data Analysis Techniques

Survey Analysis: The survey data, primarily categorical, was analyzed using Microsoft Excel and Python. Descriptive statistics, such as frequency distributions and percentages, were calculated in Excel to uncover key trends in user preferences and demand patterns across Via Verde's services. Python was used as a data visualization tool, generating bar plots, pie charts,

and stacked bar graphs to effectively present survey results. This combination of tools ensured a systematic and visually compelling presentation of the data, providing actionable insights into user adoption drivers and potential barriers.

Interview Analysis: Thematic analysis was conducted to explore key insights from the interview data. Responses were systematically coded and categorized into major themes, such as "user convenience," "collaborative challenges," and "sustainability alignment." Microsoft Excel was used to assist in organizing and quantifying themes, ensuring a systematic and structured approach to qualitative data analysis. This method enabled the identification of recurring patterns and actionable insights to align with the study's objectives.

3.5 Research Limitations

1. **Self-Reported Bias** in survey data: As survey responses rely on self-reported data, there may be a risk of overestimating interest in new services.
2. **Sampling Constraints**: Given the purposive sampling for interviews, the findings may reflect the perspectives of specific stakeholders, which may not be fully generalizable.
3. **Time Constraints**: Interview scheduling limitations might restrict the range of perspectives obtained from stakeholders.

These limitations will be acknowledged in the analysis and discussion sections, and steps to mitigate them, such as cross-verifying results through triangulation, will be implemented.

3.6 Survey Demographics and Initial Findings

The survey's initial section gathered demographic data, including residence, age, occupation, and car ownership. Most respondents were from urban areas like Lisbon and Porto, predominantly aged 18–35, and either full-time workers or students. A large portion owned car, signaling potential interest in parking and EV-related services. This demographic profile provides a solid foundation for analyzing demand and tailoring Via Verde's offerings to target users effectively.

4. P2P Car Rental – Gonçalo Marcelino

4.1 Overview and Objectives

4.1.1 Objective of Service Expansion

Per Shaheen et.al (2014), the P2P car rental business model is a carsharing service where "vehicle owners temporarily rent their personal automobiles to others in their surrounding area", acting as "an alternative to car ownership that enables individuals to enhance their mobility without the maintenance and storage costs associated with private vehicle ownership" (Shaheen, Ballús-Armet, Clonts, & Weinzimmer, 2014). In this context, Via Verde would act as the service provider, facilitating these rentals by offering a secure platform for transactions, insurance coverage, and customer support, ensuring a stress-free and convenient experience for both car owners and renters (Pereira, 2024) (*Appendix 7*).

Introducing a P2P car rental service would strengthen Via Verde's position in Portugal, aligning with the growing demand for flexible, sustainable transportation and providing an affordable, eco-friendly alternative to traditional rentals (Jelti, Allouhi, & Tabet Aoul, 2023). By tapping into a service model already successful in other European markets (P&S Intelligence, 2023), Via Verde could explore and become the permanent player a market in Portugal that remains largely untapped (Jelti, Allouhi, & Tabet Aoul, 2023).

The rationale for exploring this business model lies in the relatively low level of local competition, as existing players have minimal impact. While another P2P service, P2P ride-sharing, was considered, strong competitors such as BlaBlaCar made it less promising. In contrast, Via Verde has the potential to, as previously mentioned, dominate the P2P car rental market and position itself as an innovator, making this model a more viable option. This paper investigates the feasibility of establishing a successful service by leveraging the company's strengths and reputation.

4.1.2 Scope of Collaboration

In this service, Via Verde would serve as the connector and platform provider for the P2P Car Rental service, serving as the backbone that connects the car hosts and the renters.

A key element of this service is the integration of comprehensive insurance coverage to address rental-related issues. Via Verde could leverage its own insurance company, Via Verde Connected Cars (VVCC), created through a partnership with Fidelidade (Grupo Brisa, n.d). By keeping insurance services in-house, Via Verde allows for tailored policies covering accidents, theft, or damages while simplifying operations, lowering costs, and increasing flexibility.

4.1.3 Potential Benefits

The P2P business model offers benefits for both the company running the business but also for every client involved:

1. **Untapped-market entry:** The P2P car rental market in Portugal remains largely unexplored, offering Via Verde an opportunity to expand its role as a leader in mobility solutions. With its trusted brand, Via Verde can effectively introduce and build trust in P2P rentals, capturing early adopters and solidifying its presence in flexible and sustainable transportation in Portugal.

2. **Expanding Customer Reach:** Via Verde's current services focus on residents, overlooking tourists—a continuously growing segment with 26.5 million non-resident visitors in 2023 (INE, 2024). By launching a P2P platform, Via Verde can cater to cost-conscious tourists, expanding its reach and seizing opportunities in the tourism sector.

3. **Client-Centric Accessibility:** P2P car rental services address traditional rental challenges such as limited vehicle variety and inflexible pick-up locations, by offering broader options and greater convenience (Archana, 2024). They are also more cost-effective, due to incurring less overhead costs, enabling competitive pricing (Valor, 2020; Archana, 2024).

4.2 Market Research and Stakeholder Insights

4.2.1 Broad Survey Analysis

Research on the P2P Car Rental concept highlighted key preferences and behaviors:

- **Low Awareness of the Service**: Only 29.2% of respondents had heard of the P2P Car Rental service, and significantly fewer (2.95%) had used the service.

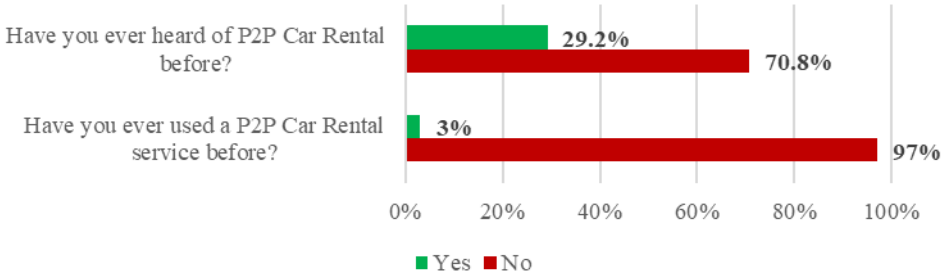


Figure 29– Awareness and Usage of the Service

- **Overall Opinions Regarding the Concept:** Customers showed significant reluctance to list their cars for rent on P2P platforms but were more open to renting vehicles from others. However, both values remain low overall (*Figure 30*).

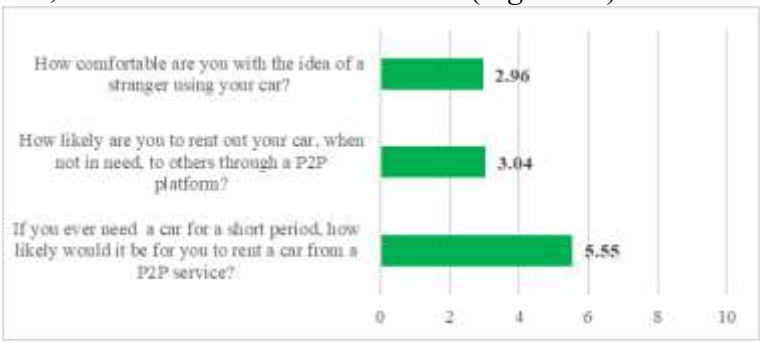


Figure 30– Overall P2P Car Rental Opinions

- **Demographics Insight Regarding Acceptance**: Individuals aged 18–45 are more receptive to both renting out their car and using the service.

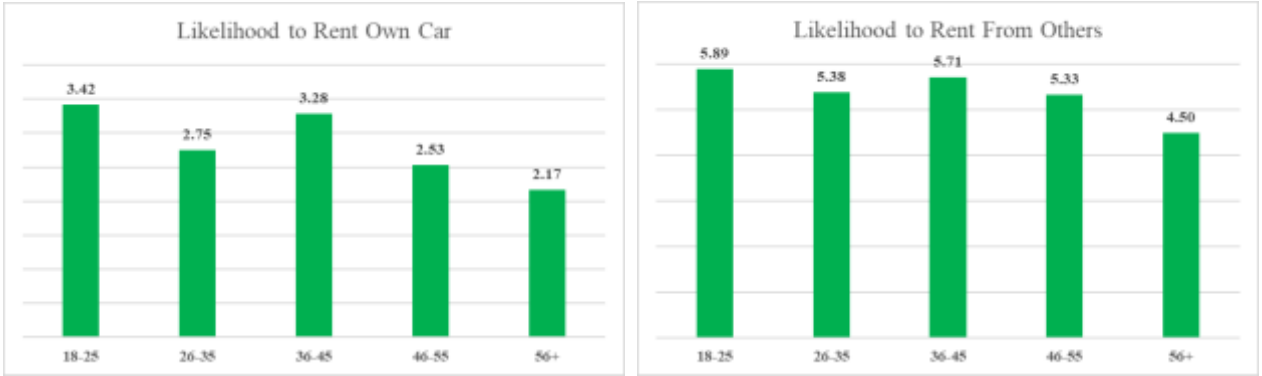


Figure 31 – Age as a Factor in Using the P2P Car Rental Service

- **Regional Paradoxes in P2P Car Rental Acceptance:** Medium-sized city and suburban residents are open to renting cars but less willing to rent out their own, while large city and rural residents show more consistent acceptance of both aspects.

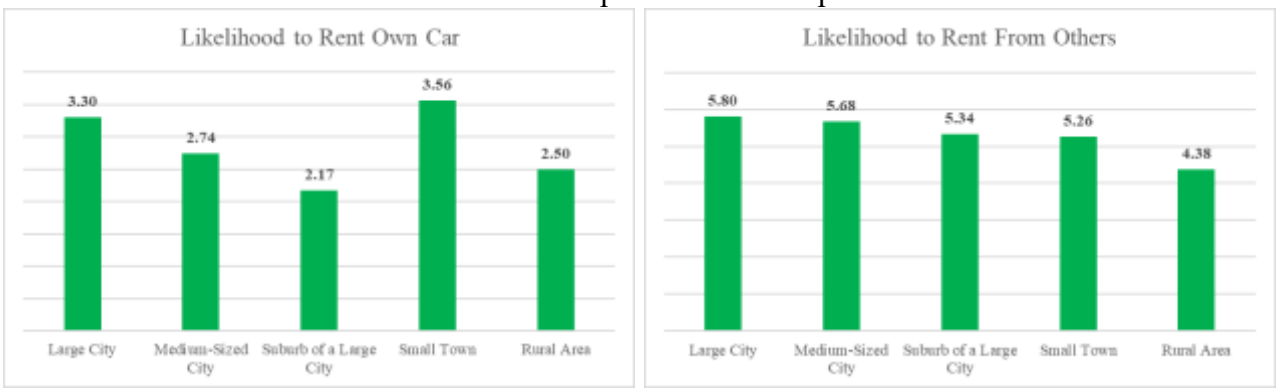


Figure 32 – Location of Residence as a Factor in Using the P2P Car Rental Service

- **Brand Trust**: 66.67% of respondents expressed a reasonable level of trust in Via Verde implementing the service, while only 5.98% reported an entirely lack of trust.

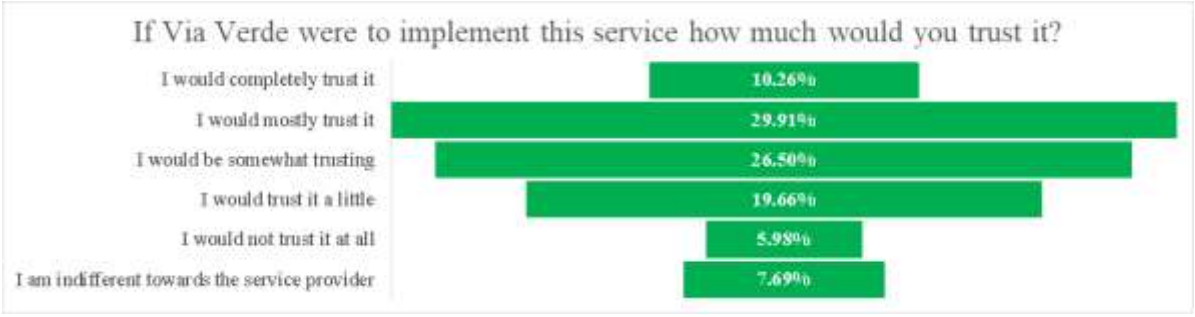


Figure 33 – Opinion Regarding Via Verde's Involvement in the Service

4.2.2 Key Survey Finds

- **Mixed Willingness to Adopt Service:** Only 13.1% of respondents are fully committed to adopting the service at launch, while 48.9% are open to, but skeptical. Meanwhile, 38% indicated they would not use the service based on the features presented in the survey (*Appendix 8*).
- **Motivations for Participation:** Respondents expressed interest in the P2P concept as a host primarily for the opportunity to earn extra income (67.3%) and maximize the use of idle vehicles (31.1%). As renters, the users understand that affordable pricing (79.7%) is the most important parameter when deciding whether to use the service or not (*Appendix 9)*

- **Usage Scenarios:** Respondents understood they would primarily consider using the service for longer periods, such as traveling for vacation (66.9%), visiting a new city or location (34.1%), or when their vehicle is unavailable and needs replacement (54.8%). They were less inclined to use the service for short-term, momentary needs such as when attending events (19.3%) or running errands (5.6%) (*Appendix 10*).
- **Trust Issues:** A significant trust gap was identified, with users expressing concerns about both car owners (68.7%) (*Appendix 11*) and renters (65.6%) (*Appendix 12*).
- **Concerns About Renting Out Personal Vehicles**: 92.5% of the answers pointed out damages to the vehicles as one of the causes of concern when renting out their vehicle, with other main causes of concern being theft or misuse of the car by the renter (64.3%) and the need for insurance coverage (59.2%) (*Appendix 11*).
- **Insurance Requirements:** Insurance coverage was deemed crucial for adopting the service. 77.8% of the users rated 8 or more when asked how important they consider the existence of comprehensive insurance when dealing with a P2P car rental service (*Appendix 13*). 92.5% of the respondents believe the insurance should cover full damage liabilities, 63.3% for theft and vandalism, and 46.2% for roadside assistance (*Appendix 14*).

4.2.3 Interview results

Interviews were conducted with an industry professional, a potential user, and a non-adopter to gain deeper insights into the topic and understand different perspectives. Key findings include:

- **Trust and Risk Management:** Customers place significant emphasis on security measures for both renters and the platform. This aligns with industry efforts to prioritize robust insurance and renter verification processes.
- **Tourism as a Key Market:** Tourists represent a significant customer base for P2P car rentals, with demand peaking during seasonal travel periods.

- **Cultural Considerations:** Industry experts highlight that Portuguese consumers tend to have a strong emotional attachment to their personal vehicles, which mirrors the hesitancy expressed by local customers about sharing their cars.
- **Preference for Traditional Platforms:** Traditional rental companies are still preferred for their reliability, often overlooking the benefits of the P2P platform.

4.2.4 Challenges Identified in Execution

Considering the data collected, Via Verde must address key challenges:

1. **Establishing a Transparent Trustworthy System**: to address the mutual trust concerns between hosts and renters, Via Verde should implement robust verification measures for vehicles listed on the platform, for prospective car hosts and renters.
2. **Insurance Structure:** Given concerns about vehicle safety and the low willingness to rent personal cars (2.96 out of 10) (*Appendix 12*), it's crucial to prioritize the protection of car hosts' property. Via Verde must implement comprehensive insurance coverage to protect against damages, theft, misuse, and other risks, ensuring hosts feel secure, all while ensuring compliance with local regulations.
3. **High National Car Ownership:** According to a Statista study on car ownership in Portugal (2024), around 90% of respondents reported driving a personal car or company vehicle, indicating a possible limited domestic market demand towards the service.

4.2.5 Fit with Via Verde's Capabilities

As Via Verde rolls out this service, its existing capabilities can provide several advantages:

- **Service Offering Compatibilization**: Through the interdimensional platform, users can leverage Via Verde services to pay for parking, EV charging, and tolls. This integration simplifies the process and helps avoid common payment problems often associated with traditional car rental services (Saprina, 2023).

- **Data Optimization:** Via Verde's travel data can assist car hosts in adjusting vehicle availability and pricing based on demand trends across regions and times in Portugal.
- **Registration Ease:** Via Verde's records can streamline the registration process by automatically linking car owners to their vehicles and verifying users efficiently.

4.3 Business Model, Value Proposition, and Marketing Strategy

4.3.1 Collaborative Value Creation

In an idealized P2P car rental service, the value chain consists of three key components: the car host, the service provider, and the car renter. Each participant produces and receives value in distinct ways:

1. **For Car Hosts**: car hosts can earn extra income by renting out their vehicles, which helps offset existing ownership costs and ensures that otherwise idle vehicles are utilized to their full potential (Edwards, 2023).

2. **For the Service Provider (Via Verde)**: the regular service provider in a P2P car rental service earns revenue through service fees from the renters and commissions on each rental transaction from the hosts (Edwards, 2023; Schmidt & Deryckere, 2020). Via Verde can use this opportunity to collect data on user preferences and habits, which can drive improvements in its existing services (Palanivel, 2023) and strengthen its position in the Portuguese mobility sector by expanding its offerings into untapped markets.

3. **For Car Renters:** The platform simplifies the renting process when compared with traditional car rental alternatives, allowing individuals to book vehicles easily through an app or website and pick them up at convenient locations, avoiding the hassle of fixed rental sites and its traditional bureaucratic procedures rentals (Nansubuga & Kowalkowski, 2021; Lagadic, Verloes, & Louvet, 2019). It also offers a wider variety of vehicle options provided by individual hosts, making it easier for renters to find a car that suits their specific needs and budget (Kosche, 2020). Furthermore, the absence of high overhead costs ensures more

competitive pricing, making this an affordable alternative to traditional rental services (Edwards, 2023; Fraiberger & Sundararajan, 2015).

4.3.2 Revenue Model

A marketplace can use various revenue models, but for P2P car rentals, a **commission-based model with optional subscription features** is most effective (Schlie, Rheinboldt, & Waesche, 2011; Taeuscher & Laudien, 2018).

The **commission model** earns revenue by taking a percentage of each transaction, as seen with Turo and Getaround, which charge fees ranging from 10% to 40% with fixed amounts for insurance coverage (Mormot, 2023; Sabatier, 2023; Turo, n.d.) (*Appendix 13).*

Subscription models, while less efficient alone, are used by companies like Getaround and Hiyacar to offer extra features, such as keyless entry systems, for a monthly fee feature (Getaround, 2024; Hiyacar, n.d.).

Via Verde should adopt a commission model to lower entry barriers and attract users, with optional subscription benefits like boosted visibility and keyless entry to enhance convenience, provided the implementation costs are justified.

4.3.3 Value Proposition

Via Verde's P2P Car Rentals value proposition can be identified on two fronts:

- **Economic Value**: Offers car owners the opportunity to monetize their idle or unused vehicles while offering customers a more affordable alternative to temporary car ownership.
- **Customer Value**: Delivers a convenient and flexible solution for those seeking short-term car access without ownership, offering a wide variety of vehicles in numerous locations.

4.3.4 Marketing Strategy

The P2P Car Rental service requires the engagement of both the car host and the renter. As such, marketing strategies should slightly differ for each audience, addressing their unique needs and priorities.

Objective of the Marketing Strategy

- Car Hosts: Via Verde must focus on increasing awareness of the service, as it shows low recognition from the broader public (Bertoli, Marcelino, Stefanelli, & Terêncio, 2024) and addressing low interest from potential car hosts by emphasizing economic benefits such as monetizing idle vehicles and reducing ownership costs. It must also highlight the robust security measures in place, including comprehensive insurance, to ease concerns about renting out vehicles.
- Car Renters: The strategy for car renters should focus on building awareness by highlighting the service's flexibility, convenience, and financial benefits. Above all, it's essential to highlight the benefits it has over traditional car rental and other mobility alternatives.

Target Audience

- Car Hosts: Considering the service's features and characteristics, the target audience personas to address in the car host marketing efforts can be divided into three segments:
  - **Infrequent Usage Individuals**: those who don't require the vehicle daily, using it only occasionally or on weekends, and can monetize their otherwise idle cars.
  - **Multiple Vehicle Owners**: individuals who own more than one vehicle and can rent out their cars occasionally when they're not in use.
  - **Seasonal Car Drivers**: individuals who own cars in Portugal but use them only seasonally, such as those living abroad, and can earn income during the off-season.
- Car Renters: Based on the service's features and the benefits it offers, the target audience for car renters can be divided into three segments (*Appendix 15*):
  - **Digital Nomad**: Remote workers, living in city centers and don't own a personal vehicle, that value flexibility and affordability, using car rentals to explore places beyond the reach of public transport.

- **Urban Professional**: City professionals who commute by public transport and occasionally need a car for trips and errands, without the commitment of ownership.
- **International Traveler**: Visitors who enjoy exploring beyond main tourist spots, seeking easy and accessible alternatives to help them discover a new country.

Promotional Tactics and Channels

- Car Hosts: Examples of essential promotional tactics and channels to optimize marketing efforts include **social media campaigns** on platforms like Facebook, Instagram, and LinkedIn to showcase car hosts' success stories and the benefits of joining the platform.

  Email marketing can directly reach Via Verde's client base, targeting potential car hosts, while **promotional offers**, such as fee discounts and loyalty rewards, can attract new hosts and encourage continued engagement.
- Car Renters: Promotional tactics to optimize the marketing efforts for this segment include using **social media** platforms like Facebook, Instagram, and LinkedIn to showcase the service's benefits, and leveraging **Search Engine Marketing (SEM)** with targeted keywords such as "car rentals" and "cheap trips" to attract active users.

  Physical advertisements in high-traffic locations like airports can boost visibility, while **referral programs** incentivize users to bring in new members by sharing unique links.

  Strategic partnerships with travel agencies can also help engage tourists and tap into a travel-focused audience.

Messaging Focus

- Car Hosts: Promotional efforts should deliver clear, consistent, and value-driven messages tailored to the audience. **Economic benefits** are a key motivator, with 67.3% of respondents citing extra income as their main driver and 48.3% rating income importance as highly significant (at least 8 out of 10) (*Appendix 16*). **Convenience** is another theme, with approximately 43% of respondents expressing interest in renting out idle cars during unused

periods (*Appendix 10*). **Insurance security** is critical, with 77,8% of users valuing comprehensive coverage with at least an 8 out of 10, emphasizing the need to highlight the safety measures and in-house insurance (*Appendix 14*) (Bertoli, Marcelino, Stefanelli, & Terêncio, 2024).

- Car Renters: Promotional efforts should focus on delivering clear, consistent, and value-driven messages. **Convenience, flexibility, and simplicity** are key, providing access to nearby vehicles for various needs, from short trips to extended travels, with an effortless, user-friendly booking experience that streamlines searches and payments on a single platform. **Cost savings** highlight competitive and transparent pricing with no hidden fees, making the service an affordable option. **Trust and security** are reinforced by comprehensive insurance and verified hosts, ensuring a safe and reliable rental experience.

Performance Tracking

- Car Hosts: The success of the car hosts' marketing strategy should be measured using these key metrics:
  - **New Host Sign-ups:** Directly measures the success of your strategy in converting potential car hosts into active users of the platform.
  - **Host Retention Rate:** Percentage of hosts who continue using the platform over time, reflecting satisfaction with the service and alignment of messaging with expectations.
  - **Message Resonance**: As a new service, it's important to use feedback surveys and polls to assess audience comprehension of the service's features and benefits.
- Car Renters: The success of the car renters' marketing strategy should be measured using these key metrics:
  - **New Renter Sign-ups**: Measures the number of individuals registering as renters, reflecting the overall effectiveness of awareness and engagement efforts.

- **Repeat Bookings**: Monitors the percentage of renters booking multiple times, signaling satisfaction with the service.
- **Renting Patterns**: Analyze periods and identify the primary reasons people rent vehicles through the service, to further adapt and improve the marketing efforts.
- **User Feedback and Satisfaction**: Gather insights from users to improve the service and it continues to align with their changing needs and expectations.

4.4 Research Proposition

4.4.1 Hypothesis/Research Questions

The question this research aims to answer is the following:

"Is the introduction of a P2P car rental service a strategically viable expansion for Via Verde within the Portuguese mobility market?"

This hypothesis addresses two main core objectives:

1. **Market Potential Evaluation**: Assess the risks and user demand involved in entering an untapped market in Portugal to determine the opportunity's viability.
2. **Company's Market Entry Capability**: Assess the company's resources and capabilities to determine its ability to successfully enter the market.

4.4.2 Key Metrics

To evaluate the success of the P2P car rental service, KPIs will be grouped into three categories: **user acquisition and retention**, **revenue and profitability**, and **operational metrics.**

User Acquisition and Retention

- **User Growth Rate**: Tracks user growth to evaluate the impact of offerings, marketing, and communication. While the global 20.2% CAGR (Grand View Research, 2022) suggests 4.7% quarterly growth for P2P services, a 7–10% increase in the first year is achievable through strong adoption and marketing, before stabilizing near the industry average.

- **Retention Rate**: Analyze the percentage of users returning to the platform. Given the industry average of 83% (Shopify, 2024), a target of 60%-70% would be reasonable due to it being a new service in a new market.
- **Rental Frequency**: Tracks how often users engage with the service, particularly whether new users make repeat bookings, indicating that the features and benefits are effectively meeting their needs.

Revenue and Profitability

- **ROI**.
- **BEP.**
- **NPV**: assesses if the P2P car rental service's future revenues exceed its upfront costs, accounting for time and risk. *(For detailed calculations and assumptions underlying these projections, refer to Appendix 17).*

Metric	Result
Average Time a Car is Rented per Month (Year 1)	17 days
Average Daily Rate	€55 EUR
Number of Cars in the Platform (Year 1)	60 cars
Projected Monthly Gross Revenue (Year 1)	€56,100 EUR (17 days × €55 EUR × 60 cars
Percentage of Revenue Taken	40%
Projected Monthly Net Revenue (Year 1)	€22,400 EUR (€56,100 EUR × 40%) per month
Projected Yearly Net Revenue (Year 1)	€269,280 EUR per year
Setup Costs	€260,000 EUR
Return on Investment (ROI)	3.57%
Break-Even Period	11.6 months = Approximately 12 months
Net Present Value (NPV)	€968,620.97 EUR (using a 15% discount rate and assuming a yearly growth of 35% in total number of vehicles in the platform and a constant increase in average monthly usage per vehicle)

Figure 34: Estimation of Financial Metrics

Operational Metrics

- **Fleet Utilization:** the percentage of vehicles rented out during a period shows the efficiency of matching supply (hosts) with demand (renters).
- **Average Rental Duration**: The average number of days a car is rented per transaction helps understand customer behavior and informs pricing and marketing strategies.

4.5 Executional Challenges and Practical Considerations

4.5.1 Operational Barriers

Implementing a P2P car rental service presents several operational challenges that must be addressed for success, such as ensuring **vehicles adhere to safety and operational standards**, accurately verifying renters, and complying with regulations regarding the commercial use of private vehicles, taxation, and licensing. Logistics also present a challenge, particularly in **coordinating pick-up and drop-off points for both the keys and vehicles**, which can potentially lead to disagreements between users.

4.5.2 Proposed Solutions

To successfully face these barriers and problems, Via Verde could cover these solutions:

- **Implementation of Digital Verification:** Implementing biometric and document verification systems ensures accurate user vetting and security. Services like Veriff and 365id widely used in global mobility services (Burt, 2024) can address trust issues effectively through reliable verification processes (Vadim, Firdaus, & Rhee, 2024).
- **Pickup Location Flexibility:** Allow hosts and renters to propose preferred locations, with incentives for hosts meeting renter needs to boost satisfaction.
- **Keyless System:** Introduce a system where renters can unlock cars without meeting the host, making the process simpler and more user-friendly.

4.6 Conclusions

The findings confirm that the P2P car rental service has the potential to diversify Via Verde's offerings and generate additional revenue streams. By leveraging its strong reputation and addressing the trust concerns of Portuguese car owners, the service could:

- Provide a convenient and affordable car rental option for users.
- Optimize the use of underutilized private vehicles.
- Enhance Via Verde's brand by expanding its presence in the Mobility-as-a-Service (MaaS) market.

However, cultural attachment to vehicles and limited awareness of the service remain significant barriers. Via Verde should first and foremost make efforts to create public awareness and build trust through strong and targeted marketing campaigns that emphasize security, insurance, and user verification, in an attempt to address these challenges effectively. In conclusion, while viable, the service should be considered for a later phase, following the successful deployment of other initiatives.

5. Final Recommendations

5.1 Analysis and Justification

This thesis systematically analyzed the potential of four distinct business models for Via Verde's strategic expansion. The evaluation draws on the growing trend of innovative platform-based solutions across industries and the increasing emphasis on sustainable mobility. To determine the most viable service, we utilized a structured evaluation on a scale of 1 to 5. The scale was selected to provide meaningful differentiation without introducing unnecessary complexity, ensuring actionable insights for decision-makers.

Parameter	Weight (%)
Market Size	30
ROI	25
Complexity of Implementation	15
Relation to Existing Services	10
Potential Profits	10
Regulatory Practices	5
Collaboration Needs	5

Figure 35: Parameters and Weights used to analyze the optimal service

Seven parameters were weighed to reflect their strategic importance. **Market size** and **ROI** were prioritized as the most critical factors due to their direct impact on financial sustainability and scalability, both of which are primary goals for this project. These were followed by **complexity of implementation** and **relation to existing services,** which capture the feasibility of integration with Via Verde's infrastructure and operations. While **profitability** is inherently linked to market size and ROI, it was considered independently to ensure a balanced evaluation. Finally, **regulatory practices** and **collaboration needs** were included to address practical challenges and requirements for implementation. (*Appendix 18*)

Service	Final Score
Private Company Parking	4.7
P2P EV Charging	3.9
P2P Parking Rental	3.7
P2P Car Rental	2.9

Figure 36: Services' Final Grading Scores

The scores demonstrate clear differentiation among the options. While the numerical differences may seem modest, a gap of 0.8 points between Private Company Parking and EV Charging represents a 16% higher viability, highlighting significant distinctions that are essential for investment prioritization.

The analysis highlights clear distinctions between the four services, based on their strategic alignment, market potential, and feasibility:

Private Company Parking: The most viable option, scoring 4.7, aligns with Via Verde's strengths, high demand, and profitability. Minimal regulatory barriers and easy integration make it the best choice for immediate implementation.

P2P EV Charging Rental: A strong secondary option, scoring 3.9, aligned with the growing EV market and sustainability goals. However, challenges like initial investment and slower adoption limit its scalability compared to Company Parking.

P2P Parking Rental: A long-term option, scoring 3.7. While it demonstrates significant market potential, reliance on individual property owners and fragmented demand introduces operational complexities. It's better suited for phased implementation after refining the model.

P2P Car Rental: The least viable option, scoring 2.9. Limited market size, cultural resistance, high complexity in trust-building and insurance management reduces its feasibility. It should only be considered for exploration in the distant future.

This scoring framework prioritizes services based on immediate impact, scalability, and alignment with Via Verde's strategic goals.

The systematic evaluation and weighting process highlight Private Company Parking as the optimal choice for Via Verde's strategic expansion. Its strong market demand, ease of integration, and profitability potential position it as the most viable service for immediate implementation. P2P EV Charging, while promising, is better suited for secondary expansion,

followed by P2P Parking in the long term. P2P Car Rental, with its significant challenges, remains the least viable and requires further exploration to address its limitations.

5.2 Financial Projections

This section provides a comprehensive financial analysis of the proposed Private Company Parking model, evaluating its feasibility through key financial metrics. It presents a total revenue of **€10.4M EUR** and a total profit before taxes of **€7.8M EUR** over the next five years. The analysis not only considers market trends and sustainability goals but also factors in Via Verde's financial structure, including its 2024 operating income of €393.2M, which predominantly stems from toll services (97.6%) (Via Verde Annual Report, 2024).

Expanding into Private Company Parking offers a substantial opportunity to diversify revenue streams and enhance long-term profitability. For a company that generates only €9.4M annually from non-toll services (2.4% of its income), this project represents a transformative opportunity to expand its footprint in the mobility market. It represents an increase in non-toll services revenue of **20%** a year for the next five years. This strategic shift will position Via Verde as a diversified mobility provider, less reliant on tolls and better aligned with consumer demand for urban solutions. (*Appendix 11*)

To achieve these transformative results, the Private Company Parking model leverages Via Verde's existing operational strengths and infrastructure. By securing partnerships with 15 buildings in the first year and scaling to 30, 45, 60, and 75 buildings over five years, the project ensures a robust inventory base necessary to drive demand and establish credibility. A smaller initial inventory would fail to generate sufficient usage or justify the platform's operational costs, while this structured growth strategy balances investment with scalability. This way, along with examples of similar platforms in Barcelona, rapid scalability can be justified and feasible through the support of Via Verde's infrastructure.

Assuming the corporate entities and Via Verde will agree on a revenue-sharing model, we conducted market research regarding industry fee rates. Similar platforms, such as those focused solely on P2P parking, typically charge fees around 30%. However, Via Verde's model targets corporate partners and offers greater value through a turnkey solution, including infrastructure setup, marketing, and operational support. This approach minimizes risks for partner companies and enables them to generate revenue from previously idle parking spaces (Gouais, 2022). Comparable commission models in sharing-economy platforms like Airbnb and Uber often range from 30-50%, depending on the service provided. A 50% revenue-sharing agreement is justified here due to Via Verde's significant investment in implementation and ongoing management, which ensures higher utilization rates and stable income for both parties. These elements combine to yield €10M in revenue, an ROI of 114.8%, and a BEP within 5 months and 18 days, showcasing the model's financial and strategic impact.

Additional Assumptions

Assumptions	Values
Via Verde's commission	50%
Underutilized Parking Spaces per facility	30
Projected Parking Spaces rented daily	21
Average daily price per parking spot	€12.5 EUR
Discount Rate	10%
Costs per parking facility	
IoT Sensors	€8,000 EUR
Installation	€3,000 EUR
Software Integration	€3,000 EUR
Networking and Cloud Storage	€2,000 EUR
Marketing	€1,000 EUR
Administrative and Operational Onboarding	€5,000 EUR
Total Setup Costs per parking facility	**€22,000 EUR**

Projected Parking Facilities
1st year - 15
2nd year - 30
3rd year - 45
4th year - 60
5th year - 75

Figure 37: Assumptions and Costs per Parking Facility

For this analysis, we assumed that each company's parking facility in Lisbon and Porto has on average 100 parking spaces, of which 30% are underutilized, based on existing data from corporate and hotel facilities in urban areas. This amounts to **30 idle parking spaces** per parking facility. Due to off-peak periods, we will assume a 70% occupancy rate, consisting of **21 spots consistently rented daily**.

Additionally, in urban areas, parking spaces typically rent from €10 EUR to €15 EUR per day, so an average price of **€12.5 EUR** was assumed.

As shown in *Figure 37,* the total setup costs per parking facility amount to **€22,000 EUR,** consisting of sensor installation, software, and cloud storage integration, onboarding costs, and marketing (*Appendix 11*).

Revenue

Revenue per parking facility	Values
Total Daily Revenue	€262.5 EUR (21 spaces x €12.5 average price)
Monthly Revenue	€7,875 EUR
Annual Revenue	€94,500 EUR
Via Verde's share	€47,250 EUR (94,500 x 50%)

Figure 38: Revenue per Parking Facility

Based on our research and assumptions, one parking facility could generate around €94,500EUR of total annual revenue. Taking the 50% Via Verde commission, the annual revenue generated from one specific parking facility will be **€47,250 EUR** (*Appendix 11*).

ROI

The ROI is calculated for the first year, based on fifteen companies joining the platform.

1. $ROI = (Annual\ Revenue - Setup\ Costs / Setup\ Costs) \times 100$

ROI = (47,250x 15 −22,000 x 15) / (22,000 x 15) ×100= **114.8%**

An ROI of 114.8% is an excellent result based on our initial assumptions, indicating that this project could generate more than double the initial investment in the first year (*Appendix 11*).

NPV

For the calculation of the NPV, we assumed a lifespan of 5 years and a fixed annual cost of €180,000 EUR, which includes expenses for marketing, system maintenance, and the employees required to manage the service. Contrary to the setup costs, these fixed costs are not incurred per building; rather, they support the overall service and ensure its scalability. This budget covers platform maintenance to guarantee smooth operation, targeted marketing campaigns to drive user adoption, and personnel dedicated to managing operations and

partnerships. These centralized costs enable efficient management and effective promotion of the service across all locations. The NPV will then be **€5.6M EUR**, representing a potentially strong financial return and clear financial viability for the project (*Appendix 11*).

Project Year	Cashflow
1st year	€198,750 EUR (47,250 x 15 - 22,000 x 15 - 180,000)
2nd year	€907,500 EUR (47,250 x 30 - 22,000 x 15 - 180,000)
3rd year	€1,616,250 EUR (47,250 x 45 - 22,000 x 15 - 180,000)
4th year	€2,325,000 EUR (47,250 x 60 - 22,000 x 15 - 180,000)
5th year	€3,033,750 EUR (47,250 x 75 - 22,000 x 15 - 180,000)
NPV	**€5,616,720.71 EUR**

Figure 39: 5-year Cash Flow Projections

BEP

2. *BEP (Months)=Setup Costs/Monthly Revenue*

BEP =22,000/(7,875 x 0.5)= 5.59 months = **5 months and 18 days**

Interpretation: The project may BEP in 5 months and 18 days, presenting a significantly quick recovery. This rapid recovery of the initial investment suggests low financial risk.

Capital Expenditures (CAPEX)

Project Year	Capital Expenditure
1st year	€330,000 EUR (22,000 x 15)
2nd year	€330,000 EUR (22,000 x 15)
3rd year	€330,000 EUR (22,000 x 15)
4th year	€330,000 EUR (22,000 x 15)
5th year	€330,000 EUR (22,000 x 15)
Total CAPEX	**€1,650,000 EUR**

Figure 40: Capital Expenditures (CAPEX)

Following our assumptions, first-year investments are expected to be **€22,000 EUR** per building, amounting to a total of **€330,000 EUR** for the initial **15 buildings**. In subsequent years, the investment will scale according to the projected growth rate, with the platform expanding to 30, 45, 60, and 75 buildings over five years. This will result in a total investment of around **€1.7M EUR** across the five years, reflecting the increasing number of facilities adhering to the platform (*Appendix 11*).

Operational Expenditures (OPEX)

Ongoing costs per year will include:

- Software and System Maintenance: €40,000 EUR
- Marketing: Targeted campaigns to sustain user adoption – €50,000 EUR
- Employee Costs: Personnel required to manage operations, partnerships, and platform scalability – €90,000 EUR

Total Fixed Operating Costs per Year: **€180,000 EUR**.

Scalability Potential

The Company parking model's scalability is robust due to its modular nature. The financial projections indicate that due to the low operational costs per year and a strong potential revenue source, the model is a financially viable and scalable solution for Via Verde. With a strong NPV, ROI, and profitability index, the model looks to deliver significant returns while aligning with Via Verde's operational strengths and strategic objectives.

Financial Summary

The financial analysis of the Private Company Parking service highlights the high profitability and suitability for immediate implementation. Over the first five years, the project presents a total revenue of **€10.4M EUR** and a total profit before taxes of **€7.8M EUR** (*Appendix 11*).

The investment needed per parking facility might seem large, however, the service yields a compelling first-year ROI of **114.8%**. The BEP, achieved within a period of **5 months and 18 days**, emphasizes the swift cost recovery and low financial risk associated. Moreover, while the projection of annual earnings before taxes (EBT) demonstrates consistent growth, starting at €198,750 EUR and ending year 5 with €3M EUR, it also illustrates the potential for scalability and revenue generation *(Appendix 31).*

All Values in € EUR	Year Ended December 31					Total
	Year 1	Year 2	Year 3	Year 4	Year 5	
Revenue	**708,750**	**1,147,500**	**2,126,250**	**2,835,000**	**3,543,750**	**10,361,250**
Total Business Setup Costs	330,000	330,000	330,000	330,000	330,000	1,650,000
Gross Profit	**378,750**	**1,087,500**	**1,796,250**	**2,505,000**	**3,213,750**	**8,711,250**
Operating Expenses (OPEX	180,000	180,000	180,000	180,000	180,000	900,000
EBT	**198,750**	**907,500**	**1,616,250**	**2,325,000**	**3,033,750**	**7,811,250**

Figure 41: 5-year Profit and Loss (P&L) Summary

It is important to note that the P&L projection above does not include tax considerations. This omission comes from the uncertainty regarding the corporate structure under which Via Verde and Brisa operate, which could involve different jurisdictions.

In addition, the NPV of €5.6M EUR reaffirms the substantial value it can produce over the course of a five-year period, supporting its financial potential for Via Verde.

Financials Summary	Values
Via Verde's Annual Revenue p/ parking facility	€47,250 EUR
ROI	114.8%
Break-Even Point	5 months and 18 days
NPV	€5,616,720.71 EUR
Total Revenue	€10,361,250 EUR
Total Profit before taxes	€7,811,250 EUR

Figure 42: Financial Summary

From a financial perspective, the Private Company Parking service stands out as an optimal choice for Via Verde's expansion further into mobility solutions. With the fifth year's revenue representing a very significant part (more than 30%) of non-toll services' revenue, this initiative provides a substantial and sustainable boost to Via Verde's revenue base. Its exceptional revenue generation, high profitability, and rapid cost recovery position it as a cornerstone for future growth in the market. These metrics showcase its financial viability and its potential to transform Via Verde into a more diversified mobility provider.

5.3 Implementation Guidelines

To ensure the successful deployment of this new service, a structured, timely implementation approach and marketing efforts must be executed.

Engage in Partnerships and Collaborative Agreements: The first step is to establish strategic partnerships with corporate entities, hotels, and other facilities with underutilized parking spaces. These agreements should align the objectives of both parties, including revenue-sharing terms and the mutual goal of maximizing parking efficiency. During this phase:

- Assess Technological Requirements: Conduct a needs assessment for IoT sensor installation and other infrastructure upgrades to enable real-time monitoring and dynamic allocation of parking spaces.
- Regulatory Compliance: Verify local regulations, secure necessary permissions, and address any potential legal barriers to operation.

Platform Development and IoT Integration: Building on Via Verde's existing app infrastructure, the platform must be upgraded to support the new Private Company Parking service. This includes:

- IoT Integration: Install IoT sensors in parking spots to track real-time occupancy, enabling priority access for employees or guests during peak hours and reallocating unused spaces to external users during off-peak times.
- Dynamic Pricing and Availability: Incorporate real-time occupancy data to adjust availability and pricing, optimizing space use and improving user satisfaction.
- Seamless User Interface: Design an intuitive app interface for easy search, booking, and access to parking spaces without disrupting current functionality.

Pilot Program in Lisbon and Porto: Before scaling up, Via Verde should first launch a pilot in Lisbon and Porto, two high-demand urban centers, to:

- Test System Performance: Evaluate the functionality of IoT-enabled features, including real-time monitoring, dynamic pricing, and user interaction.
- Gather Insights: Collect data on user behavior, partner satisfaction, and operational challenges to refine the service.
- Minimize Risk: Identify and address potential issues in a limited deployment before expanding to additional cities

Marketing Efforts and User Engagement: Simultaneously, targeted marketing campaigns should be deployed to promote the service and engage users. Strategies include:

- Co-Marketing with Partners: Leverage corporate and hotel partnerships to advertise the service through their digital platforms, booking confirmations, and on-site materials.
- Educational Content: Create tutorials, videos, and guides to showcase how to use the app for pre-booked parking, highlighting its convenience and reliability.
- Incentives for Early Adoption: Offer discounts, loyalty rewards, and referral bonuses to encourage trial and drive initial adoption.

Monitoring Performance Metrics

Define KPIs to track and measure the performance and use these to adjust in-app features and service offerings. Depending on the success of the implementation, prepare the app to expand and scale up and use the data from the current service to develop a predictive algorithm regarding availability.

KPIs	
Revenue	Customer Feedback
Profit	Incident Resolution Time
Occupancy Rate per Facility	Net Promoter Score (NPS)
User Retention	Reduced Search Time
User Growth Rate	Carboon Footprint Reduction
Company's Adherence Requests	

Figure 43: KPIs

KPIs were chosen to balance all sectors of the project's performance – revenue and profit in order to measure financial accomplishments; occupancy rate per facility, user retention, and growth rate to verify how much the company's parking facilities are being used and if the clients are reusing the app; user growth rate and company's adherence requests to assess how many new users from both companies and customers are willing to join; moreover, customer feedback and resolution time of reported incidents – related to either the platform or the parking facility - as well as NPS, which will measure customer satisfaction and likelihood of recommendations. Lastly, concerning sustainability, which is a key factor in the implementation of the service, quantifying the decrease in average time spent searching for parking among users is really important since it correlates with reduced traffic congestion. Consequently, a decrease in

congestion will lead to a reduction in fuel consumption and CO2 emissions, which could also be measured to align with municipal and national environmental goals, contributing to both sustainability and mobility solutions.

5.4 Additional Recommendations for Future Phases

The current analysis supports the implementation of the Company Parking service, not only due to financials factors but also due to the alignment with Via Verde's existing service and the ease of implementation regarding logistical and operational details. The service is considered the most feasible and ready to be carried out as of now.

Future phases following implementation should focus on enhancing this service and gradually exploring the option of integration regarding the other services analyzed in this study.

As the Company Parking model grows, improvements and expansion should be considered to maximize engagement, user experience, and operational efficiency:

- **Dynamic pricing and availability algorithms** could help the company to optimize prices based on demand patterns and user preferences.
- **Expanding** to other major Portuguese cities such as Braga, Guimarães, Faro, among others, using the data and insights gathered from the first years in Lisbon and Porto.
- Focusing on **addressing niche markets** such as regions with limited public transport or tourist-heavy areas to increase adoption. These should be considered for future phases in order to consolidate Via Verde's position as a leader in mobility services.

Once sustained expansion and operational expertise are established, Via Verde should consider integrating P2P EV charging, parking, and car rental models, using insights from the Private Company Parking service for smoother implementation.

According to our analysis, P2P EV charging should be prioritized for its alignment with sustainability goals and increasing EV adoption rates, targeting urban areas with high EV penetration. P2P parking would be an extension of the recommended service adapted to

individuals and, despite higher complexity and presenting the lowest grade for implementation, P2P car rental could fill the gaps in the mobility-as-a-service (MaaS) market. Monitoring mobility services and their regulatory and technological developments will be important to understand how these models can evolve.

The phased approach outlined above – starting from refining the current recommended model, expanding it into new regions of Portugal, and finally gradually integrating the other services – enables Via Verde to secure early success with the Company Parking service while maintaining a strategic outlook for growth and innovation in the mobility sector. Moreover, this progression not only aligns with market trends and consumer preferences but also ensures long-term sustained profitability for the company and a path forward to a solidified position as a pioneering mobility platform for Via Verde.

6. Thesis Limitations and Conclusions

Thesis Limitations

This study, while comprehensive in its scope and methodology, is subject to certain limitations that should be acknowledged. First, the reliance on survey and interview data introduces potential biases, as the responses reflect subjective perceptions rather than observed behaviors. This limitation is particularly relevant when assessing willingness to adopt services such as P2P parking rentals or P2P EV charging, which are novel concepts in the Portuguese market.

Second, the geographic focus of the research is restricted to Portugal, primarily Lisbon and Porto. Although these cities represent key urban markets, the findings may not fully account for regional variations or the dynamics of smaller cities and rural areas. As a result, the generalizability of the recommendations beyond the Portuguese context is limited.

Third, the study highlights the strategic feasibility of the proposed services but lacks a deep dive into potential technological or regulatory challenges. A more detailed exploration of these factors would strengthen the proposed business model.

Finally, the financial projections and market share estimates are based on preliminary assumptions, which may vary as market dynamics evolve. A more detailed financial analysis would provide a stronger foundation for investment decisions.

Conclusions

This thesis has examined Via Verde's strategic potential to expand into four key mobility services: private company parking, P2P parking rentals, P2P EV charging, and P2P car rentals. The research identified private company parking as the most viable option for immediate implementation. This service not only aligns with existing capabilities but also addresses pressing urban mobility challenges, such as parking shortages in Lisbon and Porto, by optimizing underutilized corporate assets.

While the other services present compelling long-term opportunities, they face significant adoption barriers, including technological infrastructure gaps, trust issues, and market readiness. These services may become integral to Via Verde's portfolio in the future as the shared economy and sustainable mobility trends gain traction.

The findings highlight the value of leveraging underutilized assets and building trust through a recognized brand. They also emphasize the role of partnerships with corporate and residential stakeholders in driving adoption and scaling operations.

In conclusion, Via Verde's expansion into private company parking represents a pivotal step toward addressing urban mobility challenges and positioning the company as a leader in sustainable and integrated mobility solutions. Future research and implementation efforts should build upon the insights provided in this thesis to refine the proposed strategies and unlock additional growth opportunities.

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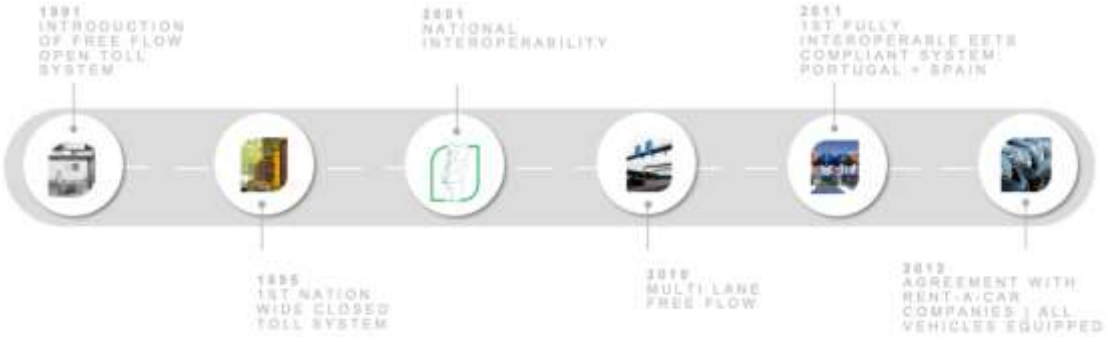
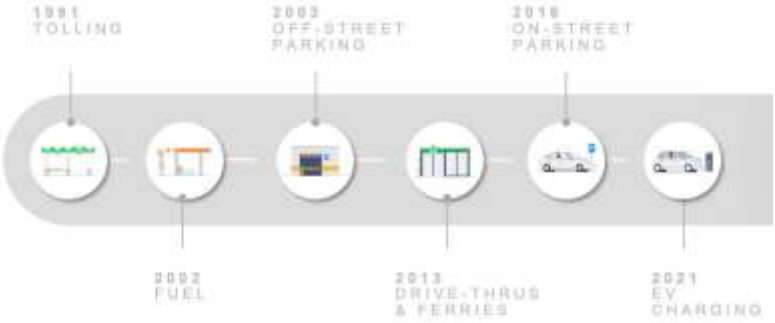
8. Appendix

Appendix 1: Via Verde Core Tolling



Appendix 2: Via Verde Other Mobility Services



Appendix 3: *Competitive Profile Matrix of Key Players in the Private Parking Market*

Table Description: The table evaluates the competitive positioning of four digital parking platforms—Parkimeter, Parclick, Parkopedia, and SpotHero—against key factors that influence success in the private parking market. Each factor is assigned a weight reflecting its relative importance in the digital parking industry, and the platforms are scored on a scale from 1 to 5, where 1 represents the lowest performance and 5 the highest. The weighted scores are summed to calculate the total score for each platform.

Factors and Weights

1. **Ease of Use (Weight: 0.2):** Ease of use is a critical determinant of user adoption and customer satisfaction in digital platforms. A well-designed, intuitive interface directly impacts user retention and reduces friction during the booking process. This factor was

assigned the highest weight among non-operational metrics because convenience is consistently ranked as a top priority for users in surveys and industry studies.

   - Platforms were rated based on the simplicity and intuitiveness of their user interface and overall customer experience.

2. **Geographic Coverage (Weight: 0.15):** Geographic coverage is important to attract both B2B and B2C customers by ensuring a wide network of parking options. A diverse geographical footprint enables platforms to appeal to a broader audience, particularly in urban areas or tourist-heavy locations.
   - Ratings were based on the platforms' ability to provide parking options in key cities, regions, and countries.
3. **Pricing (Weight: 0.15):** Competitive pricing helps platforms gain market share and retain price-sensitive users. Transparent and affordable pricing structures, combined with the ability to implement dynamic pricing models, play a pivotal role in customer acquisition.
   - Scores were attributed based on affordability and pricing transparency compared to competitors.
4. **Real-Time Data & IoT (Weight: 0.25):** The ability to provide real-time parking availability through IoT integration is vital for optimizing parking operations and improving customer satisfaction. Real-time data reduces parking search times and supports smarter urban mobility management. This factor was assigned the highest weight because it directly impacts operational efficiency and the value proposition of digital platforms.
   - Platforms were evaluated on the presence and reliability of real-time data features and IoT integration.
5. **B2B Customer Focus (Weight: 0.25):** Platforms that cater to business clients, such as corporate offices, hotels, or shopping centers, have a competitive advantage by tapping into

a high-value customer segment. B2B partnerships allow for revenue diversification and deeper market penetration.

- Ratings were based on the platform's ability to attract, manage, and provide customized solutions for business clients.

Each platform was rated based on publicly available information, user reviews, and market reports. The scoring criteria are as follows:

1. **5:** The platform performs exceptionally well in the given category.
2. **4:** The platform is above average but may have minor limitations.
3. **3:** The platform performs adequately but lacks distinguishing features.
4. **2:** The platform is below average, with significant gaps in performance.
5. **1:** The platform does not address the factor effectively or lacks the feature entirely.

Justification of Scores

1. **Parkimeter:**
   - Strengths: Broad geographic coverage and strong B2B customer focus.
   - Weaknesses: Limited real-time data features compared to other platforms.
2. **Parclick:**
   - Strengths: Balanced performance across all metrics; excels in B2B customer solutions.
   - Weaknesses: Geographic coverage slightly lags behind Parkimeter.
3. **Parkopedia:**
   - Strengths: Advanced real-time data capabilities and extensive coverage.
   - Weaknesses: Ease of use and pricing are less competitive than Parclick’s.

4. **SpotHero:**
    - Strengths: Exceptional ease of use and customer-centric design.
    - Weaknesses: Weaker geographic presence in Europe compared to other platforms

Appendix 4: Online Survey Structure

Section 1: Introductory Questions

1. Where are you from?
2. Do you live in Portugal?
    a. Yes
    b. No
3. Which type of region do you currently live in?
    a. Large City (Lisbon, Porto)
    b. Medium-sized city (Coimbra, Braga, Faro, etc)
    c. Suburb of a large city
    d. Small town
    e. Rural area
4. Identify your age range
    a. 18-25
    b. 26-35
    c. 36-45
    d. 46-55
    e. 56+
5. You identify yourself as:
    a. Female
    b. Male

c. Prefer not to say

d. Other

6. What is your professional occupation?

a. Full-time work

b. Part-time work

c. Student

d. Working student

e. Unemployed/Looking for a job

f. Retired

7. Do you own a car?

a. Yes

b. No

8. If yes: Do you own a fully or partially electric car?

a. Yes

b. No

9. If yes: Do you own a private EV charger?

a. Yes

b. No

Section 2: Via Verde Assessment

10. Are you a Via Verde Client?

a. Yes

b. No

11. On a scale from 1 to 10, how much do you trust Via Verde (1- No Trust; 10 – Complete Trust)?

12. How secure do you feel using Via Verde's services (1 – Not Secure; 10 – Very Secure)?

Group Part

Section 3: Parking Rental Services

13. Do you have a private spot for your car(s)? (e.g. garage, private property, residential spot, etc)
    a. Yes
    b. No
14. Do you ever struggle to find available parking?
    a. Yes, frequently
    b. Yes, occasionally
    c. Rarely
    d. No, never
15. How often do you use private parking? (e.g. universities, hotels, shopping centers, airports, etc)
    a. Daily
    b. Weekly
    c. Monthly
    d. Rarely/Never
16. What is your primary concern when choosing a parking space?
    a. Location
    b. Price
    c. Safety
    d. Availability
    e. Other
17. Would you be interested in renting a private parking space from others? (e.g. similar to Airbnb for parking spaces)?
    a. Yes

b. No

c. Maybe

18. How likely are you to consider renting out your own parking space to others through a platform (1 – Not Likely; 10 – Very Likely)?
19. What would make you choose a private parking space from others over a public one?
    a. Proximity to destination
    b. Price
    c. Guaranteed availability
    d. Security
    e. Additional services (e.g. EV charging, car washing, etc)
    f. Other
20. How convenient would you find a service that allows you to book parking in advance (1 – Not Convenient; 10 – Very Convenient)?
21. Would you recommend such a service to others if it existed?
    a. Yes
    b. No
    c. Maybe
22. What features/benefits would make you more likely to use a service to book private parking in advance?
    a. Guaranteed parking availability
    b. Affordable pricing
    c. Convenient location
    d. Ability to reserve for specifi c times/dates
    e. Real-time availability updates
    f. Secure parking facilities

g. Easy-to-use booking platform
h. Option to cancel or modify reservation
i. Loyalty rewards and/or discounts
j. Customer service support
k. Other

23. If you had available private parking spots, would you consider renting them out, provided that a company would facilitate the transaction through the necessary platform and payment system?
    a. Yes, whenever available
    b. Yes, occasionally
    c. No
24. If Via Verde were to implement this service, how much would you trust it?
    a. I would completely trust it
    b. I would mostly trust it
    c. I would be somewhat trusting
    d. I would trust it a little
    e. I would not trust it at all
    f. I am indifferent toward the service provider

Section 4 – P2P Car Rental

25. Have you ever heard of P2P Car Rental before?
    a. Yes
    b. No
26. Have you ever used a P2P Car Rental service before?
    a. Yes
    b. No

27. If yes, rate your experience (1 - Very Bad; 10 – Excellent)

28. If you ever need a car for a short period, how likely would it be for you to rent a car from a P2P service (1 – Not Likely; 10 – Very Likely)?

From the viewpoint of the renter

29. What features/benefits would make you more likely to use a P2P car rental service?

    a. Environmentally friendly option
    b. Positive reviews and ratings of cars and its owners
    c. Insure and safety guarantees
    d. Affordable pricing
    e. Availability
    f. Will never consider using the service
    g. Other

30. What concerns do you have about using this service?

    a. Trust in the car owner
    b. Insurance coverage and liability
    c. Vehicle cleanliness and maintenance
    d. Data privacy and security
    e. Pricing transparency
    f. Accessibility (getting the car keys, etc)
    g. Other

31. For what reasons would you consider renting a car from a P2P platform?

    a. Travelling for vacation or leisure
    b. Attending special events (weddings, parties, etc)
    c. Work or business trips
    d. Running errands or daily tasks

e. Replacing a vehicle that is temporarily unavailable

f. Exploring a new city or location

g. Other

From the viewpoint of the host

32. If in the question " Do you own a car?" you answered “Yes”: How often do you use your car?

a. Daily

b. Several times a week

c. Weekly

d. A few times a month

e. Rarely

33. For how long do you typically leave your car unused?

a. A few hours a day

b. A day or two at a time

c. Several days at a time

d. A week or longer

34. How likely are you to rent out your car, when not in need, to others through a P2P platform (1 – Not Likely;10 – Very Likely)?

35. On what occasions would you be most likely to rent out your car?

a. When away on vacation or travelling

b. During weekends when the car isn't needed

c. When my vehicle is unused for extended periods

d. When I want/need extra income

e. If I have multiple vehicles and can spare one

f. When I'm attending events or activities that don't require a car

g. Other

36. What would motivate you to rent out your car on a P2P platform?

a. Extra income

b. My car is unused for long periods

c. Supporting a more sustainable transportation system

d. Meeting new people and creating a community

e. Helping others who need a vehicle temporarily

f. Curiosity about the experience

g. Other

37. How important is earning extra income in your decision to rent out your car (1 – Not Important; 10 - Very Important)?

38. Where would you prefer to hand off the car to the renters?

a. At your house

b. Designated public location

c. Renter's location

d. Unlock through a remote system (keyless entry, etc)

e. Other

39. What concerns would you have about renting your car to strangers?

a. Potential damage to the car

b. Trust in the renters

c. Insurance coverage and liability issues

d. Wear and tear on the vehicle

e. Not having access to my car when I need it

f. Vehicle cleanliness after a rental

g. Theft or misuse of the car

h. Data privacy (GPS tracking, Car data, etc)

i. Difficulty in managing bookings and logistics

j. Other

40. How comfortable are you with the idea of a stranger using your car (1 – Not Comfortable; 10 – Very Comfortable)?

41. How important is comprehensive insurance coverage in your decision to rent out your car (1 – Not Important; 10 – Very Important)?

42. What type of insurance coverage would you expect a P2P platform to offer?

    a. Full damage and liability coverage

    b. Coverage for theft and vandalism

    c. Roadside assistance and emergency services

    d. Coverage for wear and tear

    e. Coverage for lost income (if the car is unavailable due to repairs)

    f. I would prefer to use my personal insurance

43. If you had a car, would you consider renting it out in such a service, provided that a company would facilitate the transactions through the necessary platform and payment system?

    a. Yes, whenever available

    b. Yes, occasionally

    c. No

44. If Via Verde were to implement this service, how much would you trust it?

    a. I would completely trust it

    b. I would mostly trust it

    c. I would be somewhat trusting

    d. I would trust it a little

e. I would not trust it at all

f. I am indifferent toward the service provider

Section 5: Electric Vehicles Charging Station

45. How important is the availability of convenient charging stations in the decision to purchase an electric vehicle (1 – Not Important; 10 – Very Important)?

46. If in the question "Do you own a fully or partially electric car?" you answered “Yes”: How often do you use public EV charging stations?

    a. Daily

    b. Few times a week

    c. Few times a month

    d. Rarely

    e. Never

47. What challenges do you face when charging your EV?

    a. Long waiting times

    b. Lack of charging stations in the area

    c. Cost of charging stations

    d. Broken or mal-functioning stations

    e. Price

    f. Other

48. How convenient would you find a service that allows you to book an EV charging spot in advance (1 – Not Convenient; 10 – Very Convenient)?

49. How likely would you be to rent a private charging station (either from a company or an individual) if it was available?

    a. Very unlikely

    b. Unlikely

c. As likely as the ones for public use

d. Likely

e. Very likely

50. What concerns would you have about renting a private EV charging station?

a. Reliability of the station

b. Price

c. Safety of the location

d. Trust in the payment system

e. Other

51. Would you be more willing to rent a private EV charging station if a platform/company were to facilitate the transaction, and secure safety and logistics?

a. Yes

b. No

c. Maybe

52. Would you prefer to use a trusted payment system to pay for EV charging instead of having separate payment methods and cards?

a. Yes

b. No

c. Maybe

53. What features would be the most important for you in a peer-to-peer charging station/charger platform?

a. Proximity and availability of charging stations

b. Affordable price of charging stations

c. Security of transactions

d. User reviews and feedback

54. If you had a private EV charging station at home, would you consider renting it out to other EV drivers, provided that a company would facilitate the transaction through the necessary platform and payment system?
    a. Yes, whenever available
    b. Yes, occasionally
    c. No
    d. I don't have or plan to have a charger/charging station
55. What would motivate you to rent out your charger/charging station on a P2P platform?
    a. Extra income
    b. Unused charger/charging stations for periods of time
    c. Supporting a better EV infrastructure
    d. Helping others in need
    e. Meeting new people and creating a community
56. What concerns would you have about renting your charger/charging station to strangers?
    a. Potential damage
    b. Trust in the users
    c. Insurance coverage and liability issues
    d. Wear and tear
    e. Theft or misuse
    f. Difficulty in managing bookings and logistics
57. If Via Verde were to implement this service, how much would you trust it?
    a. I would completely trust it
    b. I would mostly trust it
    c. I would be somewhat trusting
    d. I would trust it a little

e. I would not trust it at all

f. I am indifferent toward the service provider

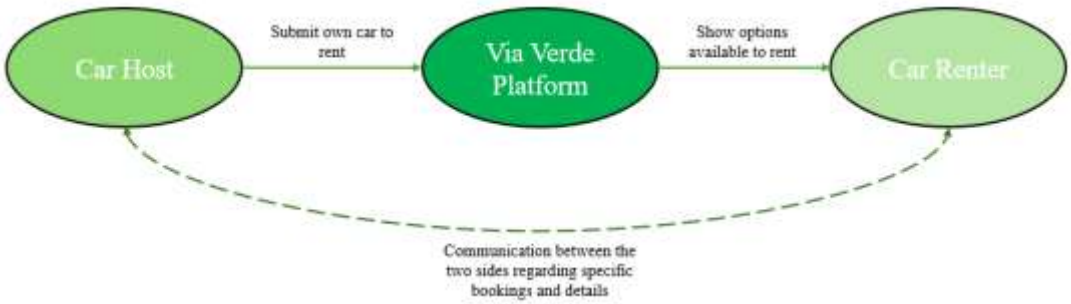
Appendix 5: Online Survey Answers
Link to the Survey Answers:

https://docs.google.com/spreadsheets/d/17g70YeDUgcrJRwn7jp1Uwhwe1tZMLmSit-Wgfo4S3DQ/edit?gid=0#gid=0

Appendix 6: Information on the Individuals Interviewed
Link to the Survey Answers:

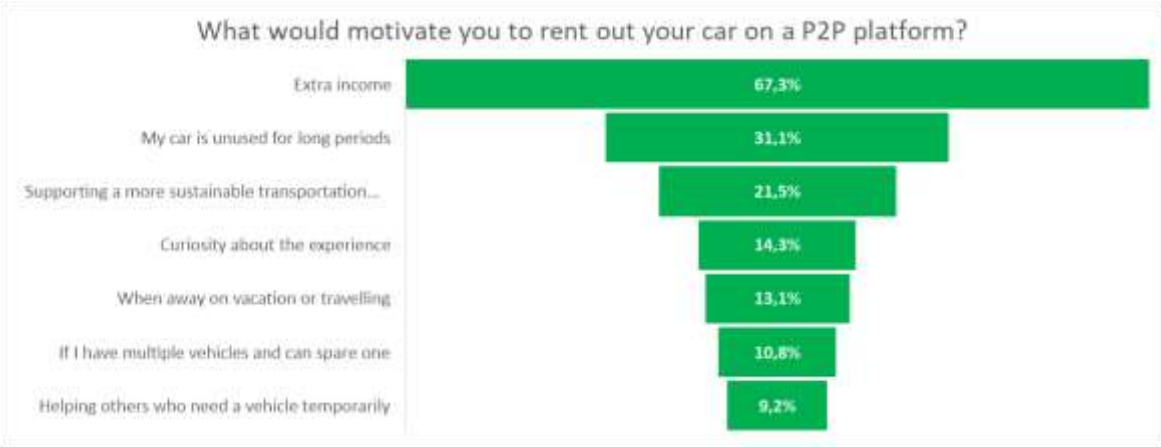
https://drive.google.com/file/d/1NS-fTB2MGSZrDjbGJD7rJnhS4fbKl3ek/view?usp=sharing

Appendix 7: P2P Car Rental - Service Value Chain

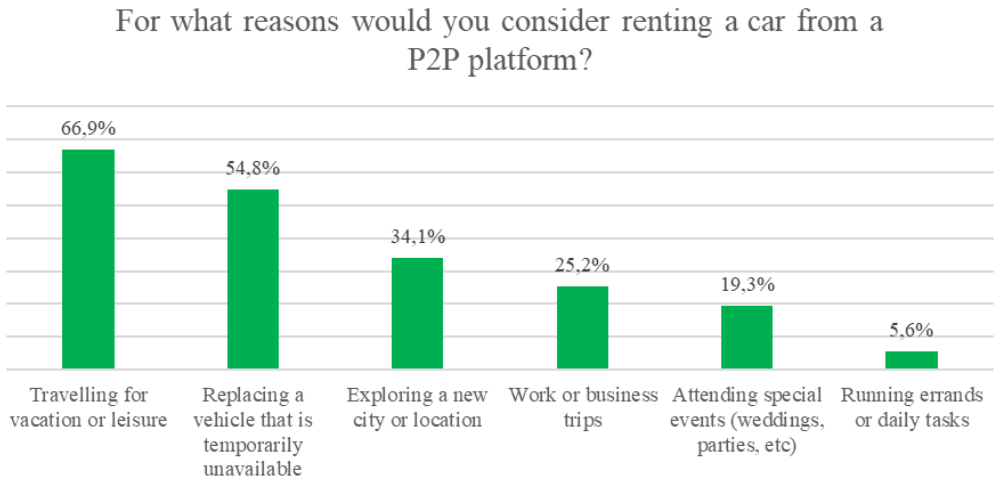


Appendix 8: P2P Car Rental - Willingness to Adopt

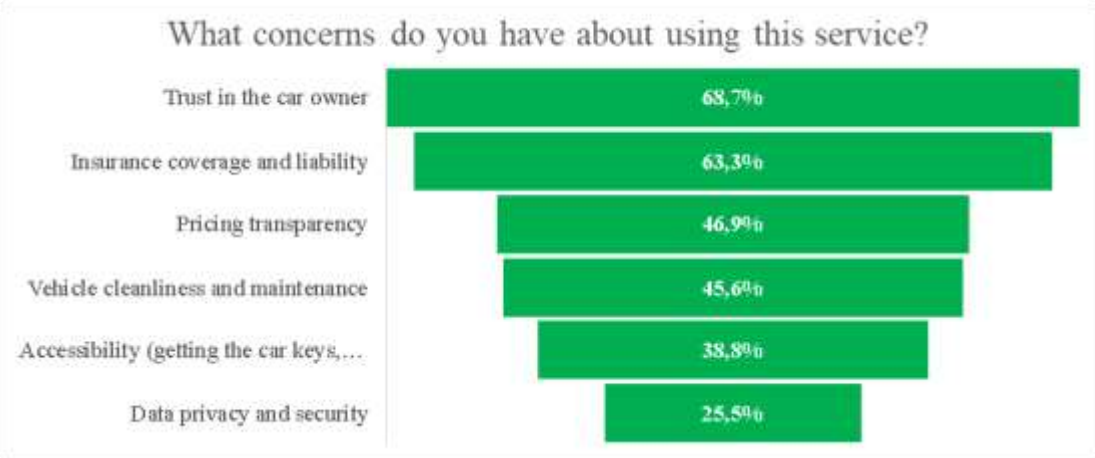
Appendix 9: P2P Car Rental – Motivations to Rent Own Vehicle



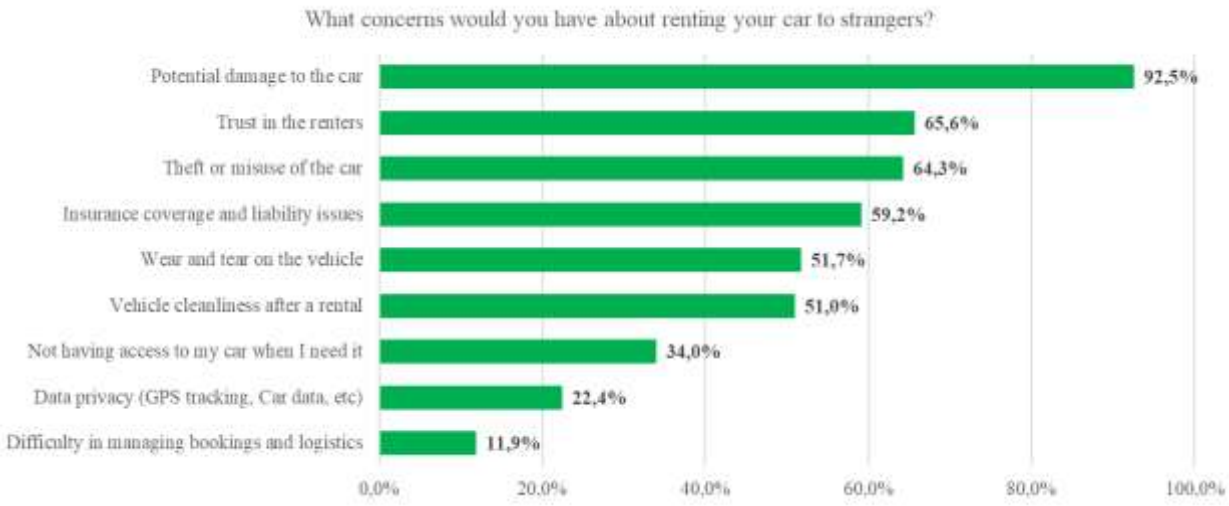
Appendix 10: P2P Car Rental – Reasoning Behind Intentions to Rent from a P2P Platform



Appendix 11: P2P Car Rental – Concerns Regarding Renting Out Own Vehicle

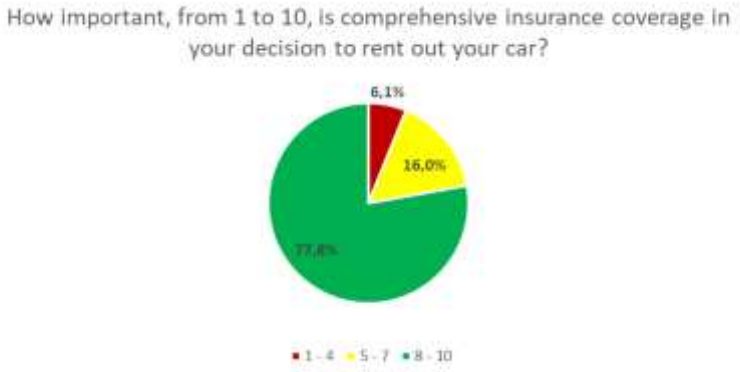


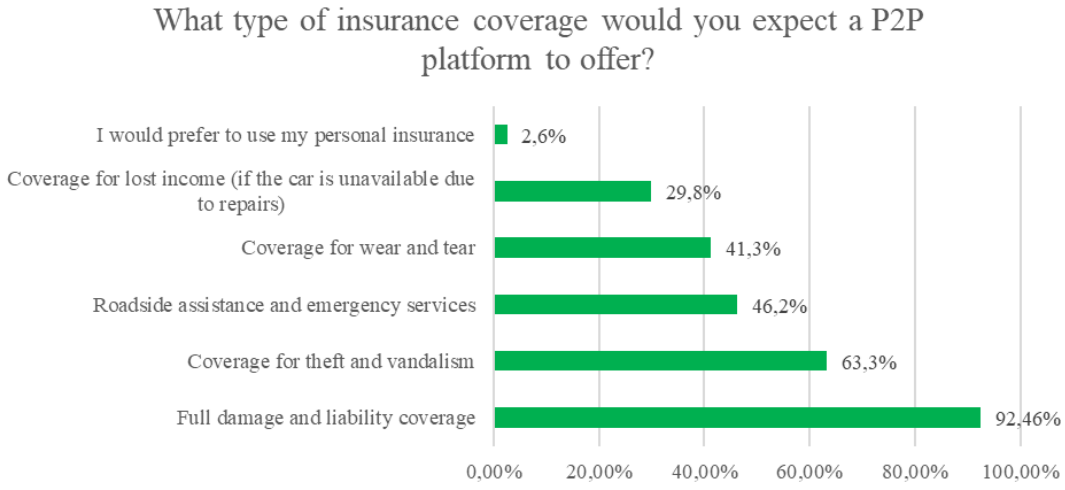
Appendix 12: P2P Car Rental – Concerns Regarding Using Rented Vehicle



Appendix 13: P2P Car Rental – Importance of Car Insurance

Appendix 14: P2P Car Rental – Insurance Coverage Expectation





Appendix 15: P2P Car Rental - Buyer Personas

Persona 1: Digital Nomad

- **Name:** Rita Carlos
- **Age:** 32
- **Occupation:** Marketing Manager
- **Location:** Lisbon
- **Behavior:**
    - Lives in the city center and relies on public transportation or rideshares for daily commutes.

    - Occasionally needs a car for punctual appointments or weekend gateways

- **Needs:**
    - Access to a vehicle without the burden of ownership.
    - Flexible and reliable service for short-term rentals.
- **Motivation to Use the Service:**
    - Avoids the cost and hassle of owning a car.
    - Save time and focus on work commitments.

Persona 2: Urban Professional:

- **Name:** Franz Schmidt
- **Age:** 28
- **Occupation:** Freelance Graphic Designer
- **Location of Residence:** Lisbon, occasionally travels around Portugal
- **Lifestyle:**
    - Works as a digital nomad from Lisbon
    - Doesn’t own a vehicle in Portugal
    - Appreciates working remotely from different locations
    - Likes to explore the country when not working
- **Pain Points:**
    - When travelling has to use public transport, which takes a lot of time to get to the destination
    - Or rent a car through a traditional service which takes a lot of time and requires going to a lot of bureaucracy
- **Needs:**
    - Affordable and easy access to vehicles for traveling to smaller towns and scenic areas where public transport is limited.

  - Short-term rentals to match his irregular travel schedule.

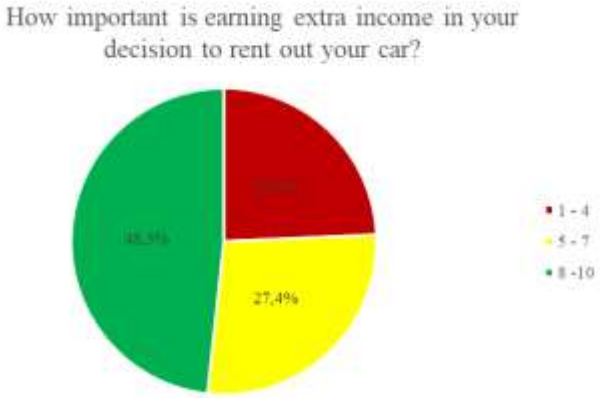
- **Motivation to Use the Service:**
  - Can have access to a vehicle when he feels like visiting places
  - Competitive pricing and easier booking process compared to traditional rental services.
  - Flexible and adaptable process

Persona 3: International Traveler

- **Name:** Cristopher Smith
- **Age:** 45
- **Occupation:** IT Consultant
- **Location of Residence:** Seattle, Washington (visiting Portugal)
- **Lifestyle:**
  - Frequent traveler, who enjoys exploring countries beyond the typical tourist spots.
  - Prefers immersing himself in local culture and traveling independently.
- **Pain Points:**
  - Navigating unfamiliar rental process in a foreign country
  - Isn’t used and doesn’t know where to find public transportation alternatives to travel to areas outside the main cities
  - Concerned about insurance and customer support as an international user.
- **Needs:**
  - A convenient and flexible car rental option for exploring Portugal’s countryside, smaller towns, and coastal areas.
  - Avoiding the rigid and time demanding processes of traditional car renting
  - Easy-to-use platform to manage its bookings
- **Motivation to Use the Service:**

- Cost savings compared to major rental agencies, particularly for longer trips.
- Appreciates the ease of connecting directly with locals for vehicle rental, making his experience feel more personal and unique.

Appendix 16: P2P Car Rental – Importance of Earning Extra Income



Appendix 17: P2P Car Rental - Financial Key Metrics: Reasoning and Calculations

As outlined earlier, it is recommended that Via Verde adopts the commission model, which will therefore be used in the financial calculations. While a subscription model could also be integrated into the overall service offering, it will not be considered in this analysis for the sake of simplification.

Revenue

The projected revenue values for Via Verde's P2P car rental service is €269,280 EUR broken down as follows:

- **Average Daily Rate** – €55 EUR/day

  Source: (Bookycar n.d.)

- **Days per month car is used** – 17 days

  The industry average is 20 to 25 days, but due to it being an untapped service in Portugal, it's sensible to aim for a lower value

https://www.reddit.com/r/turo/comments/rmzfer/how_many_days_a_year_are_your_rentals_rented/

- **Number of Cars** – 60 cars

  Estimate: Based on Bookycar numbers (Bookycar n.d.) and assuming a higher value taking into account Via Verde's stronger reputation

- **Percentage of Revenue Taken**: 40%

  Industry average (Turo n.d.; Bookycar n.d.; Getaround n.d.)

Projected First-Year Monthly Net Revenue = €55 EUR * 17 days * 60 cars * 40% = €22,440 EUR

Projected First-Year Annual Net Revenue = €22,400 EUR * 12 months = €269,280 EUR

Setup Costs:

The estimated setup cost for Via Verde's P2P car rental service is **€260,000 EUR**, broken down as follows:

1. **Marketing and Customer Acquisition Costs (€125,00 EUR):**

   Estimate based on Via Verde's capacities and the need to invest in a strong marketing campaign to attract users to new innovative service)

2. **Platform Development Costs (€100,000 EUR):**

   Estimate value based on multiple websites and research, taking into account the average cost found of €90,000 EUR and an additional cost due to the additional needs such as face and document recognition.

3. **Legal and Compliance Costs (€20,000 EUR):**

   Covers drafting contracts, ensuring compliance with laws (e.g., GDPR, liability regulations), handling licensing and registrations, and consulting legal experts for disputes or cross-border rentals.

4. **Customer Support Infrastructure (€15,000 EUR):**

   Additional costs associated with establishing support infrastructure to handle the increased volume of requests and provide comprehensive assistance for a new platform entering a new market.

ROI = (€269,280 EUR – €260,000 EUR) / €260,000 EUR* 100 = **3.57%**

Breakeven Period

Break-Even Period (Months)=Setup Costs/Monthly Revenue

Break-Even Period = €260,000 EUR / €22,440 EUR = Approximately 11.6 months = Close to 12 months

NPV

Selecting the Discount Rate

1. **Industry WACC**

Since the service falls under both the Technology and Transport & Leisure industries, their WACC estimates by KPMG (2024) will be considered:

- **Technology Industry:** 10.2%
- **Transport & Leisure Industry:** 9.7%

After reviewing these values, a WACC reference of **10%** will be used.

2. **Additional Risk Premium**

Besides the industry-estimated cost of capital, it's important to consider some of the volatility of the service implementation, based on the nature of the project

- **Innovation Risk Premium:** +3%, due to the project's innovative nature and the lack of an established national market.

- **Market Uncertainty Risk Premium:** +2%, reflecting potential revenue volatility caused by seasonality and demand dependence.

3. Discount Rate Definition

Based on previous information, it's possible to define the discount rate formula as the following:

Discount Rate = WACC + Innovation Risk Premium + Market Uncertainty Risk Premium (=)

Discount Rate = 10% + 3% + 2% = **15%**.

5-Year Revenue Assumption

Based on a projected growth in market adoption over the next 5 years, the following assumptions will be made:

- Given the projected vehicles in P2P rental platforms growth to be around 500% over the next five years (Orion Market Research 2024), the same growth will be considered for Via Verde. For this end value to be achieved, a consistent growth of 50% needed to occur, but due to the cultural complexities of the Portuguese market, a conservative growth of 35% in average number of vehicles rented per month will be considered:
    - Year 1: 60 cars
    - Year 2: (60 × 1.35) = 81 cars
    - Year 3: (81 × 1.35) = 109 cars
    - Year 4: (109 × 1.35) = 147 cars
    - Year 5: (147 × 1.35) = 198 cars
- Taking into account an increase in acceptance and recognition of the service of the Portuguese market over the next 5 years, an assumption over the increase of the growth in the average number of days per month a vehicle is rented will be made, as presented below:
    - Year 1: 17 days

- Year 2: 19 days
- Year 3: 20 days
- Year 4: 22 days
- Year 5: 24 days

And so, the annual revenue will amount to the following:

- Year 1: 60 cars × €55 EUR × 17 days × 0.4 = €269,280 EUR
- Year 2: 84 cars × €55 EUR × 19 days × 0.4 = €406,296 EUR
- Year 3: 109 cars × €55 EUR × 20 days × 0.4 = €575,520 EUR
- Year 4: 147 cars × €55 EUR × 22 days × 0.4 = €853,776 EUR
- Year 5: 198 cars × €55 EUR × 24 days × 0.4 = €1,254,528 EUR

Yearly Costs

To calculate the NPV it's necessary to take into account the cost of the employees coordinating the ensuring the effectiveness of the operations. The industry standard for similar services of 5 employees (3 Frontend/Backend Developers, 1 DevOps Engineer, and 1 QA/Test Engineer). Taking an average yearly salary of €35,000 EUR (Salary Expert n.d BRIDGE IN 2024), the total yearly amount directed at personnel is:

Personnel Costs = €35,000 EUR × 5 workers = €175,000 EUR

Also, it's important to maintain the marketing and promotional efforts to steadily increase the public recognition of the service and the brand. It will be taken 50% out of the initial promoting costs:

Yearly Marketing Costs = €125,000 EUR × 50% = €75,000 EUR

Total Fixed Costs = €200,000 EUR + €75,000 EUR = €250,000 EUR

- **Project Lifespan:** 5 years
- **Annual Fixed Costs:** €250,000 EUR

- **Setup Costs:** €260,000 EUR
- **Discount Rate:** 15%

Year 1: PV1= (€269,280 EUR - €250,000 EUR))/ (1+ 0.15) ^{1} = €16,765.22 EUR

Year 2: PV2= (€406,296 EUR - €250,000 EUR)/ (1 + 0.15) ^{2} = €118,182.23 EUR

Year 3: PV3= (€575,520 EUR - €250,000 EUR)/ (1 + 0.15) ^{3} = €214,034.68 EUR

Year 4: PV4= (€853,776 EUR - €250,000 EUR)/ (1 + 0.15) ^{4} = €345,210.89 EUR

Year 5: PV5= (€1,254,528 EUR - €250,000 EUR)/ (1+ 0.15) ^{5} = €499,427.95 EUR

Total PV = PV1 + PV2 + PV3 + PV4 + PV5 = **1,193,620.97 EUR**
NPV = Total PV − Setup Costs = 1,193,620.97 EUR − €260,000 EUR = **€968,620.97 EUR**

Appendix 18: Strategic Comparative Evaluation of the Service Models

Private Company Parking			
Parameter	**Weight**	**Grade**	**Justification**
Market Size	0,3	5	Urban areas like Lisbon and Porto face significant parking shortages in corporate sectors. The service directly addresses high-demand business districts, offering scalability and profitability in these markets.
ROI	0,25	5	Corporate partnerships offer steady revenue streams through long-term agreements, with potential for high ROI due to low operational costs and the ability to monetize underutilized spaces.
Complexity of Implementation	0,15	4	Requires partnerships with multiple but mitigated by existing infrastructure.
Relation to Existing Services	0,1	5	Strong alignment with Via Verde's current offerings, such as the Parking Helper and mobility app, ensuring seamless integration and leveraging the existing user base.
Potential Profits	0,1	5	High revenue potential through dynamic pricing, off-peak utilization, and corporate partnerships, leveraging low operational costs and maximizing underutilized spaces for substantial ROI.
Regulatory Practices	0,05	4	Relatively low regulatory barriers as it focuses on corporate agreements and private parking lots, which are less regulated than public spaces. However, some local zoning laws may apply.
Collaboration Needs	0,05	3	Requires significant collaboration with corporate partners and technology providers for dynamic allocation systems. While necessary, these partnerships are manageable within Via Verde's scope.
Average	4,7		

P2P EV Charging Rental			
Parameter	**Weight**	**Grade**	**Justification**
Market Size	0,3	4	The expanding EV market shows strong demand for charging infrastructure, driven by increased EV adoption and policy incentives. While supplier infrastructure may limit scalability, the market potential remains high.
ROI	0,25	4	Promising returns, though requiring initial investments and a slower adoption rate.
Complexity of Implementation	0,15	4	Integration of smart charging technology and compatibility with existing systems present challenges but are manageable with Via Verde's expertise.
Relation to Existing Services	0,1	4	The service aligns with current Via Verde's offerings and infrastructure, working to sustain and improve its position in the EV mobility market.
Potential Profits	0,1	4	High potential profitability due to dynamic pricing and long-term scalability.
Regulatory Practices	0,05	3	Some private residential laws may apply regarding commom spaces in condominums but low regulatory barriers. Nonetheless, additional compliance with tax reporting and safety standards may apply.
Collaboration Needs	0,05	3	Requires moderate collaboration with charger owners regarding the installation of API and app upgrades for compability, however, no dependency on external suppliers.
Average	3,9		

P2P Car Rental			
Parameter	**Weight**	**Grade**	**Justification**
Market Size	0,3	3	The car rental market is limited in Portugal due to cultural resistance to sharing personal vehicles and a relatively small P2P segment. Demand is further constrained by seasonal tourism patterns.
ROI	0,25	3	Returns are modest and highly dependent on demand variability, especially during off-peak seasons. Additionally, operational costs for ensuring trust (insurance, user verification) reduce profitability.
Complexity of Implementation	0,15	2	Managing security, insurance, and trust-building for P2P car rentals is resource-intensive. It also requires significant investment in marketing and user education.
Relation to Existing Services	0,1	3	While the service complements Via Verde's ecosystem, it doesn't directly enhance or leverage core offerings like parking or toll services.
Potential Profits	0,1	3	Low competition, minimal operational costs (only insurance costs can reach higher values), and high tourist demand lead to strong profit potential, despite seasonality risks.
Regulatory Practices	0,05	3	The implementation could be hindered by issues related to vehicle security and insurance, as well as the impact of taxes that directly affect the process.
Collaboration Needs	0,05	4	Requires moderate collaboration with car owners and possibly insurance providers, though the possibility of internal insurance simplifies the process.
Average	2,9		

P2P Parking Rental			
Parameter	**Weight**	**Grade**	**Justification**
Market Size	0,3	4	Significant demand for parking in urban areas, but the fragmented nature of individual property owners reduces scalability.
ROI	0,25	4	Good ROI and quick recovery of costs, though user acquisition requires investment.
Complexity of Implementation	0,15	3	Operational challenges include onboarding and managing a large number of individual listings, many of which involve private properties with varying availability and conditions.
Relation to Existing Services	0,1	4	Strong synergy with Via Verde's ecosystem, leveraging app, infrastructure, and customer base.
Potential Profits	0,1	3	Moderate revenue potential due to lower rates, but scalability across urban centers compensates; dynamic pricing adds opportunity.
Regulatory Practices	0,05	3	Potential regulatory and liability challenges, manageable through established partnerships.
Collaboration Needs	0,05	3	Relies on partnerships with private property owners; incentivizing listing may require competitive pricing strategies.
Average	3,7		

Appendix 31: Recommended Service - Detailed Profit and Loss Table for Private Company Parking

All Values in € EUR	Year Ended December 31					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Parking Facilities	15	30	45	60	75	
Total Sales	1,417,500	2,835,000	4,252,500	5,670,000	7,087,500	20,722,500
Via Verde's Commission	**708,750**	**1,147,500**	**2,126,250**	**2,835,000**	**3,543,750**	**10,361,250**
Business Setup Costs						
IoT Sensors	120,000	120,000	120,000	120,000	120,000	
Installation	45,000	45,000	45,000	45,000	45,000	
Software Integration	45,000	45,000	45,000	45,000	45,000	
Networking and Cloud storage	30,000	30,000	30,000	30,000	30,000	
Facility Marketing	15,000	15,000	15,000	15,000	15,000	
Onboarding	75,000	75,000	75,000	75,000	75,000	
Total Business Setup Costs	330,000	330,000	330,000	330,000	330,000	1,650,000
Gross Margin	**378,750**	**1,087,500**	**1,796,250**	**2,505,000**	**3,213,750**	**8,711,250**
Operating Expenses (OPEX)	180,000	180,000	180,000	180,000	180,000	900,000
EBT	**198,750**	**907,500**	**1,616,250**	**2,325,000**	**3,033,750**	**7,811,250**