



Balanced Scorecard as a tool for an E-Bike selling business

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Life is like riding a bicycle. In order to keep your balance, you must keep moving.

Einstein

Acknowledgments

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Abstract

This final thesis project has as its main objective to explore the design of a Balanced Scorecard model for a company selling electric bicycles. In this sense, this project describes the whole process of Balanced Scorecard development in the company BIKE&SURF. The starting point is the theoretical review of the theme, starting with a description of the use of the bike in the modern world, adding the operation of the company in question and the new challenges it faces. Complementarily, an approach will be made to the Balanced Scorecard, identifying its characteristics and barriers to business objectives. The Balanced Scorecard has gained an increasing popularity, thanks not only to the use of non-financial indicators but also to its growing concern with strategy. Facing an ever-changing environment, with different information needs, as a result of changing market conditions, and growing competitiveness, it is necessary for companies to have valued propositions, in order to conquer their place in the market. Next, based on the mission, vision, and values of the BIKE& SURF company, the objectives, indicators and targets are defined, allowing us to understand the process and all the barriers. Finally, the conclusions and limitations inherent to the development of the project are highlighted.

Keywords: electric bicycle; company; balanced scorecard.

Resumo

Este projeto final de tese tem como principal objetivo explorar a conceção de um modelo de Balanced Scorecard para uma empresa de venda de bicicletas eléctricas. Neste sentido, este projeto descreve todo o processo de desenvolvimento do Balanced Scorecard na empresa BIKE&SURF. O ponto de partida é a revisão de literatura sobre o tema, começando por uma descrição da utilização da bicicleta no mundo moderno, acrescentando o funcionamento da empresa em questão e os novos desafios que esta enfrenta. Complementarmente, será feita uma abordagem ao Balanced Scorecard, identificando as suas características e barreiras aos objetivos empresariais. O Balanced Scorecard tem vindo a ganhar uma popularidade crescente, graças não só à utilização de indicadores não financeiros, mas também à sua crescente preocupação com a estratégia da empresa. Perante um ambiente em constante mutação como é o caso da área da mobilidade elétrica, com diferentes necessidades de informação, é necessário que as empresas tenham propostas de valor, de forma a conquistarem o seu lugar no mercado. De seguida, com base na missão, visão e valores da empresa BIKE& SURF, são definidos os objetivos, indicadores e metas, permitindo-nos compreender o processo e todas as barreiras. Por fim, são destacadas as conclusões e limitações inerentes ao desenvolvimento do projeto.

Palavras-chave: bicicleta elétrica; empresa; balanced scorecard.

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1. Introduction

In recent years, "green mobility" has been the focus of attention worldwide, mainly due to the climate problems we are suffering with increasing intensity. This shows, more and more, that the government needs to be aware of the mobility choices of its citizens, to be able to meet their needs in the most sustainable way (Dill et al, 2008).

A series of aspects related to transportation, traffic, infrastructure, and management of urban mobility has led to the degradation of circulation systems in Portuguese cities and to the dehumanization of urban spaces. In this scenario in which cities develop, the use of infrastructure for bicycles, and encouraging the use of bicycles as a means of transportation, play an important role in sustainable development and the humanization of traffic.

The bicycle could be one of the most powerful allies in urban sustainability if it weren't for one of the most practical and important inventions of humanity. The bicycle has shown not only benefits in terms of sustainability but also in terms of the health of those who use it. The role of the bicycle in the transport system must be considered, as well as the infrastructure necessary for its use, as only in this way will it be possible to increase its number of users (Dill et al, 2008).

For the bicycle to be used as a means of mobility, it is also important that the infrastructure is prepared for it. The "cycle-friendly" structures include everything that improves the use of the bicycle in terms of safety and practicality. This can include bike lanes (and their maintenance), separators between roads and bike lanes, creating safe intersections for cyclists, and also taking into account the aesthetics of the routes (Dochery et al., 2018).

In the environmental aspect, there should be actions that preserve a balance for the natural ecosystem, a decrease in environmental pollution, and also protection of natural resources; on an economic level, this must be balanced with the environmental level, having industrial structures, the appropriate rate of economic growth, and developing ways to save resources and energy; at the social level, actions should be promoted to protect people, to ensure that their rights are fulfilled, and to promote an improved quality of life and health (Claudy et al., 2014).

The bicycle is the mode of transport that has the lowest primary energy consumption and is energy consumption and is ideal for short-distance urban travel. Its benefits are considerable for both the urban community and its users. Thus, the concept of urban

mobility centered on the bicycle will be reflected in a system of sustainable transport, based essentially on public transport and active modes (walking and cycling) and less in the car. The bicycle will go through this to play a central role. It will not be a leading role, but a key role in ensuring the sustainability of the transport system, being the mode that connects all other modes of carriage.

Coming from this whole phenomenon and problem of mobility, BIKE&SURF was born. Aiming to meet the needs of people who want to use the bike as a means of transport, but with less effort, they specialized in selling electric bicycles and their accessories.

Despite being innovative and disruptive, the company needs an instrument for performance improvement aligned with the developed strategy, to achieve its goals- and the Balanced Scorecard proposal is an instrument to meet the existing needs.

Within this scenario, this study seems to be justified in order to help the company's management to identify factors that are important to facilitate the development and growth of its organization.

The development of this work was supported by a qualitative and exploratory methodology, resulting from data collection and the fact that the author has functions in the company BIKE&SURF, originating a knowledge of the business area and of the company itself.

The case study developed presents a proposal for organization and management, to provide a global and integrated view of the organization's performance - Balanced Scorecard – and to analyze their future objectives.

The Balance ScoreCard is a tool that allows to strengthen and implement the organizational strategy. Enables us to optimize the business, having an overview of what happens in the organization, optimizing the communication between related parties in the organization. Besides that, allows positive changes in the organization's performance, increasing motivation, and changing the behavior of employees.

1.1 Justification, goals and methodology

The current levels of congestion and the environmental impacts emissions from motor vehicles are relevant reasons for changes in paradigms and values in the transportation sector. In parallel with the rational use of the automobile and investment in public transport, there has to be encouragement for the use of alternative transport such as the bicycle to improve the quality of life.

The bicycle is the mode of transport that has the lowest primary energy consumption and is energy consumption and is ideal for short-distance urban travel. Its benefits are considerable for both the urban community and its users (Nazelle et al., 2011).

Therefore, it is considered of great relevance to choose as the case study company of the thesis, a company that operates in the area of selling bicycles, a valuable instrument to revolutionize mobility.

The main objective of this thesis is to explore the use of the balance scorecard tool in the BIKE&SURF company.

For adequate clarification of the subject under study, the structure of the Project that will be developed follows the following structure:

- Chapter 1- Introduction. In this chapter, a first approach is made to the theme and its surroundings. It frames some information in order to understand the relevance of the theme in the global context and also to contextualize the research carried out. The objectives, the research questions, and the structure of the thesis can be found in this chapter.
- Chapter 2- Literature Review. Describes the state of the art, with the presentation and information about the use of the bicycle, and the challenges of managing organizations, the development of the Balanced Scorecard.
- Chapter 3- Company Presentation, where is presented a description of the company BIKE&SURF, as well as its structure, mission, values, objectives, goals, and critical success factors-
- Chapter 4- Balanced Scorecard Proposal, where a model's conception proposal is presented, defining the various steps for building the corporate Balanced Scorecard for BIKE&SURF which includes, its objectives, methods, and indicators.
- Chapter 5 (Discussion) and Chapter 6 (Conclusion)- Finally, it describes the conclusions of the designed system, summarizing the study, pointing out the practical

contributions, alluding to the limitations faced in carrying out the of the project, and finally suggestions for future research.

2. Literature review

2.1. The bicycle as a commuting mode of transport

In recent decades, problems related to sustainability and the environment have been highlighted on the agenda of world authorities. World problems like drought, pollution, and climate change are major points of concern, and every effort is being made to find solutions.

In order to reduce carbon dioxide emissions, sustainable mobility has received a lot of attention within the transport network area, and one of the frequently presented solutions is the use of bicycles (Ko et al., 2019).

The use of bicycles brings several advantages, not only at a sustainable level but also at the level of the individual's health. It can reduce the risk of several chronic diseases such as: coronary heart disease, hypertension, diabetes, and obesity. It not only has advantages in terms of physical health but also in terms of mental health. Being able to have this type of advantage while commuting for the different tasks of daily life is, without a doubt, a great positive point of using the bicycle (Dill, 2008).

The implementation of sustainable plans focusing on cycling modes of transportation is highlighted worldwide in different scales of priority. In the European context, there are exemplary cities that are struggling to increase their cycling usage level.

However, there are also barriers to its use: Bad weather; the lack of bike-friendly infrastructure, the lack of comfort, and the lack of storage facilities.

Choosing a bicycle as a means of transport depends on several factors, mainly socio-demographic, and in this study, we will focus on its impact in the modern world.

The bicycle use can be divided into three categories: everyday, for who uses the bicycle to travel home-to-work or home-to-school, which can be combined with public transport or in urban areas on a regular or periodic basis; sporty, for whom use the bicycle for sport, on the road, at higher speeds and longer distances trails or in the mountains, either in the practice of mountain biking or in the practice of downhill; leisure or Cycling tourism, who intend to make trips in a group, or to tourist spots and who use usually greenways or roads with low traffic volume (IMTT- Plano de Promoção da Bicicleta e Outros Modos Suaves 2013-2020).

It is possible to identify different types of bicycle users, depending on their experience, dexterity, risk perception, and behaviors in the context of complete coexistence

and integration with the circulation of trivialized traffic, which represent three categories: **the frequent cyclist**, more aware of his rights and obligations, who uses the bicycle as a means of commuting on a day-to-day basis, who are comfortable sharing space with traffic motorized; **the occasional cyclist**, who has practical knowledge but lacks the experience or agility and is not comfortable sharing space with motorized traffic (higher speeds); **and the inexperienced cyclist**, with reduced practical knowledge, little experience and that sometimes presents unconscious behaviors in the face of the dangers to which it is exposed. (Winter et al., 2011; Gatersleben et al., 2010).

2.1.1 Impacts of bicycle use

Health

The main way to increase physical activity suggested by the most diverse studies carried out in area of health, suggest that the easiest and most acceptable ways to ensure an increase in physical activity are those that can be incorporated into the routine of populations, such as walking and cycling instead of using a car (Nazelle et al., 2011).

These modes of transport most actives are very effective ways of guaranteeing an adequate physical form, since they are more convenient, more accessible and low-impact, and can be combined with other transport for greater distances. Cycling is compared to other exercise physical activities, perhaps the ideal way to practice physical activity in order to obtain gains in health, as it avoids some of the problems that are usually associated with activities such as running (Ege, 2005).

According to the recommendations of the vast majority of studies by health authorities, including one World Health Organization report, the practice of at least 30 minutes of exercise moderate per day for adults and about 60 minutes for children has a major impact on public health, which are quantified in approximately 5 more years of life compared to physically inactive people (Shayler et al., 1993).

Economic

The implementation of the bicycle in societies as well as all its dedicated infrastructures has an economic impact on the region where it is located, like other modes of transport. The consideration of this fact is of great importance since it is one of the main

methods of selection that local decision-makers use to guide their investment policies, trying to make investments that in the short, medium, or long term are also profitable in terms of economic (Claudy, 2014).

The increase in bicycle trips has yet another direct consequence related to the reduction of kilometers traveled by cars and buses, which are necessary condition for the creation of benefits. One of these benefits is greater and better fluidity road, a consequence of the reduction in the number of vehicles that use the roads, influencing directly travel times for car and public transport users , thus increasing their productivity by reducing time lost on travel (Ben Clarke, 2016).

Allied to this benefit is another related to the security improvements that check on the roads, since with the investment made to increase bicycle trips, particularly in terms of building cycle paths and improving existing intersections, it is likely to reduce the rate of accidents involving cyclists. (Claudy, 2014).

According to the European Comission, when cities combine measures in favor of cycling and public transport, they achieve a reduction in the rate of motorized individual transport use.

Depending on the level of congestion in the urban environment, cycling is faster than motorized private transport for trips of at least 5 km, and this distance can be up to 8 km **(Figure 1)** when compared with public transport.

On the other hand, in Europe 30 % of journeys made by private motor vehicle are within 3 km of distances of less than 3 km and 50% of these journeys are less than 5 km. It is in this range that the bicycle proves to be more competitive and can replace motorized individual transport contributing directly to the reduction of urban congestion and other externalities related to car use (European Comission, 2018).

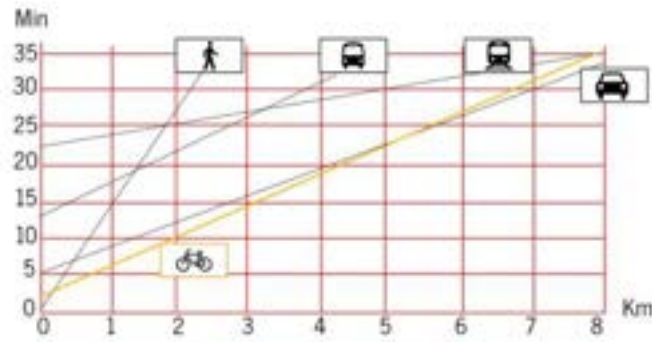


Figure 1- Travel time as a function of km to be covered (CE, 2018).

The reduction of the part of the family budget devoted to individual motorized transport, the reduction of hours of work lost in traffic jams, and the reduction of medical expenses thanks to the practice of regular physical exercise, are examples of economic benefits that European commission (2018) associates with the use of the bike regularly.

Environment

Nowadays and as a result of some transformations and critical changes observed throughout the planet, the issue of environmental protection is gaining more and more visibility and is increasingly one of the main concerns of decision-makers and the population in general. At this point, Europeans have always been one of the most dynamic and concerned peoples according to a survey carried out in 1995, where 82% of Europeans declared that environmental issues constituted a problem of to the fore and 72% considered that economic development and environmental protection should be considered together (Gossling et al., 2019).

These concerns reported on the European continent range from meeting global goals for the future, where the aim is to reduce impacts on the environment without harming the economic evolution of the countries. The bicycle and all its infrastructures and complementary policies have become a solution for a development more sustainable, placing itself as an environmentally clean alternative for transport motorized (Pucher et al, 2010).

Transport is one of the points where intervention is most important and sensitive, and produces major changes in environmental terms, as this activity is described as one of

the most polluting human activities. The traffic and consequently the pollution caused by it, has gradually increased every year, contrary to what happens with other sectors of society that managed to reduce their emissions in order to converge to the values agreed in many protocols among the years.

At the moment, the transport sector is both the fastest growing sector in terms of energy consumption and greenhouse gas production greenhouse, releasing a wide range of atmospheric pollutants creating a negative impact on the environment (Handy et al., 2014).

Social

The democratization of mobility through greater sharing of public space and the possibility of greater and better autonomy in travel by bicycle, allowing both young and old to access facilities, are pointed out by the European Commission (2000) as social benefits.

It is important to emphasize that the use of public space and congestion in cities have a huge impact on social issues. Every means of transportation uses public space either when movement (circulation), or stopped (parked)- Individual motorized transportation takes up the most public space.

In this way, increasing bicycle use in a city can lead to more public space being available for social activities and allow the city to have a more people-friendly design and use. With a modal shift from individual motorized transport to bicycles, it is estimated that there will be an effective reduction in traffic congestion, as there will be a reduction in the number of cars in circulation and greater traffic fluidity (Morckel, 2014).

A reduction in the volume of motorized traffic in cities and an increase in bicycle use leads to that the safety of the city, especially for children (Pusher, 2008).

Road Safety

The increase in the number of people walking and cycling is directly linked to the reduction number and severity of accidents. Jacobsen (2003) concludes that a person who drives a motor vehicle is less likely to collide with a person walking or cycling when more people are walking or cycling. Furthermore, it mentions that doubling the number of bicycle users in the city leads to a reduction by one-third of risk of accident for those who use the bicycle.

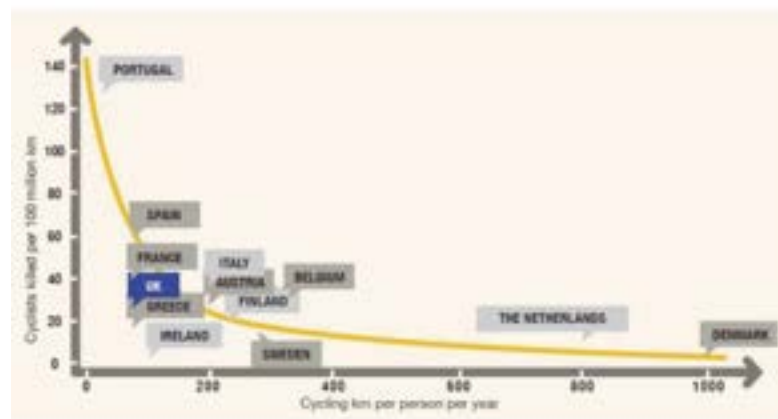


Figure 2- More bicycles lead to greater road safety (European Road Safety Observatory Facts and Figures – Cyclists – 2021)

Figure 2 shows us that in countries with the highest number of kilometers cycled per person, smaller is the number of fatal accidents per 100 000 kilometers of road users. Among the countries analyzed in the Figure, we know that Portugal has the lowest modal index with regard to the use of bicycles as a means of transport, in contrast to Denmark.

Here it appears that the more bicycles on the road, the lower the number of deaths. The graph shows us that in Portugal around 130 cyclists die every 100,000 kilometres, while in Denmark less than 10 cyclists die every 100,000 kilometers cycled.

2.1.2 Portugal and the use of the bicycle

Bicycle networks have been seen as a tool to reduce automobile congestion and car congestion, and more recently, air pollution. In However, in Portugal, the lack of a legal framework for bicycles is accompanied by the integrated way in which its infrastructure has been implemented, the result of a planning process still marked by modernist mono-functional zoning and not by the idea of system, continuity, overlap and integration (Magalhães et al., 2006).

In Portugal, where the bicycle was traditional whenever space allowed it, its disappearance accompanied the explosion that occurred in car use in recent decades. last decades. Currently, few municipalities in the Lisbon metropolitan area present cycling plans.

In 2001 the first project for a municipal cycling network was presented for Lisbon, integrating for the first time the idea of overlapping with the ecological structure, with routes

oriented for everyday use and in close articulation with the transport system. This first approach created the basis for the deepening of the methodology in support of the "Plan for Cyclable Almada", in which CEAP - Center for the Study of Architecture and Landscape Architecture of the Instituto Superior de Agronomia planned a municipal network of cycling paths. (Magalhães et al, 2006).

This integration of bicycle paths into the ecological structure (which is presented in the form of green spaces, woods, agricultural spaces, squares, and wooded squares) accompanies the need for their integration into a broader transportation system.

In Portugal, bicycles and their routes are an effective alternative and a complement to the transport system, and can contribute to increasing the overall efficiency of the system. This situation results from the fact that the bicycle is very competitive short distances, as known before.

Smooth mobility is increasingly present in EU policies and strategies, as has become a very necessary and current topic. Portugal despite finding it a little late with regard to policies adopted for the promotion of modes smooth, also created some incentives in this area that deserved visibility.

The Government created an Plan for National Promotion of Bicycles and Other Smooth Transport Modes – 2013-2020, such as the title suggests, its fundamental challenge is to promote of more vigilant means of transport for that period. The Plan forms part of a new mobility paradigm, which aims to combine the economic development of cities and accessibility with the improvement of citizens' quality of life, together with the practice of a healthy life, the defense of the environment, and the reduction of dependency energetic. Changing behavior in favor of sustainable mobility implies “valuing the use of bicycles and “walking”, as practices for daily life.

In addition, despite being a National Plan that establishes a public strategy to promote the use of soft modes, introducing the notion of cycling networks and systems, it is at the local level that the action is more prominent, giving preference to the scale of the agglomeration, the neighborhood, the school, and the work.

2.2 Market Overview

The electric bicycle market was valued at \$26.73 billion in 2021 and is expected to reach \$53.53 billion by 2027, registering a CAGR of 12.27% during the forecast period (2022 - 2027).

Due to the COVID-19 pandemic outbreak, people started showing an increasing interest in purchasing their own means of getting around. The increasingly hectic life and the need for daily commuting, it has become almost necessary to own a vehicle, as public transportation is often unreliable. Behind this, there is a growing concern to preserve and sustain the environment for future generations, mainly due to the increasing scarcity of natural resources and environmental concerns. Electric bicycles are the ideal solution to this problem. They are environmentally friendly and solve the problem of daily commuting (Ling et al., 2017).

Asia-Pacific is expected to dominate the global market. In Asia-Pacific, China led the regional market. The largest consumption of electric bikes is in China, which drove the number of sales, influencing the growth of the global electric bike market. Regions such as Europe are witnessing the process of shift in consumer motivation to purchase an e-bike from leisure to daily use.

The electric bicycle market is highly fragmented, with the major players holding a low share of the total market. Some of the major players in the market are Giant Bicycles, Merida, Trek Bikes, Riese & Muller, and Fritzmeier Systems. The presence of all these companies is concentrated mainly in China, with Europe and North America being the other important markets.

In addition to factors such as spatial structure, geography, morphology, and climatic conditions that have an obvious impact on bicycle use, political strategy is a prerequisite essential condition for achieving a high level of bicycle use. Following the evolution of bicycle 20th century, policy strategies have encouraged cycling in Europe (McQueen et al., 2019; Sun, 2022).

According to CONEBI (2020), around 20 million bicycles and e-bikes are sold annually in Europe, directly and indirectly generating more than 120,000 jobs and creating more than 900 SMEs.

Regarding the sale of bicycles in the European Union (including the United Kingdom) over the last 20 years, sales have remained more or less stable at about more or less stable at around the 20 million bicycles mentioned above.

2.3 Balanced Scorecard

The Balanced Scorecard was developed in the 1990s in a study carried by two professors, Robert Kaplan and David Norton, of Harvard Business School, and a set of twelve North American companies, believing that financial metrics were ineffective for modern companies.

The group discussed several possible alternatives, but bet on the development of a scorecard with performance measures, which would allow capturing activities of the entire organization - problems with customers, activities of employees, concerns of shareholders and internal management processes (Norton et al., 1996).

The Balanced Scorecard ensures a comprehensive perspective of the performance in critical areas of the business, and at the core of the four perspectives that make up the Balanced Scorecard, are the vision and strategy (Niven, 2003).

It describes the organization's strategy around four axes, the perspectives: financial, customer, internal processes, learning and growth. From these perspectives, objectives and metrics are outlined to evaluate the execution of the strategy. Metrics are linked together through cause-effect relationships, providing management with visibility into the impact of each of the perspectives on the all of the organization (Martunis et al., 2020).

The Balanced Scorecard does not only aim to control the performance organization, but it helps to implement the strategy, define the objectives, take the actions according to the strategy and the objectives to be obtained according to the feedback results (Russo, 2009).

In order to compare the financial performance of the past with the future strategic performance, Kaplan & Norton (1996) state that the four perspectives based on the Balanced Scorecard allow analyzing the organization as a whole. It gains great importance at an organizational level when it moves from a system of organizational performance mediation for a strategic management system.

The perspectives of the Balanced Scorecard represent different angles of view of the strategy. Together, provide the strategy with a mix of metrics, a mix of goals and a mix of indicators.

The Financial and Customer perspective metrics reflect the consequences of actions taken in the past and the contribution to the “bottom-line” of the company by the execution of the strategy. These are the so-called “lagging indicators” and are an important source of strategy feedback (Kaplan et al, 2007; Pinto, 2007).

Metrics from the Internal Processes and Learning and Growth perspectives represent what steps are being taken to boost the future growth of the company and ensure its development. These metrics will have a direct impact future result of the Financial and Customer perspective metrics. Consequently, are called “leading indicators” (Kaplan et al, 2007; Pinto, 2007).

3. BIKE&SURF- Business Presentation

3.1 Description and Objectives

The business of BIKE&SURF is based in a physical and online sales company for e-Bikes and bicycle accessories. Their mission is to bring all the positive aspects of technology to the practice of cycling. The main motivation is to encourage physical exercise and a healthy lifestyle, not only by replacing the car by the bicycle for all short-distance journeys within the city, but also for the leisure of riding in the open air.

The main product that they offer is an electric bicycle using an integrated electric motor for more propulsion. In this business, in addition to the sale of the e-Bikes, there are also sold accessories directly related to the normal use of the bicycle (helmets, adaptable bags, cell phone holder, repair kit, etc.). It is important to mention that sales are mostly made by the implementation of the business model supported by E-commerce, Digital Marketing, online branding, and social networks.

The company believes that today, due to the reality we live in, the real solution to achieve the quality of urban life is through the use of bicycle so, the main goal, is to reach more users.

3.2 Target and Consumers

Approaching now the aspect of the target market, BIKE&SURF is exploring the territory of Oporto because it is the district where it is located, even though it is not a territory with a large extension of bike paths (Table 1), and the ones that exist do not have the oversight and maintenance that it should.

Ecovia do Litoral Norte: 73 kilometers
Cycle path of Foz, on the Douro River: 4,862 meters
Cycle Paths of the City Park: 9,778 kilometers.
Bike path in Foz da Ribeira da Granja: 4,504.47 meters.
Bike path of Afurada - Marbelo Beach: 5,859 km
Bike path Canidelo - Litoral: 3,243 km.
Bike path of Valadares - Praia da Sãozinha: 1.871 km.
Bike path of Aguda: 0.421 km
Bike path of Granja: 0,295 km

Table 1- Examples of Bike Paths in Oporto.

The target audience is situated in the age group of 25 years and over, and there are always models of e-bikes that fit better each case in particular. There is always considered the physiognomy of each individual, as well as the framework of the different styles of bicycles and the type of use for which they are intended (leisure/road trip; urban for commuting; urban to complement with public transport; leisure/mountain transport; recreation/mountain; for sports use).

3.3 SWOT Analysis

The first analysis relates the company to its environment, seeking to eliminate its weaknesses, as well as convert external threats into new opportunities. Next, the weaknesses, strengths, weaknesses, and opportunities of the company BIKE&SURF are identified.

Strengths:

- Excellent price-quality ratio of our products;
- Good geographical location (coastal zone), enabling democratization of the electric bicycle in harmony with the sea sports;
- Bicycle as a more efficient and faster means of transport in urban displacements;
- Environmental sustainability in line with the reduction of gas emissions under greenhouse gas emissions and respective improvement of automobile traffic as well as improvement of urban spaces;
- Products with a guarantee that will convey safety to the customer;
- Great relationship with costumers.

Weaknesses/Weaknesses:

- Price range not accessible to all people;
- Lack of education and discernment of the Portuguese population to conclude that this means of transportation is a direct contribution to improving the quality of individual and collective life;

Opportunities:

- Motivation to reduce the use of transport powered by fueled transportation;
- Complementarity of these transport solutions with public transport such as train and subway;
- Emerging phenomenon of electric bicycles;
- Improvement of individual and collective health (bicycle as a direct promotion of physical exercise);
- Incentives for the purchase of electric bicycles by the environmental fund;

Threats:

- Business implementation in a receiving economy;
- High affluence to the implementation of these businesses in Portugal.

3.4 Management Analysis

The conception, implementation, and development of a management control system presuppose a correct diagnosis of the implementation conditions. The diagnosis of the company's needs and the instruments to meet these needs are an essential phase to answer the conception of an ideal control system. From this diagnosis, it is necessary to identify the instruments that actually exist.

Accounting is outsourced, which sometimes means that the documents are not available on time to support decision making, particularly at the management decision-making, particularly at the management level.

For the company under study, there is no system used as a form of cash control. It is controlled by excel sheets, where calculations are made in order to have a perception of the income and expenses of each project, making it difficult and quite time-consuming, to have a global and accurate view of the evolution of the business.

Excel sheets also serve as treasury sheets, with formulas made in these documents, where it is quite easy to make mistakes, causing errors, and consequently can cause a distorted view of the treasury funds.

The hours are not accounted in any management tool. As there are only three employees, there has never been this need.

4. Balanced Scorecard application- BIKE&SURF

4.1 Strategic Objectives

As seen in the previous chapter, the company is quite new and does not yet have a well-defined market strategy. In addition, the company does not yet have a defined control management tool, monitoring of results and performance.

It is important to choose a method, which allows to overcome these two shortcomings- so the model chosen was the Balanced Scorecard, enabling the definition of strategic objectives indicators and targets, in the search for the strategy's success.

At this point, we will present the strategic map, based on the vision and strategic objectives of BIKE&SURF company. The main goals are:

- Differentiate from the competition;
- Attracting new customers;
- Maintenance of existing customers;
- Increased sales;
- Increased margins;
- Increased quality of service.

In the development of this practical case, we have based the Kaplan & Norton (1996) model of the four perspectives, adjusting it to the reality of the company, with the objective of responding to the company's needs. In this study case, the financial perspective was excluded because it was not possible to access financial data.

In the **Customers' Perspective**, the strategic objectives were defined as:

- Improve customer satisfaction;
- Increase the client portfolio;
- Retention of existing clients;
- Increase business volume.

From this perspective, there is the concern to maintain the relationship with the customer and simultaneously acquire new clients. It will be adopted a strategy of intimacy,

improving the relationships with clients, building customized solutions to the needs of each one.

In order to accomplish deadlines, quality, cost, and services defined by the clients, BIKE&SURF must define objectives and goals, so it can increase customer satisfaction and loyalty.

The "**increase the client portfolio**" objective will be measured by the number purchases made with new customers- it is fundamental that the company obtains new clients for its growth and profitability.

The "**Retention of existing clients**", will be measured according to the percentage of projects sold to existing customers- loyal customers are indispensable for the growth the company.

From the **Internal Processes Perspective**, attention is focused on the internal processes required for customer satisfaction. The company needs to define what it is necessary to do in order to know how to exceed customer expectations.

The objectives requested for the Internal Processes Perspective are:

- Continuous improvement of the sales process and improvement of quality suppliers.

With the implementation of the Balanced ScoreCard, BIKE&SURF will be able to find new processes that contribute to the creation of value, and identify improvements in sales, obtaining a competitive advantage in the markets in which it operates.

Finally, **the Learning and Development Perspective** should give importance to the competencies required to achieve the strategic objectives. One of the factors for the organization's success is its human capital, it's their employees.

In this perspective, the objectives are:

- Increase the motivation of its employees;
- Investing in the education of its employees.

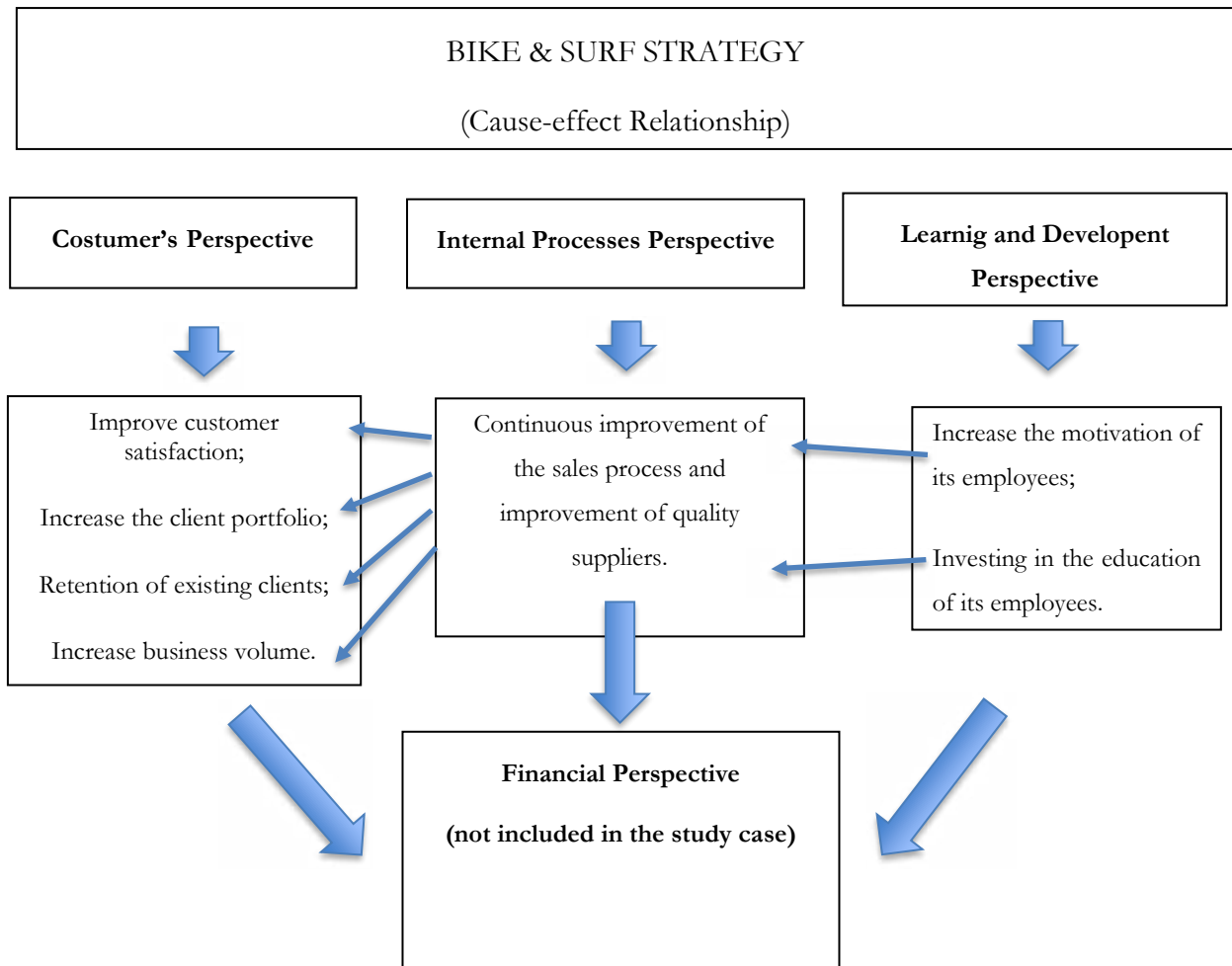


Figure 3- BIKE&SURF strategy.

4.2 Performance indicators

Performance indicators, or metrics, are the elementary level of the Business Scorecard. The indicators quantify and represent the degree to which the organization's strategic objectives of the organization.

Their definition must be clear, and they must be able to be measured on a regular basis to gauge their performance. As much as possible they should be objective and their results allow for a clear reading.

In the **Customer Perspective**, were defined as indicators the **customer loyalty, number of visits to customers, percentage of new customers, and client satisfaction.**

With the entry of new products in the store, the company wants to increase its number of customers. This growth, associated with an improvement in the efficiency of the services provided, will be seen by reducing the time of the bike assembly and configuration, as well as the maintenance and technical support services, which can guarantee better proximity to customers and automatically better support in the internal processes of these customers ensuring customer satisfaction.

In the **Internal Processes Perspective**, the main indicators defined were **customer response time, repair delay time, and waiting time between purchase and delivery.**

Poor planning may lead to increased costs, including logistics costs, additional transport or even the refusal by the customer of the requested order.

The indicators considered for the **Learning and Development Perspective** were **the increase of hours of employee formation and employee satisfaction.** The indicator of an increase of employee formation leads to reduce waste of time, increase capacity, and improve quality of the services.

The indicator of employee satisfaction is interconnected with the capacity of the company. Customer satisfaction depends on the satisfaction of the of the employees, therefore the increase of the satisfaction of the human capital increases the productivity of BIKE&SURF.

4.3 Objectives and barriers of Balance ScoreCard implementation

With the implementation of the Business ScoreCard at BIKE&SURF, it is expected to provide management with a global and holistic vision of the organization. This overview of the organization enables one to assess organizational performance and evaluate processes in order to update strategy.

One of the major objectives of the organization is to ensure the quality of its services, meeting deadlines, and ensuring the motivation of its employees.

One of the major obstacles in the implementation of this tool will probably be the lack of technological and organizational structure of the company, also taking into account the fact that it is a very recent company. After the definition of the indicators, one of the

perceived obstacles was the lack of computer data for the analysis of some indicators. This problem will be solved by developing a computer database program, that will allow to make a correct data analysis.

After analyzing the employee's opinion, it became clear that the lack of communication in the organization became a negative point in the organization. With the implementation of the Balance ScoreCard, BIKE&SURF aims to align the organization's objectives with individual objectives, using more effective methods of communication between workers.

5. Discussion

The Balance Scorecard enabled to clarify vision and strategy, setting goals and managing resources; and improving feedback and learning for growth through the three perspectives (customers, internal processes internal processes; learning and growth). But to reach more customers, there are also needs that the balance scorecard cannot solve - the structures needed to use the product that is sold at BIK&SURF.

For people to feel like buying bicycles at BIKE&SURF, it is important that the business is optimized, but it is also important that the structures surrounding BIKE&SURF area are prepared for bicycle use.

The demand for bicycle use is influenced by several factors, not only structural but also social. The “demand” refers to the population that presents characteristics that make them more inclined and prone to bicycle use in. To plan mobility by bicycle, it is important to take into account the individual socioeconomic characteristics and the behavior of users in relation to the infrastructure offered. Regarding this aspect, two intervening factors were raised: socioeconomic characteristics and the user's perception.

International experience and data obtained in several countries have shown that levels of cycling are somehow conditioned by the existence of proper infrastructures for their practice, both at a recreational level and in terms of urban transport, and there is even a historical precedent for the use of cycle paths as a means of promoting cycling.

In this scenario, the cycling and its promotion are of great relevance given the threat to the quality of life caused by the uncontrolled increase in car traffic. The constant need to revitalize urban areas and restrict car traffic demonstrated by local decision-makers and urban planners, leads to the consideration of alternative solutions for urban transport, mainly for short distances, since they are responsible for a large part of the trips in cities, with cycling and walking emerging as the most sustainable solutions (Reid, 2010).

Security is relevant in several aspects and can be influenced in several ways, either by construction of long routes without interruptions in residential areas, either by minimizing routes on streets considered more dangerous, either by making connections as legible as possible, either by limiting the number of solutions and making the solution as unambiguous as possible, or even avoid or minimize conflicts with oncoming traffic or crossing the cycle path, reducing speeds, especially in areas with a high number of conflict points and avoid obstacles along the street (Brussel et al., 2012). People who use bicycles on their journeys are

even more vulnerable in the dark and on rainy days. In these conditions, safety is related to issues of visibility, verifying that this decreases for all those who circulate on the public road (Crow, 2007).

Last but not least, is the infrastructure attractiveness criterion. One of the requirements more difficult to achieve, because what is attractive to a person who cycles may not be for another. However, it will always be pleasant to use the bicycle if everyone's safe road users and the attractiveness of the area surrounding the infrastructure exist (Kroesen et al., 2016).

In the city of Porto, where BIKE&SURF operates, the dynamics that currently occur in multiple sectors of urban life, and in economy, is a unique opportunity to deepen this process of change. The international affirmation of the city and also of the region is growing, demonstrating its capacity to attract people, innovation, modernity, and private investment. The PDM2020 a new approach to transport policy, redistributing existing public space and encouraging multimodality.

The current predominance of individual transport must be changed the sustainability of the city under the environmental point of view, impact on climate change, energy equation, and public health. (INE, Mobilidade e Funcionalidade do Território nas Áreas Metropolitanas do Porto e Lisboa, 2017; Estratégia para uma rede de circuitos cicláveis para o Grande Porto, 2014; Plano Diretor Municipal- Relatório, 2020).

From this perspective, the vision for mobility is focused on increasing the supply of space dedicated to pedestrians and other soft modes, in increasing and improving the supply of public transportation, not forgetting the parking management policy. In other words, more and better public transport, less individual transport, and the requalification of the space dedicated to pedestrian space.

Given the rugged topographic profile of the city of Porto, the slopes are an especially decisive factor in the choice of especially decisive in the choice of routes and bicycle users. Steep slopes or very steep ones are suitable if they are short and followed by flat sections. In Porto, slopes between 3% and 6% are common and extensive, and can be considered a barrier and demotivating.

International experience and data obtained in several countries have shown that levels of cycling are somehow conditioned by the existence of proper infrastructures for their practice, both at a recreational level and in terms of urban transport, and there is even a

historical precedent for the use of cycle paths as a means of promoting cycling. In the context of sustainable urban development, the importance given by the society to the growth in the use of transport considered sustainable.

Soft modes of transport are increasingly becoming a transport option, particularly for younger generations, so the strengthening of cycling channels, and establishing a network of routes articulated with the other modes of transport, is also a central element of the Plan's proposal (INE, Mobilidade e Funcionalidade do Território nas Áreas Metropolitanas do Porto e Lisboa, 2017; Estratégia para uma rede de circuitos cicláveis para o Grande Porto, 2014; Plano Diretor Municipal- Relatório, 2020).

Despite all the investment, Portugal, and Porto in particular, still lags far behind the rest of Europe when it comes to bicycle use, comparing to Copenhagen, where the number of bicycles exceeds the number of cars.

A very important factor is to create roads with cycle lanes where cyclists have priority and motor vehicle drivers are not allowed to overtake or drive too fast. In the case of the city of Copenhagen, this street concept was implemented, which resulted in a high degree of success in terms of citizen adherence and satisfaction of the respective residents.

Another way of promoting the adoption of the bicycle, also following the example of Copenhagen, create initiatives and incentives for bicycle use, because the cultural mentality is also an important factor.

Something that may explain why the ideal conditions for e-bikes are not yet in place is that the electric bicycle market is small and in need of significant expansion. However, there are considerable opportunities to be explored in this growing sector.

The electric bicycle market has great potential for growth. As more people become aware of the benefits of sustainable mobility, the demand for e-bikes has the possibility to increase significantly. Moreover, the uptake of e-bikes will enable the development of adequate cycling infrastructure and government incentives can drive the mass adoption of electric bicycles. It is critical that BIKE&SURF keep up with trends and changes in the market, adjusting its strategies as needed.

While the electric bicycle market may face initial challenges, the combination of an expanding market and the pursuit of growth opportunities, can result in increased profitability for BIKE&SURF.

Over time, demand for electric bicycles is expected to grow and become more profitable, as awareness of sustainable mobility intensifies and infrastructure develops.

6. Conclusion

Applying the Balanced Scorecard (BSC) to BIKE&SURF, a bike shop, can be an effective approach to assessing and managing business performance from several key perspectives. However, when faced with a lack of adequate infrastructure for bicycle use, the store can face extraordinary challenges in achieving its goals and maximizing its potential.

The Balance ScoreCard is a management system strategy that involves the definition and monitoring of goals and indicators in four interconnected perspectives: financial, customer, internal processes and learning and growth. By applying this strategy at BIKE&SURF, it is possible to assess financial performance, customer satisfaction, efficiency of internal processes and the development of new skills. But the lack of adequate infrastructure for the use of bicycles can have a negative impact on all these perspectives. For example, in the gain of new costumers, the demand for bicycles and accessories may be constrained due to poor road safety for cyclists or lack of proper parking. This can directly affect the store's revenue.

In this way, the application of the Balanced Scorecard at BIKE&SURF can reveal the importance of adequate infrastructure for the success of the business. The lack of safe bike lanes, adequate parking and other necessary infrastructure can hinder the achievement of financial objectives, customer satisfaction, efficiency of internal processes and the development of skills and innovation. It is essential that the bicycle shop works in partnership with the bodies responsible for urban infrastructure to overcome these challenges and create an environment favorable to the use of bicycles as a sustainable means of transport.

It is necessary to create alternatives to cars, a good public transport system - with some regular lines, having a single ticket office for the entire existing transport system in the city, a good cycling network, good cycling infrastructure, create a large-scale bike-sharing system and, fundamentally, physical interfaces that function as bike parks. But at the same time, campaigns of promoting the use of bicycles, informing citizens of what is being done and why it is being done.

In a topic like cycling mobility, everything will never be done and everything will never be studied. When talking about cities, it is unlikely that a model will be achieved that is the recipe for everyone. The problems of one city, won't be the problems of another one, because no two cities are alike. Despite this, there is a awareness that there are several

problems that are common to most cities, and that some solutions for their resolution are the same or similar, hence the benchmarking is fundamental.

Oporto has an ambitious project, not only in terms of cycling mobility, but in terms of regarding mobility in general. It is therefore important, in the near future, to deepen themes such as urban logistics, where the bicycle will play a decisive role.

7. References

- Baptista P., et al.** (2015). From on-road trial evaluation of electric and conventional bicycles to comparison with other urban transport modes: Case study in the city of Lisbon, Portugal. *Energy Conversion and Management*, 92, 10–18.
- Bartle C., Avineri E., Chatterjee K.** (2013). Online information-sharing: A qualitative analysis of community, trust and social influence amongst commuter cyclists in the UK. *Transportation Research Part F: Traffic Psychology and Behaviour*, 16, 60–72.
- Ben Clark, et al.**, 2016. Changes to commute mode: The role of life events, spatial context and environmental attitude. *Transportation Research Part A*, pp. 89-105.
- Berk T., et al.** Increased injury severity and hospitalization rates following crashes with e-bikes versus conventional bicycles: an observational cohort study from a regional level II trauma center in Switzerland. *Patient Saf Surg* **16**, 11 (2022).
- Brockman R., Fox K.** (2011). Physical activity by stealth? The potential health benefits of a workplace transport plan. *Public Health*. Apr;125(4):210-6.
- Brussel M., Zuidgeest M.** (2012). Cycling in developing countries: context, challenges and policy relevant research, Chap. 8. In: Parkin J (ed) *Cycling and sustainability*. Emerald Group Publishing Limited, Bingley, pp 181–216.
- Buehler, R.**, (2011). *Journal of Transport Geography*. Determinants of transport mode choice: a comparison of Germany and the USA , p. 644–657.
- Buehler R., Pucher. J.** (2022). “Cycling through the COVID-19 Pandemic to a More Sustainable Transport Future: Evidence from Case Studies of 14 Large Bicycle-Friendly Cities in Europe and North America” *Sustainability* 14, no. 12: 7293.
- Classio J. et al.**, (2022). Cycling in sub-Saharan African cities: Differences and similarities with developed world cities, *IATSS Research*, V. 46, P 398-410.
- Claudy C., Peterson M.** (2014). Understanding the underutilization of urban bicycle commuting: A behavioral reasoning perspective. *Journal of Public Policy and Marketing*, 33(2), 173–187.
- Crow.** (2007). “Design Manual for Bicycle Traffic”. CROW, Ede.

- De Chardon M.** (2016). "A Geographical Analysis of Bicycle Sharing Systems."
- Deakin S. & Nikolaeva A.** (2021) The human infrastructure of a cycling city: Amsterdam through the eyes of international newcomers, *Urban Geography*, 42:3, 289-311.
- Dill, J., & Gliebe, J.** (2008). Understanding and Measuring Bicycling Behavior: A Focus on Travel Time and Route choice. *Bicycling*.
- Dill J. & Kim V.** (2007) . Factors Affecting Bicycling Demand: Initial Survey Findings from the Portland, Oregon, Region. *Transportation Research Record: Journal of the Transportation Research Board* 2031:pp 9-17.
- Dochery, I., Marsden, G. & Anable, J.** (2018). The governance of smart mobility. *Transportation Research Part A* 115, pp. 114-125.
- Ege, C. Krag, T.** (2005). Cycling will improve environment and health. 12p.
- Handy S., Van Wee B., & Kroesen M.** (2014). Promoting cycling for transport: research needs and challenges. *Transport reviews*, 34(1), 4–24.
- Gatersleben B. & Haddad H.** (2010). Who is the typical bicyclist? *Transportation Research Part F-Traffic Psychology and Behaviour* 13, 41-48
- Gössling S., Choi A., Dekker K., & Metzler D.** (2019). The social cost of automobility, cycling 323 and walking in the European Union. *Ecological Economics*, 158, 65–74
- Heredia, A. et al.,** (2014). Understanding cyclists' perceptions, keys for a successful bicycle promotion. *Transportation Research Part A: Policy and Practice*. 63. 1–11.
- Holladay D., McClintock H.** (2002). Cycling with public transport: combined in partnership, not conflict. In *Planning for Cycling: Principles, Practice, and solutions for urban planners*, Woodhead Publishing, Cambridge, 2002.
- Instituto da Mobilidade e dos Transportes Terrestres (IMTT).** (2012). Ciclando – Plano de Promoção da Bicicleta e Outros Modos Suaves 2013-2020.
- Jacobsen P.** (2003). Safety in numbers: More walkers and bicyclists, safer walking and bicycling. *Injury prevention : journal of the International Society for Child and Adolescent Injury Prevention*. 9. 205-9. 10.1136/ip.9.3.205.

- Kalter** O., M. J., Geurs, K. T., & Wismans, L. (2021). Post COVID-19 teleworking and car use intentions. Evidence from large scale GPS-tracking and survey data in the Netherlands. *Transportation Research Interdisciplinary Perspectives*.
- Kennedy** C. (2005). The four Pillars of Sustainable Urban Transportation. *Transport Reviews*, 25(4), 393-414.
- Kaplan**, R., Norton, D. (1997). A estratégia em ação: balanced scorecard. Gulf Professional Publishing
- Kaplan**, R., Norton, D. (2007). Using the Balanced Scorecard as a Strategic Management System. *Harvard Business Review*. July-August 2007. pp. 150-161.
- Ko**, J., Lee, S. & Byun, M., 2019. Exploring factors associated with commute mode choice: An application of city-level general social survey data. *Transport Policy* 75 , pp. 36-40.
- Kroesen**, M. & Cranenburgh, S. Van, 2016. Revealing transition patterns between mono- and multimodal travel patterns over time: A mover-stayer model. *EJTIR*, 16(4), pp.754–771.
- Ling**, Z., Cherry, C. R., MacArthur, J. H., & Weinert, J. X. (2017). Differences of cycling experiences and perceptions between e-bike and bicycle users in the United States. *Sustainability*, 9(9), 1662.
- Magalhães** M. & Mata D. (2006). Uma nova mobilidade na área metropolitana de Lisboa (AML): A rede ciclável do concelho de Almada, Pluris 2006.
- Martens** K. (2004). The bicycle as a feedering mode: experiences from three European countries. *Transportation Research Part D*, 9(4), 281-294.
- Martunis**, A. et al. (2020). Adaptation of the Balanced Scorecard Model to Measure Performance of the Departments at Dr Zainoel Abidin Regional General Hospital, Banda Aceh. *J. Model. Manag.* 15, 365–379.
- Martins**, P, (2012). Gestão estratégica com o balanced scorecard: estudo de caso. (Tese de mestrado. ISCTE – Lisboa).
- Marquet** O. *et al.* (2017). Neighborhood walkability and active ageing: A difference in differences assessment of active transportation over ten years. *Journal of Transport & Health*.
- McQueen**, M., MacArthur, J., & Cherry, C. (2019). How E-Bike Incentive Programs are Used to Expand the Market.

- Molinares A.**, Florez J. (2018). Bike and train intermodality: ¿what are users considering when commuting?
- Morckel V.**, & Terzano, K. (2014). The influence of travel attitudes, commute mode choice, and perceived neighborhood characteristics on physical activity. *Journal of Physical Activity & Health*, 11(1), 91–98.
- Moudon A.** et al (2005) Cycling and the built environment, a US perspective. *Transp Res Part D Transp Environ* 10(3):245–261.
- Nadal J.**, Lázaro N., Molina J. (2022). Increasing the use of public bicycles: Efficiency and demand, *Economic Analysis and Policy*, Volume 76, Pp-745-754.
- Nazelle A.**, Nieuwenhuijsen, J., Brauer, M., Briggs, D., Lebre, E. (2011). Improving health through policies that promote active travel: A review of evidence to support integrated health impact assessment. *Environment International*.
- Niven, P. R.**, (2003). “Balanced Scorecard Step by Step: Maximizing Performance and Maintain Results”.
- Oddrun H.** & Rynning M. (2021) Promoting cycling through urban planning and development: a qualitative assessment of bikeability, *Urban, Planning and Transport Research*, 9:1, 276-305
- Pinto, F.** (2007). *Balanced Scorecard – Alinhar Mudança, Estratégia e Performance nos Serviços Públicos*. Edições Sílabo
- Pucher, J.**, & Buehler, R. (2008). Making cycling irresistible: Lessons from the Netherlands, Denmark, and Germany. *Transport Reviews*, 28(4), 495–528.
- Pucher J.** (2010). Infrastructure, programs, and policies to increase bicycling: An international review. *Preventive Medicine*, 50, 106-125.
- Reid, S.**, & Adams, S. (2010). Infrastructure and cyclist safety. *Trl Report Ppr580*.
- Rietveld P.** & Daniel V. (2004). Daniel, V.: Determinants of bicycle use: do municipal policies matter? *Transp. Res. A* 38(7), 531-550. *Transportation Research Part A: Policy and Practice*. 38. 531-550
- Russo, J.** (2009). “Balanced Scorecard para PME”, LIDEL – Edições Técnicas.

- Rybarczyk** G., Gallagher L. (2014). Measuring the potential for bicycling and walking at a metropolitan commuter university, *Journal of Transport Geography*, Elsevier, vol. 39(C), pages 1-10.
- Saelens** B., Sallis, J., & Frank, L. (2003). Environmental correlates of walking and cycling: Findings from the transportation, urban design, and planning literatures. *Annals of Behavioral Medicine*, 25(2), 80-91.
- Shayler**, M., Fergusson, M and Rowell, A. (1993) Costing the benefits: the value of cycling. A report for the Cyclist's Touring Club, CTC, Godalming.
- Sun**, Q. (2022). Beyond market success: unpacking the societal implications of the e-bike. In *Innovations in Transport* (pp. 164-187). Edward Elgar Publishing.
- Silva** C (2014). How urban structure constrains sustainable mobility choices: comparison of Copenhagen and Oporto. *Environment and Planning B: Planning and Design*, 41, 211-228.
- Titze** S., et al. (2008). Association of built-environment, social-environment and personal factors with bicycling as a mode of transportation among Austrian city dwellers. *Prev Med* 47(3):252–259.
- Winters** M., Davidson G., Kao D. & Teschke K. (2011). "Motivators and deterrents of bicycling: comparing influences on decisions to ride", *Transportation* 38, 153-168.

