Perception of bicycle parking conditions and the quality of life of the residents in the inner city of Groningen

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Abstract:

Pressure on bicycle parking management is on the rise with bicycles becoming more popular among residents. As a result, bicycle parking among residents of the inner city of Groningen has lacked in capacity, availability, and accessibility. This study looks at governmental, physical, social, and environmental factors that impact bicycle parking conditions. This research aims to identify how bicycle parking conditions effect the quality of life of the residents in the inner city of Groningen. Surveys were distributed in pedestrian, bicycle accessible and car accessible zones. Additionally, an expert interview was carried out to further explore the current situation. Results show a clear relationship between bicycle parking conditions and the quality of life of the residents. The city center of Groningen presents adequate parking conditions, with possible governmental and physical aspects to improve to ensure optimal satisfaction among the residents. It is recommended to investigate the topic and get a deeper understanding of the issues. Furthermore, repeating the research with a high number of respondents will benefit the accuracy of the relationship.

Keywords: Bicycle parking conditions, Quality of life, City center

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Chapter 1: Introduction

1.1 - Research context

Groningen is recognized as one of the most cyclable cities in The Netherlands (Gemeente Groningen, 2015). In the city with 230 thousand inhabitants, of which twenty-five percent are students, the bicycle is the main transport mode for many (Gemeente Groningen n.d.). Currently, more than 50 percent of trips in the municipality are done by bike, making Groningen the most cycled city in the Netherlands (Gemeente Groningen, 2021). When cycling in the city center of Groningen the density of bicycles is visible, in fact, 1.4 bikes are recorded per resident in the municipality (Renate van der Zee, 2015).

The city of Groningen has a long history of bicycle management that has been of example for many other cities (Deutsches Architekturmuseum, 2018). The transformation to a cyclable city started in 1977, when the circulation plan was put into place. The regulation restricted the use of cars in the city center through specific changes to its accessibility, pushing cars away from the inner city (Deutsches Architekturmuseum, 2018). This approach, heavily opposed at start, had an impact on the inhabitants and the shopkeepers who started later seeing its benefits (Van Hoven & Elzinga, 2009). From the 1980s onwards the concept of compact city was followed, decreasing the overall distance to travel by further promoting bicycle use and pressure pedestrian areas. City planning and policy development still follow these principles in the current day (Van Hoven & Elzinga, 2009). The municipality of Groningen implemented its latest bicycle strategy in 2015 with a vision to further enhance accessibility in the bicycle-oriented city. The strategy consists of 5 goals that are planned to be reached by 2025. These strategies consist of 1) making bicycle use the number one mode of transport, 2) creating a coherent bicycle network, 3) making space for bicycle use, 4) designing better bicycle parking, and 5) promoting the city bicycle use (Gemeente Groningen, 2015).

Many scholars have written on the subjects influencing and improving bicycle use, bicycle policy, mode choice, and the perception of it (Hunt & Abraham, 2007; Akar & Clifton, 2009; Rietveld & Daniel, 2004). Bicycle parking management is seen as an important aspect to shift people from car dependency. Replacing cars with bikes creates space in cities but requests an active involvement in bike storage management as the number of users increases (Van der Spek & Scheltema, 2015). Factors to consider around train stations and city centers are lack of capacity, availability, and accessibility (Hunt & Abraham, 2007; Van der Spek & Scheltema, 2015). Bicycle parking is a core aspect that has been discussed and shared in all these subjects (Van der Spek & Scheltema, 2015). Nevertheless, the issues around bicycle parking conditions in shopping malls, train stations, and city centers are hardly mentioned (Van der Spek & Scheltema, 2015). This study investigates how bicycle parking conditions affect the quality of life of the residents in the city center of Groningen.

1.2 - Area of case study

The area considered for this study is the inner-city center of Groningen. More specifically this paper studies the bicycle parking conditions in three street typologies: pedestrian, bicycle accessible, and car accessible. The inner-city parking conditions consist of a mix of underground facilities, designated parking spots, and flexible parking places. The municipality considers different parking needs which are based on the time of the stay: short, medium, or long (Gemeente Groningen, 2015). The municipality has housing regulations for which each new house that is built needs to consider bicycle parking spaces for its residents. This can come in various forms, but it is mostly seen as private bicycle sheds or inside bicycle parking. The regulations are set by the municipality and vary in specific streets or zones of interest. In pedestrian zones bicycle parking on the street is not allowed and many households have access to indoor parking facilities. On the other hand, bicycle and car accessible streets have both access to outdoor and indoor private parking facilities; with car accessible areas also having to consider car parking spots (Urban Policy Developer interview). Policies in place differ in the three settings studied in this paper, affecting the conditions for which a bicycle can be parked. The parking regulations established in 2020 by the council of the municipality of Groningen consist of a set of rules:

1. "In the interest of the appearance of the municipality to prevent or eliminate nuisance or to prevent damage to public order and safety, it is prohibited to leave bicycles longer than the set amount of time by the municipality executives" (Schuiling, 2020a, p. 1).
2. "The time set for the maximum duration of a bicycle parked in certain designated areas is set to 4 weeks, after which the bicycles will be moved to a facility." (Schuiling, 2020b, p. 1).

1.3 - Research Problem

In the city 66 thousand inhabitants are students, making it one of the youngest cities in The Netherlands (Gemeente Groningen, 2021). Young people have been found to use the bicycle as their main mode of transport (Deutsches Architekturmuseum, 2018). The increase of students every year intensifies the pressure on the inner city, where young people are more inclined to live and travel too (Gemeente Groningen, 2015). The bicycle strategy has not reached its goals yet regarding bicycle parking infrastructure and it is still working on creating more places where bicycles can be parked. During the interview, the Urban Policy Developer confirmed it is not perfect everywhere, some areas can become problematic during peak hours.

During the Corona pandemic, the government implemented the 1.5m distance rule, which didn't allow people to be closer than this set distance. The rule changed the way cities functioned through measures of social distancing (Abusaada et al., 2022). To accommodate pedestrian traffic during the pandemic the municipality of Groningen implemented policies

and regulations on bicycle parking spots, making space for pedestrians in streets where social distancing was otherwise not possible (Urban Policy Developer interview). For certain roads parking a bicycle has become illegal. Bicycles that are parked for too long are brought to a deposit outside the city, specific outlines are visible on the street to show where parking is allowed, and bike stewards manage bicycle spots (Gemeente Groningen, 2020). This resulted in the loss of many bicycle parking spaces. Bicycles parked in the wrong spots would be moved by the municipality, creating confusion among the inhabitants. (Groenendijk, 2022). These were then brought to a deposit, where at a cost they could be re-acquired (Gemeente Groningen, 2019). Because of this change, the report about missing bicycles has increased in the past two years (Groenendijk, 2022). Due to the nature of the inner city, being built in a time that the bicycle did not exist, it is difficult to plan new parking spaces and create underground parking lots, making it challenging to quickly solve the situation (Urban Policy Developer interview).

1.4 - Research Question

Bicycle parking spots are currently a challenge for the municipality to provide. With the increase in bicycle use, not only more bicycle parking spots are in need but also more space for pedestrians must be considered (Urban Policy Developer interview). This research proposes three sub-questions that will seek answers on the extent of the problem. This paper aims to further understand the impact of bicycle parking conditions in an environment where the main mode of transport is the bicycle. Understanding the institutions in place that create such conditions and how they affect the quality of life of the residents.

The research focus:
How do bicycle parking conditions affect the quality of life for Groningen city center residents?

Sub-questions:

- *What are the current factors and institutions that provide bicycle parking in the city center of Groningen?*
- *How do perceived bicycle parking conditions differ among the residents of the city center of Groningen?*
- *How do bicycle parking conditions and the perceived quality of life of the residents differ per street typology in the city center of Groningen?*

The first chapter has introduced the topic and context of this paper. Following this, the theories and concepts are presented. The third chapter will explain the methodology used in this paper. The last two chapters present the empirical findings and a conclusion on the topic.

Chapter 2: Theoretical Chapter

2.1 - Theoretical framework

Bicycles as the main mode of transport

The bicycle is seen as a sustainable, convenient, and flexible transport mode choice (Van der Spek & Scheltema, 2015). Due to the benefits that can be achieved through bicycle use, in the past decade's popularity of the transport mode among planners and potential cyclists has increased (Heinen et all., 2010). Many factors influence bicycle use, these can be related to the environment, physical aspects, safety, economic, and infrastructure factors, of which bicycle parking is included (Dill & Voros, 2007). Bicycle parking is one of the fundamental aspects of bicycle management. The transport mode can only be functional when adequate parking conditions are accessible. Solutions influencing bicycle parking ability, policy, route choice, and mode choice are topics of increasing academic discussion (Van der Spek & Scheltema, 2015; Martens, 2007; Puncher et all., 2010).

To encourage citizen engagement and promote bicycle use, pro-cycling policies need to be established. According to Puncher and Buehler (2008), several institutional and physical measures can effectively promote bicycle usage. These can be extensive systems of separate cycling facilities, intersection modifications and priority traffic signals, traffic calming, bicycle parking, coordination with public transport, traffic education and training, and traffic laws (Puncher & Buehler, 2008). The Netherlands is one of the few countries that has appropriate bicycle infrastructure and has given a significant amount of attention to the implementation of policies and regulations (Rietveld & Daniel, 2004). Through policies, infrastructure, and education, the bicycle has become one of the main modes of transport in the Netherlands (Martens, 2007).

The success of pro-bicycle policies also brings its downsides. In several European cities, where more than fifty percent of commuters travel by bike, the capacity of the infrastructure is tested to its limits. This affected the infrastructure in place, its capacity, quality of parking places, significantly damaging the bicycle flow (Van der Spek & Scheltema, 2015). Bicycle parking behavior was also found to take place in unintended locations or attached to urban elements (Aldred & Jungnickel, 2013). Therefore, it is essential to create rules and regulations that can offer parking possibilities that prevent orphaned or unwanted bicycles around the city (Van der Spek & Scheltema, 2015). Nevertheless, the idea that promoting bicycle use benefits the users and improves the city's quality of life is still valid (Akar & Clifton, 2009).

Defining bicycle parking

Bicycle parking is a requirement for a functioning city. These can happen in many forms: from simple non-zoned spots, bike racks, facilities, private garages, guarded facilities, to bicycle secure boxes (Van der Spek & Scheltema, 2015). It is important to consider the timeframe a bike is parked, which can vary from the kind of trip the user is prone to take (Puncher et all., 2010). Availability of bicycle parking infrastructure, both at the origin and destination, influences the user's decision on the chosen transport mode (Hunt & Abraham, 2007). Van der Spek (2015), which studied the importance of bicycle parking management, found six factors that affect the type of bicycle parking and its use. These are: required capacity in time, available space, duration of the parking, distance to the destination, type of user (and type of bike), and willingness to pay for parking. Cyclists intend to park their bicycles as close as possible to their destination, at a low cost and without any inconvenience (Van der Spek & Scheltema, 2015). As cycling becomes more popular, parking situations must be managed precisely. Cities need to consider these factors to provide good bicycle infrastructure and a standard to quality of life.

Defining quality of life

Urban planning has evolved with the desire to improve people's quality of life. Urban attributes change the way people perceive the urban environment, and so the satisfaction with a particular area (Shalabi et al., 2013). There are many aspects in an urban setting that define quality of life, these can be divided into physical features, features of social nature, environmental features, and institutional features (Węziak-Białowolska, 2006). Attributes such as recreational opportunities, transportation, land use patterns, and access to basic amenities, services, and goods impact satisfaction among residents (Shalabi et al., 2013). Urban planners shape the environment considering the needs of its residents. Planning visions and designing strategies to improve people's quality of life (Węziak-Białowolska, 2006). Quality of life is a broad indicator that can be used and defined in many situations. Evaluation can only be possible with a precise understanding of what quality of life means for the study in consideration (Felce & Perry, 1995).

> "Quality of life is an elusive concept approachable at varying levels of generality from the assessment of societal or community wellbeing to the specific evaluation of the situations of individuals or groups." (Felce & Perry, 1995, p. 51)

Factors determining quality of life vary in levels of generality and are conceptualized depending on the assessment (Felce & Perry, 1995). Individuals are studied in this research with the scope towards a general assessment of societal wellbeing. The conceptualization of quality of life is visible in figure 1. Considering the combination of objective (life conditions) and subjective (personal satisfactions) components. This may be assessed through objective indicators on physical, social, governmental, and environmental features, or subjective

indicators like questionnaires on satisfaction and wellbeing (Felce & Perry, 1995; Węziak-Białowolska, 2006; Shalabi et al., 2013). This study focuses on the combination of both components through the use of questionnaires. The reality perceived by the residents is the determinant of the perceived quality of life.

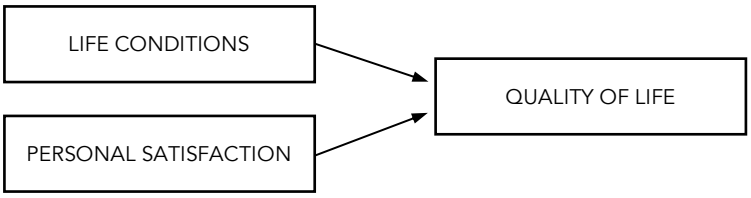


Figure 1: Conceptualization of quality of life (Felce & Perry, 1995).

2.2 - Conceptual Model

The model aims to investigate the relationship between quality of life and bicycle use.

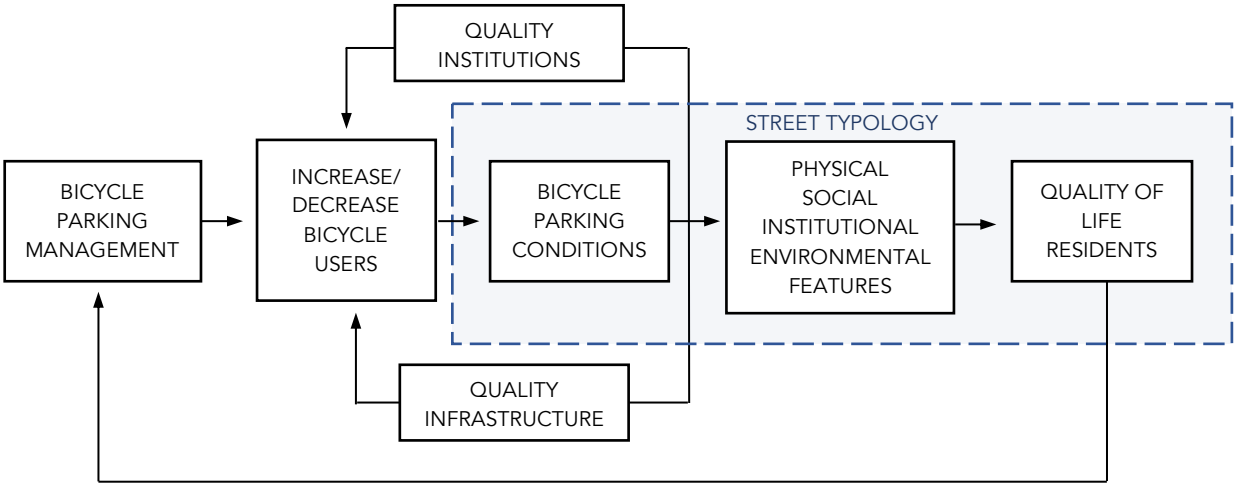


Figure 2: Conceptual model showing the relationship between bicycle use, bicycle parking conditions, and quality of life.

2.3 - Hypotheses

Bicycle parking conditions are challenged by the growing population, and rise in bicycle users (Van der Spek & Scheltema, 2015). The change toward sustainability and compactness has made Groningen the most cyclable city in the Netherlands (Groningen Gemeente, 2015). Parking conditions have been challenging for the residents of the inner city with the increase in demand (Urban Policy Developer interview). Therefore, the hypothesis in this research is that "bicycle parking conditions influence the quality of life of the residents of Groningen."

Chapter 3: Methodology

This paper investigates how bicycle parking conditions effect the quality of life of the residents in the city center of Groningen. The study will explore the current situation through policy documents, informatory documents, and an expert interview. Furthermore, suitable analysis of bicycle parking conditions and satisfaction among the residents of the inner city of Groningen is performed with quantitative methods. According to Punch, survey research is particularly good at analyzing people's attitudes and opinions on environmental, social, and political issues such as quality of life (Punch, 2014).

3.1 - Schematic Overview of the Research

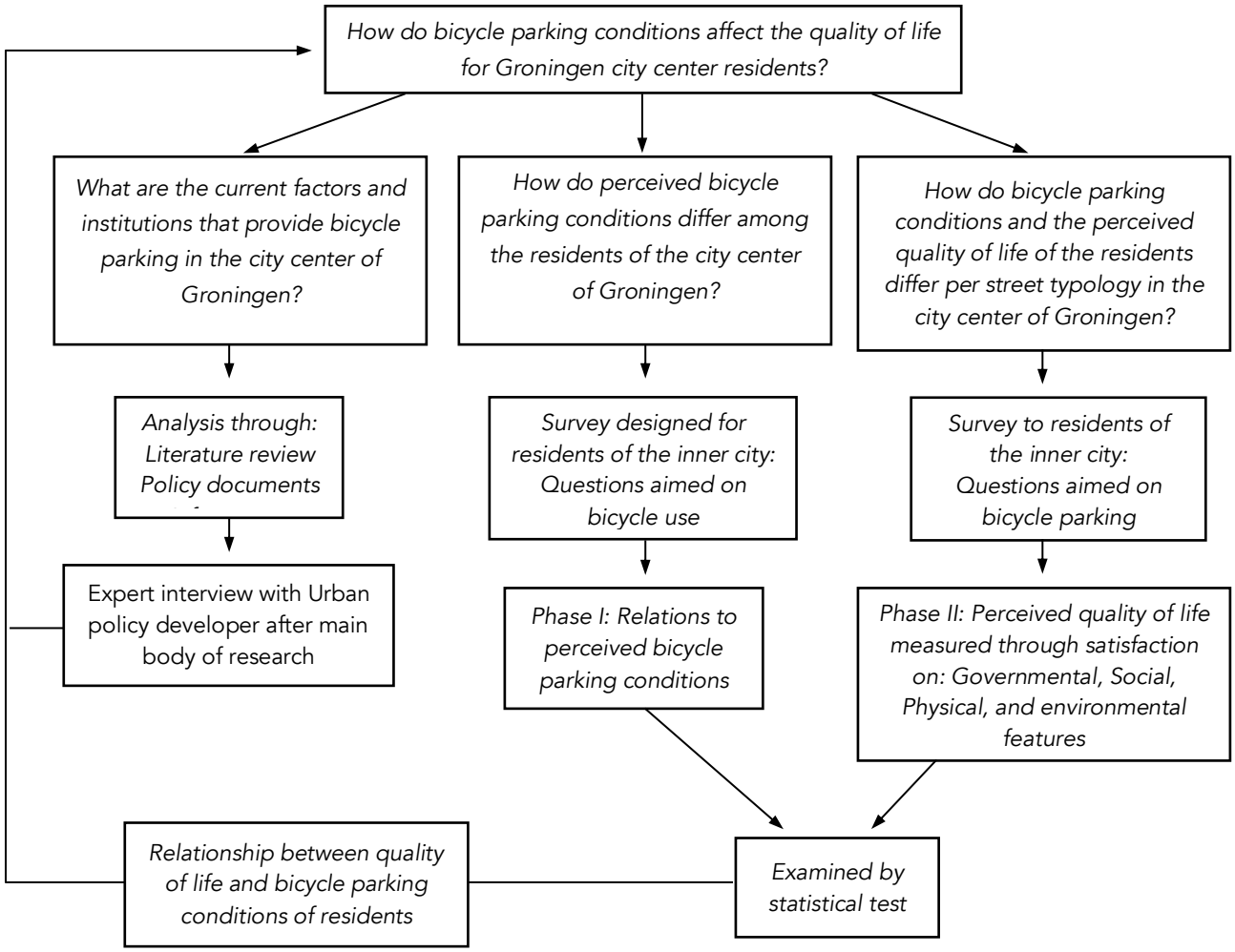


Figure 3: Schematic overview of research, steps taken towards the outcome of this study.

The schematic overview, visible in figure 3, answers the main research question through the division of sub questions. Each sub question was formulated to support an outcome that would generate answers for the main research question. The first sub question is answered through literature review, policy documents, and an expert interview. The second and third

sub questions are aimed at the residents of the city center. These are analyzed through questionnaire responses and the appropriate statistical methods.

The study focuses on the inner-city area. Three street typologies have been defined: pedestrian, bicycle accessible, and car accessible. Figure 4 shows the streets analyzed in this research. The author has defined a set of criteria for the analyzed roads, these are visible in table 1.

Table 1: Criteria street typology

Street typology	Viable mode of transport	Total number of households
Pedestrian	Walking	195
Bicycle accessible	Walking, bicycle	190
Car accessible	Walking, bicycle, car	200

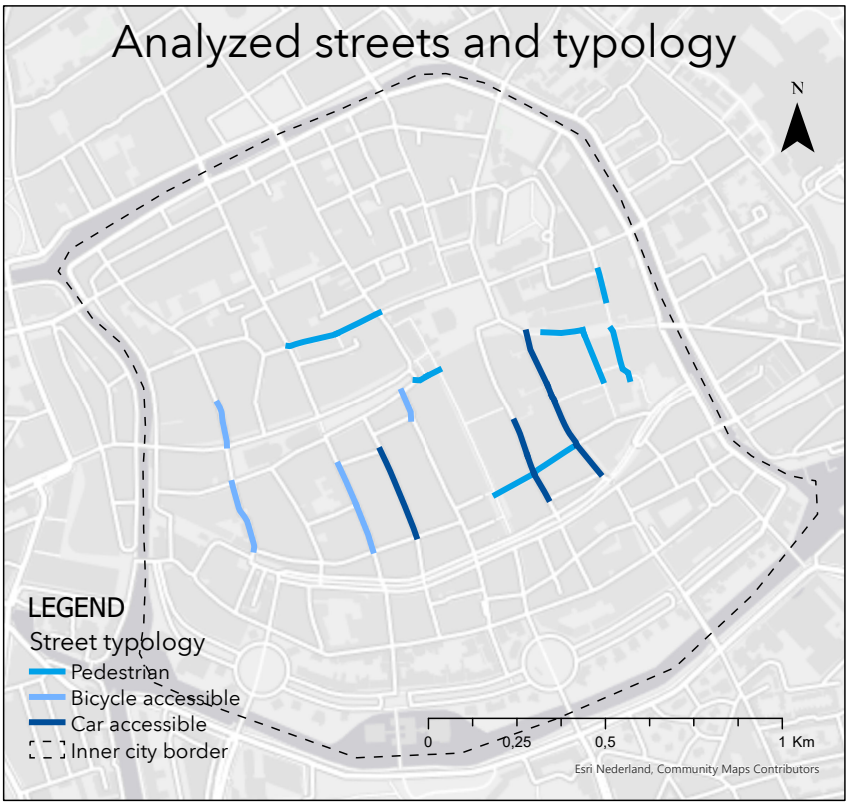


Figure 4: Map showing the analyzed road segments and its distribution in street typology.

3.2 - Data Collection

Collection encompasses primary and secondary data sets. Statistics describing the population in consideration were taken from the Central Bureau Statistic (CBS). The data used for this study was taken from the Nationaal Georegister (NGR, 2020). This shows information about the population for each postcode.

To further understand bicycle management in the inner city of Groningen, an informative semi-structured interview was held with the Urban Policy Developer of the municipality. According to Punch, Semi-structured interviews can yield information, perspective, or insight that the interviewer would have difficulty finding in a structured interview (Punch, 2014). The respondent is currently working on the bicycle strategy and is actively involved in the recent changes in bicycle management. The interview was prepared with a set of guiding questions that would explore the topic, giving room to expand to the responder. The interview was communicated via email and executed online.

To investigate bicycle parking conditions and their perceived satisfaction, surveys were distributed among the residents. The data was collected through ArcGIS survey123. Data point with coordinate system was collected to confirm household location. Points out of range of the examined streets are not considered in this study. To ensure the study being statistically successful, the sample must represent a minimum 10% of the population. Therefore, the considered street typologies would not have to exceed a total of 200 households. Hence, only one respondent could be questioned per household.

3.3 - Questionnaire Design

The questionnaire is designed to answer the second and third sub-questions. To do so the survey was designed in three sections, visible in table 2. Categories are representative of the conceptual perceived quality of life model (figure 1). Factors that affect quality of life have been divided into governmental, physical, social, and environmental factors. Governmental factors represent the policies, regulations, and institutions in place that effect bicycle parking conditions, physical factors are considered as concrete obstacles and lack of allocated space for bicycles. Social factors are seen as societal, acquaintances or nearby neighbors that effect the bicycle parking conditions. Lastly environmental factors are green obstacles effecting bicycle parking conditions. These follow the guidelines of European empirical study on quality of life by Węziak-Białowolska (2016). Hence, the perceived quality of life of the residents was the focus of this questionnaire. In line with Punch's (2014) methods of research, it was relevant to capture the inhabitant's opinion on bicycle parking conditions. The questionnaire is visible under appendix 2, where more in depth description and the aim of each question is presented.

Table 2: Questionnaire categorization

N.	Section	Data group code	Variable code
1	General information	Age	V1
2	General information	Transport mode	V2
3	General information	Bicycle use	V3
4	Quality of life factor	Physical factors	V5
5	Quality of life factor	Physical factors	V5
6	Quality of life factor	Physical factors	V5
7	Quality of life factor	Institutional factors	V4
8	Quality of life factor	Governmental factors	V4
9	Quality of life factor	Governmental factors	V4
10	Quality of life factor	Social factors	V6
11	Quality of life factor	Governmental factors	V4
12	Bicycle parking conditions factor	Perceived parking availability	V8
13	Bicycle parking conditions factor	Perceived factors parking conditions	V9
14	Quality of life factor	Governmental factors	V4
15	Quality of life factor	Physical factors	V5
16	Quality of life factor	Social factors	V6
17	Quality of life factor	Environmental factors	V7

3.4 - Recruiting Participants

The research had to be conducted following the street typologies assigned to each street. Therefore, coordinate points were needed to confirm the location of the respondent. Due to the nature of this research, a door-to-door survey was performed. Additionally, this enabled the researcher to get further insight into the bicycle parking situation, finding himself engaging in small conversations on the topic.

3.5 - Data Analysis

Primary data is firstly explored in each question, defining the measurement level. Due to the nature of the questionnaire and the way the index of quality of life is achieved, the data had to be restructured into variables. Variables are visible in table 3. For the questions regarding satisfaction with quality of life aspects, the mean was taken following the data group code (table 2), forming variables V4, V5, V6 and V7. A total quality of life variable (V10) was then created by taking the mean of the considered variables.

Question 12 and 13 had to be translated into a ratio variable to get a value expressing the perceived bicycle parking conditions. For question 12, the logarithm of the provided answer was calculated, forming variable V8. For question 13, multiple answers could be selected. Being nominal, more steps needed to be changed into a weighted ratio variable. Popular responses, such as physical aspects, have a lower value, meaning lower bicycle parking

conditions are connected to that factor. The formula utilized in the process is visible in figure 5. To determine the weight of the answered factors the total amount of responses for each factor was subtracted by the total amount of respondents. Appendix 3 shows the data used as $x_a \ldots x_b$. The value n is the number of factors selected per respondent. V9 is the result of this calculation. The sum of V8 an V9 ked to the total perceived bicycle parking conditions of the participants. The complete overview of the data analysis process from question to variable can be seen in figure 5.

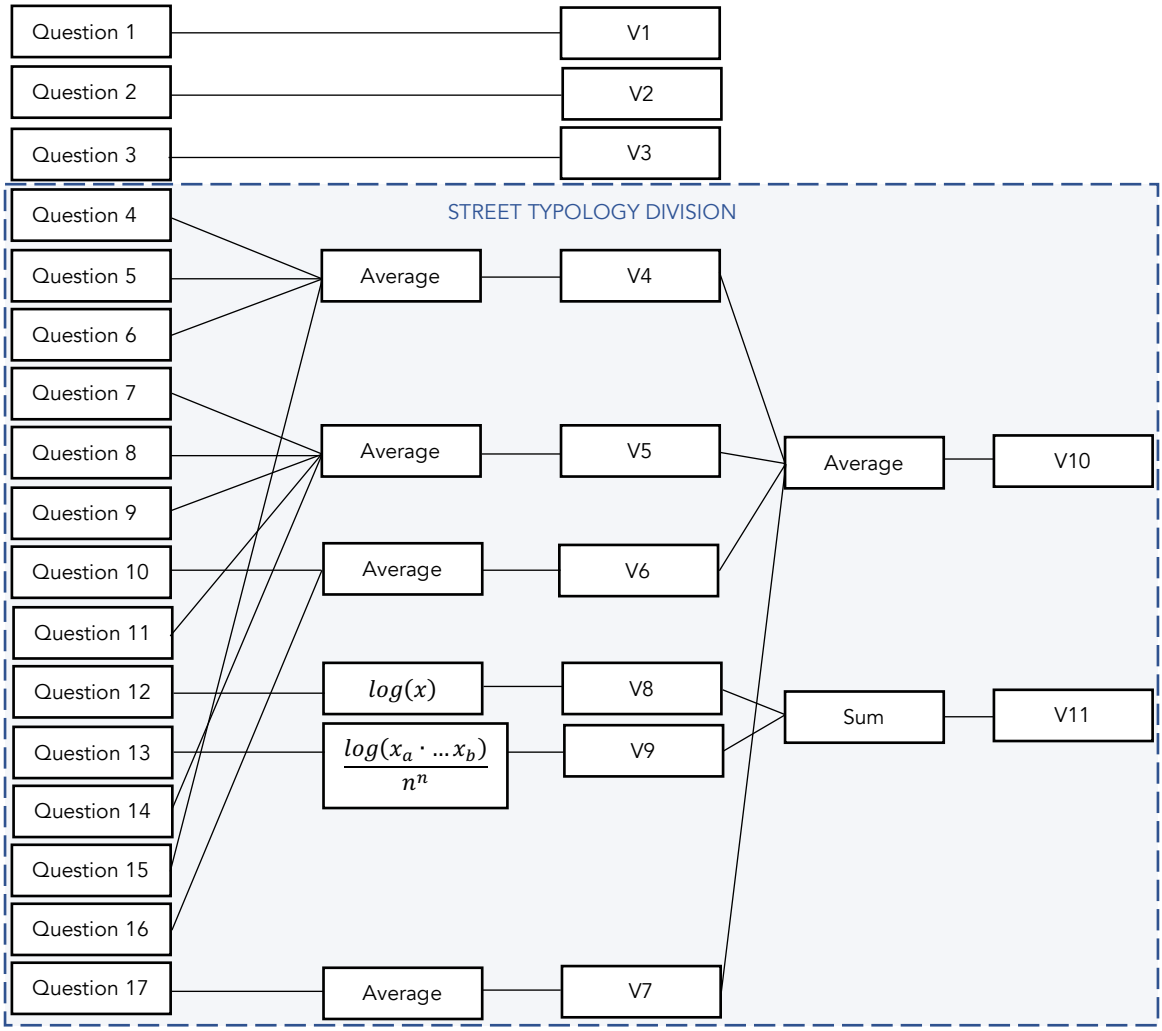


Figure 5: Data analysis process from question to variable

Table 3: Variables description

Variable	Variable description	Measurement level: Nominal, Ordinal, interval, Ratio
V1	Age	Nominal
V2	Daily transport mode	Nominal

V3	Weekly bicycle use	Nominal
V4	Satisfaction governmental aspects	Ratio
V5	Satisfaction Physical aspects	Ratio
V6	Satisfaction Social aspects	Ratio
V7	Satisfaction Environmental aspects	Ratio
V8	Difficulty parking spot in the vicinity of your home	Ratio
V9	Factors making bicycle parking difficult	Ratio
V10	Total quality of life	Ratio
V11	Total bicycle parking conditions	Ratio

In this study, the aim is to explore and analyze the data through descriptive statistics and statistical hypothesis testing. Descriptive statistics will present data in summarized forms, graphs, and charts. Due to the division in street typologies parametric and non-parametric tests are utilized. Table 4 gives an overview of the variables tested, the statistical test used, and their null hypothesis.

Table 4: Overview hypothesis testing

Dependent Variable	Independent Variable	Statistical test	Null hypothesis
V11	V1	One-way ANOVA (parametric)	In the population, the perceived bicycle parking conditions are equal between groups based on age.
V11	V2	One-way ANOVA (parametric)	In the population, the perceived bicycle parking conditions are equal between groups based on daily transport mode.
V11	V3	One-way ANOVA (parametric)	In the population, the perceived bicycle parking conditions are equal between groups based on weekly bicycle use.
V10	V11	Simple linear regression (non-parametric)	In the population, there is no linear relationship between the perceived quality of life and the perceived bicycle parking conditions.
V10	V4	Simple linear regression (non-parametric)	In the population, there is no linear relationship between the perceived quality of life and the satisfaction with governmental aspects.
V10	V5	Simple linear regression (non-parametric)	In the population, there is no linear relationship between the perceived quality of life and the satisfaction with Physical aspects.
V10	V6	Simple linear regression (non-parametric)	In the population, there is no linear relationship between the perceived quality of life and the satisfaction with social aspects.
V10	V7	Simple linear regression (non-parametric)	In the population, there is no linear relationship between the perceived quality of life and the satisfaction with environmental aspects.

3.6 - Ethical Considerations

In this research, the author opted for questionnaires with an informatory interview. To ensure the study follows ethical considerations, the author presented its research with transparency to its participants. Therefore, before conducting interviews or a survey, a form was presented whether they would agree with the terms of the research or not. The form contained an overview of the research, data management, and privacy. An informatory interview was scheduled through an exchange of emails. The interview was conducted online, recorded, transcribed, and stored safely. Before the interview, it was asked to agree on the terms, in which the anonymity of the Urban Policy Developer was safely kept. During data collection, interaction between the respondent and the researcher were inevitable due to the chosen method. Covid safety measure were taken into consideration. With the door-to-door method the researcher presented the questionnaire at the doorbell with the same phrase for each household in the study area. This was prepared to make sure the respondent was not influenced in its decision, and so have less accurate results due to lack of interest from the participant. The anonymity of the participants was guaranteed throughout the study.

Chapter 4: Empirical Findings

In this section, empirical findings will be given and discussed. Firstly, findings of the general studied population in relation to bicycle parking conditions will be presented. Secondly, the relationship between bicycle parking conditions and quality of life factors will be displayed. The outcomes will display the relationship between variables calculated in the previous chapter.

During the collection period, 61 valid responses were recorded over 3 weeks. A minimum of 20 respondents were needed per street typology. Figure 6 and figure 7 show general information about the studied population. 77% of respondents were between the age of 18 and 24, and 15% were between the age of 25 and 30. 77% of the respondents use the bike as their main transport mode, while 18% are pedestrians.

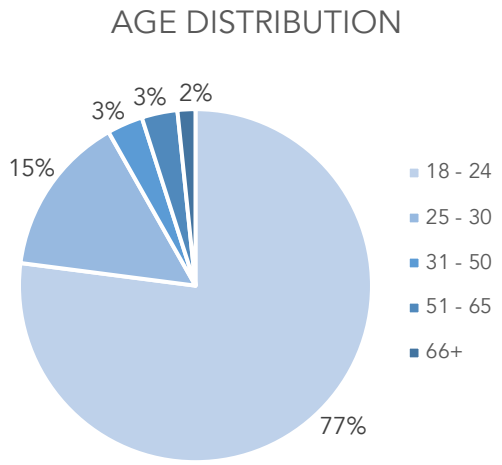


Figure 6: Age distribution

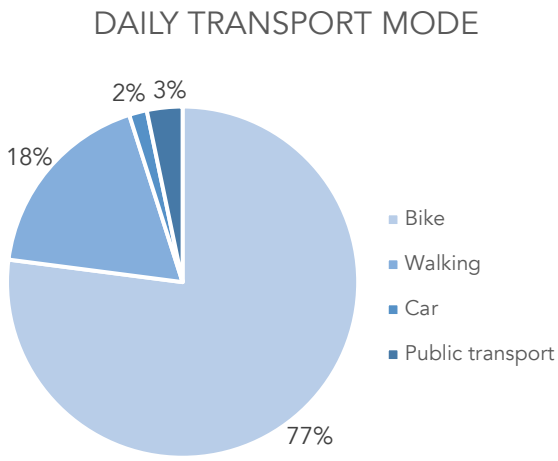


Figure 7: Daily transport mode

4.1 - Phase I: Relations to perceived bicycle parking conditions

This section aims to answer the second sub-question: '*How do perceived bicycle parking conditions differ among the residents of the city center of Groningen?'*. Figure 8 and figure 9 show responses about the perception of bicycle parking conditions. Firstly, it's noticeable that bicycle parking conditions are similarly experienced in each street typology. Physical and governmental aspects have the biggest effect on the population. Respondents for bicycle and car accessible streets have recorded the same aspects effecting bicycle parking conditions. Further, figure 8 shows that residents living in pedestrian streets perceive less governmental and social related issues and more physical and environmental related issues that affect bicycle parking conditions. Governmental policies restricting bicycle use and parking possibilities have a direct effect on the physical aspects on bicycle parking conditions (Van der Spek & Scheltema, 2015). It is noticeable that pedestrian area perceives fewer issues related to regulations and restrictions and more on physical aspects, hence limiting parking

possibility and bicycle use. 17 respondents found it difficult to find a bicycle parking spot nearby their house, of which 2 find it very difficult. Bicycle parking conditions were found to be easy in pedestrian and bike accessible streets. On the contrary, car accessible streets were found to have difficult parking conditions.

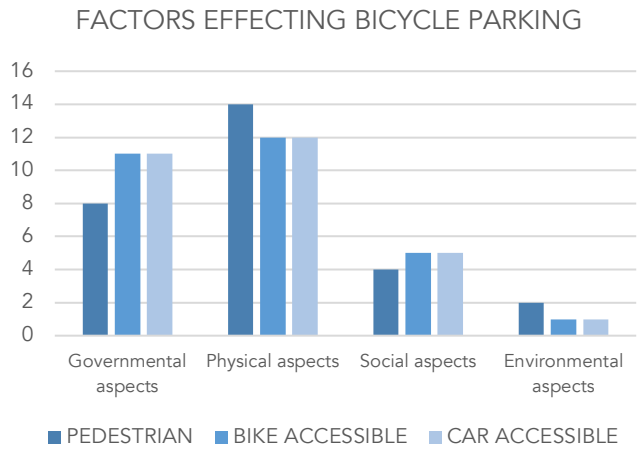


Figure 8: Number of responses on factors effecting bicycle parking

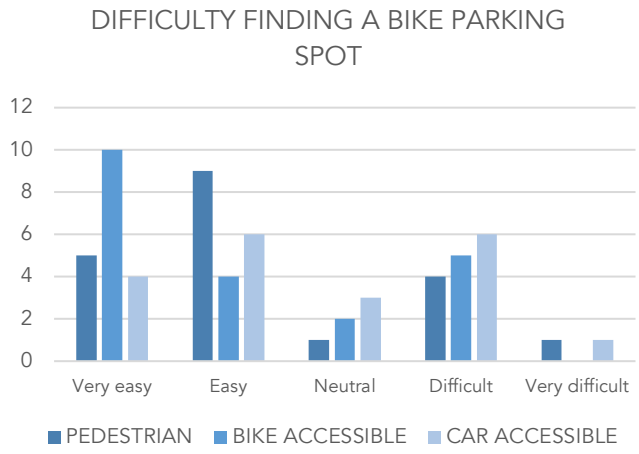


Figure 9: Number of responses on difficulty finding a bike parking spot spot

To further understand the relationship between the population and its relation to bicycle parking conditions, hypothesis testing was carried out (appendix 4). Age of the respondents, daily transport mode choice and weekly bicycle use are the factors related to the perceived bicycle parking conditions. Hypothesis testing showed non-significant results with a weak relationship. Therefore, bicycle parking conditions are perceived similarly by most of the respondents. This shows that every respondent has a similar understanding of the situation and possible problems within the system and that the point of view is not dependent on age.

4.2 - Phase II: Relations to perceived quality of life

This section aims to answer the third sub-question: '*How do bicycle parking conditions and the perceived quality of life of the residents differ per street typology in the city center of Groningen?'*. Perceived quality of life is measured through satisfaction with governmental, physical, social, and environmental aspects. Appendix 3 shows an overview of the responses on satisfaction levels. In general, respondents are satisfied with bicycle parking availability, distance to parked bike, keeping the sidewalk free from bikes, and the facilities provided by the municipality. Further, respondents are not satisfied with bicycle free areas, municipality's decisions about where bikes are allowed to be parked, and not being able to freely park their bike. It is noticeable that dissatisfaction among the respondents is present on governmental related aspects, such as policies, and regulations (figure 10, figure 11). Looking into figure 10, respondents are generally not satisfied with regulations restricting bicycle use and parking possibilities. However, pedestrian areas are more positively perceived suggesting that satisfaction with policies is dependent on an acclimated living situation. Pedestrian areas, even though with stricter regulations on bicycle use, are seen by the respondents as properly

managed and a higher quality of life is perceived. To sum this up, promoting livability on the streets, with integrated urban governance providing codes and legislations to manage bicycle parking conditions, has a positive effect on the perceived quality of life (Shalabi et al., 2013). Respondents are seen to be satisfied with physical factors connected to bicycle parking ability (figure 12, figure 13). Provided infrastructure facilities are satisfactory to the respondents. The distance from the user to the parked bicycle is seen as satisfactory. This could be due to many households in the inner city having available indoor bicycle parking spots. The availability of appropriate bicycle infrastructure at the origin of the trip is found to have a big impact on satisfaction with its transport mode (Hunt & Abraham, 2007).

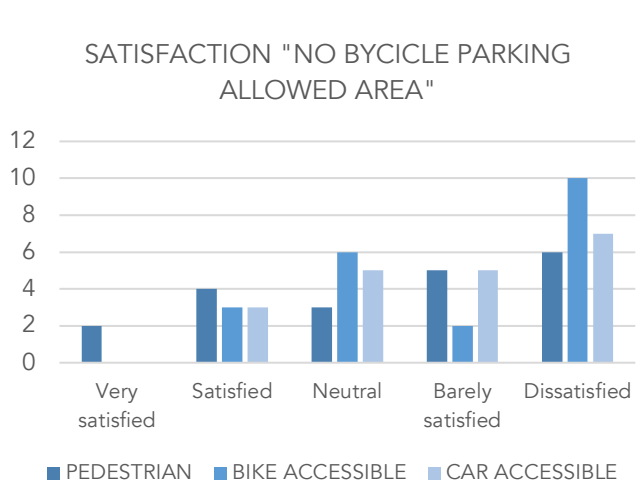


Figure 10: Number of responses on satisfaction "no bicycle parking allowed area"

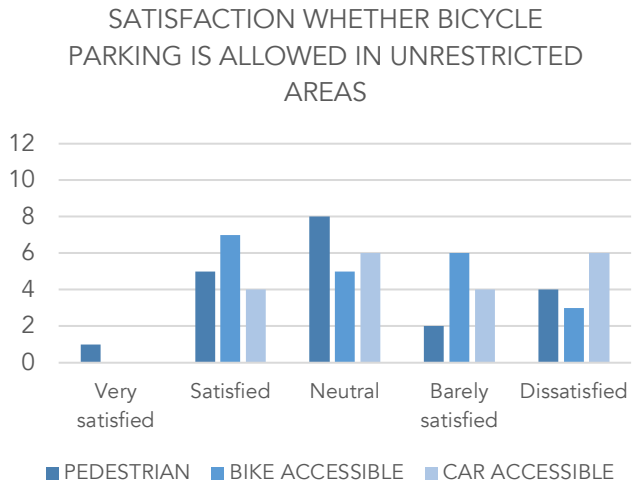


Figure 11: Number of responses on satisfaction whether bicycle parking is allowed in unrestricted areas

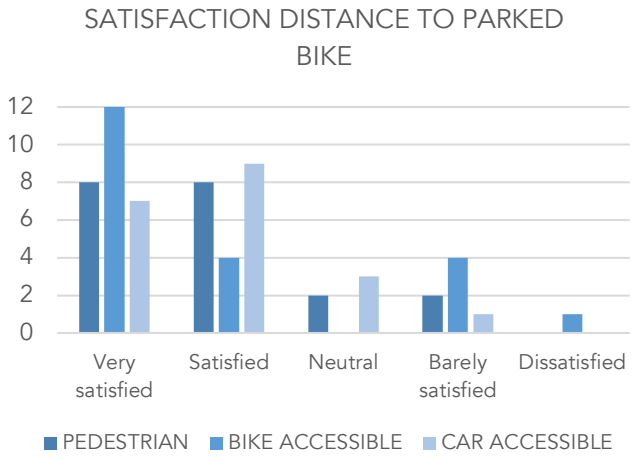


Figure 12: Number of responses on satisfaction distance to parked bike

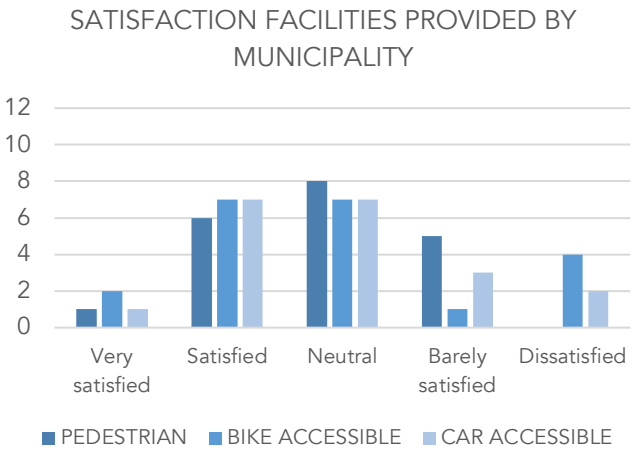


Figure 13: Number of responses on satisfaction facilities provided by the municipality

To further understand the relationship between the perceived quality of life and bicycle parking conditions, hypothesis testing was carried out in 2 stages (appendix 4). To find out the linear relationship between two variables, simple linear regression was performed. Firstly, the linear relationship between perceived satisfaction on quality of life aspects

(governmental, physical, social, environmental) and perceived bicycle parking conditions was calculated. Hypothesis testing showed significant results for all aspects, therefore we can say with 95% confidence that there is a linear relationship between perceived quality of life aspects and perceived bicycle parking conditions. Secondly, the linear relationship between perceived satisfaction on quality of life and perceived bicycle parking conditions carrier out. Hypothesis testing showed significant results for car accessible streets and non-significant results for pedestrian and bicycle accessible streets. A linear relationship is existent in car accessible streets while no linear relationship was found for pedestrian and bicycle accessible streets. This may be due to the high number of outliers or the data not being homoscedastic.

Finally, the relationship between total perceived quality of life and the total perceived bicycle parking conditions for all respondents was tested. Hypothesis testing showed significant results, meaning a linear relationship exists between the two variables (figure 14). The relationship was found to be weak due to the number of outliers and the amount of data. However, bicycle parking conditions were found to be satisfactory for most residents, affecting positively the perceived quality of life.

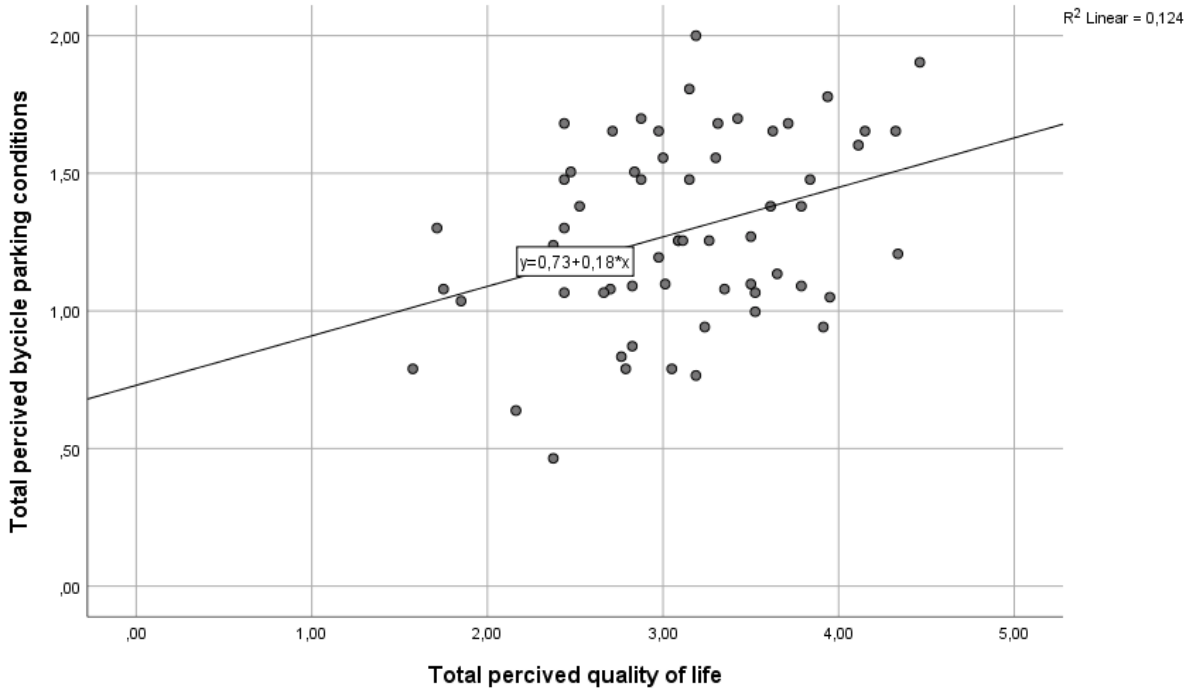


Figure 14: Relationship Total perceived bicycle parking conditions and Total perceived quality of life (V10 – V11)

Chapter 5: Conclusion

The survey found that bicycle parking conditions are perceived differently for each street typology. Pedestrian streets are seen to have better bicycle parking conditions, due to good bicycle infrastructure and regulations providing bicycle parking at a close distance. In general, institutions, regulations, lack of space, and lack of parking facilities have the biggest effect on satisfaction among residents. Policies, such as whether the use or parking of a bicycle is allowed or not, greatly affect the quality of life of the residents. Overall, the inner city of Groningen has good bicycle parking conditions, hence quality of life is perceived as satisfactory for most of the respondents. The bicycle parking facilities provided by the municipality and the distance to the parked bike are perceived as satisfactory by the residents. The availability of appropriate bicycle infrastructure at the origin of the trip is found to have a big impact on satisfaction with its transport mode (Hunt & Abraham, 2007). The municipality of Groningen is experiencing a rise in bicycle users and is therefore planning more pedestrian areas and bicycle parking facilities (Urban policy developer interview). Decreasing the amount of bicycle free zones would improve the overall satisfaction among the residents, as the bicycle could be parked on the street freely. Furthermore, the construction of parking facilities could also improve the quality of life of the residents. Additionally, housing regulations on household parking is required for new and old constructions, to further ensure livability in the neighborhood. Finally, the bicycle parking condition in the inner city of Groningen is positively perceived by the residents, with space for improvement needed in physical and governmental aspects.

5.1 - Improvement of the Survey

During the data collection process, it was noticed that a lot of respondents had indoor bicycle parking in their households. The survey result and analysis could have led to some interesting results on the residents with private bicycle spots. Satisfaction with bicycle parking conditions could differ if the respondent parked their bicycle in a private place instead of the public context, the street typology would not matter at this point. Issues with bicycle parking conditions were not perceived by every respondent. For question 13, factors that made bicycle parking difficult could be non-existing to some. Therefore, a respondent should have had the option to not select any of the answers if no issues were perceived.

5.2 - Recommendation for further research

Satisfaction with bicycle parking conditions was studied under four aspects that defined quality of life of the residents of the inner city. According to the findings of this study, governmental and physical related aspects had the biggest effect on the population. This paper mentions the factors but focuses more on the perceived quality of life of the residents. Further research could investigate and focus on the specific factors that influence bicycle

parking conditions and how they are perceived by residents. Due to the sample size, the relationship between factors was found to be weak but existing. Therefore, a larger sample size would give more reliable results and overall provide better evidence of the existing relationships. Additionally, this paper would benefit from comparative studies on other mid-sized cities with bicycle parking related issues.

References

1. Abusaada, H. and Elshater, A. (2022) "Covid-19's Challenges to Urbanism: Social Distancing and the Phenomenon of Boredom in Urban Spaces," Journal of urbanism, 15(2), pp. 258–260.
2. Aldred, R., & Jungnickel, K. (2013). Matter in or out of place? Bicycle parking strategies and their effects on people, practices and places. Social and Cultural Geography, 14(6), 604–624.
3. Akar, G. and Clifton, K. J. (2009) "Influence of Individual Perceptions and Bicycle Infrastructure on Decision to Bike," Transportation Research Record: Journal of the Transportation Research Board, 2140(1), pp. 165–172. doi: 10.3141/2140-18.
4. Christien, B. (2021). Explosieve groei vooraanmeldingen, soms zelfs verdubbeling. [online] UKrant.nl. Available at: https://ukrant.nl/explosieve-groei-vooraanmeldingen-soms-zelfs-verdubbeling/ [Accessed 16 Jun. 2022].
5. Deutsches Architekturmuseum (ed.) (2018) Ride a bike!: reclaim the city. Basel: Birkhauser. doi: 10.1515/9783035615258.
6. Dill, J. and Voros, K. (2007) "Factors Affecting Bicycling Demand: Initial Survey Findings from the Portland, Oregon, Region," Transportation Research Record, 2031(1), pp. 9–17. doi: 10.3141/2031-02.
7. Felce, D. and Perry, J. (1995) "Quality of Life: Its Definition and Measurement," Research in Developmental Disabilities, 16(1), pp. 51–74.
8. Gemeente Groningen (2015). We are Groningen cycling city. [online] Groningen Gemeente. Available at: https://groningenfietsstad.nl/friksbeheer/wp-content/uploads/2016/05/Groningen_CycleCity_Strategy_2015-2025.pdf.
9. Gemeente Groningen (2019). Fietsfolder. [online] Groningen Fietsstad. Available at: https://www.groningenfietsstad.nl/contact/download-pers [Accessed 22 May 2022].
10. Gemeente Groningen (2020). Fietsparkeren. [online] Groningen Fietsstad. Available at: https://www.groningenfietsstad.nl/fietsparkeren [Accessed 10 Mar. 2022].
11. Gemeente Groningen (2021). *Statistisch Jaaroverzicht gemeente Groningen, Mobiliteit.* Gemeente Groningen, p. Thema 11. Data 11.5a.
12. Gemeente Groningen (2021). *Statistisch Jaaroverzicht gemeente Groningen, Mobiliteit.* Gemeente Groningen, p. Thema 8. Data 8.7.1.
13. Gemeente Groningen (2021). *Statistisch Jaaroverzicht gemeente Groningen, Mobiliteit.* Gemeente Groningen, p. Thema 2. Data 2.1.
14. Gemeente Groningen (n.d.). Groningen: studentenstad. [online] Groningen.nl. Available at: https://groningen.nl/studeren/ontdek-het-studentenleven/groningen-studentenstad.
15. Groenendijk, L. (2022). Outlawed bikes: Why do the police take some and leave others? [online] UKrant.nl. Available at: https://ukrant.nl/magazine/outlawed-bikes-why-do-the-police-take-some-and-leave-others/?lang=en [Accessed 10 Mar. 2022].

16. Heinen, E., van Wee, B. and Maat, K. (2010) "Commuting by Bicycle: An Overview of the Literature," Transport Reviews, 30(1), pp. 59–96. doi: 10.1080/01441640903187001.
17. Hunt, J. D. and Abraham, J. E. (2007) "Influences on Bicycle Use," Transportation : Planning - Policy - Research - Practice, 34(4), pp. 453–470. doi: 10.1007/s11116-006-9109-1.
18. Martens, K. (2007) "Promoting Bike-And-Ride: The Dutch Experience," Transportation Research Part A, 41(4), pp. 326–338. doi: 10.1016/j.tra.2006.09.010.
19. NGR (2020). Nationaal georegister. [online] www.nationaalgeoregister.nl. Available at: https://www.nationaalgeoregister.nl/geonetwork/srv/dut/catalog.search#/metadata/c2e8487d-8eff-4d16-837b-6ae39b737e85 [Accessed 31 May 2022]. Data Name: postcode62020 URL: https://geodata.nationaalgeoregister.nl/cbspostcode6/wms?request=GetCapabilities&service=WMS.
20. Punch, K.F., (2014). Introduction to Social Research: Quantitative & Qualitative Approaches. 3rd Edition. London: Sage.
21. Pucher, J. and Buehler, R. (2008) "Making Cycling Irresistible: Lessons from the Netherlands, Denmark and Germany," Transport Reviews, 28(4), pp. 495–528. doi: 10.1080/01441640701806612.
22. Pucher, J., Dill, J. and Handy, S. (2010) "Infrastructure, Programs, and Policies to Increase Bicycling: An International Review," Preventive Medicine 50, p. 125.
23. Renate van der Zee, R. (2015). How Groningen invented a cycling template for cities all over the world. [online] the Guardian. Available at: https://www.theguardian.com/cities/2015/jul/29/how-groningen-invented-a-cycling-template-for-cities-all-over-the-world [Accessed 6 Mar. 2022].
24. Rietveld, P. and Daniel, V. (2004) "Determinants of Bicycle Use: Do Municipal Policies Matter?," Transportation Research Part A, 38(7), pp. 531–550. doi: 10.1016/j.tra.2004.05.003.
25. Schuiling, K. (2020a). Verordening fietsparkeren 2020 Groningen. [online] lokaleregelgeving.overheid.nl. Available at: https://lokaleregelgeving.overheid.nl/CVDR642334 [Accessed 22 May 2022].
26. Schuiling, K. (2020b). Aanwijzingsbesluit instelling maximale fietsparkeerduur stad Groningen (Verordening fietsparkeren 2020 Groningen). [online] lokaleregelgeving.overheid.nl. Available at: https://lokaleregelgeving.overheid.nl/CVDR642333.
27. Shalabi, A. et al. (2013) "Principles of Urban Quality of Life for a Neighborhood," Housing and Building National Research Center Journal, 9(1). Available at: INSERIRE-URL-MANCANTE (Accessed: 2022).

28. Van Hoven B and Elzinga M (2009) "Bikes Are Such a Nuisance - Visually Impaired People Negotiating Public Space in Groningen," European Spatial Research and Policy, 16(1), pp. 131–144. doi: 10.2478/v10105-009-0008-2.
29. Van der Spek, S. C. and Scheltema, N. (2015) "The Importance of Bicycle Parking Management," Research in Transportation Business & Management, 15, pp. 39–49. doi: 10.1016/j.rtbm.2015.03.001.
30. Węziak-Białowolska, D. (2016) "Quality of Life in Cities - Empirical Evidence in Comparative European Perspective," Cities, 58, pp. 87–96. doi: 10.1016/j.cities.2016.05.016.

Appendices

Appendix 1: Questionnaire design

I am a student from the university of Groningen doing research for my achelor project on bicycle parking conditions in the city center of Groningen. The data gathered will be anonymous, safely stored and used only for research purposes. Geo location point is gathered in this research. The data will be deleted at the end of the passing of my bachelor thesis. At any moment the participant is allowed to step out of the research.

Herby, I give my permission on the use of the data gathered in this survey.

N.	Question	Measurement level: Nominal, Ordinal, interval, Ratio	Answer option	Aim of question
1	*Age*	Ordinal	▫ 18-24 ▫ 25-30 ▫ 31-40 ▫ 41-50 ▫ 51-60 ▫ 60+	Socio demographic data, representing the studied population.
2	*Daily transport mode*	Nominal	▫ Bike ▫ Car ▫ Foot ▫ Public transport	Data determining preference on transport mode.
3	*How often do you use the bike in a week?*	Ordinal	▫ 1-2 ▫ 3-5 ▫ 6-8 ▫ 9-12 ▫ 13+	Data determining trend on weekly bike use.
4	*How satisfied are you about bicycle parking availability?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on bicycle parking availability.
5	*How satisfied are you about the distance from your house to your parked bike?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on the distance between the parked bike and the living place.
6	*How satisfied are you about the bicycle parking organization in the neighborhood?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on bicycle parking organization in the neighborhood.

7	*How satisfied are you about the municipality having "No bicycle allowed area"?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on "no bicycle allowed areas".
8	*How satisfied are you about the municipality's decision on where bike parking is allowed or not?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on the municipality decision on where bike parking is allowed or not.
9	*How satisfied are you about the municipality's decision on keeping the sidewalks free from bikes?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on the municipality decision on keeping the sidewalk free from bikes.
10	*How satisfied are you about not being able to park in front of a shop?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on being able to park the in front of a shop.
11	How satisfied are you about the bicycle parking facilities provided by the municipality?	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on bicycle parking facilities provided by the municipality.
12	*How difficult is it to find a bike parking spot in the vicinity of your home?*	Ordinal	▫ Very difficult ▫ Difficult ▫ Neutral ▫ Easy ▫ Very easy	Data determining difficulty on finding a parking spot in the vicinity of the living place.
13	*What are the factors that make parking a bicycle difficult in your area?*	Nominal	▫ Governmental aspects (laws, rules, policies) ▫ Physical aspects (lack of space allocated for bikes, public space, sidewalk accessibility) ▫ Social aspects (neighbors, shop owners) ▫ Environmental aspects (green space)	Data determining which category of aspects make bicycle parking difficult in the area.
14	*How satisfied are you about the governmental aspects (laws, rules, policies) effecting bicycle parking quality?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on governmental aspects effecting bicycle parking quality.
15	*How satisfied are you about the physical aspects (lack of space allocated for bikes, public space,*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied	Data determining satisfaction on physical aspects effecting bicycle parking quality.

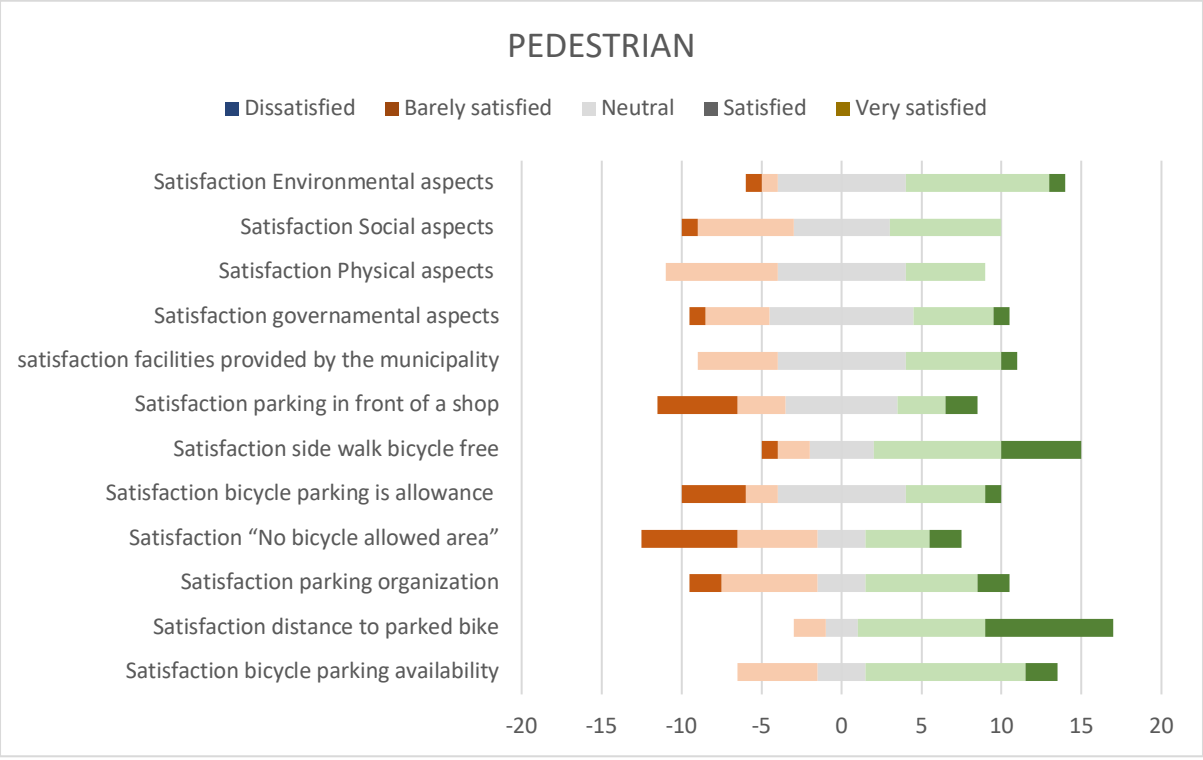
	sidewalk accessibility) effecting bicycle parking quality?		▫ Very satisfied	
16	*How satisfied are you about the social aspects (neighbors, shop owners) effecting bicycle parking quality?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on social aspects effecting bicycle parking quality.
17	*How satisfied are you about the environmental (neighbors, shop owners) effecting bicycle parking quality?*	Ordinal	▫ Dissatisfied ▫ Barely satisfied ▫ Neutral ▫ Satisfied ▫ Very satisfied	Data determining satisfaction on environmental aspects effecting bicycle parking quality.

Appendix 2: Calculation data

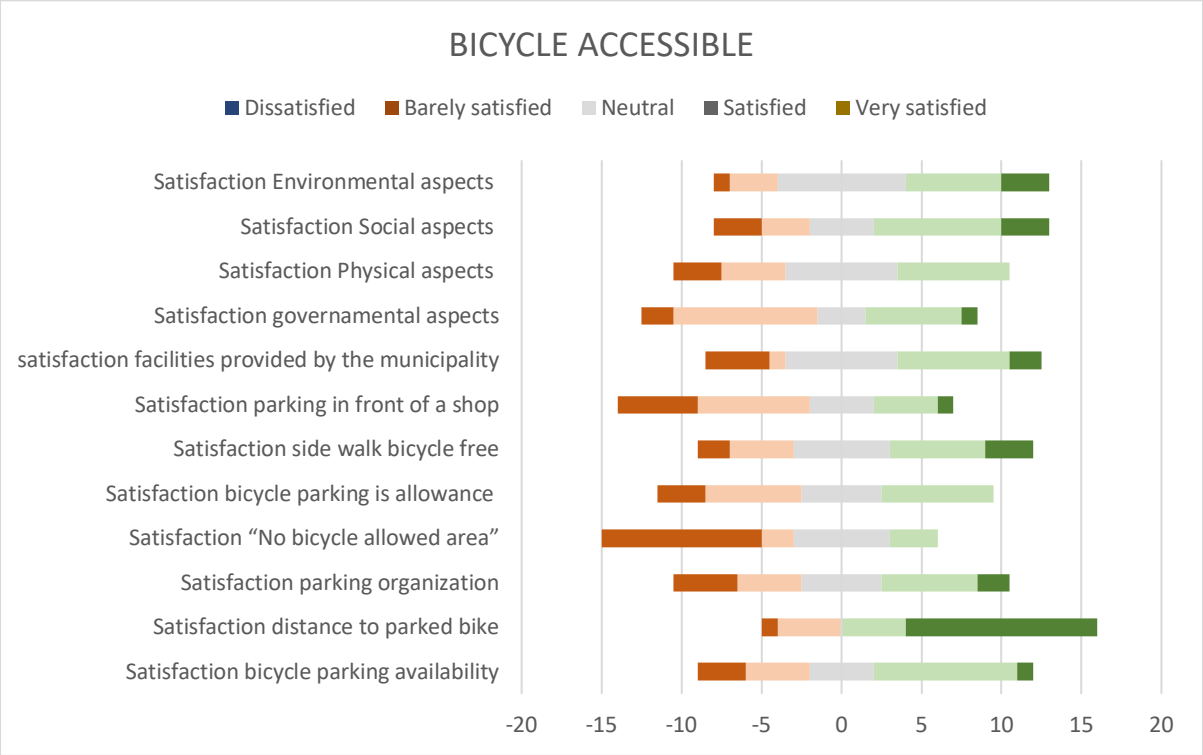
Factor	Pedestrian	Bicycle accessible	Car accessible
Governmental aspects	12	10	9
Physical aspects	6	9	8
Social aspects	16	16	15
Environmental aspects	18	20	19

Appendix 3: Questionnaire responses phase II

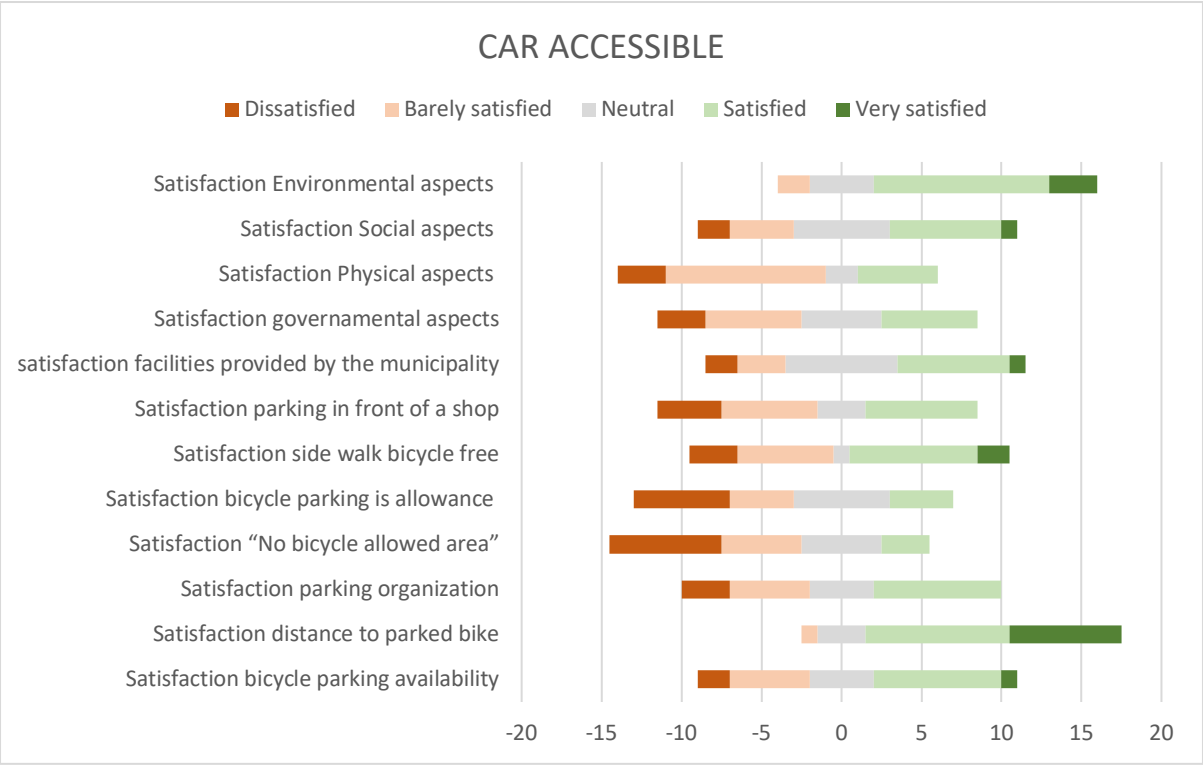
Pedestrian



Bicycle accessible



Car accessible



Appendix 4: Statistics

Significant → reject null hypothesis
Not significant → Failed to reject null hypothesize

Descriptive statistic general information

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 24	47	77,0	77,0	77,0
	25 - 30	9	14,8	14,8	91,8
	31 - 50	2	3,3	3,3	95,1
	51 - 65	2	3,3	3,3	98,4
	66+	1	1,6	1,6	100,0
	Total	61	100,0	100,0	

Daily transport choice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Walking	11	18,0	18,0	18,0
	Bike	47	77,0	77,0	95,1
	Car	1	1,6	1,6	96,7
	Public transport	2	3,3	3,3	100,0
	Total	61	100,0	100,0	

Weekly bike use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 2	9	14,8	14,8	14,8
	3 - 5	11	18,0	18,0	32,8
	6 - 8	13	21,3	21,3	54,1
	9 - 12	9	14,8	14,8	68,9
	13+	19	31,1	31,1	100,0
	Total	61	100,0	100,0	

Relationship between perceived bicycle parking conditions and age (V11 – V1) – One-way ANOVA

ANOVA

Total perceived bicycle parking conditions

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,149	4	,037	,313	,868
Within Groups	6,654	56	,119		
Total	6,802	60			

Test result: Not significant → perceived bicycle parking conditions are equal between groups based on age.

Relationship between perceived bicycle parking conditions and daily transport mode (V11 – V2) – One-way ANOVA

ANOVA

Total perceived bicycle parking conditions

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,282	3	,094	,821	,488
Within Groups	6,521	57	,114		
Total	6,802	60			

Test result: Not significant → the perceived bicycle parking conditions are equal between groups based on daily transport mode.

Relationship between perceived bicycle parking conditions weekly bicycle use (V11 – 3) – One-way ANOVA

ANOVA

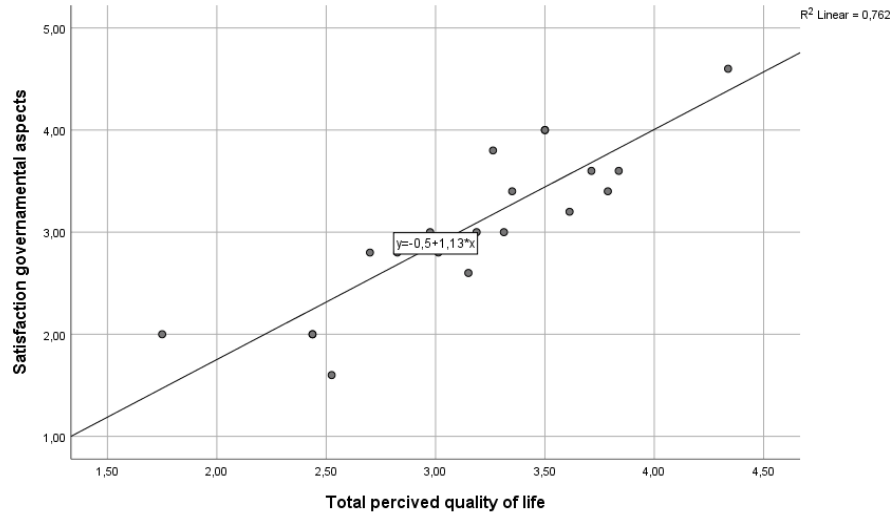
Total perceived bicycle parking conditions

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,292	4	,073	,627	,645
Within Groups	6,511	56	,116		
Total	6,802	60			

Test result: Not significant → the perceived bicycle parking conditions are equal between groups based on weekly bicycle use.

Relationship satisfaction governmental aspects and perceived quality of life (V10 – V4)

Pedestrian:



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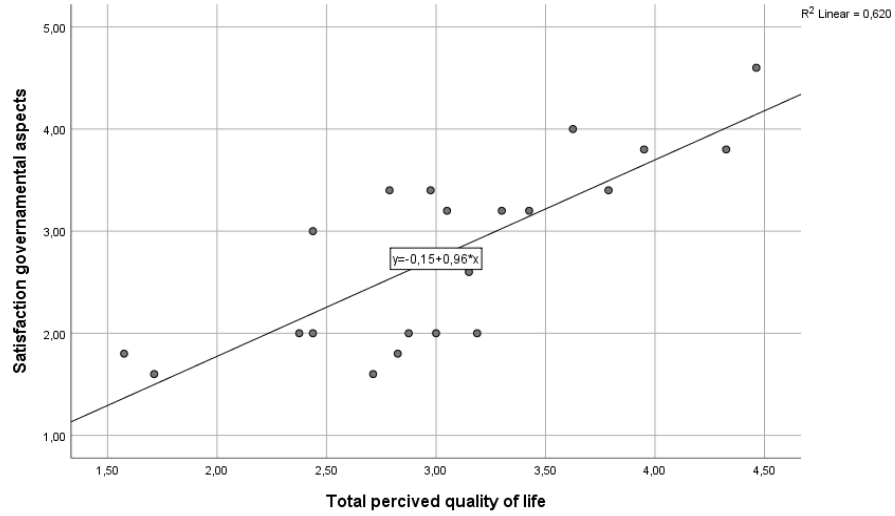

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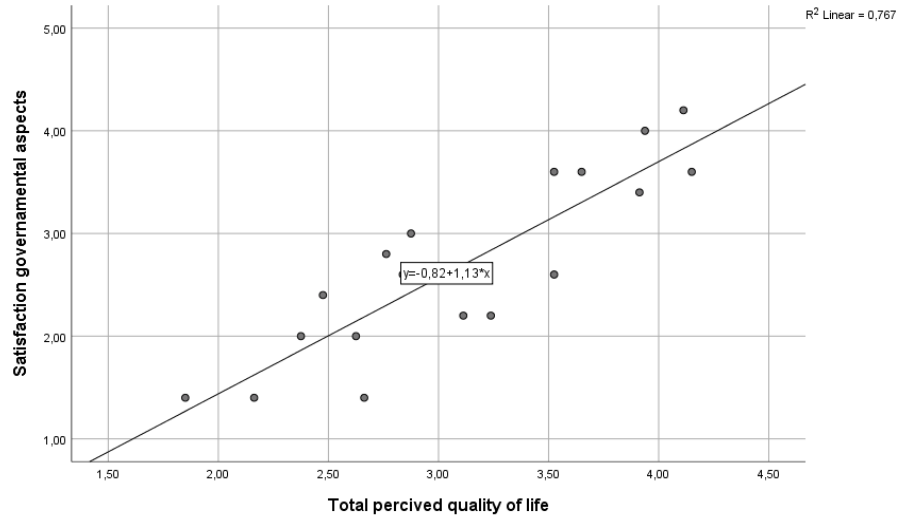
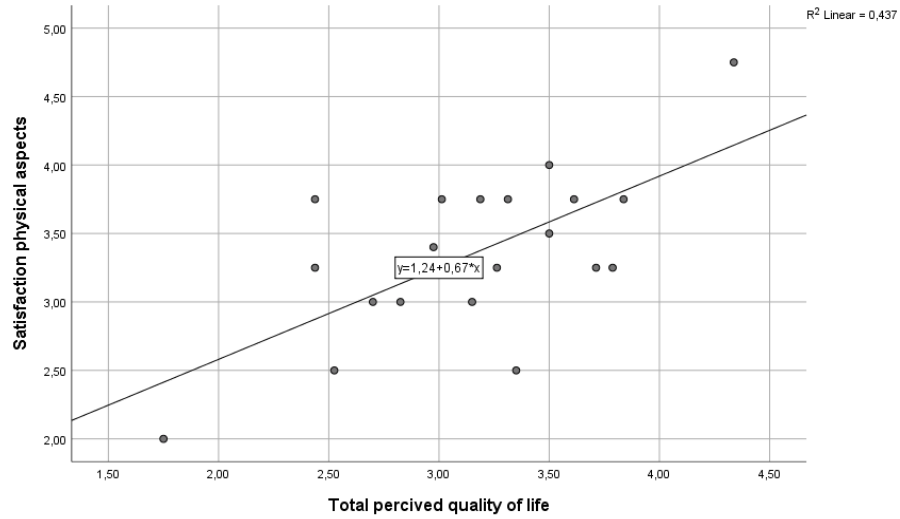
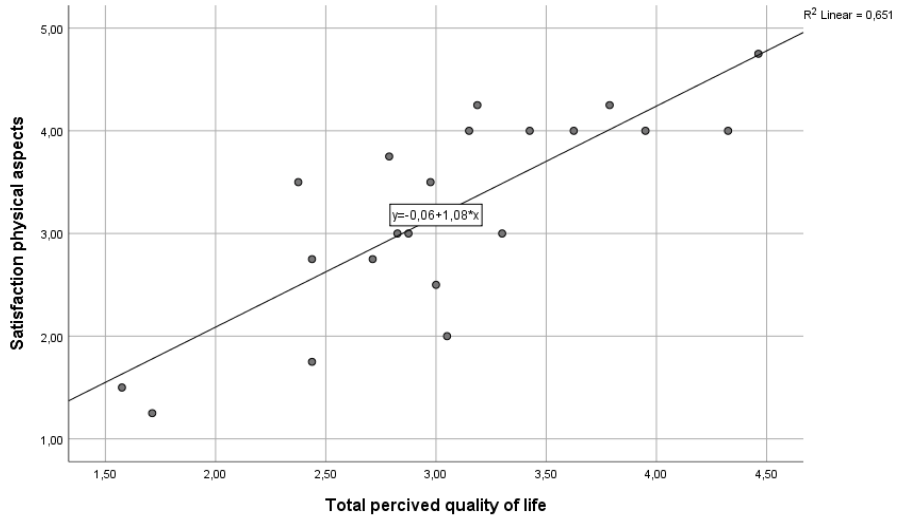


Relationship satisfaction Physical aspects and perceived quality of life (V10 – V5)

Pedestrian:



Bicycle accessible:



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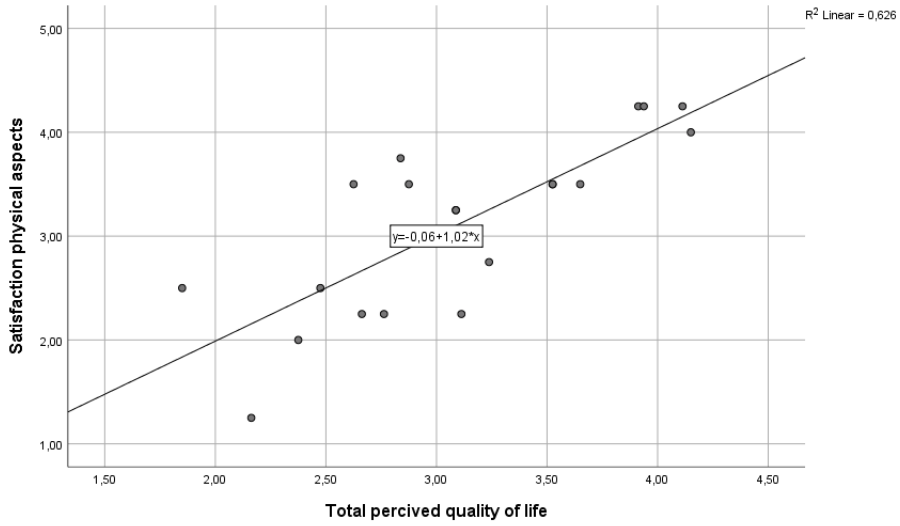
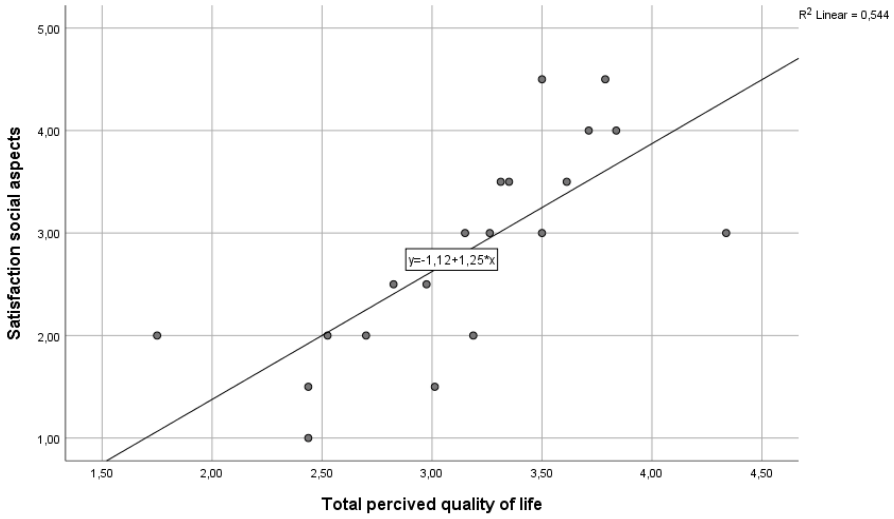
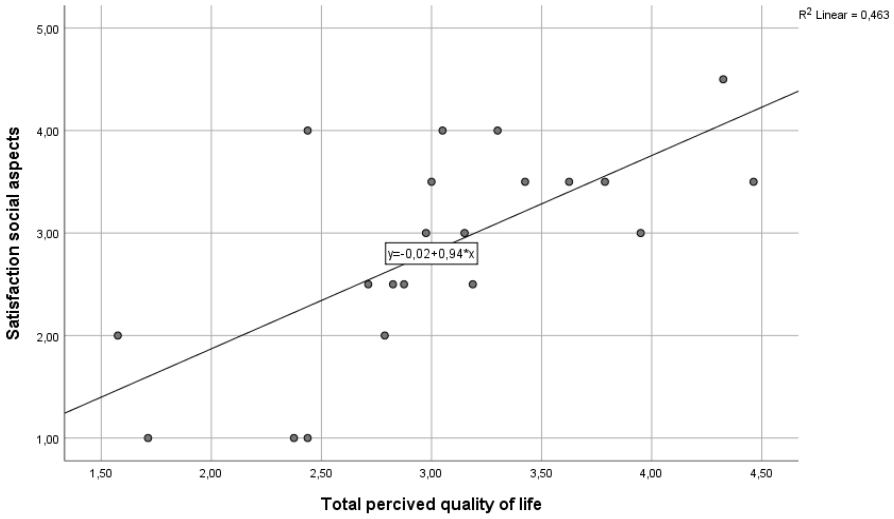


Relationship satisfaction Social aspects and perceived quality of life (V10 – V6)

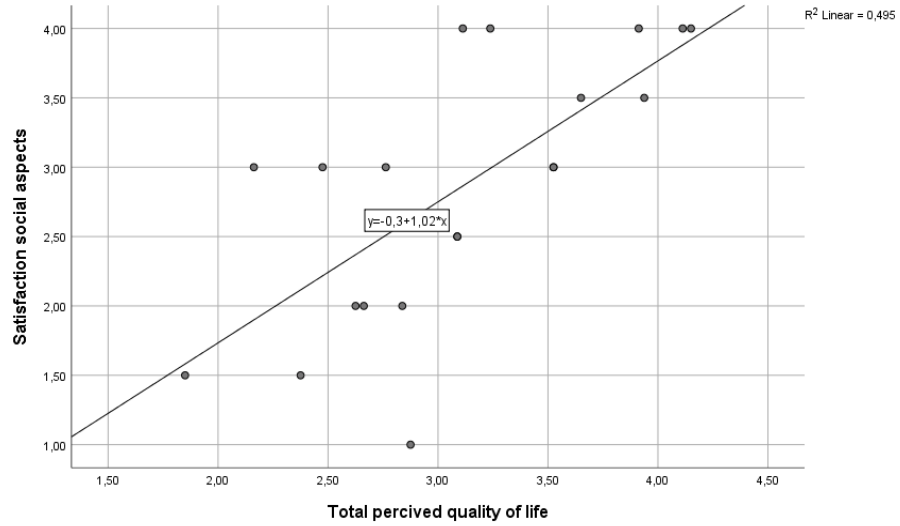
Pedestrian:



Bicycle accessible:

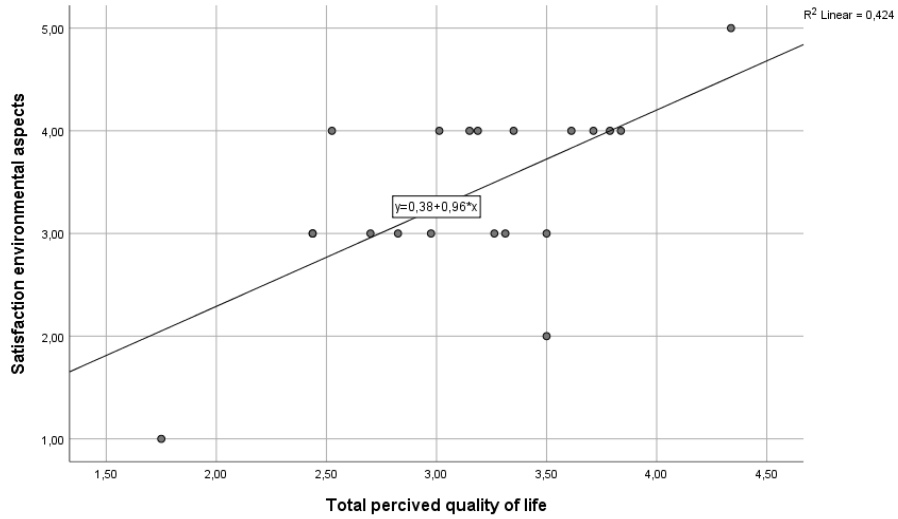


Car accessible:

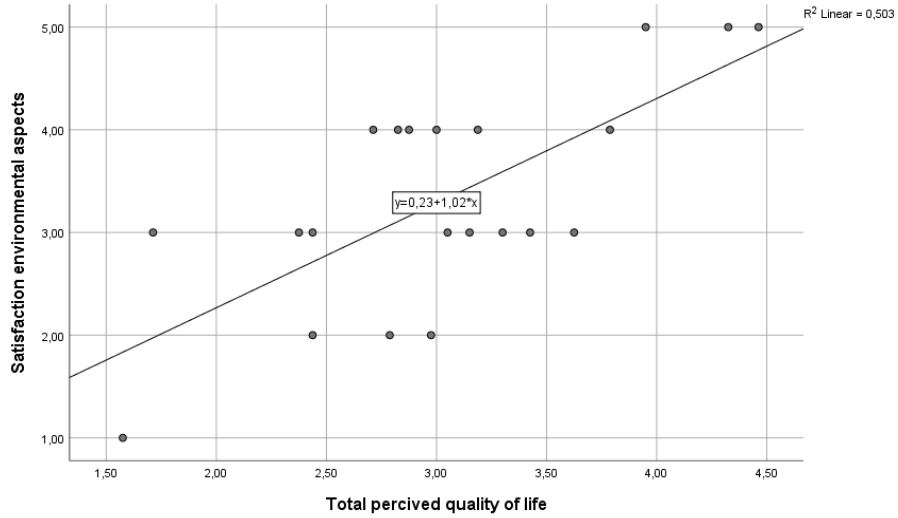


Relationship satisfaction Environmental aspects and perceived quality of life (V10 – V7)

Pedestrian:



Bicycle accessible:



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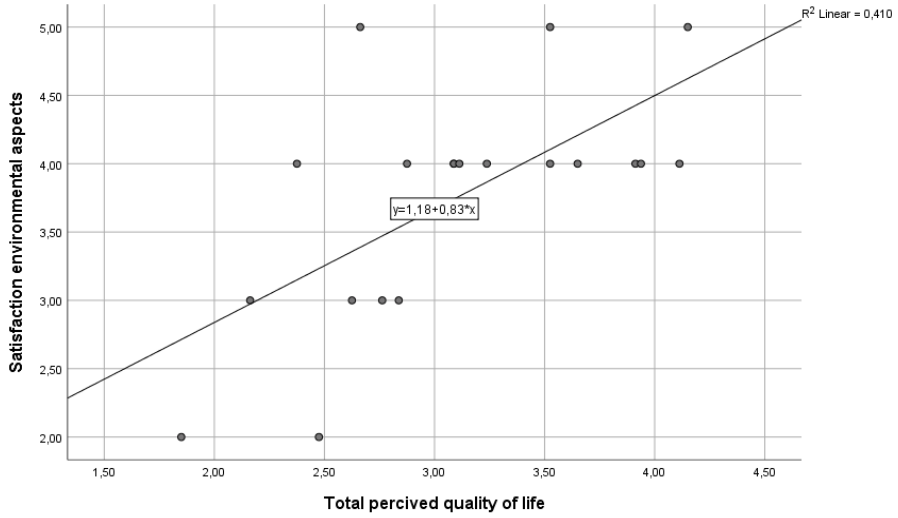
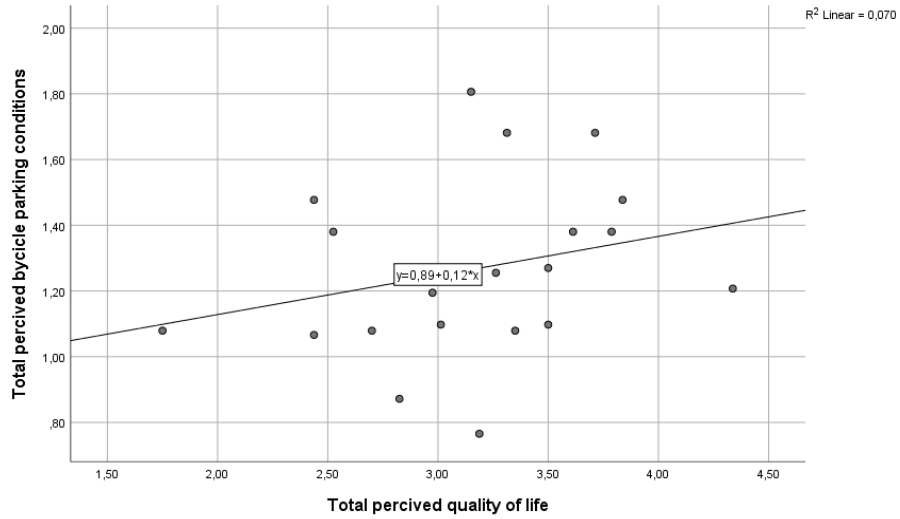


Relationship perceived bicycle parking conditions and perceived quality of life (V10 – V11)

Pedestrian:



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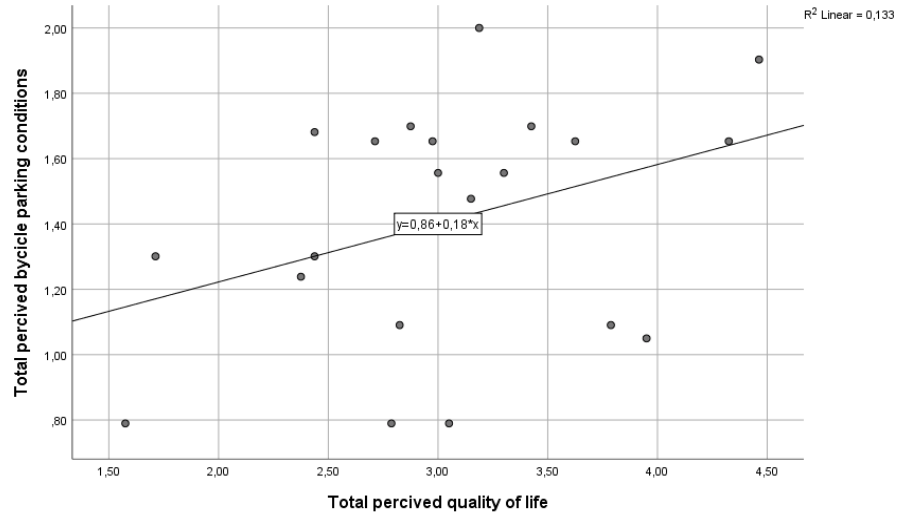

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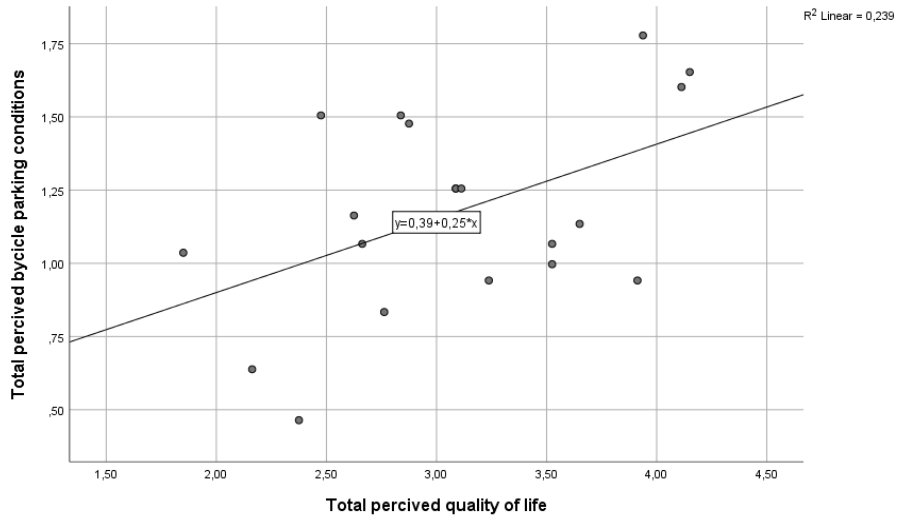


Linear relationship between perceived quality of life and perceived bicycle parking conditions (V10 – V11) – Simple Linear Regression

Pedestrian:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,265[a]	,070	,019	,59549	,070	1,363

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,483	1	,483	1,363	,258[b]
	Residual	6,383	18	,355		
	Total	6,866	19			

a. Dependent Variable: Total perceived quality of life

b. Predictors: (Constant), Total perceived bicycle parking conditions

Test result: Not significant → there is no linear relationship between the perceived quality of life and the perceived bicycle parking conditions.

Bicycle accessible:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,365[a]	,133	,088	,70764	,133	2,926

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,465	1	1,465	2,926	,103[b]
	Residual	9,514	19	,501		
	Total	10,980	20			

a. Dependent Variable: Total perceived quality of life

b. Predictors: (Constant), Total perceived bicycle parking conditions

Test result: Not significant → there is no linear relationship between the perceived quality of life and the perceived bicycle parking conditions.

Car accessible:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,489[a]	,239	,197	,58816	,239	5,648

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,954	1	1,954	5,648	,029[b]
	Residual	6,227	18	,346		
	Total	8,180	19			

a. Dependent Variable: Total perceived quality of life

b. Predictors: (Constant), Total perceived bicycle parking conditions

Test result: Significant → there is a linear relationship between the perceived quality of life and the perceived bicycle parking conditions.

Linear relationship between perceived quality of life and perceived satisfaction with Governmental aspects (V10 – V4) – Simple Linear Regression

Pedestrian:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,873[a]	,762	,748	,30157	,762	57,499

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,229	1	5,229	57,499	,000[b]
	Residual	1,637	18	,091		
	Total	6,866	19			

a. Dependent Variable: Total perceived quality of life

b. Predictors: (Constant), Satisfaction governmental aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with governmental aspects.

Bicycle accessible:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,787[a]	,620	,600	,46861	,620	30,999

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6,807	1	6,807	30,999	,000[b]
	Residual	4,172	19	,220		
	Total	10,980	20			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction governmental aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with governmental aspects.

Car accessible:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,876[a]	,767	,754	,32545	,767	59,233

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6,274	1	6,274	59,233	,000[b]
	Residual	1,907	18	,106		
	Total	8,180	19			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction governmental aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with governmental aspects.

Linear relationship between perceived quality of life and perceived satisfaction with Physical aspects (V10 – V5) – Simple Linear Regression

Pedestrian:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,661[a]	,437	,405	,46357	,437	13,951

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,998	1	2,998	13,951	,002[b]
	Residual	3,868	18	,215		
	Total	6,866	19			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction physical aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with Physical aspects.

Bicycle accessible:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,807[a]	,651	,633	,44914	,651	35,428

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7,147	1	7,147	35,428	,000[b]
	Residual	3,833	19	,202		
	Total	10,980	20			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction physical aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with Physical aspects.

Car accessible:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,791[a]	,626	,605	,41239	,626	30,103

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,119	1	5,119	30,103	,000[b]
	Residual	3,061	18	,170		
	Total	8,180	19			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction physical aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with Physical aspects.

Linear relationship between perceived quality of life and perceived satisfaction with Social aspects (V10 – V6) – Simple Linear Regression

Pedestrian:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,738[a]	,544	,519	,41684	,544	21,516

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,739	1	3,739	21,516	,000[b]
	Residual	3,128	18	,174		
	Total	6,866	19			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction social aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with social aspects.

Bicycle accessible:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,681[a]	,463	,435	,55697	,463	16,393

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,086	1	5,086	16,393	,001[b]
	Residual	5,894	19	,310		
	Total	10,980	20			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction social aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with social aspects.

Car accessible:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,704[a]	,495	,467	,47884	,495	17,678

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4,053	1	4,053	17,678	,001[b]
	Residual	4,127	18	,229		
	Total	8,180	19			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction social aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with social aspects.

Linear relationship between perceived quality of life and perceived satisfaction with Environmental aspects (V10 – V7) – Simple Linear Regression

Pedestrian:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,651[a]	,424	,392	,46870	,424	13,256

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,912	1	2,912	13,256	,002[b]
	Residual	3,954	18	,220		
	Total	6,866	19			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction environmental aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with environmental aspects.

Bicycle accessible:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,709[a]	,503	,477	,53597	,503	19,222

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,522	1	5,522	19,222	,000[b]
	Residual	5,458	19	,287		
	Total	10,980	20			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction environmental aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with environmental aspects.

Car accessible:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	,640[a]	,410	,377	,51784	,410	12,506

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,354	1	3,354	12,506	,002[b]
	Residual	4,827	18	,268		
	Total	8,180	19			

a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Satisfaction environmental aspects

Test result: Significant → there is a linear relationship between the perceived quality of life and the satisfaction with environmental aspects.

Linear relationship between Total perceived quality of life and Total perceived bicycle parking conditions (V10 – V11) – Simple Linear Regression

Descriptive Statistics

	Mean	Std. Deviation	N
Total perceived quality of life	3,1008	,66031	61
Total perceived bicycle parking conditions	1,2872	,33671	61

Correlations

		Total perceived quality of life	Total perceived bicycle parking conditions
Pearson Correlation	Total perceived quality of life	1,000	,353
	Total perceived bicycle parking conditions	,353	1,000
Sig. (1-tailed)	Total perceived quality of life	.	,003
	Total perceived bicycle parking conditions	,003	.
N	Total perceived quality of life	61	61
	Total perceived bicycle parking conditions	61	61

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,353[a]	,124	,109	,62313

a. Predictors: (Constant), Total perceived bicycle parking conditions
b. Dependent Variable: Total perceived quality of life

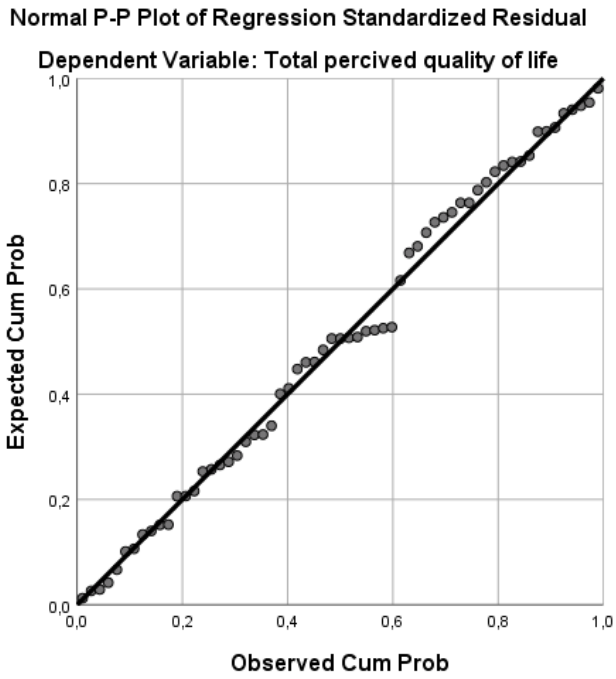
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,251	1	3,251	8,372	,005[b]
	Residual	22,909	59	,388		
	Total	26,160	60			

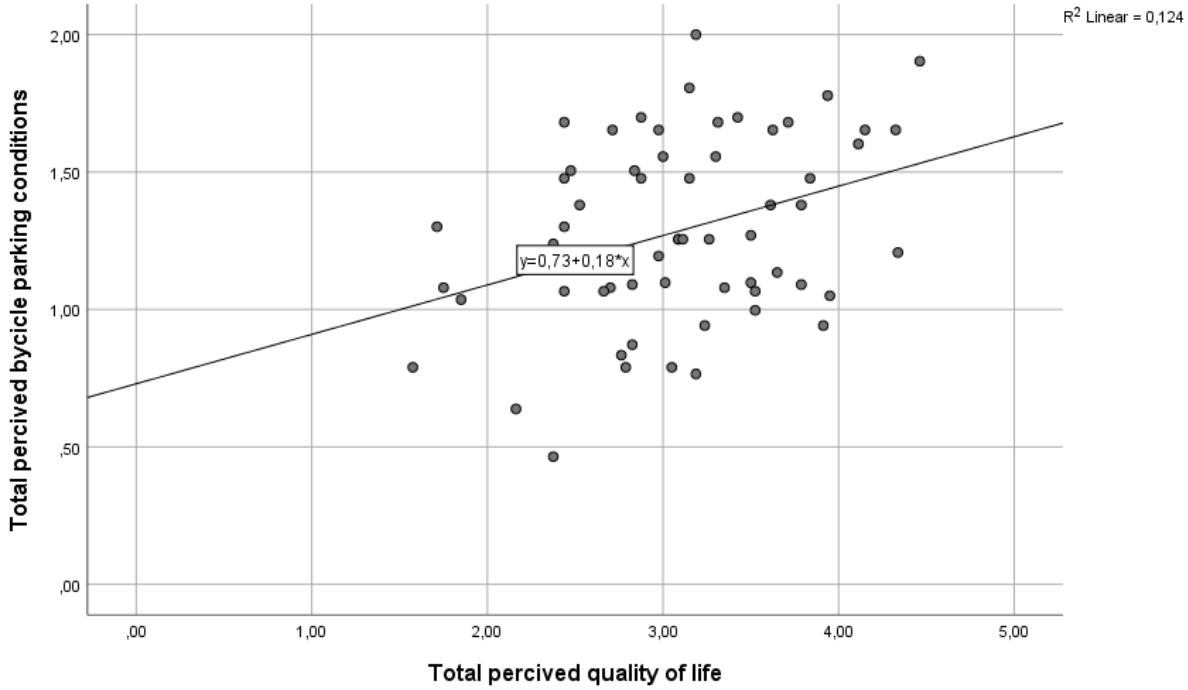
a. Dependent Variable: Total perceived quality of life
b. Predictors: (Constant), Total perceived bicycle parking conditions

Test result: Significant → there is a linear relationship between the perceived quality of life and the perceived bicycle parking conditions.

P-P plot Total perceived bicycle parking conditions and Total perceived quality of life (V10 – V11)



Relationship Total perceived bicycle parking conditions and Total perceived quality of life (V10 – V11)



Appendix 5: Interview

Urban Policy Adviser Department of City Development, Municipality of Groningen

Researcher Thank you so much for taking time for for this. I'm writing my thesis on bicycle parking conditions and the quality of life of the residents who live in the streets, where the conditions of how the bicycle can be parked and where it can be placed. It differs in certain places. So, to see how the inhabitants of those streets perceive their quality of life, and they are depending on this on certain factors, which are governmental factors, such as legislations, regulations, which is also mostly what I would like to to talk about and also environmental factors, physical factors, social factors. I forgot to to ask is it okay if a record this and use for the research?

Urban Policy Adviser Yes that no problem.

Researcher Okay. Perfect. Thank you.

Urban Policy Adviser What faculty once again?

Researcher The faculty of Spatial Sciences.

Urban Policy Adviser Oh, yeah. Yeah, I've been down there by myself. Between 1999 and 2005. So, a little bit familiar with with the urban planning, the environmental study.

Researcher And also a master in Groningen?

Policy adviser Yes.

Researcher And your position in it's a policymaker?

Urban Policy Adviser Yes, policy adviser within the municipality, and within the Department of City Development. And I'm working on the cycling strategy, mobility vision, etc.

Researcher Yeah perfect. I read a lot about it and I'm very intrigued and also, I know, Groningen it's one of the, one of the best cycle cities in the Netherlands, but also, I would say Europe. I have to say it's also a really nice job.

Urban Policy Adviser Yeah, it's just also a matter of opportunity we have in The Netherlands as well. I think in The Netherlands it's very good to cycle.

Researcher Yeah.

Urbam Policy Adviser It's Groningen the, it's also especially more or less also, a matter of sticking to the same strategy throughout the decades. Probably you read about the 70s in Groningen and then when all of city centre was made free of cars, not really free of cars but it was not possible any more to drive through the city.

Researcher Yeah. The, the circulation I think it's called

Urban Policy Adviser Exactly. So, one could say our culture of cycling started probably even before it started in those days when everyone in Europe and in the world was thinking about planning for the car and making some nice breakthroughs within the old districts. And even Groningen it wasn't going to happen that way. But at last, a very leftist coalition within the politics, decided to "no we are not going to do that we are going to make the city centre more car free, more for pedestrians, etc.." so I think it starts with this one point in history. Together with the opportunity that we are, of course, a flat country, so don't forget about it. And Groningen was a compact city and, uh, and that political movement to get rid of the car. And our particular city made it easier to have the bicycle as the safest bicycle as the best way of go from A to B. But in the city and as a matter of fact, I think at these moments, to two

thirds of the trips are being made by bicycle. Just depending on what point you take. But I mean when you look at the city centre It's far higher, of course. But still, there's still a lot of work to do because we are not there yet frankly. Still a lot of our infrastructure has been made been designed for cars. And that's just one point. Don't forget about as a cyclist you can cycle almost everywhere and it's very difficult to have a barricade for a cyclist as you probably have encountered by yourself and for cars must be different. For cars you can design and say "hey that street is not for cars anymore" put a roadblock on it and you're ready. But that's not easy. Now we are very busy with our mobility vision as agreed upon last year in December. I think it's a good thing for you all to read a little bit about that. There's an English version on our website. Read about the different things which we try to make another step forward so that what we are doing within the city centre the past decades we tried to apply it the whole city within the ring road. That's a huge step. It's quite expensive and time costly of course. But that's the way we are going to move on and that's a logical step for us from the past decades. And what I would like to stress is that it's a matter of culture and political to culture. So, we we have at this moment a leftish alderman. And before we got the element from the middle party and before that it was an alderman from the Rights Party and the city, the cycle strategy was not really different. We got different political parties in the coalition.

Researcher Yeah. And that makes the decision even more difficult because it's a continuous change between right, left and now.

Urban Policy Adviser No, I would say just the other side. One would say it, would be difficult, but history proves that it is continuously more or less the same strategy has been adapted and put through. And a stick through because, it didn't depend on what the political colour was. The thinking was more or less the same. And I think that that's one thing that Groningen has got as an advantage of that became a quick good cycling city.

Researcher Yeah indeed. Yeah. Because the strategy was always the priority to make those cities cyclable. Actually. Also, because I also read in the in the main document for the strategy that you want to make the city centre more pedestrian friendly. What is the actual like vision of the pedestrian friendly city centre? And how do you think that affect the the bicycle situation?

Urban Policy Adviser Yeah. I think the two things again, because the bicycle is a good thing, it's something we cherish and, but it has some minor back loss also as your account for you by yourself, I think. And sometimes when it's busy parking bicycle is a problem. it's space consuming and it's it's not good for the spatial quality and the quality of life. That's more what we also see, and we have policies on, parking, bicycle parking. And the second thing is every cyclist should become pedestrians. Don't forget about this. So, everyone. More or less the same group of people who are pedestrian are cyclists, let alone some exceptions, are

there. Of course, people who live very near by the city centre, but most of the people who walk through the city have been cyclist on becoming cyclists on a dated trip. We are busy with investigating what the percentages is of it, but some people are just using the city centre as a route through to go from A to B. For example, when you go from the west part of the city to the hospital on the eastern side of the city centre, and you go to city centre. So, we are busy with trying to make new routes, develop new routes. And one example is that we are redesigning the Grote Market now, in the coming months It will be executed, and it will not be possible anymore to cycle along Grote Market from east to west. You have to go to little bit north via a new street. That doesn't say that you can't do it, but we say, "take that route as the best route and not any more along the Grote Market area". So, it's a little bit you have to go a hundred-meter longer trip, but that's it. You have to encourage people to take a little bit of a different route than you did before. So, we've done it before on the Zernike routes, probably, you know about the Zernike routes, we got three main Zernike routes and we try to encourage the routes along the jetpack through the pacxji area and not to take the routes via the ONELAN and the shopping mall. That's an example of how we try to encourage people to take another route and not to block a typical route so that there's no point we going to do. when we talk about parking, which I've been busy with, to realize new parking areas, be it under the grounds, on street level, because at this moment we've got a huge shortage on parking, on real parking places. So, if you are not able to have a parking place at all, then you could put it on the street somewhere else and sometimes, most times it's no problem, but sometimes in some places it becomes a problem because it's overcrowded, etc. So, our policy is frankly to three lines. Base one is, I talk about city centre in this moment, base one is the capacity should be okay and that ok should be quantitative and qualitative. So, the quantitative is just have enough place for what we see on the street. In this moment we got, let's say, 6000 parking places in on street and in the new parking facilities at the forum and the Grote Market facility. We have two big facilities. But that's a measurement of 2019. And within two weeks we don't have new measurements about what's the situation at this moment. Line two. And then okay, that's a bit about quantitative, that just to figure out how much you need, and of course, you also have to figure out is how much you need for the long-term parking and the short of parking. Because when you go to the city centre for let's say, let's have a dinner and let's have a lunch or let's have a drink for, and then you stay in the city centre for almost 4 hours or more. But when you go down to the city centre, just for let's say, okay I'm a dutchman, a little bit cheese on the market area. Then you are a quarter or 15 minutes and not any longer, and then you go back then when you do that, a visit like that. Then you are less willing to park your bicycle a little bit further away and further away, and we can go down to centre and you know, you're there for, let's say, 4 hours. Then you are willing to park a little bit more on a distance, let's say two or three meters more. Etc. And that's the qualitative to quantity part of the capacity. So, we're we're so we know at this moment that the the eastern part of the city centre and let's say the whole tomorrow and the Forum area, we've got two huge facilities now, a good facility which are always open,

free, or free of charge. And this area, we are at the moment that we say "ok in this area our capacity is at this moment. Right? Right. Check. That's okay". So, no one has an excuse to park its bicycle just anywhere.

Researcher Yeah. And this is also why is this like more and more legislations on where exactly you put the bike on the street or not. And I've read that there's, of course, a policy which, for certain roads and for certain spaces you can't put the bikes or park a bike on those streets, which yeah, it's kind of like a beautification of the city kind of movement. I've also read, and I went through a lot of houses of residents of the city centre and quite a bit of them also had problems with where to park a bike because a lot of the streets were "ok you can't park a bike here". And for some places, which it's also like in the housing law, you have a parking garage with the house so you so you can put a bike in within the house because there's a parking space inside, like for some houses that's not available. And a lot of the residents had problems in the past few years about cities since this law came into play, where their bikes get taken by the municipality and then they go to the deposit of bikes and then they get them. And with a lot of the people that I talk to, it's not really. It's not really said the municipality doesn't really say that there's this thing into place. It's kind that they notice from one day to the other because their bike was gone, and they thought it was stolen. So, is the municipality also thinking of putting any or informing the residents of this? Is there anything going on with the information part to the residents about it?

Urban Policy Adviser You're correct about the problem. And I think to most of the older living areas it is a problem because they've been built in times when the bicycle was not there yet. Of course, information is available on our website. There's no problem to go to to find it. If you look for it, you will find it in one minute. Yeah, but people have to look after it. So, people are going to. And we've got a very, in my opinion, clear website with clear information on what's allowed, what's not allowed. But in the past times it's frankly, it's lacked about the right communication. So, I think since let's say half a year, it became, in my opinion, very clear on the website in the Corona Times, it was far more difficult because we had to implement a regulation about the keeping distance. And then was in the city centre, not allowed to park your bike anymore in different places.

Researcher But that's still in place. If I'm not wrong.

Urban Policy adviser No it's not not done in my place. It is not.

Researcher Okay then. Wrong sources.

Urban Policy Adviser No, no. But I agree that that's not all our signs are in place at the moment. Some signs are still there, and we have to remove it. But some are still there. We

got two legislations basically. One regulation is on a station area in the vicinity of the new Grotemarkt area. And You're not allowed to park your bike outside the parking facilities. Be it a wreck on the street or a box on the street are there are the big parking facilities because what we do in place is because we put enough capacity in this place.

Researcher Yeah. So then ultimately there's the regulation around the parking, parking lots, parking place. Next to the Forum, for example.

Urban Policy Adviser the forum and Pulenstraat area and then let's say to the surrounding two hundred meters.

Researcher Yeah. But in that case, do you also expect the residents to park their bikes in the facility?

Urban Policy Adviser Yeah, that's what we what we encourage because and you can also and that's the second baseline of a policy and legislation is to defer to baseline to, not to start with, but to close with our policy, the legislation. But the second part is to encourage people to park in the right way, and in the right place. And that's the more behavioural side of parking. Okay, we've got the facilities and we try to encourage people, make use of it. And in some places, we are we have legislation to have a little bit more force to go to for what if. No, but in most of the places in the in the city centre, we don't have enough capacity. This becomes and force it. Let alone only situations where parked cyclist is endangering the, uh, let's say the fire engine and the police are the people who can't walk or who are disabled to pass by or you parked your bicycle by a bus stop, etc. Then the bicycle can be taken away immediately. But also, that's a case of we don't have a police cop in every corner. So, it's sometimes it's been there and it's no problem then it's not been taken away right away. There are some places we know we allow the bicycles parked, but then we know that the accessibility of emergency services is in danger. Then we are keen to remove the bicycle immediately. So that's the second part of legislation we are allowed to. And the first one, this legislation and that you are that's who you are allowed to park your bicycle, your bicycle four weeks at one place. And it's not a matter of if you use your bike within four weeks, there's no problem. But when you your bicycle has been untouched for four weeks, that has to be removed as well.

Researcher And to do that, I think I've also noticed the. There are little stripes that you put around the bike.

Urban Policy Adviser Yeah, yeah, yeah.

Researcher But also for certain places, that's fourteen days, if I'm not wrong.

Urban Policy Adviser That's on the station area. It's, 12 days, actually. Because the station areas have a far more, circulation of Bicycle. So that four weeks is too long because the, the station area is also another, uh, typical use because it's part of a larger trip and most of the time two spots of a train trip or bus trip or etc. Station areas are not, mainly the main goal is not to, to store your bicycle station, bicycle for living area, etc.

Researcher Yeah, it's just a temporary stay.

Urban Policy Adviser So typical, the commuter trips are probably a little bit longer that you are one week where parents are at or you go you go back to sleep for example, or for one week then it's okay. But when you do a two-week stint and then you have to discuss the. there is not enough room for it. Frankly at the train station areas, it's sometime, it's overcrowded. So, it is necessary.

Researcher And um, regarding future plans and future, maybe future policy, I think you said that in two weeks there's going to be a new legislation that will come into play. Am I right or wrong?

Urban Policy Adviser What do you mean, two weeks?

Researcher You said that there's going to be a new legislation coming into place regarding.

Urban Policy Adviser Oh, no, not new legislation. We have a new account of the parking facility. We are counting how many cities do we have in the city centre and how much is it being used in certain different times throughout the week.

Researcher Yeah. Okay. And is there any other, let's say, future plans on how to improve bicycle parking? Are you planning more facilities?

Urban Policy Adviser Yeah, we do. So, we got at this moment for the train stations, we got three main train stations and the train station in Europa Park has been doubled recently. Train stations station Noord It's also plans to double the capacity and for the Hoog station we are more than doubling the capacity. So, then that's 17 thousand bicycles can be parked there. Then we've got and we are prepared for the future for the train stations. But in the city centre if we have also planned, we've got now two huge, big parking facilities, as you know, at Grotemarkt and Niewe Markt, and we see the success of it. So, we try we are planning now for doing the same type of facility in the southern part and the western part of the city centre. But that's different. Frankly, it's very difficult because finding the right spots is good to do, but have the right circumstances are very difficult because we got an old city centre and it's

not even possible to, let's say, to pick a church and make a parking facility in a church. And because of the and going underground, it's also very difficult in a historical city centre, one can say that's the park facilities that we have. it's the easiest one to make. Because there were building for the whole time there was a building, but it has been built in the fifties, so it was fairly easy. Okay, easy. It wasn't easy, but it was fairly easy comparatively to make a parking facility in the end. You at the forum location It has been built from, from scratch so you could plan easily for it. So, and then the rest of the city centre we don't have such locations. So, it's a difficult puzzle to solve. Yeah, but we have the ambition to do that. And in the meanwhile, we are investing in temporary parking space on the streets, etc. to try to get to. And that's because the city is growing, and the amount of cyclist are growing, and the number of parked bicycles is also growing. That's that's for sure. So, we have to find new solutions and because also some specific place in mind actually. But I think when the coalition is being formed after the elections, because at this moment, right now it's in progress at this moment than I think there will be some news about more specific locations.

Researcher Okay. Well, that's very nice to hear as well. And., I think. Yeah, I think this is it. I think this is all the questions I actually had.

Urban Policy Adviser Oh, okay. Yeah. It's been a little bit said the answers you expected.

Researcher Yeah. No, I think I got a lot of information through this. Through this, thanks to you.

Urban Policy Adviser Okay. Yeah, you're welcome.

Researcher And do you have maybe any other contacts in the municipality that you think I could find. That would be useful for my research to interview as well?

Urban Policy Adviser Yeah. Very specifically in parking, bicycle parking, you could interview someone else, but I think it is more or less the same story you will hear. Probably you could ask someone from more from the city design part. What was his opinion about it? But of course not. My opinion is not always the same as the opinion of people who like to encourage the pedestrian areas, because somewhere someone says, hey, the Old City Centre should be pedestrian area. And I think that's just not fruitful. Yeah, I think I think I think the cyclists won't accept it. But some people have that vision in mind and I'm not sure if it's for you to elaborate on that.

Researcher No, I think that would also be nice to elaborate because I also read about a lot about making it more pedestrian and how, you know, then the implications of that to the residents would be quite enormous. In general, I would say.

Urban Policy Adviser I think that's a different topic because everyone agrees on this in the city of calling and the pedestrian is number one, the cyclist, number two, the public transport number three and the cars number four and everyone agrees upon it. And at some places, sometimes it's a little bit different. But when you come into city centre, of course, a pedestrian is number one, but everyone is becoming a pedestrian. Sometimes it's complex. Yes, but we don't have to exaggerate the conflicts over exactly because most of the time it's going very okay and it's no problem at all. So it is, in my opinion, is a temporary problem and locates a problem and not not really a must. I mean, we are working on new place and a temporary. I mean, also, it's a bit more a problem of some peak hours during the week. And most of the time it's not a problem.

Researcher Okay. Perfect.

Urban Policy Adviser Oh, yeah. And one last remark. Yeah. We can problem problematize parking safe parking like this. But I wouldn't do that because if you didn't have the policy, uh, sincerity on the car, then everyone was talking about complaining about car parking, etc. I'm very happy that this is our problem and not the car parking in the car. Effects of cars. Cars in the city. Yeah. At this place. Because then I think this problem is far bigger and far bigger than than all the problems with cyclists.

Researcher Yeah, definitely.

Urban Policy Adviser to put a little bit into proportions.

Researcher To put it in proportion to the other transport modes. Yeah. Because um, it was also my, my main concern is the city is growing, more students are coming more. That means more bicycles on the roads. And, but it's nice to, to hear that the strategy is actually working out slowly now.

Urban Policy Adviser but in general, when it's becoming busier in a city, there's not only for the cyclist, but when we talk about strategy, our strategy is not. And most places would say, okay, let's bundle the cycle infrastructure because this includes bundling the city and make it into infra for the cyclist. Good. And it is a good thing in other places. But in a city of Groningen in and when it's concentrated and becoming busier, then we have to spread it over a lot of more roads. And that's so that the problem becomes even out. Yeah, that's, that's a little bit of a mathematical approach. But this one thing that, that will work for sure because we have experiences, I mean the routes to Zernike when you spread on three routes then it's. Less difficult, then we abandon those onto one route which becomes overcrowded. And to

Zernike, the Zernike route also sometimes become overcrowded, but still manageable. Yeah. So, a one last remark, I think when you talk about business in the cycle.

Researcher Yeah. That's a that's actually a really good remark. But I am unfortunately running out of time from this software. But thank you very much for your time. It's been a real good talk.

Urban Policy Adviser Okay. Good luck with it.

Researcher Thank you. Bye bye.