

THE EFFECT OF TOURISM INDUCED CROWDS ON THE MOBILITY PATTERN OF RESIDENTS OF THE AMSTERDAM CITY CENTRE



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SUMMARY

The number of tourists in Amsterdam is growing, and so are the effects on the residents. In this study, the effect of overcrowding, partly caused by tourism, on the mobility pattern of residents of the city centre of Amsterdam is investigated. Not only in Amsterdam but in several cities, the presence of tourism is influencing the lives of the residents. A well-known example is Venice, where several effects on the mobility pattern have been found. The situation in Venice will be compared with Amsterdam based upon four mobility indicators: trip aggregation, modal split, route choice and time of the trip. With surveys of 61 randomly chosen residents, the stated preference is collected. The results of this study are supplemented with the findings of studies done by the municipality of Amsterdam looking into the perception of the city and the tourism situation.

The results show that there are substantial differences in how often residents are irritated by overcrowding. They consider that tourism has a big role in overcrowding. The route is the most influenced mobility indicator, followed by trip aggregation, time of the day and modality. The route people choose is more influenced in Amsterdam than in Venice, time of the trip and trip aggregation are in Venice more influenced than in Amsterdam.

As possible solutions, the respondents mention limiting the number of tourists, fewer touristic activities a reduction in the number of sleep locations. Spreading tourists and making areas car-free are also mentioned by respondents.

The mobility pattern of residents of the city centre of Amsterdam is influenced by the presence of tourism. This makes the tourism situation in the city centre of Amsterdam not socially sustainable. Further research could look into the effect of a changed mobility pattern on liveability.

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1. INTRODUCTION

Tourism is a growing sector and the United Nations World Tourism Organization (UNWTO) expects that it will continue to grow (UNWTO, 2017). The growth of tourism in cities with a historic centre can form a threat for the conservation of the residents' local values. It can affect the formal, socio-economic and symbolic aspect of this landscape (García-Hernández, de la Calle-Vaquero, & Yubero, 2017). Overcrowding can be one of the impacts that tourism has on a city (Deery, Jago, & Fredline, 2012). In places where public space is limited and with a growing number of visitors, overcrowding could lead to serious mobility problems. In many European cities, tourism management has become a key issue on the urban agenda (García-Hernández et al., 2017). In the city of Amsterdam, the effect of overcrowding is increasing. One of the causes of overcrowding in the city centre is tourism; this leads to irritation of the residents (Gerritsma & Vork, 2017). Media is reporting about the issues with tourism, indicating that it is a subject of the public debate (Parool, 2018; Volkskrant, 2018). This study will analyse if the tourism situation in Amsterdam is socially sustainable with regard to mobility. The term socially sustainable is used as defined by Gössling (2017) as respecting the cultural and behavioural values of the host community.

The effects of overcrowding, partly caused by tourism, on the mobility pattern of residents in the city centre of Amsterdam will be investigated in this study. It is difficult to investigate only the effects of tourism, therefore both the general effects of overcrowding on mobility and the role of tourism in the overcrowding will be studied.

The research question for this study is:

Does the overcrowding, partly caused by tourists, affect the mobility pattern of residents of the Amsterdam city centre?

Three sub-questions arise from this research question:

1. How do the residents of the city centre of Amsterdam perceive overcrowding?
2. Does overcrowding influence residents mobility indicators in the city centre?
3. How is the role of tourism in overcrowding of the city centre of Amsterdam perceived by residents?

First, the theoretical framework will be discussed, in which concepts are defined and relevant studies are presented. Thereafter the conceptual model and hypothesis are shown. Next, the methodology is explained. Then the results are presented and used to answer the research questions in the discussion. Thereafter the conclusion and recommendations for further results are given.

2.2 HYPOTHESIS

Academic literature and media show that there might be an influence of tourism on mobility. To test the research question, some hypotheses are used. In general, the hypothesis is that overcrowding, partly caused by tourism, influences the mobility pattern of residents of the city centre of Amsterdam. For the sub-questions the following hypotheses are formulated.

1. Residents of the city centre of Amsterdam perceive the city centre as overcrowded.
2. Overcrowding influences mobility indicators of residents of the city centre of Amsterdam.
3. The role of tourism in overcrowding is perceived as a big role by the majority of the residents of the Amsterdam city centre

These hypotheses are tested in the data analysis and explained in the discussion. This leads to the answer to the research question in the conclusion.

2. THEORETICAL FRAMEWORK

In the theoretical framework, the used definitions will be given and relevant studies and their results will be presented.

Tourism has been defined in various ways. Almost all definitions are about people who stay temporarily away from their home. However, some definitions include the activities they do, for example, the interaction with other people and places, or undergoing experiences that may influence the attitude of themselves or the host community towards opinions, and ultimately lifestyles (Sharples, 2014). The time tourists spend on travelling differs, similar to the distance from their homes and the goals associated with their travel. In this study, the presence of visitors is relevant, whereas cultural or geographical differences are less relevant for the definition. The geographical determination for tourism is stated as people coming from outside the Metropolitan Area Amsterdam as defined by Metropool Regio Amsterdam (2018). This region can be seen as the service area of the city of Amsterdam in the field of the labour market, housing, transport, education, culture and economics (Metropool regio Amsterdam, 2018). The area is shown in figure 1. The duration of the trip is not relevant for the definition of tourism in this study, although it is for the overcrowding. The goal of the trip has to be associated with recreation, for example recreational shopping or cultural interests.

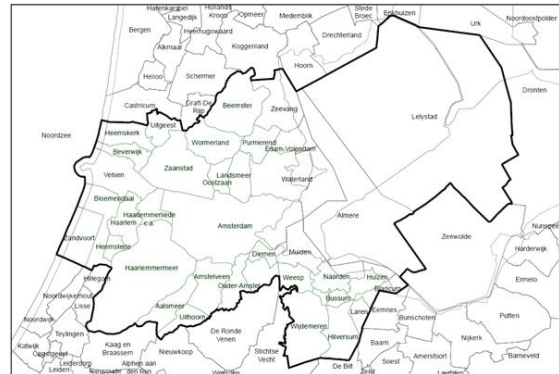


Figure 1 Demarcation of the Metropolitan region Amsterdam (Metropool Regio Amsterdam, 2018)

In most scientific literature, the main focus is on the perception of tourists when overcrowding is associated with tourism, specifically the risk that overcrowding influences the perception of tourists (Brau, 2008). Overcrowding by tourists results in a loss of welfare because it could lead to a reduction in demand (Concu & Atzeni, 2008). Furthermore, the concept of overcrowding has not been defined in context with tourism although it is mentioned in some literature. In this thesis overcrowding with tourists will be defined as the presence of a number of tourists that is so large that people perceive it as irritating. Overcrowding will be related to social sustainability in the field of mobility. This means that there should be respect for the social-cultural authenticity of the host community, conservation of their built and living environment, traditional values and contribute to intercultural understanding and tolerance (Gössling, 2017). Overcrowding could lead to a change in the living environment because people perceive this in a different way, choose to go somewhere else or do not engage in a type of activity anymore. A small change in any of the factors of social sustainability can make the situation not social sustainable, there are no levels within the concept.

In the conflict between tourists and residents, the term "residents" is used and not "locals". This is done because locals might not represent the group of people that live in a place and call it home, it could refer to an undifferentiated social or ethnic community (Mordue, 2005). The spaces where the conflict between resident and tourist occur should be understood as entities that are practised or performed. Not just as places where people pass through (Quinn, 2007). This is because residents who share space with high numbers of tourists are active in reconfiguring practices, relationships and mobility with and within places (Joseph & Kavoori, 2001).

To determine if overcrowding influences the mobility pattern of residents, indicators of peoples travel behaviour are relevant. The characteristics of trips are categorised into the following factors: aggregation, modal split, route and time of the trip (Wee, Annema, & Banister, 2013). Trip aggregation is whether people leave their houses to undertake an activity or for a recreational trip. The modal split describes what transportation mode is used for a trip. The route is the outcome of the navigational decisions that are made.

The time of the trip contains the time of departure and arrival, the travel time could be extracted from this information. People make choices concerning mobility at many moments of the day, during the travel and in-between. Many choices are based on intuition, this covers habitual and impulsive choices. Intuition is unconscious, these are the most of the mobility choices that someone makes. Choices which are not based on intuition are on rationality (Wee et al., 2013). It can be hard to say which choices are made on an intuitive basis and which are made on a rational basis. The results will not be split into these two categories, but it is important to keep in mind that these differences exist.

For a long time, research has focused on the social impact and perception of tourism by the host community. In this sense, the host community was a larger group than the residents in the crowded tourist places. The specific group, residents in crowded tourists places, might be more influenced by tourism than the host community.

This study is looking into the perception of overcrowding with tourists, and the effects of crowds on the residents. Most studies in the field of the tourist-resident conflict are narrow case studies (Sharpley, 2014). More general studies, which could help to solve the problems in multiple cities are being done. These studies rely on case studies for empirical support. Both types of studies are addressing more specific topics in the conflict between residents and tourist, broadening the knowledge in the field. This study will add knowledge to the specific field of mobility of residents. Most studies focus on perception and not on the response (Sharpley, 2014), that is why this study will look explicitly at the influence of tourism on the mobility pattern.

Internationally there are some case studies describing the effects of overcrowding in relation to tourism. Some of them do also take the subject mobility into account (Anna & Rocca, 2005; Concu & Atzeni, 2008; García-Hernández et al., 2017; Gerritsma & Vork, 2017; Joseph & Kavoori, 2001; Mordue, 2005; Quinn, 2007; Sharpley, 2014). Tourism is still growing (UNWTO, 2017) and, if people do not choose to go to other places, the problem of overcrowding will occur in more places and have more effects in places where it already occurs. In Barcelona and Venice, there are significant groups of residents against tourism. High numbers of tourists in a historic city centre can form a threat for the conservation of the local values (García-Hernández et al., 2017). For example, in Venice people are changing their mobility pattern. Some people leave their houses less often because of the overcrowding (Quinn, 2007). Large numbers of people can be seen as congestion which has a negative influence on the quality of life of residents (García-Hernández et al., 2017) and the welfare of tourists (Concu and Atzeni, 2008).

The only article describing the effects of overcrowding on the mobility pattern of residents is about Venice, written by Quinn (2007). She had a sample of residents of the historic city centre of Venice. The public transport in Venice is overcrowded, so residents choose to walk, travel at other times or use circular public transport routes around the centre instead of through it. Public piazzas and routeways are blocked by the physical presence of tourists and by the behaviour of them. Residents zigzag around the tourists or try to avoid central places and main streets at all. Some residents talk about "no-go" zones of the city. The tourists walk at a slower pace than the residents would like to do, the crowd forces the residents to slow down. Residents experience that it is becoming harder to travel around the city with growing numbers of tourists because they spread across a larger area what makes alternative routes not useable. A big difference is perceived between day- and nighttime, during the day many tourists visit the city, and they leave in the evening. The places change depending on the weight of the tourist presence, and on when and where overcrowding is felt most. The clearest statement explaining the effect of overcrowding by tourism is: "Venetians must be one step ahead, anticipating the crowds, planning their movement for certain times and thinking about alternate, short-cut or roundabout ways of getting to their destinations"(Quinn 2007, p.471).

Cities have different characteristics, thus the effect of overcrowding might also differ. In Venice, the transport over water and walking are the most important forms (Quinn, 2007). In Amsterdam, cycling is the most important transport mode for residents (CBS, 2016). These transportation modes function in different ways

(Schoemaker, 2002) and therefore they may have other consequences for the mobility pattern of residents. Another important difference is the circadian rhythm of tourists. In Venice, they are predominantly present during daytime (Quinn, 2007) while international tourists in Amsterdam stay mostly for some nights and national tourists can return during nighttime (OIS Amsterdam, 2018b).

A critical note should be made about the section above. Almost all information is based on case studies and generalised in relation to other case studies. There are no articles found describing that overcrowding, partly caused by tourism, does not lead to changes in the mobility pattern. It is not implicating that this situation does not occur, but just that it hasn't been described or found in the literature by the researcher. It could also be influenced by the different definitions of overcrowding that exist.

In the year 2017, approximately 5.340.000 tourists have visited Amsterdam of which 4.359.700 foreign (Meijers Interactive, 2018). The tourists who are not foreign are people living in the Netherlands and using services of the touristic sector such as cultural and recreational facilities. Together they stayed 7,3 million nights in a hotel, this is a rise of 10% since 2016 (OIS Amsterdam, 2018). International tourism in The Netherlands and especially the region of Amsterdam is expected to continue to grow, this is predominately caused by economic prosperity. The metropolitan region Amsterdam expects that ageing might also lead to an increase in tourism because elderly people have more time to spend on holiday and in combination with the economic prosperity they can afford it (CBS, 2017; Metropoolregio Amsterdam, 2014).

2.1 CONCEPTUAL MODEL

The conceptual model, shown in figure 2, is a visualisation of the relation between the core concepts in this study. Tourism is an input of overcrowding, it is not the only cause of overcrowding, but the one which is being investigated. The presence of overcrowding influences the intuitive and rational choices forming the mobility pattern of residents. The mobility pattern consists of four factors: trip aggregation, modal split, route choice and time of the trip. Just like overcrowding, the mobility pattern of residents of the Amsterdam city centre is also influenced by other factors, but those are not the subject of this research. The interaction of those concepts takes place in the built environment.

The model will be tested by asking residents about the effects that overcrowding has on their mobility pattern and whether they perceive that tourism is a relevant factor in overcrowding.

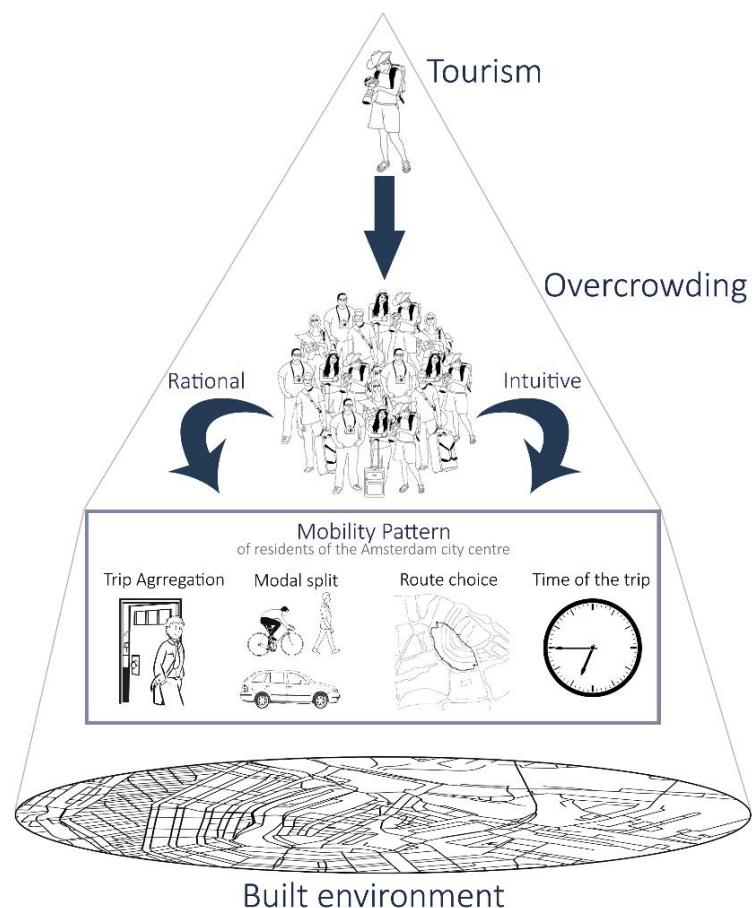


Figure 2 Conceptual model

3. METHOD

A combination of primary and secondary data has been used to answer the research question. The primary data is collected via surveys. The secondary data is the outcome of several studies by the municipality of Amsterdam. First, this secondary data will be described, then the method of primary data collection will be described.

One study executed by the municipality of Amsterdam, "Buurtenquête Stadsdeel Centrum 2017", looks into the perception of residents of the city centre on various fields. 3000 cases were collected, which contain predominantly residents, but also some entrepreneurs and visitors are included. Native Dutch people and people with higher education are overrepresented in the dataset. The research agency expects that the people who filled out the survey are more than average involved in their neighbourhood (Greven & Jakobs, 2017). The relevant data for this study is about the perception of tourism, overcrowding and mobility. Also, other topics are addressed which are not relevant to this study.

Another document that has been used is "Stand van de Balans" (2016). This is a study into the usage and perception of the city of Amsterdam. The results are based on public data sources and a survey consisting of 4731 cases. Residents and entrepreneurs have been asked to fill out this survey. The age group 18-35 years is not fully represented.

3.1 PRIMARY DATA COLLECTION

The primary data is collected via surveys to gather information about behaviour and attitudes of a population. Another option to collect data about mobility could be a diary or GPS tracker, however when using those methods it is harder to find respondents (Clifford, French, & Valentine, 2010) and it will be more time-consuming. Therefore in this study, the choice is made to use surveys as data collection instrument.

In the survey, respondents have been asked questions about how they perceive overcrowding, their mobility pattern, and the relationship between those. The survey consists of 20 closed questions to be able to draw general conclusions. Also, 4 open questions have been added to get more insight into the motivations of how residents perceive tourism and make mobility decisions. Additional to this a GIS (Geographic Information System) interface is used to allow respondents to provide spatial information. The survey is conducted with Maptionnaire, an online survey program. The questions and answers can be found in Appendix 1 and 3.

On the first and second day collection, the GIS interface was used incorrectly. The collected data was not saved. The answers that have been collected are from the south and east part of the city centre and are not representative of the whole centre. Although they are not representative, they can be used as an indication of the influence of tourism on the route choice of residents.

It would be desirable to ask respondents about the situation before and after the overcrowding which is partly caused by tourism. However, this is impossible, because there is no clear start of overcrowding and it is unsure whether residents have ever been in such a situation. The questions will be about the imaginary situation in which there are no tourists in the city centre of Amsterdam. The method is also referred to as stated preference. This method is not very strong because respondents can only predict what they might do, which is not always a reliable prediction (Wee et al., 2013). Although it is not as strong as a revealed preference methodology, it is a way to answer questions that cannot be answered with revealed preference.

To be able to interview a representative group of residents of the Amsterdam city centre the surveys have been conducted at the door. This way only people living in the city centre have been interviewed and the mobility pattern of the residents does not influence the sample. By surveying with face to face contact, the response rate is relatively high. If a person is not at home or does not want to fill out the survey at that time, a flyer is given with a link to the online survey. Only 6 cases were collected via the flyers linking to the online

survey. This is insufficient to test whether there are differences between the two groups. Because of the difference in collection methods these cases have been removed from the dataset.

The method clustered sampling has been used to get a random sample and keep the conducting practical. The locations that are being interviewed are randomly selected from houses in the administration of the building, in Dutch: Basis administratie gebouwen (Kadaster, 2018). When a house is selected the 19 houses with the following house numbers are also asked to fill out the survey.

The city centre of Amsterdam had 86851 residents on the first of January 2018 (OIS Amsterdam, 2018). With a confidence level of 95% and a confidence interval of 5%, the sample should consist of 361 cases. This is seen as an unrealistic goal because it takes too much time to collect those cases. That is why a confidence interval of 12,5% is chosen which requires 61 cases (Creative Research Systems, 2012).

The demarcation of the city centre is done based on the determination of the municipality of Amsterdam (Municipality of Amsterdam, 2018). The area of the city centre is the so-called "grachten gordel" this is the historic centre. See figure 3 for an overview of this area. Like other authors reporting about tourism in historic cities, the sample has been in the oldest part of the city (García-Hernández et al., 2017; Quinn, 2007). While conducting the surveys, it turned out that this demarcation was not correct. The "Plantage buurt" was also seen as the city centre, but residents do not perceive it as the city centre. Tourism has a marginal role in the traffic of the neighbourhood.

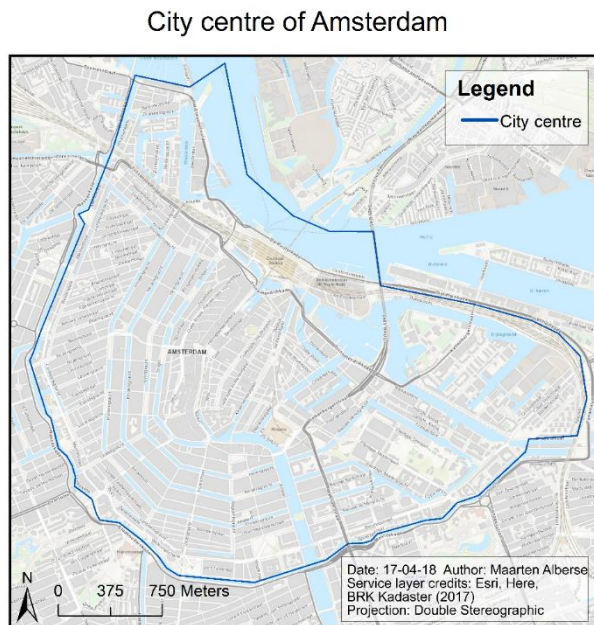


Figure 3 Demarcation of the city centre of Amsterdam

3.2 ETHICAL CONSIDERATIONS

The respondents are asked if their data may be used for this study and whether it may be shared after anonymising.

All personal information is collected via a protected data collection tool: Maptionnaire. It is downloaded on secured computers of the University of Groningen. When using the data, the Data Protection Regulation 2018 is taken into account.

With the GIS interface, the living location of a respondent can be collected. Spreading this information is prevented by removing the origin and the destination of the data. Only the places where the used route differs from the desired route will be shown. If this part of the data shows the origin or the destination of a respondent, the data is removed. The data that is collected will not be shared with others outside of the research community, and only for a good reason. Before the GIS questions were asked, there was an explanation of how the answers will be used.

There is no reason to believe that the outcome of the research will cause any harm in a sense. The outcomes of this research will provide more insight into the changed mobility pattern, making it easier to address for governments.

The researcher is not personally involved in the subject. He does not come from Amsterdam and doesn't visit the city centre often. In the public discussion about less or more tourism, he does not have an opinion because he does not have relations with tourism, neither in a positive nor negative way.

3.3 DATA ANALYSIS

3.3.1 ANALYSIS OF GIS DATA:

The goal of the GIS data is to see the part of routes that differ from the desired route. To extract this information the following steps have been taken (see figure 4 for a visual representation of the GIS analysis):

1. The data is cleaned of errors. In this step lines that do not look like a route are removed, even as data outside of the research area. Also, vertices are removed that are likely to be placed by accident, making the routes more logical when looking at the street pattern.
2. Create a buffer of 10 meters around the desired route.
3. Create points along the actual route with a sequence of 1 meter.
4. Delete points drawn along the actual route that are not within the buffer of the desired route.
5. Convert leftover points drawn along the desired route with the same respondent number that are within 1,1 meter of each other to a line.

Step 2-5 are repeated with the desired and actual route reversed.

The differences in routes are shown. An explanatory study of the results is done. Places which are avoided are inventoried.

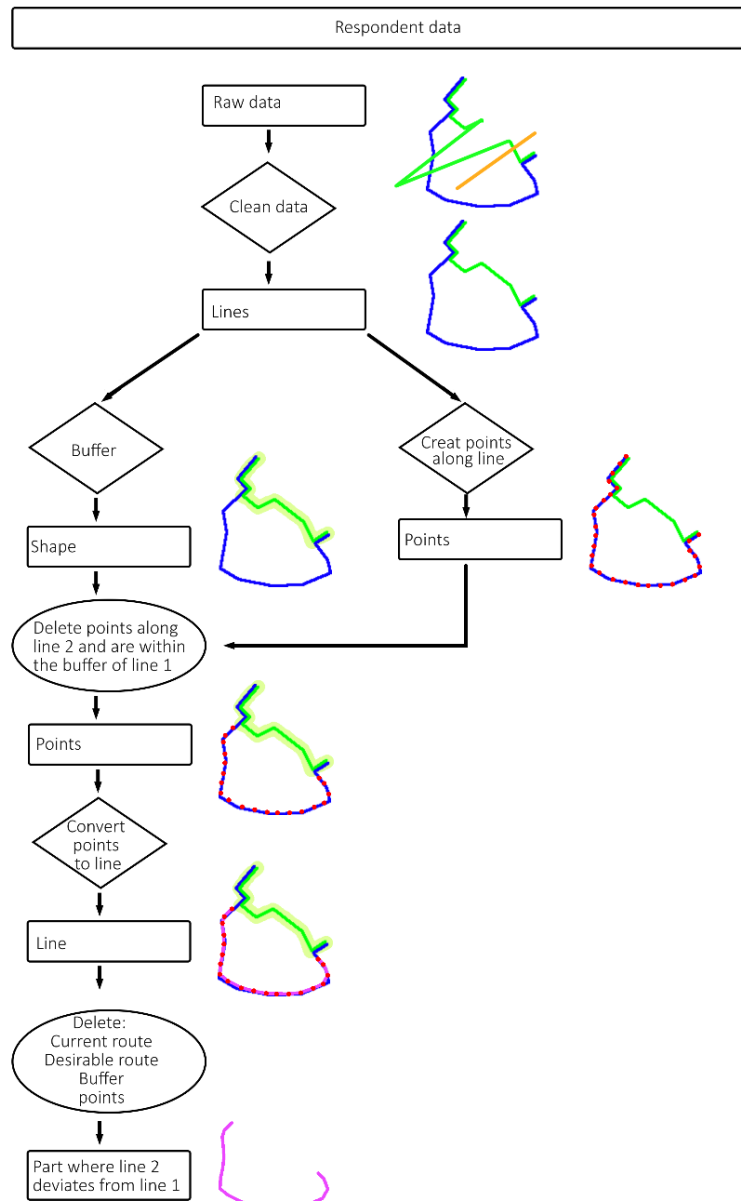


Figure 4 Flowchart of GIS analysis

3.3.2 ANALYSIS OF CLOSED QUESTIONS:

The data of closed questions is described using percentages of respondents that gave an answer.

Statistical tests have been done to analyse whether there are relations between used modalities and the perception or changed behaviour. Scale variables have been made that indicate which proportion a modality has in the mobility pattern of the respondent. These have been used as input in an ordinal regression together with how they perceive/act on crowds. The outcome could be that people who use a transport mode relatively often have the same perception/action. Walking, cycling, driving and using public transport have all been used as a reference variable, resulting in 4 regressions per subject. In total 44 regressions have been done. To

counteract the problem of multiple comparisons a Bonferroni correction has been done manually before interpreting the results. To keep a 5% significance level the probability of a statistical relationship should be smaller than 0,114% to be significant. Criticism on the Bonferroni correction is that it is too conservative and may fail to catch significant findings (Moore & McCabe, 2013).

3.3.3 ANALYSIS OF OPEN QUESTIONS:

The outcomes of open questions will be categorised. Themes that are mentioned several times are considered relevant and explained in the results. Also, quotes will be used to indicate a relevant aspect of tourism, overcrowding or mobility.

4. RESULTS

First, the general findings of the perception of overcrowding are given, then the effect on the mobility pattern will be explained based upon the four indicators. Thereafter the outcome of the statistical tests will be explained. After the numerical information, the GIS results will be shown. In the end, the qualitative data will be presented.

4.1 PERCEPTION OF OVERCROWDING

The perception of overcrowding differs between residents of the city centre. The respondents have been asked how many times a week they are irritated by overcrowding. On average a respondent is 9,64 times a week irritated by overcrowding. The distribution is not normal but skewed to the right as can be seen in figure **Fout! Verwijzingsbron niet gevonden.** (the x-axis is on with a logarithmic scale). A standard deviation of 35,9 in combination with the average of 9,64 and no negative value's shows that there is a wide distribution. The modus is zero.

A study of the municipality shows that 39% of the residents of the city centre perceive the streets as very busy, 34% say it is fairly busy, 24% think it is fairly quiet, and 3% perceive it as very quiet (Greven & Jakobs, 2017).

Table 1 shows how many residents irritate themselves at types of road users during different parts of the day. Most irritations are caused by pedestrians, and most people irritate themselves during the afternoon. At night just a few people are irritated by overcrowding. Public transport users should be interpreted in a different way than the other groups. These are irritations at people within public transport who might cause overcrowding. It can only be perceived by users of the public transport system, not by other road users like the other groups.

How many times a week are you irritated by overcrowding?

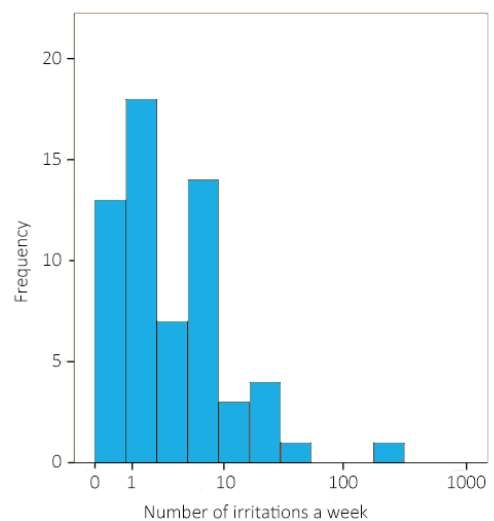


Figure 5 Frequency distribution of the times a respondent is irritated by overcrowding in a week.

Proportion of residents that are irritated by overcrowding of types of road users at different day parts

	Morning	Afternoon	Evening	Night	Not irritated
Pedestrians	21%	57%	41%	5%	27%
Cyclists	31%	33%	21%	2%	43%
Drivers	25%	33%	18%	3%	56%
Public transport users	18%	13%	10%	0%	43%

Table 1 Amount of residents that are irritated by overcrowding road user types at different day parts.

The respondents have been asked if they see overcrowding as a problem. 26% answered that it is no problem for them, 60% sees it as a problem and 14% is neutral about it (see figure 6).

Most questions were about overcrowding in general, but to be able to relate this to tourism the respondents were asked how they see the role of tourism in overcrowding. 6% said that tourism has no role in overcrowding, 80% says that it is a big role and 14% thinks it is something in between. No objective numbers are describing the role of tourism in overcrowding.

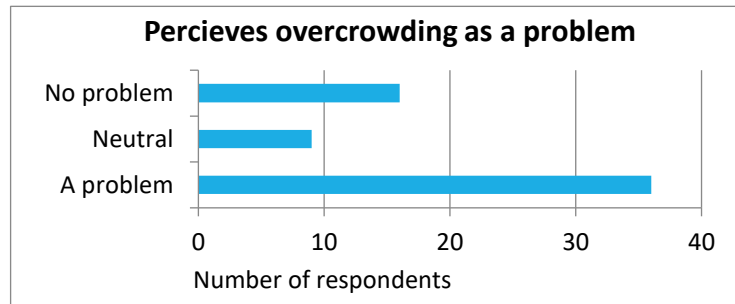


Figure 6 Perception of overcrowding in the city centre of Amsterdam

4.2 TRIP AGGREGATION

Overcrowding can form a barrier, making the costs of a trip bigger than the benefits. 21% of the respondents indicate that they would make more trips if there is no overcrowding. In this group, 81% would make the trips to engage in activities and 60% would make more recreational trips. For 79% of the respondents, the overcrowding does not influence the number of trips that are made. In Venice 26% of the residents trip aggregation is influenced by tourism, this is more than the situation in Amsterdam.

4.3 MODAL SPLIT

Another indicator of mobility that could be influenced is the modal split. 10% states that they would make a change in the transport modes they use. One respondent (1,6%) would walk more and cycle less. Another one would do it the other way around. 5% of the respondents say that they would cycle more and one respondent would use the public transport more. The information qualifying the impact of the change is not for all cases collected. One respondent does not cycle anymore because of the overcrowding, if the city would be less crowded, she would cycle again.

4.4 TIME OF THE TRIP

The time of departure of 15% of the respondents would change if there is no overcrowding. 85% would not change their travel time. 25% of the respondents that would change the times they travel would leave more during rush hour.

In Venice 23,4% of the residents interviewed by Quinn (2007) changed the times they travel because of tourism, this is more than the situation in Amsterdam.

4.5 ROUTE CHOICE

The most influenced indicator of mobility, is the route. 65% of the respondents says that they regularly avoid places because of overcrowding. This is higher than the percentage in Venice, 56,3% (Quinn, 2007). Although they say that they avoid places, not all respondents were able to show what places they avoid and what different route they choose. It is not clear if they regularly choose other routes because of overcrowding or if they only think they do. This makes it more difficult to interpret the results. In figure 8 **Fout! Verwijzingsbron niet gevonden.** the differences between current and desired routes are shown, figure 7 is a zoom-in of the core of the city centre. The most apparent observation about current and desired routes is that the core of the centre is avoided. In this area, the Damrak and Dam square are not much used in routes but are desired. The Prins Hendrikkade is also a road which is much avoided.

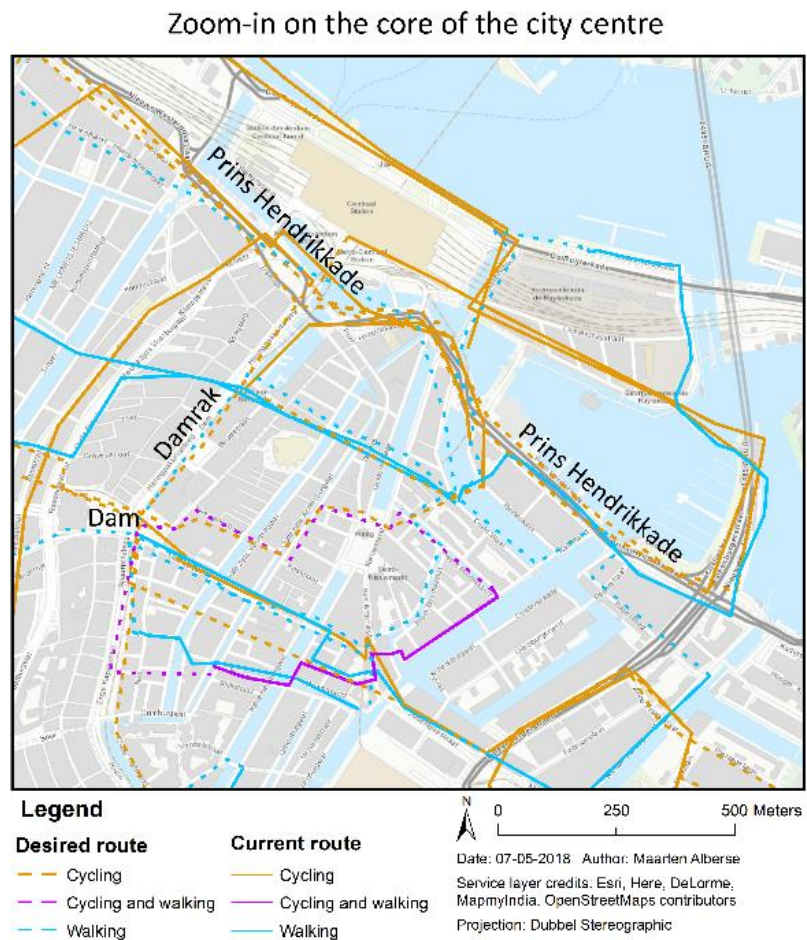


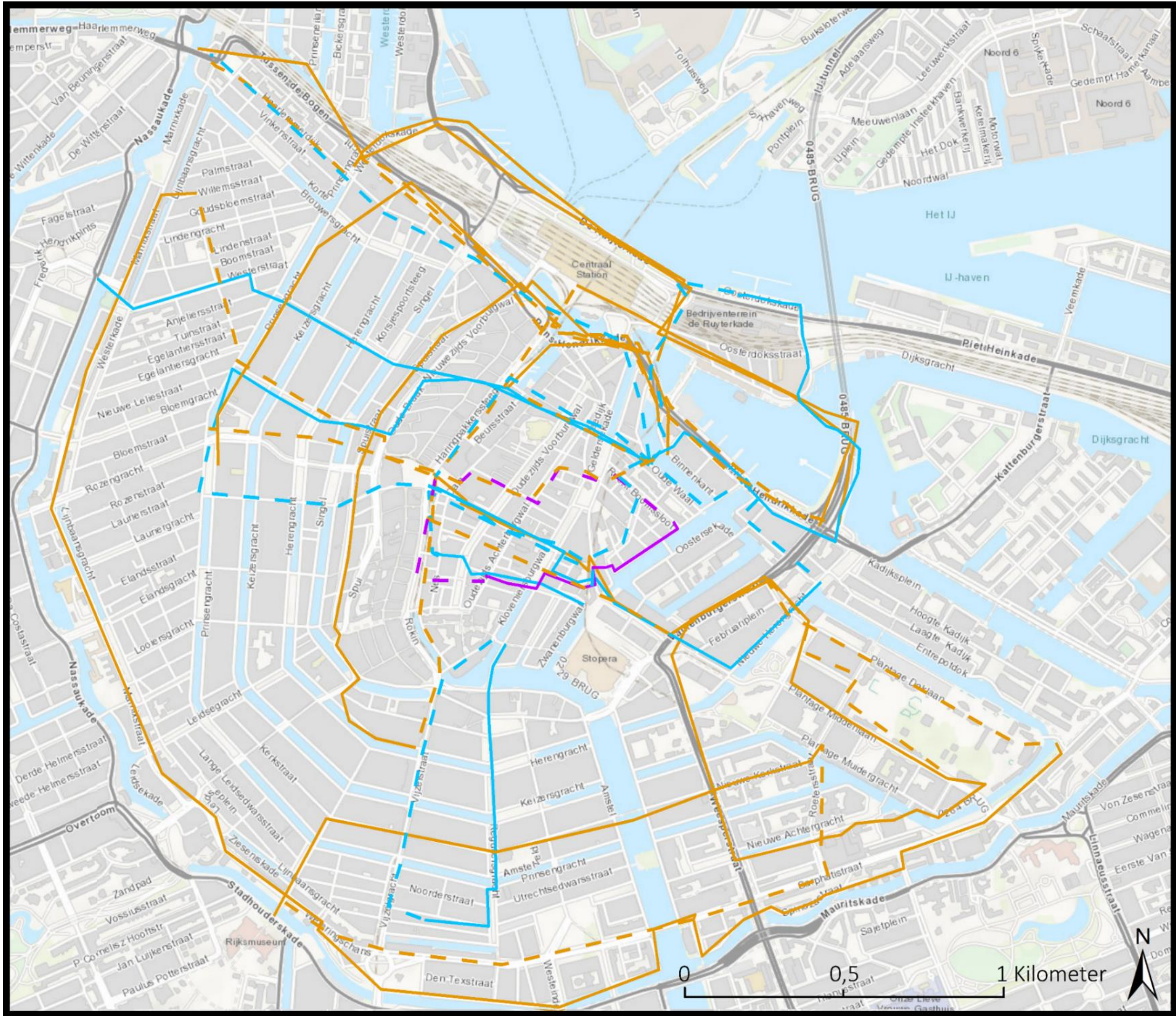
Figure 7 Zoom-in on the core of the city centre

While conducting the surveys in the west and south side of the city centre, respondents mentioned the Haarlemmerstraat/dijk also as a street they avoid. The routes of those respondents were not saved, so the map does not show the data of these respondents.

The alternative routes chosen by the residents are in general circling around the core of the city centre if this is possible. Most of the routes that go through the core of the city centre have their origin or destination in this core (this information cannot be seen in the map, it is removed to respect the privacy of the residents). To avoid the Prins Hendrikkade and the Stationsplein a detour via the Mr. J.J. van der Veldebrug and De Ruyterkade is used by several respondents.

People travelling by bike seem to be more eager to follow the circular form of the centre in their current routes than people on foot. Walking trips follow more straight lines and have a shorter distance than cycled routes.

The results based on geographical data are lacking some cases, as mentioned in the methodology. The residents that are included in the results live in south and east side of the centre. It is not possible to draw general conclusions upon this data because it might not be representative. However, it is a useful indication of the situation. Statements can be made about the alternative routes that are shown, as long they are not generalised.



Current and desired route

- Legend**
- Desired route**
- Bike
 - Bike and walking
 - Walking
- Current route**
- Bike
 - Bike and walking
 - Walking

Date: 07-05-2018
 Author: Maarten Alberse
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 Projection: Dubbel Stereographic

Figure 8 Current and desired route

4.6 OPINION

56% of the respondents think that it is a bad situation when people change their mobility pattern because of overcrowding that is partly caused by tourism. 39% thinks that it is not a bad situation and 5% has no opinion or does not know.

In a study of the municipality, 50% of the respondents say they think that crowds are irritating and 20% think it is cosy (Greven & Jakobs, 2017).

For 47% of the residents that want to move away, overcrowding is one of the reasons they want to move away. For 15% of the residents that want to move, overcrowding is the only reason.

Residents who are living in the city centre for not so long, think more often that crowding is part of the city than people who live a long time in the city centre (Jakobs et al., 2016).

4.7 STATISTICAL FINDINGS

No statistical relations have been found between the proportion of transport mode used and how residents perceive/act on tourism. This might be due to the conservativeness of the Bonferroni correction. Despite the criticism on the correction method, it is still used to counteract the problem of multiple comparisons.

4.8 QUALITATIVE RESULTS

The respondents have been asked how overcrowding could be solved. Some respondents gave solutions. Others made general remarks which will be discussed later. The number of respondents that mentioned the subject is shown in brackets. An overview of the themes of the answers of the respondents can be found in Appendix 2.

The most mentioned solution to overcrowding was fewer tourists(11). Other solutions related to this are limiting the locations where they can stay like hotels(2) and Airbnb(6). Also limiting the possible activities(1) such as closing coffee shops(1) and bike rentals(1) is seen as a solution. Reducing tourism by increasing tax(2) or stop promoting the city(4) were also mentioned. The current policy of spreading tourists around the city and country is seen as a solution by respondents(7), although one says that the tourism should stay concentrated in the current area and that the other areas should remain free from tourists(1). Other respondents suggested to start spreading residents, they said that there are just living to many people on a small piece of land(2).

Solutions which are more related to mobility are making more parts of the city centre car-free(6) or at least free from busses(3). Tourists and their luggage could be transported over water(2) or with free public transport(2). Physical changes could be improving traffic management with traffic lights(4), improving the infrastructure in general(3) and using larger trams/metro's(1). The municipality has already made policy concerning those solutions (Municipality of Amsterdam, 2018b)

Informing tourists about the local traffic rules(3) and that they are visiting a city where people live(2) could change the behaviour and attitude. Some people think that the problem of overcrowding, partly caused by tourists, cannot be solved(6)

In the survey respondents could also make remarks about tourism, mobility and overcrowding. Not all the remarks are relevant to this study. One theme that is mentioned many times is about "good and bad" groups of tourists, suggesting that a part of the problems related to tourism and not about their presence but about the type of people(14).

Some statements made by respondents are shown below:

- The city centre is becoming more crowded.
- Work traffic has a major role in traffic disturbances.
- Residents cannot enjoy their city anymore.
- I have not been in a traffic accident, but it will happen.
- I do not cycle anymore because of the overcrowding
- Bicycle streets are good.
- Tourists are not the problem, but the logistics of tourism are the problem.
- Overcrowding is not the problem, but the clumsiness of tourists is the problem.
- Overcrowding is a luxury problem.

5. DISCUSSION

The sub-questions and research questions will be answered in this section. The hypotheses are tested and accepted or rejected.

The first sub-question is: *“How do the residents of the city centre of Amsterdam perceive overcrowding?”* It can be said that residents perceive the city centre as overcrowded. The majority (73%) of the residents perceives the streets as overcrowded. 80% is irritated by overcrowding while travelling. Overcrowding with pedestrians is the most common irritation. The first hypothesis is accepted because most of the residents perceive overcrowding as a problem.

The second sub-question is: *“Does overcrowding influence residents mobility indicators in the city centre?”* All the mobility indicators are, for some people, influenced by overcrowding. The indicators trip aggregation, modal split, route choice and time of the trip are influenced for respectively 21%, 10%, 65% and 15% of the residents. Therefore the second hypothesis is accepted.

The last sub-question is: *“How is the role of tourism in overcrowding of the city centre of Amsterdam perceived by residents?”* 80% of the residents think that tourism has a big role in the overcrowding of the city centre. There are no objective numbers describing the role of tourism in overcrowding. The third hypothesis is also accepted.

When the answers of the sub-questions are being combined, the research question can be answered. Residents perceive overcrowding, partly caused by tourism, which influences their mobility pattern. Thus, the research question *“Does the overcrowding, partly caused by tourists, affect the mobility pattern of residents of the Amsterdam city centre?”* can be answered with yes.

6. CONCLUSION

Overcrowding, partly caused by tourists does affect the mobility pattern of residents of the city centre of Amsterdam. The role of tourism in overcrowding is perceived as a big role by the majority of the residents. No objective numbers are describing the role of tourism in overcrowding in the city centre.

How often residents are irritated by tourists differs, no general statements can be made about this. People are most irritated during the afternoon. Pedestrians are the most irritating road users. All four indicators of mobility are influenced by tourism. Route choice is the indicator that is influenced for most residents, followed by trip aggregation, time of the trip and modal split. Despite the fact that the route choice is the most influenced indicator this might not have the most impact on the life of residents. Only the effects of overcrowding on mobility are taken into account, not the effects of mobility on livability.

More than half of the residents think it is a bad situation if people change their mobility pattern because of overcrowding.

The tourism situation in the city centre of Amsterdam is not socially sustainable when looking at the effects on the mobility pattern of residents. According to residents, this can be solved by reducing the number of tourists and spreading them around the city and/or county. However, some do also say that the problem cannot be solved. A more general intervention which is mentioned is making more areas car-free. All things considered, the mobility pattern of residents is influenced by overcrowding, partly caused by tourism. The next step is to look into the effect on the livability.

7. RECOMMENDATIONS FOR FURTHER RESEARCH

If more studies are done on the effects of tourism on mobility, via overcrowding, it is useful to differentiate between overcrowding at different parts of the day, rush hour, weekends, and events. Another interesting aspect will be to look if residents are doing activities in different locations, which does also influence their mobility pattern.

A follow-up on this study could be to look into the effects of a changed mobility pattern on the liveability of residents.

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APPENDIXES

APPENDIX 1: QUANTITATIVE DATA

In the table below the answers to the closed questions are shown.

Respondent	How many times per week are you walking?	How many times per week are you cycling?	How many times per week are you driving a car?	How many times per week are you using public transport?	How many times a week are you annoyed by overcrowding while travelling?	Do you think that the streets of the city centre are overcrowded with pedestrians?(multiple answer)	Do you think that the streets of the city centre are overcrowded with cyclists?(multiple answer)	Do you think that the streets of the city centre are overcrowded with travelling cars?(multiple answer)	Do you think that the public transport system(or specific routes) are overcrowded?(multiple answer)	Do you perceive overcrowding as a problem?	What do you think that the role of tourism is in overcrowding? [definition tourism]	Would you leave your home more often?(multiple answer)	Would you use other transport modes?(multiple answer)	Would you change the times you travel? (leave earlier or later)	If you answered yes in the previous questions, what would the change be?	Do you avoid crowded places/intercities?	Which transport mode do you use for this trip?	Are there more routes in which you avoid crowds?	2 Which transport mode do you use for this trip?	3 Which transport mode do you use for this trip?	Do you think it is bad if residents change their mobility pattern because of overcrowding?
20	15	15	3	1	3	No	No	No	No	Neutral	A big role	No		No		Yes	Bike, Public transport	Yes	Bike		
21	35	0	0	10	21	Yes, in the afternoon, Yes, in the evening		No	No	Yes	A big role	Yes, I would leave home more often for recreational trips(e.g. walk around the neighbourhood)	I would cycle more often, I would walk less often	No		Yes	Walking	No			Yes
23	7	5	0	0	4	Yes, in the afternoon	Yes, in the afternoon	Yes, in the afternoon, Yes, in the evening	No	Yes	Neutral	No		Yes	10 minuten eerder vertrekken	Yes	Bike	No			Don't know/no opinion
25	7	0		4	1		No	No	No	Yes	A big role	No		Yes		Yes	Walking	No			No
26	0	14	0	1	2	Yes, in the afternoon, Yes, in the morning	No	Yes, in the morning	No	Yes	A big role	No		No		Yes	Bike	No			Yes
27	7	7	0	2	7	Yes, in the afternoon	Yes, in the afternoon	No	Yes, in the morning	Yes	Neutral	Yes, I would do more activities(e.g. visit facilities, go shopping)		No		No					No
28	10	6	8	0	1	No	Yes, in the evening, Yes, in the morning	Yes, at night, Yes, in the afternoon, Yes, in the evening, Yes, in the	Don't know/no opinion	Yes	A big role	No		Yes	15 minuten later vertrekken	No					No

45	14	14	0	10	3	Yes, in the afternoon	No	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	Don't know/no opinion	Yes	A big role	Yes, I would do more activities(e.g. visit facilities, go shopping), Yes, I would leave home more often for recreational trips(e.g. walk around the neighbourhood)		No		Yes	Bike	Yes	Bike		Yes
47	24	0	0	4	2	No	No	No	No	No	A big role	No	I would cycle more often	No		Yes	Walking	No			Yes
48	14	14	0	2	0	Yes, in the afternoon	No	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	No	No role	No		No		No					No
49	35	35	3	5	35	Yes, in the afternoon	Yes, in the afternoon	Yes, in the afternoon, Yes, in the morning	Yes, in the afternoon, Yes, in the morning	Yes	A big role	No		No		Yes					No
50	14	0	0	0	7	Yes, in the evening	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	Don't know/no opinion	Yes	A big role	No		No		Yes	Walking	Yes	Walking	Walking	Yes
51	5	15	1	6	3	Yes, at night, Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	No	No	Yes	A big role	No		No		Yes					Yes
52	45	0	1	10	0	No	Yes, in the morning	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	Yes, in the evening, Yes, in the morning	Neutral	A big role	No		No		Yes	Walking	No			Yes

53	35	0	5	0	0	Yes, in the afternoon	Yes, in the afternoon, Yes, in the evening		No	No	Neutral	No		No		No					No
60	28	1	0	2	7	No		No	Yes, in the afternoon, Yes, in the evening	No	A big role	No		No		No					No
61	15	14	0	0	7	Yes, in the afternoon	Yes, in the afternoon	Yes, in the afternoon	Don't know/no opinion	Neutral	A big role	No		No		No					No
63	14	14	0	0	0	No	No	No	Don't know/no opinion	No	No role	No		No							Yes
64	6	14	0	1	1	No	No	Yes, in the afternoon	No	Neutral	A big role	No		No		Yes					No
65	5	7	0	1	1	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	No	Don't know/no opinion	Neutral	A big role	No		No		Yes					Yes
66	2	14	0	10	2	Yes, in the afternoon, Yes, in the evening	Yes, in the afternoon, Yes, in the morning	No	No	Yes	A big role	Yes, I would do more activities(e.g. visit facilities, go shopping), Yes, I would leave home more often for recreational trips(e.g. walk around the neighbourhood)		No		Yes					Yes
67	14	21	0	14	21	No	No	Yes, in the afternoon, Yes, in the morning	No	No	A big role	Yes, I would do more activities(e.g. visit facilities, go shopping), Yes, I would leave home more often for recreational trips(e.g. walk around the neighbourhood)	I would cycle less often, I would walk more often	Yes	Normalere tijden naar huis. Reist nu om de spits heen.	Yes	Bike	No			Yes
68	35	0	2	2	7	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	Yes, in the morning	Yes	A big role	No		Yes	2 uur later werken	Yes					Yes
69	64	2	1	0	7	Yes, in the afternoon, Yes, in the evening	No	Yes, at night, Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	Yes	A big role	No		No		Yes	Walking	No	Walking		No
70	3	0	10	0	3	Don't know/no opinion		Yes, in the morning	No	Yes	A big role	No		No		Yes					No

71	10	15	0	0	2	No		Yes, in the evening, Yes, in the morning	Don't know/no opinion	No	A big role	No		No		No					No
72	0	28	0	1	2	Don't know/no opinion, Yes, in the afternoon, Yes, in the evening, Yes, in the morning	Yes, in the afternoon	Don't know/no opinion	No	Yes	A big role	Yes, I would do more activities(e.g. visit facilities, go shopping)		No		No					Yes
73	3	25	2	0	1	Yes, in the afternoon	Yes, in the afternoon, Yes, in the morning	Yes, in the afternoon	Don't know/no opinion	Neutral	A big role	No		No		No					No
74	1	5	1	0	0	Yes, in the afternoon	Yes, in the afternoon, Yes, in the morning	No	Don't know/no opinion	No	A big role	No		No		No					No
75	0	0	0	0	0	No	No	No	Don't know/no opinion	Yes		Yes, I would do more activities(e.g. visit facilities, go shopping)		No		No					Yes
76	64	21	0	1	280	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	Yes, in the afternoon	Yes	A big role	Yes, I would do more activities(e.g. visit facilities, go shopping), Yes, I would leave home more often for recreational trips(e.g. walk around the neighbourhood)		No		Yes	Bike	Yes	Bike		Yes
77	14	0	0	3	2	Don't know/no opinion	Yes, at night	Yes, in the evening, Yes, in the morning	Yes, in the afternoon	Yes	A big role	No		No		Yes	Walking	No			Yes
78	14	0	0	14	0	No	Yes, in the morning	No	No	No	No role	No		No		No					No
79	0	14	0	1	0	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	No	No	No	A big role	No		No		Yes	Bike	No			No
80	14	0	2	4	1	No	No	No	No	Yes	A big role	No		Yes	Later vetrekken	Yes	Walking	No			Yes
81	4	4	5	0	7	Yes, in the evening	No	No	Don't know/no opinion	Yes	A big role	No		No		Yes	Bike	No			No
82	6	0	0	2	0	No	No	No	No	No	Neutral	No		No		No					No
83	70	60	2	0	0	No	No	No	Don't know/no opinion	No	No role	No		No		Yes	Bike	No			No
84	7	0	0	4	7	No	Yes, in the afternoon	Yes, in the afternoon	No	Yes	Neutral	Yes, I would leave home more often for recreational trips(e.g. walk around the neighbourhood)		No		No					Yes

85	7	6	2	1	0	Yes, in the afternoon, Yes, in the evening	No	Yes, in the afternoon, Yes, in the morning	No	No	A big role	No		No		Yes					Yes
86	3	6	0	3	2	Yes, in the afternoon	No	Yes, in the afternoon	Yes, in the afternoon	Neutral	A big role	No		Yes	Later vertrekken vanwege kortere reisduur	Yes	Bike	Yes	Bike		Don't know/no opinion
87	25	25	2	0	5	Yes, in the evening	Yes, in the evening, Yes, in the morning	No	Don't know/no opinion	Yes	Neutral	No		No		Yes					Yes
88	5	30	0	0	1	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	Yes, in the afternoon	Don't know/no opinion	No	A big role	No		No		Yes	Bike, Walking	No			No
90	5	20	1	1	5	Yes, in the afternoon, Yes, in the evening	No	Yes, in the afternoon	Don't know/no opinion	Yes	A big role	No		No		Yes	Bike	Yes	Bike		Yes
91	3	21	0	0	3	Yes, in the afternoon	Yes, in the afternoon	No	Don't know/no opinion	Yes	A big role	No		No		No					No
92	14	14	1	0	14	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	Yes, in the evening, Yes, in the morning	No	No	Yes	A big role	No		No		No					Yes
93	14	14	1	4	3	Yes, in the evening, Yes, in the morning	Yes, in the evening, Yes, in the morning	Yes, in the evening, Yes, in the morning	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	Yes	A big role	Yes, I would do more activities(e.g. visit facilities, go shopping), Yes, I would leave home more often for recreational trips(e.g. walk around the neighbourhood)	I would cycle more often	Yes	Liever in de ochtend weg	Yes	Walking	Yes	Bike	Walking	Yes
94	14	2	0	0	14	Yes, in the afternoon, Yes, in the evening	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	Don't know/no opinion	Yes	A big role	No		No		No					Yes
95	3	21	0	2	7	Yes, in the evening, Yes, in the morning	No	No	No	Yes	A big role	No		No		Yes	Bike	No			Yes
96	14	14	0	2	7	Yes, in the afternoon, Yes, in the evening	Yes, in the afternoon, Yes, in the evening, Yes, in the morning	No	Yes, in the morning	Yes	A big role	No		No		Yes	Bike	No			Yes

APPENDIX 2: QUALITATIVE DATA

The qualitative data is divided into 4 themes, Limiting, Policy, Negative and Positive. A subject can have a subtopics or related topics; these are shown in the right row of the theme. In brackets, the number of residents that have mentioned the subject is shown. In total 61 respondents have filled in the questionnaire. The most mentioned subject was said by 11 respondents.

Limiting		Policy	
Fewer tourists(11)		Free public transport(2)	
Limit the number of activities(1)		More transport on water(1)	
	Close coffee shops(1)	Better traffic management(4)	
	No new/ fewer hotels(2)	The municipality should do more(4)	
	Limit/stop Airbnb(6)	Inform tourists about traffic rules(3)	
	Fewer bike rentals(1)	Inform that they visit a city where people live and not a museum(2)	
Spread tourists(7)		Attract high-value tourism(5)	
	Don't spread tourists(1)	Compensate residents(1)	
Increase tourism tax(2)		Improve infrastructure(3)	
Less city branding(4)		Use longer trams/metro's(1)	
More parts of centre car-free(6)			
	Keep busses outside the city centre(1)		
Keep boats outside the city centre(1)			
Spread residents, they are a part of the problem(2)			

Negative		Positive	
It cannot be solved(6)		We should be proud that the city attracts so many people(1)	
Types of tourists(3)			Tourists are a part of Amsterdam(1)
	Bad groups(6)	Tourists are good(1)	
The city centre is becoming more crowded(1)			Tourism generates money(3)
Deliver luggage with electric vehicles(1)			
Work traffic has a major role in traffic disturbances(1)		Bicycle streets are good(1)	
There is noise pollution(2)		Overcrowding is a luxury problem(1)	
Residents cannot enjoy the city anymore(1)			
An accident is going to happen(1)			
I don't cycle because of the overcrowding(1)			
Tourists aren't the problem but the logistics of tourism(1)			
Overcrowding is not the problem, but the clumsiness of tourists is(1)			

Drukke, mobiliteit en toerisme in Amsterdam

Deze vragenlijst is onderdeel van een onderzoek naar de effecten van drukte op mobiliteit, en de rol die toerisme daarin speelt. De vragenlijst bestaat uit 23 vragen en duurt ongeveer 5 minuten.

Dit onderzoek wordt uitgevoerd door Maarten Alberse als onderdeel van zijn bachelors scriptie voor de studie Planologie.

Alle antwoorden worden geanonimiseerd.



Nederlands

English



university of
 groningen

faculty of spatial sciences



1/8 Verplaatsingspatroon

Hoeveel keer per week gemiddeld gebruikt u de volgende vervoerswijzen?

Lopen

Fiets

Auto

Openbaar vervoer



De volgende vragen gaan over het centrum van Amsterdam.

Hoeveel keer per week bent u geïrriteerd door drukte?

Vind u dat de straten van het centrum te druk zijn met voetgangers? (meerdere antwoorden mogelijk)

- Ja, in de ochtend
- Ja, in de middag
- Ja, in de avond
- Ja, 's nachts
- Nee
- Weet niet/geen mening

Vind u dat de straten van het centrum te druk zijn met fietsers? (meerdere antwoorden mogelijk)

- Ja, in de ochtend
- Ja, in de middag
- Ja, in de avond
- Ja, 's nachts
- Nee
- Weet niet/geen mening

Vind u dat de straten van het centrum te druk zijn met rijdende auto's? (meerdere antwoorden mogelijk)

- Ja, in de ochtend
- Ja, in de middag
- Ja, in de avond
- Ja, 's nachts
- Nee
- Weet niet/geen mening

Vind u dat het openbaar vervoer (of specifieke lijnen) te druk zijn? (meerdere antwoorden mogelijk)

- Ja, in de ochtend
- Ja, in de middag
- Ja, in de avond
- Ja, 's nachts
- Nee
- Weet niet/geen mening

Ervaart u drukte als een probleem?

- Ja
- Neutraal
- Nee

Hoe ervaart u de rol van toerisme in drukte? (met toerisme worden mensen bedoeld van buiten de metropolitane regio Amsterdam met een recreatief doel, bijvoorbeeld recreatief winkelen of een museum bezoek)

- Geen rol
- Neutraal
- Een grote rol





3/8 Gedragsverandering

Probeer bij de volgende vragen de stad Amsterdam in te denken zonder toeristen. De vragen gaan over of u uw gedrag zou aanpassen als er geen toeristen zijn.

Zou u vaker van huis gaan? (meerdere antwoorden mogelijk)

- Ja, ik zou meer activiteiten ondernemen (bijvoorbeeld winkelen)
- Ja, ik zou meer recreatieve trips maken (bijvoorbeeld een rondje door de wijk lopen)
- Nee
- Weet niet/geen mening

Zou u andere vervoerswijzen gebruiken? (meerdere antwoorden mogelijk)

- Ik zou vaker lopen
- Ik zou vaker fietsen
- Ik zou vaker autorijden
- Ik zou het openbaar vervoer vaker gebruiken
- Ik zou minder vaak lopen
- Ik zou minder vaak fietsen
- Ik zou minder vaak autorijden
- Ik zou het openbaar vervoer minder vaak gebruiken
- Weet niet/geen mening

Zou u op andere tijden reizen? (eerder of later vertrekken)

- Ja
- Nee
- Weet niet/geen mening

Zo ja, wat zou de verandering zijn?

Vermijdt u drukke plekken/kruispunten?

- Ja
- Nee
- Weet niet/geen mening



Het volgende scherm wordt weergegeven en herhaald tot er geen routes meer zijn waarin drukte vermeden wordt, of er 3 routes zijn ingevuld.



4/8 Andere route

De volgende vragen gaan over het verschil in route tussen uw wenselijke en huidige route. Er wordt een kaart van Amsterdam weergegeven waarop u eerst uw huidige route en vervolgens de wenselijke route op kunt aangeven..

Alle begin en eindlocaties worden verwijderd om uw privacy te beschermen.

Teken de route die u nu aflegt waarin u drukke plekken vermijdt.

Als u op de kaart klikt worden de punten met lijnen verbonden. Start bij het vertrekpunt en klik bij elke bocht. Dubbelklikken om te stoppen met tekenen. Om te beginnen klik hier.

Teken de route van de wenselijke route die u zou afleggen als er geen drukte was.

Als u op de kaart klikt worden de punten met lijnen verbonden. Start bij het vertrekpunt en klik bij elke bocht. Dubbelklikken om te stoppen met tekenen. Om te beginnen klik hier.

Hoeveel keer per week legt u deze route af?

Welke vervoerswijze gebruikt u voor deze reis?

- Lopen
- Fiets
- Openbaar vervoer
- Auto
- Anders

Zijn er meer punten waar u de drukte vermijdt?

- Ja
- Nee



7/8 Afrondende vragen

Vind u het slecht als inwoners hun verplaatsingspatroon veranderen vanwege drukte?

- Ja
- Nee
- Weet niet/ geen mening

Als u drukte als probleem ziet, hoe kan dit worden opgelost?

Heeft u opmerkingen over toeristen, drukte of mobiliteit?

Heeft u opmerkingen over dit onderzoek?

Heeft u de vragenlijst zelfstandig ingevuld of samen met de onderzoeker?

- Zelfstandig
- Samen met de onderzoeker



8/8 Einde

Dank u wel voor het invullen van de vragenlijst.

Als u nog vragen heeft over het onderzoek kunt u contact opnemen via: M.A.P.Alberse@gmail.com



Klaar

APPENDIX 4: STATISTICAL ANALYSIS

In this appendix, the statistical analysis is presented. Below, the syntax is shown which has been used to prepare the data and execute the statistical tests. The output is not shown, because this are 89 pages of tables.

SYNTAX

```
DATASET ACTIVATE DataSet1.

COMPUTE totaal=Walking + Bike + Car + Publictransport.
EXECUTE.

COMPUTE walking_perc=Walking/totaal*100.
EXECUTE.

COMPUTE bike_perc=Bike/totaal*100.
EXECUTE.

COMPUTE car_perc=car/totaal*100.
EXECUTE.

COMPUTE publictransport_perc=publictransport/totaal*100.
EXECUTE.

IF
(Doyou think that the street of the city centre are overcrowded_T
= 1
OR
Doyou think that the street of the city centre are overcrowded_S=
1
OR
Doyou think that the street of the city centre are overcrowded_R=
1
OR
Doyou think that the street of the city centre are overcrowded_Q=
1) A_crowd_ped=1.
EXECUTE.
IF
(Doyou think that the street of the city centre are overcrowded_P
=1) A_crowd_ped=0.
EXECUTE.
IF
(Doyou think that the street of the city centre are overcrowded_O
=1) A_crowd_ped=2.
EXECUTE.

IF
(Doyou think that the street of the city centre are overcrowded_M
= 1
OR
Doyou think that the street of the city centre are overcrowded_L=
1
OR
Doyou think that the street of the city centre are overcrowded_K=
1
OR
Doyou think that the street of the city centre are overcrowded_J=
1) A_crowd_bike=1.
EXECUTE.

IF
(Doyou think that the street of the city centre are overcrowded_I=
1) A_crowd_bike=0.
EXECUTE.
IF
(Doyou think that the street of the city centre are overcrowded_H
=1) A_crowd_bike=2.
EXECUTE.

IF
(Doyou think that the street of the city centre are overcrowded_F
= 1
OR
Doyou think that the street of the city centre are overcrowded_E=
1
OR
Doyou think that the street of the city centre are overcrowded_D=
1
OR
Doyou think that the street of the city centre are overcrowded_C=
1) A_crowd_car=1.
EXECUTE.
IF
(Doyou think that the street of the city centre are overcrowded_B
=1) A_crowd_car=0.
EXECUTE.
IF
(Doyou think that the street of the city centre are overcrowded_A
=1) A_crowd_car=2.
EXECUTE.

IF
(Doyou think that the public transport system or specific route_F=
1
OR
Doyou think that the public transport system or specific route_E=1
OR
Doyou think that the public transport system or specific route_D=1
OR
Doyou think that the public transport system or specific route_C=1
) A_crowd_pub=1.
EXECUTE.
IF
(Doyou think that the public transport system or specific route_B=
1) A_crowd_pub=0.
EXECUTE.
IF
(Doyou think that the public transport system or specific route_A=
1) A_crowd_pub=2.
EXECUTE.

IF (Doyou perceive overcrowding as a problem ___Yes=1)
B_overcrowding_problem=2.
```


IF (Doyouperceiveovercrowdingasaproblem___No=1)
 B_overcrowding_problem=0.
 IF (Doyouperceiveovercrowdingasaproblem___Neutral=1)
 B_overcrowding_problem=1.
 EXECUTE.

IF
 (Whatdoyouthinkthattheroleoftourismisinovercrowding_C=1)
 C_role=2.
 IF
 (Whatdoyouthinkthattheroleoftourismisinovercrowding_B=1)
 C_role=1.
 IF
 (Whatdoyouthinkthattheroleoftourismisinovercrowding_A=1)
 C_role=0.
 EXECUTE.

IF
 (Wouldyouleaveyourhomemoreoftenmultipleanswer___Yes_
 A=1) D_aggre=1.
 IF
 (Wouldyouleaveyourhomemoreoftenmultipleanswer___Yes=
 1) D_aggre=1.
 IF
 (Wouldyouleaveyourhomemoreoftenmultipleanswer___No=
 1) D_aggre=0.
 IF
 (Wouldyouleaveyourhomemoreoftenmultipleanswer___Dont
 =1) D_aggre=2.
 EXECUTE.

IF
 (Wouldyouuseothertransportmodesmultipleanswer___lwoul
 d_G=1) E_modal=1.
 IF
 (Wouldyouuseothertransportmodesmultipleanswer___lwoul
 d_F=1) E_modal=1.
 IF
 (Wouldyouuseothertransportmodesmultipleanswer___lwoul
 d_E=1) E_modal=1.
 IF
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 d_D=1) E_modal=1.
 IF
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 d_C=1) E_modal=1.
 IF
 (Wouldyouuseothertransportmodesmultipleanswer___lwoul
 d_B=1) E_modal=1.
 IF
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 d=1) E_modal=1.
 IF
 (Wouldyouuseothertransportmodesmultipleanswer___Dontk
 =1) E_modal=2.
 EXECUTE.
 RECODE E_modal(SYSMIS=0).
 EXECUTE.

IF
 (Wouldyouchangethetimesyoutravelleaveearlierorlater_D=1)
 F_time=1.

IF
 (Wouldyouchangethetimesyoutravelleaveearlierorlater_C=1)
 F_time=0.
 IF
 (Wouldyouchangethetimesyoutravelleaveearlierorlater_B=1)
 F_time=2.
 EXECUTE.

IF (Doyouavoidcrowdedplacesintersections___Yes=1)
 G_avoid=1.
 IF (Doyouavoidcrowdedplacesintersections___No=1)
 G_avoid=0.
 IF
 (Doyouavoidcrowdedplacesintersections___Dontknownoopin
 i=1) G_avoid=2.
 EXECUTE.

IF
 (Doyouthinkitisbadifresidentschangetheirmobilitypatter_C=1)
 H_bad=1.
 IF
 (Doyouthinkitisbadifresidentschangetheirmobilitypatter_B=1)
 H_bad=0.
 IF
 (Doyouthinkitisbadifresidentschangetheirmobilitypatter_A=1)
 H_bad=2.
 EXECUTE.

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```
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/DEPENDENT H_bad
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