The impact of planning interventions on public opinion: An exploratory study

A case study on the car-free centres of two municipalities in Noord-Brabant

By

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Preface

Before you lies the master thesis ‘The impact of planning interventions on public opinion: An exploratory study’. It has been written to fulfil the graduation requirements master Landscape Architecture & Planning programme of Wageningen University and Research. I have been engaged with writing this thesis from May 2024 until the beginning of January 2025.

The initial idea started with a segment in the Dutch daily show of the comedian Arjen Lubach about a car-sheltered centre, on the 6th of March, 202. That idea has slowly developed into this thesis. The thesis will be interesting for planners, government officials, politicians since it tries to address what the effect of their actions is on the public opinion.

I would like my supervisor Dr. Mr. Pieter Jong for his guidance, help, and support provided in the time that I have been working on my thesis. Furthermore, I would like to thank my mother, father, and brother for allowing me to recruit them as my personal research assistants.

Joep Berkers

01-10-2025

Abstract

This study investigates the relationship between planning interventions and the public opinion. In order to investigate this, 60 scientific articles have been examined, and 2 cases have been studied, including 4 semi-structured interviews, 2 field visits, and 753 survey respondents. The results indicate that planning interventions can have an impact on the public opinion, but this is not always the case. Furthermore, the results show that some of the findings in the literature on other formal institutions do also apply to planning interventions. This study concludes that planning intervention can have an effect on public opinion, but further research is required to determine the generalizability of these findings.

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1. Introduction

In 2024, there were approximately 1.5 billion cars worldwide, a number projected to exceed 2 billion by 2040 (Smith, 2024). Concurrently, the world population is expected to reach 9.7 billion by 2050 (United Nations, n.d). This increase in both cars and people means that the streets will become more congested. If no interventions are made, the negative impacts of cars on human health, liveability and the environment are likely to intensify.

Car-free cities offer numerous benefits such as an improvement in the quality of the air and human health. Furthermore, car-free cities reduce traffic, noise, and temperature. Additionally, they clear space that can be used for alternative functions, such as greenery, which in their turn, also offers cities with a number of benefits (Glazener et al., 2022; Nieuwenhuijsen & Khreis, 2016). Overall, it seems like car-free cities are a solution for numerous problems.

1.1 Context

Surprisingly, the number of cities that are car-free are limited. The number of cities that are completely without cars is even lower. In fact, the only city with a centre completely free of cars would be Venice (Pasiakou, 2022). Other cities that are often considered car-free (e.g. Amsterdam, Oslo, Ghent, etc.) usually prohibit or discourages the use of cars in specific parts of the city, usually in the centre or other big shopping/pedestrian areas (Bolt Blog, 2023).

Even in the Netherlands, a country with more bikes than people (Statista, 2023) and with an excellent system of public transport (Van Dijke, 2019), has no cities that can be considered car-free. In recent years, there has been a trend to ban cars from city centres (Gemeente Groningen, n.d.; Gemeente Utrecht, n.d.; Het Parool, 2023; Peels & Witlox, 2021). However, no city has banned cars completely. On the contrary, the number of cars in the Netherlands has increased in the last four years with approximately half a million (CBS, n.d.).

Usually, when a city plans to become free of cars, this is done by discouraging or banning cars from their centres. Politicians often fear backlash, and this is also often used by politicians as an argument to not implement car-reducing planning interventions. However, places that reduced cars are usually better rated on liveability by its residents (Kersley, 2022).

1.2 Problem description

The problem is that politicians are scared to implement car-reducing interventions, due to a fear that it might lead to backlash from their voters. Whilst car-reducing policies can actually benefit residents. So far, research on the field of public opinion and policy has mainly focussed on the

effect of public opinion on formal institutions (i.a. Dür, 2018; Ghassim et al., 2022). Some studies have studied this relationship in the reverse order, thus looking at the effect that implementation of formal institutions has on public opinion (e.g. Aksoy et al., 2020; Kotsadam & Jakobsson, 2011; Ofosu et al., 2019). Most studies find no evidence for backlash. However, these studies have mostly focussed on laws and policies, it is unclear what the effect of formal institutions that affect the space (e.g. spatial interventions) is on public opinion.

1.3 Objective

The objective of this study is to understand what the effect is of the implementation of spatial interventions on the public opinion.

1.4 Societal & scientific relevance

The scientific relevance of this study is to fill the knowledge gap regarding the effect of spatial formal institutions on public opinion.

Regarding the societal relevance, the study aims to get a better insight in how spatial interventions affect public opinion. Discovering if a relationship exists, and what the nature of such relationship is, will be useful for planners and politicians to get a better insight into the effect of their actions.

1.5 Structure of the thesis

The thesis will continue by introducing the theoretical and conceptual framework with the research questions. Afterwards the methods that will be used to answer these questions will be developed. Since for some questions, the methodology depends on the answers of earlier research questions, the development of a part of the methodology will happen in the result section that follows the methodology. The thesis will conclude with the discussion and conclusion.

2. Theoretical framework

In the following section, the theories that will be used will be discussed. Afterwards, these theories will be operationalized in the conceptual framework.

2.1 Theories

Car free cities

The theory of car-free cities posits that cities can offer their residents a higher quality of life by excluding cars. Proponents argue that banning cars will reduce pollution, decrease inequality, and improve residents' health (Nieuwenhuijsen & Khreis, 2016). Unlike other planning ideals such as modernism (The Royal Institute of British Architects, n.d.), garden city (Gatarić et al., 2019), or new urbanism (Ellis, 2002), the car-free city ideal does not prescribe specific forms of spatial organization or planning processes, thus it does not prescribe the means. Instead, it focuses solely on the end: achieving a car-free environment. Some common planning interventions that are used to reach a car-free city are creating pedestrian areas, enhancing public transport, and building cycling paths.

Policy feedback theory

Policy feedback theory, as articulated by Pierson (1993) in his seminal paper “When effect becomes cause,” argues that policy is not only the result of factors like lobbying, public demand, or elite interest but also a catalyst for new effects. He termed this concept policy feedback. Pierson (1993) identified several types of effects. First, policy can reshape interest groups, altering their political goals and capabilities. Second, it can transform state capacities by changing administrative possibilities and thereby influencing the feasibility of future policies. Third, policy can affect the mass public by altering public opinion. Fourth, it provides information to both the public and elites. Finally, the introduction of new policy can have a learning effect on government officials.

Materialistic path dependency

Materialistic dependency theory asserts that the material aspects of the physical world significantly influence governance. Drawing from the concept of path dependency, the theory

posits that materiality (both natural and man-made) can enable or constrain certain policies, a concept referred to as materiality dependency (Van Assche et al., 2022).

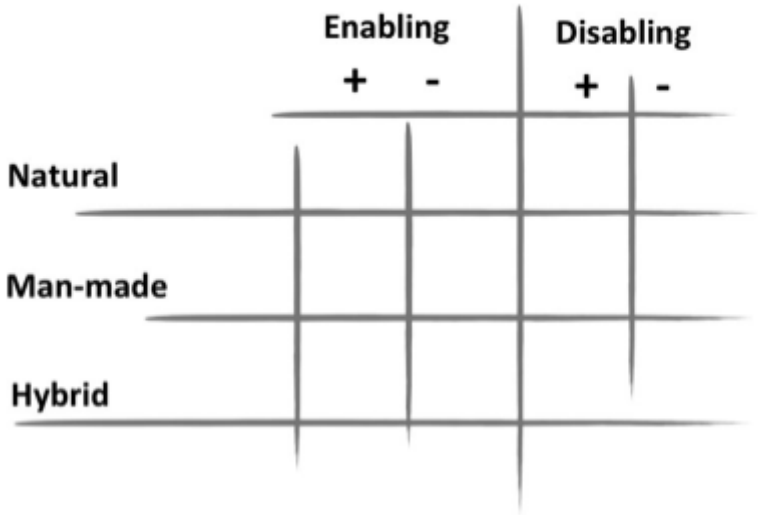


Figure 1 Materialistic dependency (Van Assche et al., 2022).

Policy cycle

The policy cycle, as described by Knill and Tosun (2008), divides policy-making into five stages. The first stage, agenda setting, involves identifying the problem. The second stage, policy formulation, involves defining, discussing, and accepting or rejecting feasible courses of action for the identified problem. The third stage, policy adoption, closely linked to the second stage, is where the final policy is chosen and adopted. The fourth stage, implementation, refers to enacting the policy in the physical world. In the final stage, evaluation, experts assess whether the implemented policy has achieved its goals.

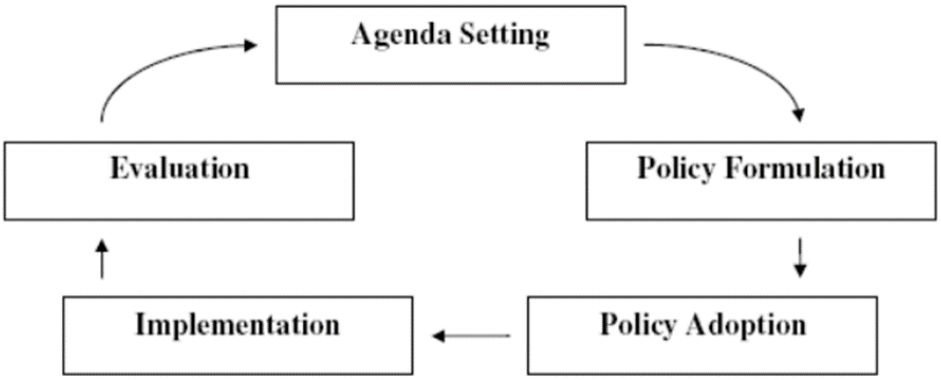


Figure 2 Policy cycle (Knill and Tosun, 2008)

2.2 Operationalization

The following section highlights the parts of the theories that will be used and explains why only these parts are utilized. to enacting the policy in the physical world. In the final stage, evaluation, experts assess whether the implemented policy has achieved its goals.

Car free cities

The ideal of car-free cities will form the underlying basis for this study. Thus, the study will not focus on the effectiveness, design components, or implementation strategies of car-free cities. Instead, it uses the example of car-free centres to study the effect that the implementation of planning interventions has on public opinion. For the boundaries of the centre, the boundaries as used by the municipalities in zoning plans will be used.

For this study, a distinction will be made between three types of centres, based on the car-free theory:

1. Car-free centre: A centre is considered car-free when it is inaccessible to cars, with the exception of delivery vehicles and emergency services.
2. Sheltered centre: A centre is considered sheltered when cars are discouraged from entering the centre but can still access it.
3. Car-accessible centre: A centre is considered car-accessible when cars are neither banned nor discouraged from entering.

These predefined types of centres will make it easier to compare cases with each other, and it gives a clear definition of what this study considers car-free, car-sheltered, or car-accessible.

Policy feedback theory

The policy feedback theory assumes that policy can have numerous effects. This theory focuses only on the effect that policy has on public opinion. By using this theory, it allows this study to draw inspiration and findings from the field of policy analysis. The effect that spatial interventions have on public opinion is unknown but since spatial interventions are a special type of formal institutions, as studied in the field of policy feedback, there might be similarities between them.

Materialistic path dependency

For the materialistic path dependency, the idea of material dependency is used to differentiate between spatial and non-spatial planning interventions. For this, an adapted framework based on the framework provided by Van Assche et al. (2022) is used, see *Table 1*. Planning

interventions are considered materialistic when they can be observed in the space and have a spatial impact. (e.g. posts limiting access, parking space, barriers, signs, street markings), they will be called spatial planning interventions. Planning interventions that cannot be observed in space will be referred to as non-spatial planning interventions. Furthermore, a distinction will be made between planning interventions that enable or disable a car-free centre. For enabling and disabling we start from the point of realising a (more) car-free centre. So, a planning intervention is enabling when it enables a (more) car-free centre, it is disabling when it disables or limits a (more) car-free centre.

Table 1 Framework for materialistic dependency

	Enabling	Disabling
Spatial planning interventions		
Non-spatial planning interventions		

Policy cycle

From the policy cycle theory, we use the notion that the implementation of the policy cycle consists of different stages. For this study, we will use two stages, based on the stages introduced by Knill and Tosun (2008):

1. Before implementation

2. After implementation

This theory will be useful for the selection of cases.

Summary of conceptual framework

Based on this conceptualization, a conceptual framework can be created, see *Figure 3*.

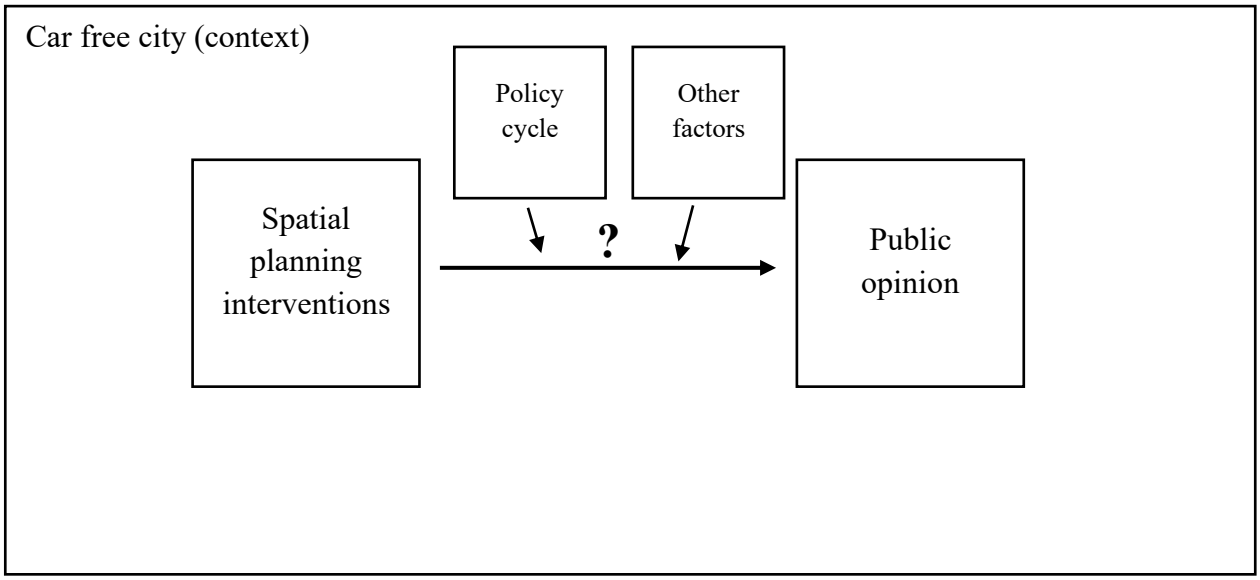


Figure 3 Conceptual framework

2.3 Research questions

This leads to the following main research question:

How do spatial planning interventions influence the public opinion?

This main research question will be answer through the following four sub-questions:

1. How do formal institutions influence the public opinion?
2. What are the planning interventions used regarding the management of cars in rural centres in the Netherlands?
3. How are the planning interventions aimed at managing cars classified in rural centres of the Netherlands.
4. What is the influence of car-reducing spatial interventions on public opinion in rural centres?

Sub-question 1 is answered by conducting a literature review and doing a systematic meta-analysis of the literature. This is necessary to provide an overview of what is already known, and such an overview does not yet exist. This information will be used to identify the factors influencing public opinion.

For sub-question 2, the aim is to find how the centre is designed. This is done with the purpose of discovering what type of car free centre is present in each of the cases (car free, sheltered centre, or car accessible) and this information is necessary to discover the type of planning interventions used to manage car usage in rural centres (e.g. policies, laws, planning

interventions). Additionally, it is important to discover when each of the formal institutions are implemented in order to conduct the statistical analysis in sub-question 4. This information will also be used for sub-question 3.

The aim of sub-question 3 is to discover the extent to which the planning interventions found in sub-question 2 are classified. For this, we will distinguish between spatial and non-spatial planning interventions, using the adapted framework as shown in *Table 1*.

The aim of sub-question 4 is to discover if planning interventions affect the public opinion and which factors can explain this relationship using a survey. These factors include the stage of the policy cycle and other factors found in the literature that has been studied for sub-question 1.

3. Methodology

The following section will provide an overview of the methods that will be used to answer the four sub-questions, and ultimately the main research question.

3.1 Approach

This study aims to find if spatial planning interventions influence public opinion and in what way. The study is a mix of qualitative (i.e. literature analysis, interviews, field visits) and quantitative (i.e. survey and statistical analysis) research. For the literature analysis of academic work, we will use secondary sources. For the rest of the study, all resources will be primary sources. The data that will be collected will all be descriptive data.

3.2 Data collection and data analysis

Sub-question 1

Snowball sampling

For the selection of documents, the snowball-sampling method will be used as described by Wohlin (2014), see *Figure 4*.

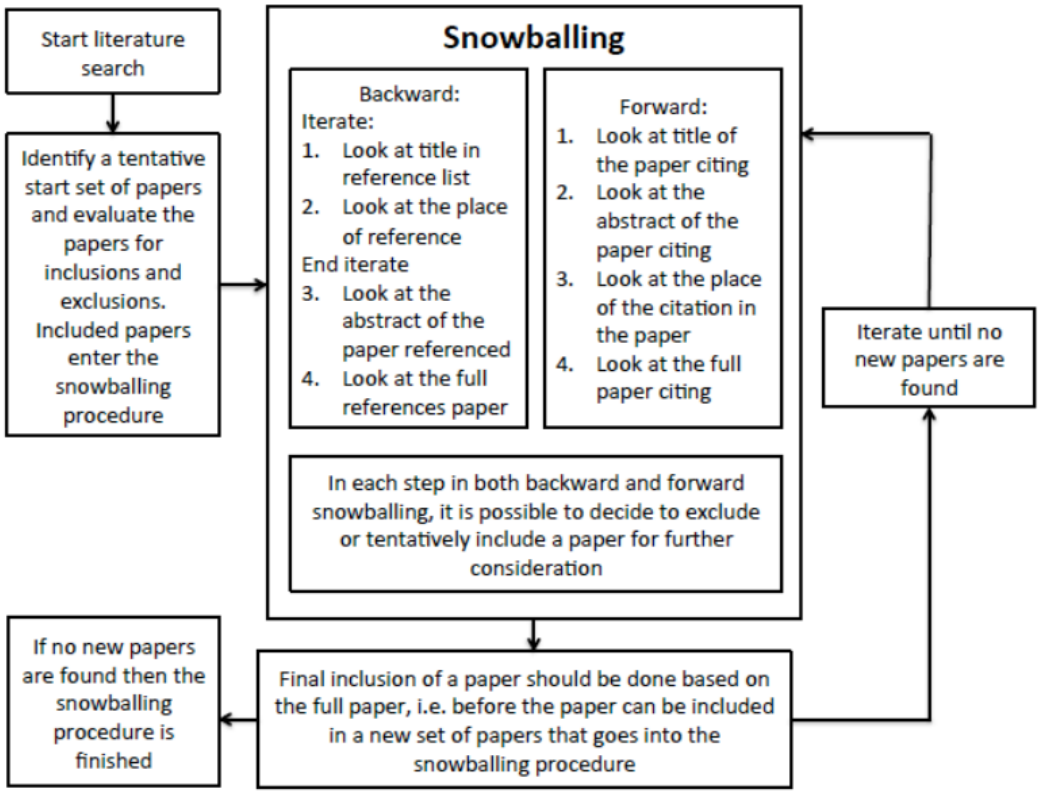


Figure 4 Snowball sampling (Wohlin, 2014)

Starting from the first set of papers, these will undergo both backward and forward snowball sampling, resulting in a second generation of papers. This new set of papers will undergo

backward and forward snowball sampling as well. This will result in a third generation of papers. The process will continue until no new papers are found and the snowball procedure is finished.

Articles are relevant, and therefore included in the snowball sampling when:

- They talk about formal institutions, or one specific formal institution (e.g. court, law, referendum, etc.)
- They talk about public opinion or a synonym of public opinion (e.g. attitude, perception, etc.)
- They are (partially) about the effect that formal institutions have on public opinion

Articles will be excluded when:

- They only mention the effect that public opinion has on formal institutions
- They are books since (1) results in books are often reproduced in articles and vice versa, (2) the procedure is aimed at finding articles over books, which might result in potential bias due to the less systematic process of the collection of books, and (3) selecting books are associated with methodological and practical flaws that have not been considered for this study (Larsen, 2018).
- They are not accessible to the researcher
- They cannot be found in Scopus

Coding

The articles will be coded in an inductive manner, meaning that the codes will stay close to the data (Linneberg & Korsgaard, 2019). First, all selected articles will be read, and all important information will be annotated. After all articles have been read, all annotations will be coded. All codes, including definition, will be presented in a table.

Analysis

The code groups will be grouped into themes that will form the basis of the analysis. Since inductive coding allows the story to follow from the codes, these themes will form the basis of the analysis.

3.2 Case study

For sub-questions two through four, a case study approach will be used. To examine the situation in rural areas of the Netherlands, a comparative, collective snapshot study will be conducted. A snapshot case study involves studying a case over a limited period (Mohajan, 2018),in this instance from May 2024 until November 2024. This measures the public opinion of the residents in the present and will not do this in the future or the past. As a result, a change in public opinion cannot be observed. This presents a problem, as it only provides one data point (the present), making it impossible to observe change in public opinion. We can, however, use a snapshot study to explore if there are signs that planning interventions influence the change in public opinion.

To address this, a collective case study will be applied, meaning that more than one case is studied. This does not only allow for comparing cases, but also broadens the scope for generalization (Crowe et al., 2011; Noor, 2008). Please note that this does not mean that this study can make statements about a change in public opinion, as previously adressed. The study can only look at what influences public opinion, and deriving from this, in combination with already existing literature, make some predictions about how public opinion would change.

Although it would be ideal to conduct a longitudinal case study, where one (or multiple) case(s) is/are followed through the entire policy cycle, there are some problems with this. Firstly, this would require a lot of resources. Secondly, a longitudinal study is not required for a study with the aim of exploring if there are signals that spatial planning interventions can influence public opinion, and if there are no signals that spatial planning interventions can influence public opinion in a longitudinal study a lot of resources would be wasted. Thirdly, a longitudinal study has the risk that during the study, the policies change, with the result that the researcher is unable to finish their study. Lastly, a longitudinal study might also see a change in public opinion that is not related to the spatial planning interventions but due to other social changes.

It is important to pick cases that are comparable with each other when it comes to the field of public opinion. By picking comparable cases, it reduces the risk of measuring a spurious relationship due to confounding variables. Literature suggests that the following characteristics of a case are determinants of public opinion: (1) age, (2) education, (3) income, (4) political beliefs, (5) gender, and (6) trust (Bergquist et al., 2022; Clutterbuck et al., 2023). The selected case studies must be similar to each other according to these characteristics. Additionally, at least one case must be before implementation of a car-free centre, and one case must be after

implementation of a car-free centre. Lastly, the cases must be located in the rural area of the Netherlands.

The characteristics of the cases, as shown in the literature, will be operationalized in the following way:

1. Age; using the population model (source of data: AlleCijfers, 2024)
2. Education; level of education of the population between 15-75 years (source of data: AlleCijfers, 2024)
3. Income: average income (source of data: AlleCijfers, 2024)
4. Political beliefs: results of last national elections (source of data: AlleCijfers, 2024)
5. Gender: percentage biological male/female (source of data: CBS, 2024b)
6. Trust in government: average attendance rate of the last election for all five types of elections (European, national, provincial, municipal, water board) (source of data: AlleCijfers, 2024)

Procedure of selection

The case selection will be done by applying the following rules in the following order. With each step decreasing the number of possible cases:

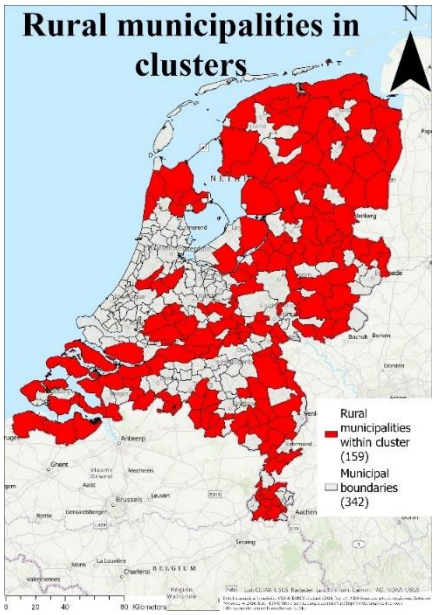
1. The cases must be in rural Netherlands. Municipalities are considered rural when the address density is smaller than 1.000 addresses per square kilometre, following the definition of CBS (2024a). For this, the municipal boundaries will be used, this is done because the dataset of the address density by the CBS (2023), and the GIS-dataset by Esri Nederland (2024) are both using these boundaries.
2. The remaining cases must be geographically close to each other to improve comparability and to reduce other factors (e.g. cultural, linguistical, environmental) from influencing public opinion. All municipalities not in a cluster will be removed from the map. A cluster is here defined as a string of at least 3 municipalities connected via land with each other
3. New clusters will be selected based on the presence of at least one case before and one case after implementation. A dataset containing this information does not exist yet and has to be created. This will be done through a quick scan of the plans by the municipality, Google Maps, and news articles. Each case will be given a number referring to the two stages. If no data is available, the case will receive the number 0. This will be operationalised in the following way:

a. Give number 2 when a car-free centre is implemented
b. Give number 1 if a car-free centre is not implemented
c. Give number 0 if no data is available

4. The created clusters will be ranked in a list on travel distance from the researcher. This is done to limit travel time and the pollution linked to traveling.
5. The cases in the cluster closest to the researcher will be compared with each other based on the six characteristics that influence public opinion (age, education, income, political belief, gender, trust in government). If two municipalities in a different stage of the policy cycle within this cluster match with each other, this cluster is chosen. If this is not the case, the same process will be repeated for the next closest cluster. This will be done until an adequate cluster is chosen.

Selection

1. For question one, the dataset on address density by the CBS (2023) is used. This dataset firstly had to be modified to remove municipalities that no longer exist due to reconstruction of municipal borders or due to combination of municipalities. After this has been done, the selection procedure will start with 342 municipalities. After exclusion of all municipalities with an address density higher than 1.000, 171 municipalities remain.
2. All municipalities not in a cluster (not connected via land to at least one other rural municipality) have been excluded. 159 municipalities remain, see *Map 1*.

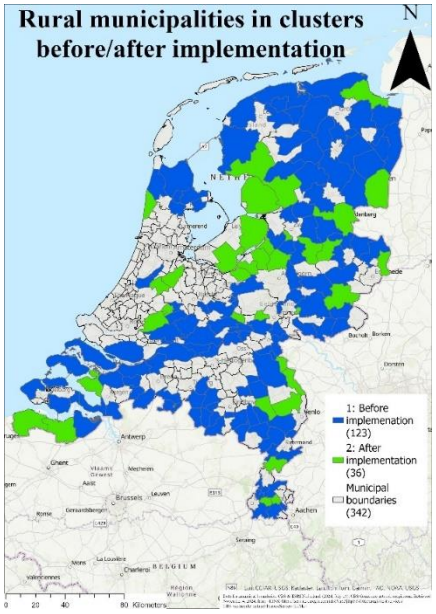


Map 1 Clusters of rural municipalities

3. All remaining municipalities have been given a number between 0 and 2:

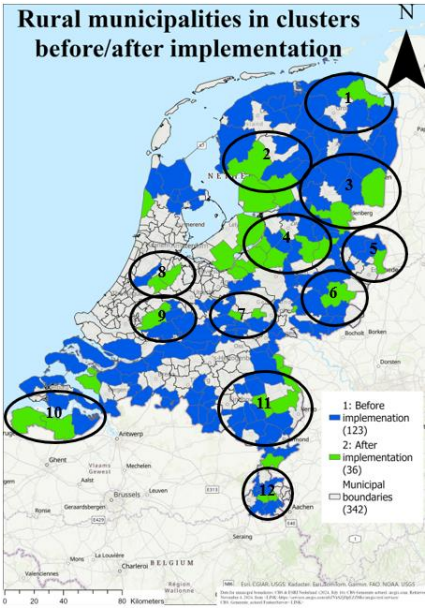
    a. Number 2 when a car-free centre is implemented
    b. Number 1 if a car-free centre is not implemented
    c. Number 0 if no data is available

The result of this is shown in *Map 2*.



Map 2 Clusters rural municipalities before/after implementation

12 appropriate clusters, with municipalities in both stages of the policy cycle, for this study have been identified as can be seen in *Map 3*.



Map 3 Appropriate clusters rural municipalities before/after implementation

4. Based on travel distance, the clusters rank in the following way, from shortest to longest travel time:

    1. Cluster 11
    2. Cluster 12
    3. Cluster 7
    4. Cluster 9
    5. Cluster 6
    6. Cluster 10
    7. Cluster 8
    8. Cluster 4
    9. Cluster 5
    10. Cluster 3
    11. Cluster 2
    12. Cluster 1

6. The comparison of the cases will begin by comparing the cases within the cluster that is closest to the researcher, in this case cluster 11. This cluster contains the following thirteen municipalities; Asten, Beesel, Cranendonck, Deurne, Gemert-Bakel, Heeze-Leende, Horst aan de Maas, Laarbeek, Leudal, Nederweert, Peel en Maas, Someren, Waalre. Information regarding the six characteristics that influence public opinion (age, education, income, political belief, gender, trust in government), have been collected and can be found in *Appendix A: Information on municipalities in cluster 11*. A comparison between all the cases based on these characteristics can be found in *Appendix B: Comparison between municipalities cluster 11.* Since the aim of this study is to compare cases that are in the two different stages of the policy cycle (before, and after implementation) it is important to select at least one case per stage. This means out of every column in *Table 2*, one municipality has to be selected.

Table 2 Municipalities and their respective stage in the policy cycle

Before implementation	**After implementation**
Asten	Deurne
Beesel	Horst aan de Maas
Cranendonck	
Gemert-Bakel	
Heeze-Leende	

Laarbeek	
Leudal	
Nederweert	
Peel en Maas	
Someren	
Waalre	

Since the column ‘After implementation’ has the lowest number of potential cases the selection will start with one of the municipalities of this column. When starting with Deurne, this removes 3 municipalities since they are not comparable with Deurne, as follows from the comparison. Leaving us with nine municipalities comparable to Deurne, see *Table 3*.

Table 3 Remaining municipalities after picking Deurne as starting point

Before implementation
Asten
Cranendonck
Gemert-Bakel
Laarbeek
Leudal
Nederweert
Peel en Maas
Someren

From the remaining seven cases, Asten is the best due to its close geographical location to Deurne. Thus, the two cases that have been selected are Asten and Deurne.

Case description

Asten

Asten is a village in Noord-Brabant, bordering Limburg. Recently, there has been a discussion about the possibility of making the city-centre car-free with opinions strongly differentiating between residents and stakeholders (Linders, 2024). The municipality has decided to experiment and test the new car-free centre for 6 weeks (Van Horik, 2024). The current situation is that the centre of Asten is car-sheltered. For the centre of Asten, the boundaries will be used as communicated by the municipality of Asten in the zoning plan (Gemeente Asten & Tonnaer, 2012). A map of the entire centre can be found in *Figure 5*.

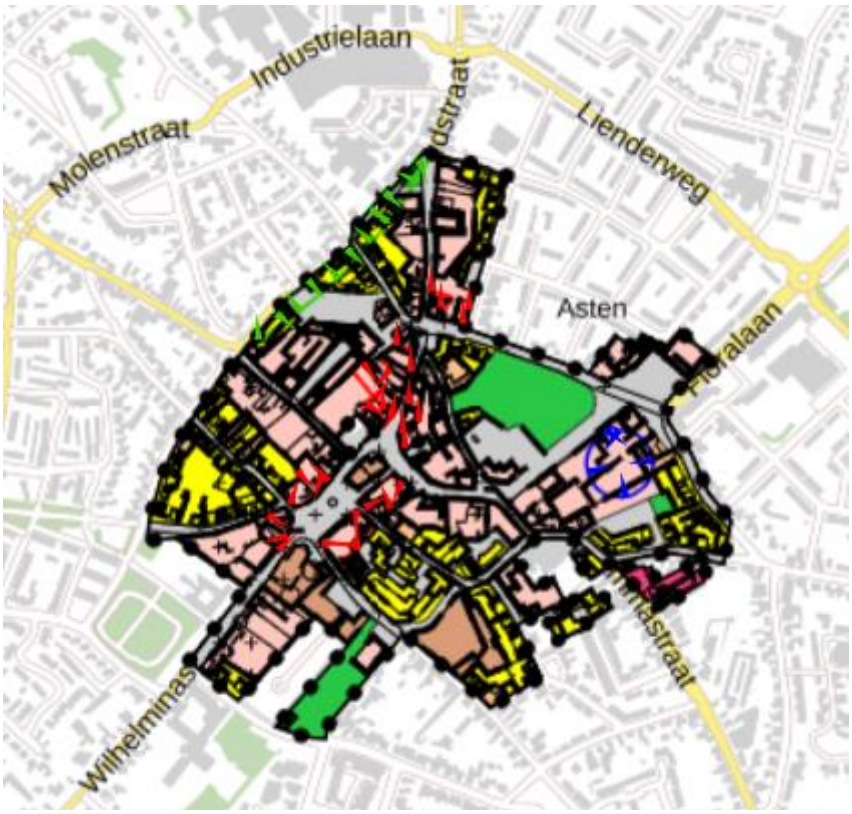


Figure 5 Boundaries of centre of the municipality of Asten (Gemeente Asten & Tonnaer, 2012), retrieved from Omgevingsloket (2014)

Deurne

In Deurne, bordering Asten in the North-East, the centre has been declared as a pedestrian-area by the municipality (Gemeente Deurne, n.d.). Cars are only allowed here to load or unload supplies for the stores located there. This means that part of the centre is car-free, and part of the centre is car-sheltered. The boundaries of the centre are based on 'Bestemmingspan: Centrum Deurne' (SAB, 2015). A map of the entire centre can be found in *Figure 6*.

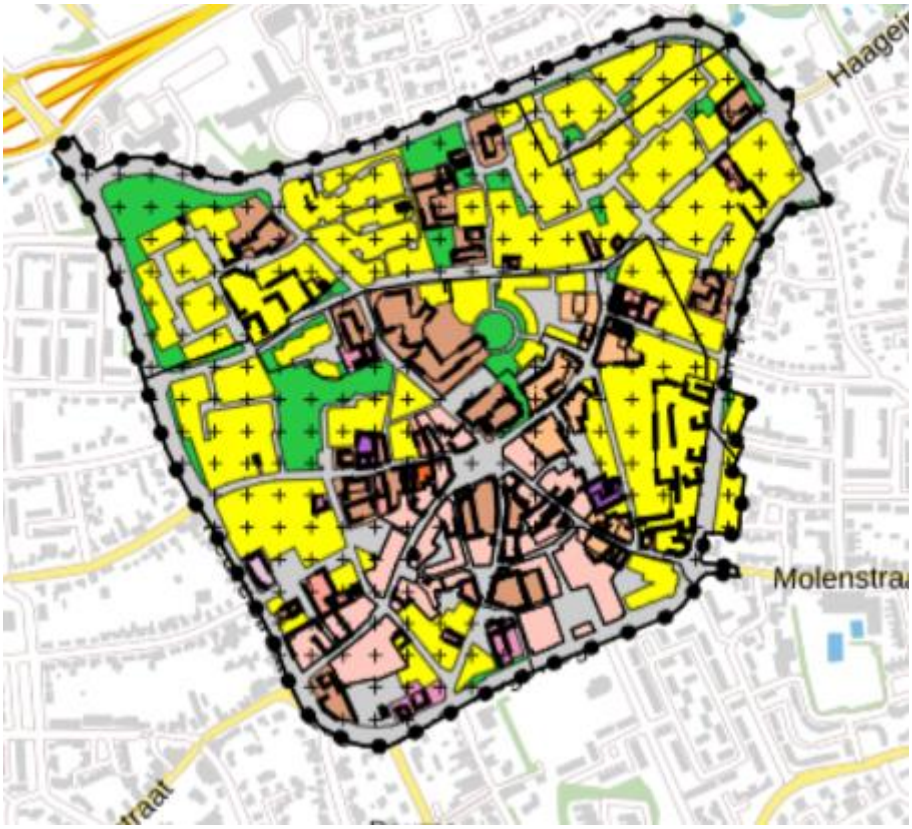


Figure 6 Boundaries of centre of the municipality of (SAB, 2015), retrieved from Omgevingsloket (2015)

3.3 Sub-question 2

Basic, descriptive policy analysis

To answer this question, a policy analysis will be conducted. This will be in the form of a descriptive policy analysis, with the focus on planning interventions that have already been implemented or new planning interventions that are being implemented at the time of writing (Patton et al., 2015). Most frameworks for conducting a policy analysis are incredibly detailed and usually contain a lot of steps, see *Figure 7* for an example of such a framework. For this study, the policy analysis will only focus on identification of different policies and see how they are (or are not) implemented in space.

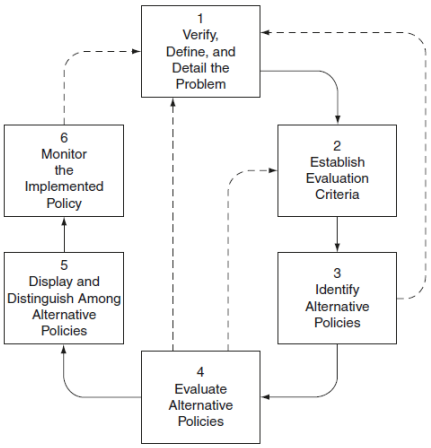


Figure 7 Example of policy analysis framework (Patton et al., 2015)

Governmental documents

To begin with, the most recent and currently active policy documents relevant to the city centre and policy documents regarding mobility of the cases will be collected through the governmental database ´Omgevingsloket'. This initial collection will happen by selecting the centre of each of the cases and selecting all relevant documents.

The second wave of document collection will happen by using the database that is present on each municipal website. For this search, the following queries will be used

1. "autovrij"

2. "autoluw"

3. "centrum"

Lastly, any additional document that are found and deemed necessary after reading the initially selected documents will be added.

The selected documents will be shown in the form of a table showing the number of documents that have been found for the different databases and the different search queries. Additionally, a complete list of the selected documents will also be provided.

Coding

After the policy document have been transcribed, they will be coded. This will happen in a hybrid manner, meaning that the code group are predefined, but the exact codes that are part of these groups are derived from the context and then linked to either one of these predefined groups. The coding will focus on identifying the different planning interventions in centre regarding cars, the stage of implementation, and the year the planning interventions are implemented. For an overview of the codes, see *Table 4*.

Table 4 Code group book

Code group	**Meaning**
Planning intervention	This code group will contain all information regarding car-reducing or car-promoting spatial interventions
Stage/year of implementation	This code group will contain all information regarding the stage/time of implementation

Content analysis

The content analysis will aim at discovering and explaining the different planning interventions for both cases separately, including the stage of implementation the intervention is in (before or after implementation), and the year of implementation. This will be done in the form of a table within the results section. For a more detailed description, fact sheets about each formal institution will be created that can be found in the appendixes. This choice is made since detailed information regarding the specific interventions are not necessarily required for the reader to understand the main message of this research, but necessary for the study. By creating these factsheets, this information will still be provided if readers are interested in this detailed information. Since they are located in the appendix it does not clutter the text, therefore not decreasing the readability.

Interviews

For the interviews, the aim is to provide a complete overview of all sides of the political spectrum (left and right) regarding the car-free, car-sheltered and car accessible centre as well as all the specific interventions following from the content analysis on the governmental

documents. Additionally, the interviews will also be used to check if all spatial interventions have been found and are correct or if spatial interventions are missing. The relevant aldermen or a representative of the municipality (as spokesperson of the coalition), a political party in the opposition on the left side of the spectrum, and a political party in the opposition on the right side of the spectrum will be contacted. By doing so, the three main points of view (coalition and opposition on both sides of the political spectrum) have been interviewed. These will be contacted using the contact protocol. An English translation of this can be found in *Appendix C: English translation of contact protocol*.

For the interviews, an interview guide will be created based on the formal institutions that have been found in the content analysis of the governmental documents. Since this information is not yet available, the development of this interview guide will happen in the results section.

Coding

After the interviews have been transcribed, they will be coded. This will happen in an inductive manner, meaning that the codes will stay close to the data (Linneberg & Korsgaard, 2019). First, all interviews will be read, and all-important information will be selected by annotating this information. After all transcripts have been read, all annotations will be coded. All codes, including definition, will be presented in a table.

Analysis

The code groups will be grouped into themes that will form the basis of the analysis. Since inductive coding allows the story to follow from the codes, these themes will form the basis of the analysis.

3.4 Sub-question 3

Field visit

For the two cases, the researcher will conduct a field trip. Here the researcher will make field notes and pictures of the physical situation regarding the car-free centre. This could include things such as traffic signs, roadblocks, bollards, etc. The field visit will follow the instructions as explained in *Appendix D: Field visit protocol*.

Content analysis

After the observations, a content analysis will be conducted on the fieldnotes and on the pictures. The content analysis starts with linking the planning interventions, which have been identified in sub-question 2, to the observations, referred to as ‘spatial manifestations’. Any additional planning interventions that have not been mentioned but that have been observed will be added. This will be presented in a table that will include the planning interventions, the spatial manifestations of the planning interventions and the number of times that the spatial manifestations have been observed. The fact sheets will be updated based on this information.

Classification and comparison

The planning interventions will be further classified according to the adapted framework (see *Table 1*). This information will be added to the fact sheets. After classification, planning interventions are compared between both cases. This comparison will be based on the meaning of the intervention, the observed spatial manifestation of the intervention, the view that the politicians and government officials have on the interventions, and the classification of the intervention.

3.5 Sub-question 4

Survey

Since the survey is based on the results from sub-question 1, 2, and 3, the survey development will happen in sub-question 4 instead of in the methodology. This is unorthodox but the only option given the fact that the information needed to develop the survey is not yet known and first needs to be acquired through the previous sub-questions. However, there are some general points that can already be determined in the methodology. The main point is that the survey will consist of three parts:

1. Public opinion on car-free centres general

2. Public opinion on the specific planning interventions

3. Other factors

The survey will ask how satisfied people are with planning interventions that are currently present within their municipality or how accepting they are to new spatial interventions that are not yet present within their municipality following a Likert-scale ranging from 1 (completely disagree) to 10 (completely agree)

Public opinion on different types of centres

In this part of the survey, people will be asked how supportive they are of the three types of car-free centres as described in the conceptual framework (car-free, car-sheltered, and car-accessible).

Public opinion regarding specific interventions

In the second part of the survey, residents will be asked how supportive they are of specific planning interventions which will have been identified in sub-question 2. In order to fulfil the aims of this study, the interventions that have been selected must fulfil the following criteria:

- The planning interventions must only be present in one case

  or
- The spatial interventions are present in both cases, but in different stages

Other factors

The last part of the survey will be used to ask question for any other factors that might influence public opinion that have been identified in the literature analysis of sub-question 1.

Sampling

People will be asked to participate in the survey through the use of social media (Facebook and Instagram) and through the use of local newspapers.

Data editing

After the data has been collected, it has to be edited in order to prepare it for the statistical analysis. In order to distinguish between respondents from Asten, Deurne, and other municipalities, all responses from individuals from the municipality of Asten will be given number 1, all responses from individuals from the municipality of Deurne will be given number 2. All responses from residents of a different municipality will be coded 0.

Analysis

The analysis is dependent on the survey, and since the survey cannot be completely developed in the methodology, the development of the statistical analyses will happen in sub-question 4 in the results section.

3.6 Ethics and data management

This section described the ethics and data management. For the four sub-questions the following raw data is collected:

- Sub-question 1: Articles
- Sub-question 2: Governmental documents and recordings of interviews
- Sub-question 3: Pictures and field notes
- Sub-question 4: Data from surveys

This raw data will then be processes into the following data:

- Sub-question 1: Coding of scientific articles using Atlas.ti
- Sub-question 2: Coding of governmental documents using Atlas.ti, anonymised transcripts and coding of these anonymised transcripts, fact sheets
- Sub-question 3: Fact sheets
- Sub-question 4: Dataset in SPSS

For the articles and governmental document, there are no problems since these are publicly available. For the interviews, the recordings will be stored on a separate hard drive, and deleted after the defence of this thesis. The transcripts are anonymised, removing information that could lead to the identification of the people that were interviewed or that could potentially damage them. The results of the survey are already collected anonymously so there are no concerns here.

4. Results

The following section contains the results of the research question.

4.1 Sub-question 1

Starting with sub-question 1, this section provides an answer how formal institutions influence public opinion according to the available scientific literature.

Snowball sampling

The snowball sampling started with 3 articles that have been found through a quick scan of the available literature:

1. Ofosu, E. K., Chambers, M. K., Chen, J. M., & Hehman, E. (2019). Same-sex marriage legalization associated with reduced implicit and explicit antigay bias. Proceedings of the National Academy of Sciences of the United States of America, 116(18), 8846–8851. https://doi.org/10.1073/pnas.1806000116
2. Kotsadam, A., & Jakobsson, N. (2011). Do laws affect attitudes? An assessment of the Norwegian prostitution law using longitudinal data. International Review of Law and Economics, 31(2), 103–115. https://doi.org/10.1016/j.irle.2011.03.001
3. Aksoy, C. G., Carpenter, C. S., De Haas, R., & Tran, K. D. (2020). Do laws shape attitudes? Evidence from same-sex relationship recognition policies in Europe. European Economic Review, 124, 103399. https://doi.org/10.1016/j.euroecorev.2020.103399

From these three papers, five snowball sampling iterations have been conducted. In the end, 60 articles have been selected. For a complete list of these articles, including visualisation, see *Appendix E: List of articles used for snowball sampling*.

Coding

After the first reading, 587 annotations have been found. After re-reading all 587 annotations, they have been grouped into 93 codes. For a complete overview of the codes, meaning of the codes and frequency of appearance, see *Appendix F: Code book scientific literature*. The total frequency of codes is higher than the total amount of annotations (respectively 720 against 587). This difference is due to the fact that some annotations are part of more than one code.

Finally, before the analysis the codes have been grouped into 31 groups, and these groups have been further grouped into six themes. For a complete overview of the code groups and the themes, see *Appendix G: Themes, code groups and codes scientific literature*.

Analysis

Research shows that public opinion influences policy (Dür, 2018; Ghassim et al., 2022). However, recent research indicates that this relationship is bidirectional; policy also affects public opinion. Unfortunately, research on this phenomenon within the field of planning is lacking, necessitating a look at studies from other disciplines. To date, research has primarily focused on how laws and policies influence public opinion (e.g., Aksoy et al., 2020; Béland, 2010; Hakhverdian, 2012) and how judicial decisions impact public opinion (e.g., Deal, 2022; Kuosmanen, 2011; Tankard & Paluck, 2017). Furthermore, this research often focuses on gender-related issues (e.g., abortion, LGBTQ+, gender equality) (e.g., Ellingsæter, 2020; Kenny & Patel, 2017; Uslaner & Weber, 1979), health-related issues (e.g., COVID-19, smoking) (e.g., Galbiati et al., 2021; Vannoni, 2019; Yörük, 2023), minority groups (e.g., Kustov, 2022; Lee, 2024), welfare reform (e.g., Bendz, 2015b), and the Care Act (e.g., Jacobs & Mettler, 2018).

The majority of the literature, found through the snowball sampling, examines the following five questions:

1. Can policy affect public opinion?
2. Do different formal institutions affect public opinion differently?
3. What are the mechanisms behind opinion change?
4. What influences this change in public opinion?
5. In what direction do formal institutions change public opinion?

In this chapter, these five questions will be addressed based on the reviewed literature, ultimately providing an answer to how formal institutions influence public opinion.

Can policy affect public opinion?

Firstly, some articles did not address this question and have therefore been excluded from the analysis. Additionally, some articles provided answers based on results from other studies, and

to avoid secondary referencing, these articles were also excluded. This left 33 articles for analysis.

The results, see *Table 5*, are mixed. Eleven articles found no evidence that formal institutions affect public opinion (Bishin et al., 2016; Breznau, 2016; Hooghe & Meeusen, 2013; Jacobs & Mettler, 2018; Johnson & Martin, 1998; Kotsadam & Jakobsson, 2011; Kuosmanen, 2011; Pacheco, 2013; Soss & Schram, 2007; Tankard & Paluck, 2017; Yörük, 2023). Seven articles found mixed evidence (Eisner et al., 2020; Flores & Barclay, 2016; Hoekstra, 1995; Hoekstra & Segal, 1996; Larsen, 2018; Ofosu et al., 2019; Stoutenborough et al., 2006; Uslaner & Weber, 1979). Sixteen articles provided evidence that policy affects public opinion (Barclay & Flores, 2015; Bendz, 2015a; Brickman & Peterson, 2006; Busemeyer et al., 2019; Casoria et al., 2021; Franklin & Kosaki, 1989; Jung & Tavits, 2021; Kazyak & Stange, 2018; Kreitzer et al., 2014; Lee, 2024; Redman, 2018; Thompson, 2022; Unger, 2008; Ura, 2013; Vannoni, 2019; Zeev-Wolf & Mentovich, 2021).

Table 5 Con policy affect public opinion

No evidence for policy feedback	Mixed evidence for policy feedback	Evidence for policy feedback
11	7	16

Overall, there is no singular answer to whether formal institutions can affect public opinion. The scientific evidence suggests that while formal institutions can influence public opinion, this is not always the case.

Do different formal institutions affect public opinion differently?

In the literature, four different formal institutions are mentioned: (1) courts, (2) law/policy, (3) referenda, and (4) presidential interventions. The effect of referenda has only been studied in one article (Jung & Tavits, 2021), and the effect of presidential interventions has not been statistically studied but briefly mentioned in a few articles. Since these do not provide an adequate basis for analysis, we will only look at courts and law/policy. Furthermore, the meta-analysis by Larsen (2018) has been excluded since it examines studies that look at the effect of both courts and law/policy on public opinion.

Table 6 Court vs law/policy

Evidence/formal institution	No evidence for policy feedback	Mixed evidence for policy feedback	Evidence for policy feedback
Court	5	5	7
Law/policy	6	2	8
Articles excluded	0	1	1
Total	11	7	16

This analysis,

Table 6, shows that there is no difference between the courts and law/policy when it comes to the influence both institutions have on public opinion. Five studies found no evidence that courts impact public opinion (Bishin et al., 2016; Hooghe & Meeusen, 2013; Johnson & Martin, 1998; Kuosmanen, 2011; Tankard & Paluck, 2017) compared to six studies that found no evidence that law/policy has an impact on public opinion (Breznau, 2016; Jacobs & Mettler, 2018; Kotsadam & Jakobsson, 2011; Pacheco, 2013; Soss & Schram, 2007; Yörük, 2023). Five studies found mixed evidence that courts impact public opinion (Eisner et al., 2020; Hoekstra, 1995; Hoekstra & Segal, 1996; Stoutenborough et al., 2006; Uslaner & Weber, 1979) compared to two studies that found mixed evidence that law/policy can change public opinion (Flores & Barclay, 2016; Ofosu et al., 2019). Lastly, seven studies found evidence that courts impact public opinion (Brickman & Peterson, 2006; Casoria et al., 2021; Franklin & Kosaki, 1989; Kazyak & Stange, 2018; Thompson, 2022; Ura, 2013; Zeev-Wolf & Mentovich, 2021) compared to eight studies that found evidence that law/policy has an impact on public opinion (Barclay & Flores, 2015; Bendz, 2015a; Busemeyer et al., 2019; Kreitzer et al., 2014; Lee, 2024; Redman, 2018; Unger, 2008; Vannoni, 2019).

Overall, there is no evidence that courts and law/policy affect public opinion differently. Both institutions can influence public opinion, but they do not necessarily do so.

What are the mechanisms behind opinion change?

Besides the obvious, direct effect that formal institutions have (e.g., punishments for not complying with the law), the literature also finds some more subtle, indirect ways in which formal institutions can influence public opinion. Four of these mechanisms are mentioned: (1) educating, (2) legitimizing, (3) first landmark decisions, and (4) normative feedback. In the following sections, we will introduce these mechanisms and explain how the literature expects them to change public opinion.

Educating

The first mechanism that could explain the effect that formal institutions have on public opinion is that of education. It is argued that through the implementation of a law or the verdict of the court, the general public is educated about what the norms in society are and re-evaluates their attitudes and realigns them to fit the newly implemented law or the verdict (Allport, 1954, as cited in Redman, 2018). When it comes to law and policy, there is evidence that supports this mechanism (Casoria et al., 2021; Pacheco, 2013). For the court, this concept of education has been developed into the concept of "the court as schoolmaster" (Franklin & Kosaki, 1989), where the court educates the public similarly to as a schoolmaster educates their students.

Legitimizing

A second mechanism that might explain the effect of formal institutions on public opinion is that laws/policies or verdicts by courts can legitimize a certain attitude since these institutions are seen as experts (Franklin & Kosaki, 1989; Tankard & Paluck, 2017). There is some evidence that this mechanism is indeed (partially) responsible for a change in public opinion (Unger, 2008).

First landmark decision

The third mechanism suggests that the effect that the court has on public opinion diminishes when the court rules on that same issue again (Johnson & Martin, 1998). This suggests that the public will only respond to initial rulings on a topic; later rulings on the same topics will have limited effects on public opinion. This idea is supported, for the most part, by findings from Brickman and Peterson (2006) and Stoutenborough et al. (2006). Stoutenborough et al. (2006) find that later rulings can influence public opinion when the result of this ruling is different from the initial ruling.

Brickman and Peterson (2006) explain why this would occur. They argue that it is due to how opinions are formed. They argue that initially, an individual will form their opinion through peripheral processing. Peripheral processing suggests that the individual will take shortcuts to form their opinion without evaluating the complete content. As a result, this opinion is relatively unstable and can be easily changed when more information becomes available. When the court makes a decision, new information becomes available, and the individual will change their opinion through central processing. This time, the individual carefully considers the full content and forms a stable opinion which is relatively permanent. As a result, further verdicts have a limited effect on the opinion of the individual unless the verdict of the court is different and new information becomes available.

There is no proof in the literature that the same process is present when it comes to laws or policies, but given that there is no difference between how courts and law or policy can influence public opinion, it makes sense to assume that the same process would apply to law or policy.

Normative feedback

The final mechanism that might explain the effect of formal institutions on public opinion is that of normative feedback. The idea behind this is that by introducing laws/policies or when the court judges on an issue, this tells the public what is desirable, normal, or acceptable (Soss & Schram, 2007; Svallfors, 2010; Tankard & Paluck, 2017). As a result, individuals will change their attitude. Multiple studies have found evidence that support this (Casoria et al., 2021; Eisner et al., 2020; Galbiati et al., 2021; Jung & Tavits, 2021; Larsen, 2018; Lee, 2024; Pacheco, 2013; Redman, 2018; Svallfors, 2010).

Tankard and Paluck (2016) argue that this normative feedback does not always happen. They identified five conditions under which a shift in public opinion is most likely to occur:

1. When individuals identify themselves with the source of the new, normative information.
2. When the new norms are believable representations of the group opinion and behaviour.
3. When the individual's opinion is close to the new norms.
4. When the new normative information is widely shared.
5. When the norms are contextualized.

To sum up, the literature identifies four mechanisms that explain the effect of formal institutions on public opinion. For all four mechanisms, there is (some) evidence, but there is no evidence that one single mechanism can fully explain the change in public opinion (Casoria et al., 2021). It is most likely that all four mechanisms form complex relationships with each other and are all responsible for the effect that formal institutions have on public opinion.

What influences this change in public opinion?

Besides the mechanisms, the literature also identifies some factors that might influence how formal institutions affect public opinion.

Visibility

Visibility refers to the extent to which a formal institution is salient to the public (Soss & Schram, 2007). Higher levels of visibility result in a higher potential for the policy/law or verdict to affect public opinion (Franklin & Kosaki, 1989; Johnson & Martin, 1998; Jung & Tavits, 2021; Kotsadam & Jakobsson, 2011; Redman, 2018; Soss & Schram, 2007).

Information

Closely linked to visibility is the role that information plays and to what information individuals have access to. Several studies have proven that if individuals receive new information during a focus event (e.g. the introduction of a law, ruling by a court, etc.), the potential for formal institutions to affect public opinion increases (Casoria et al., 2021; Eisner et al., 2020; Flores & Barclay, 2016; Pacheco, 2013; Yen et al., 2020). However, there is a prerequisite for this potential change: the opinion of individuals should be relatively unstable, this process has earlier been discussed (peripheral and central processing). When opinions are stable, individuals will most likely not change their opinion when presented with new information (Hoekstra & Segal, 1996).

Media

Linked to information is the role of the media. The media is extremely important since most citizens will get their information from it. As a result, the stance that the media takes in relation to formal institutions influences the potential for a change in opinion (Kotsadam & Jakobsson, 2011; Redman, 2018). Media influence is not only restricted to traditional media (e.g., newspapers, television, radio). Ellingsæter (2020) proved that social media also has a significant influence, and Stoutenborough et al. (2006) even used a sitcom (a genre of comedy such as Will & Grace) as an estimation for visibility.

Proximity

Proximity refers to the way individuals encounter formal institutions; this encounter can range from direct to distant (Soss & Schram, 2007). Similarly to visibility, higher levels of proximity result in a higher potential for formal institutions to affect public opinion (Hoekstra & Segal, 1996; Jacobs & Mettler, 2018; Kotsadam & Jakobsson, 2011; Soss & Schram, 2007). Proximity does not mean spatial proximity which suggest that people living closer to the area where a new formal institution has implemented shows a higher change in public opinion than people living

further away. This has also been studied but provides mixed results. Hoekstra and Segal (1996) find evidence that spatial proximity matters, but Bendz (2015a) rejects this notion.

Tangibility

The literature provides strong evidence that tangible formal institutions are most likely to have an influence on public opinion (Jacobs & Mettler, 2018; Pacheco, 2011; Vannoni, 2019). Since a formal institution can only be tangible when proximity and visibility are high, these findings provide even more evidence that proximity and visibility determine the effect that formal institutions have on public opinion.

Experience and empowerment

Closely related to tangibility and proximity, there is also the notion in the literature that direct experience with formal institutions or when these institutions empower people (e.g., when they allow them to participate) increases the potential of formal institutions changing public opinion. Bendz (2015a) finds some evidence that this could increase the potential of formal institutions changing public opinion, but this evidence is not very strong.

Sub-groups

Several scholars argue that different sub-groups in society will react differently to formal institutions (Béland & Schlager, 2019; Bendz, 2015a; Brickman & Peterson, 2006). Different factors such as race, sexuality, religion, political belief, age, and education, have been proven to influence how different groups react to formal institutions (Flores & Barclay, 2016; Béland & Schlager, 2019; Bendz, 2015a; Brickman & Peterson, 2006; Franklin & Kosaki, 1989; Kreitzer et al., 2014; Pacheco, 2013; R. D. Flores, 2017; Redman, 2018; Yen et al., 2020).

Persuasion

The effect that formal institutions have is also influenced by the persuasive power that the institutions have on individuals (Hoekstra, 1995). It is argued that formal institutions can only persuade individuals when they succeed in making them think critically (i.e., when verdicts or laws/policies are explained in detail or when the explanation is well-argued) (Tankard & Paluck, 2017).

Credibility

Another influence on the potential of formal institutions changing public opinion is the extent to which individuals trust these institutions (i.e., the credibility of these institutions). However, studies that examine this have found proof that rejects the idea that credibility matters (Kotsadam & Jakobsson, 2011; Unger, 2008).

Legitimacy of institutions

Closely linked to the idea of credibility is the suggestion that it matters how legitimate an individual views a formal institution. However, similarly to the results on credibility, results also found proof in favour of rejecting the idea that legitimacy matters (Zeev-Wolf & Mentovich, 2021).

Summary of the discussed factors

To sum up, the literature suggests a number of factors that could influence the extent to which formal institutions have an effect on public opinion. For some of these factors evidence was found that rejects them (credibility, legitimacy of institutions, and persuasion). Among the factors that were proven, it seems that three have a direct influence on the potential of formal institutions influencing public opinion: (1) visibility, (2) proximity, and (3) sub-groups. The remaining factors (information and media, tangibility, experience, and empowerment) influence one of these three factors (information and media influence visibility, and tangibility; experience and empowerment influence proximity). This finding is supported by Soss and Schram (2007), who created a general framework for analysis of mass feedback processes, see *Figure 8*. Such a framework could be used to predict if formal institutions will have an effect on public opinion, but due to the complexity of the relationship, one should be careful when making predictions purely based on this framework.

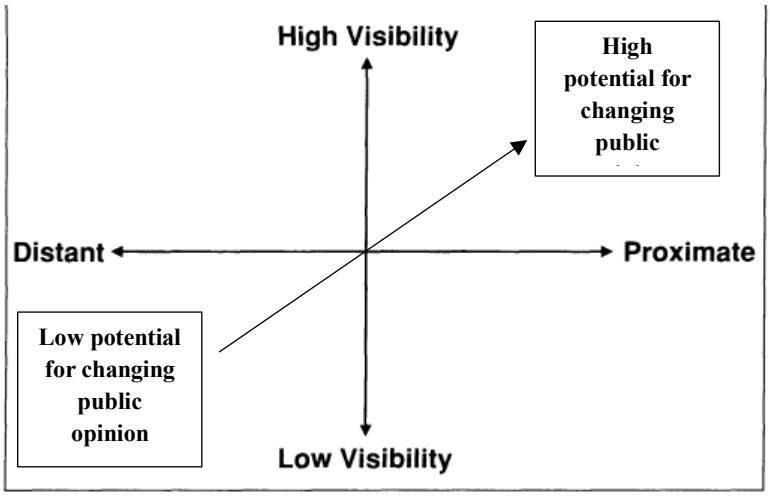


Figure 8 General framework for the analysis of mass feedback process adapted from (Soss & Schram, 2007), edited by author

In what direction do formal institutions change public opinion?

So far, we have seen that formal institutions can affect public opinion. That there is no proof to assume any differences between different types of formal institutions. What the mechanisms are behind the potential change in public opinion. Which factors influence the potential that of formal institutions to change public opinion. The last question that remains is the direction of

this change. We will discuss this by introducing five models. Unfortunately, there is no consensus regarding the terminology of models; therefore, some models with different names, highlighting the same process, have been grouped together.

Legitimacy model

The legitimacy model, also coined the naturalization model (Barclay & Flores, 2015), the increasing return model of Pierson (Breznau, 2016), or positive feedback model, assumes that a change in formal institutions will have a 'positive' effect on public opinion. This means that public opinion moves in the same direction as the formal institutions move (Barclay & Flores, 2015). The legitimacy model is beneficial for formal institutions since it moves the public opinion towards their own position (Barclay & Flores, 2015). For example, when a new law is introduced legitimizing same-sex marriage, this model assumes that public opinion moves towards favouring same-sex marriage. Hereby, public opinion helps to strengthen the law. It is important to consider that the term positive is not normative here. A law can be assumed to normatively negative by some groups (e.g. a law restricting minority groups in their behaviour), but if public opinion moves in favour of this law, it will still be considered positive feedback. When it comes to the evidence for the truth of this model, fourteen papers find evidence in favour of this model (Aksoy et al., 2020; Flores & Barclay, 2016; Breznau, 2016; Deal, 2022; Jung & Tavits, 2021; Kazyak & Stange, 2018; Kustov, 2022; Ofosu et al., 2019; Flores, 2017; Thompson, 2022; Unger, 2008; Ura, 2013; Vannoni, 2019; Zeev-Wolf & Mentovich, 2021). Only one paper finds evidence in favour of rejecting this model (Hakhverdian, 2012).

Backlash model

The backlash model, also referred to as negative feedback (Larsen, 2018), is the exact opposite of the legitimacy model. This model assumes that formal institutions will have a 'negative' effect on public opinion. This implies that the public opinion moves in the opposite direction of the formal institutions (Barclay & Flores, 2015; Bishin et al., 2016; Kustov, 2022; Redman, 2018; Thompson, 2022). Public institutions want to avoid this effect, since this will weaken their own position, and their efforts might even be counterproductive (Bishin et al., 2016; Kustov, 2022; Thompson, 2022). Following the same example mentioned before, the legitimization of same-sex marriage would in this case lead to a public opinion that moves towards opposing same-sex marriage, thereby weakening this law. Similarly, as for the legitimacy model, the term negative is not normative here. Four papers find some evidence that supports this model (Barclay & Flores, 2015; Flores & Barclay, 2016; Ofosu et al., 2019; Ura, 2013), but eight papers find evidence that rejects this model (Aksoy et al., 2020; Flores &

Barclay, 2016; Bishin et al., 2016; Hakhverdian, 2012; Kazyak & Stange, 2018; Keck, 2009; Kustov, 2022; Thompson, 2022).

Consensus model

The consensus model assumes that formal institutions listen to public opinion and act according to this public opinion. The change in formal institutions is then a result of the change in public opinion. According to this model, formal institutions do not have an effect on public opinion (Barclay & Flores, 2015; Flores & Barclay, 2016; Thompson, 2022). Three articles found evidence in favour of this model (Barclay & Flores, 2015; Flores & Barclay, 2016; Kuosmanen, 2011). Only one article finds evidence that opposes this model (Barclay & Flores, 2015). Furthermore, one might suggest that the articles that found no evidence for policy feedback can also be considered as evidence to accept the consensus model and the articles that did find proof as evidence to reject the consensus model. However, this could also be the result of other factors. Therefore, we can only use articles as evidence that state that they found evidence in favour of or against the consensus model.

Polarization model

The polarization model is a combination of the legitimacy and backlash models. It is based on the existence of sub-groups, as discussed earlier. This model can only be observed when public opinion is heterogeneous (not the same among the entire population). In this case, a focusing event (such as the implementation of a law or the publication of a verdict) can influence sub-groups with opposing views to strengthen those views, and vice versa. For a subset of the population, a positive feedback effect will be observed, and for another subset, a negative feedback effect will take place, thus polarizing the population (Flores & Barclay, 2016; Franklin & Kosaki, 1989). For example, the legitimization of same-sex marriage will have a positive effect on some part of the population, but a negative effect on another part of the population. As a result, part of the population will be in favour of same-sex marriage, while another part of the population will oppose same-sex marriage. Seven articles find evidence that supports the polarization model (Flores & Barclay, 2016; Brickman & Peterson, 2006; Franklin & Kosaki, 1989; Johnson & Martin, 1998; Kuosmanen, 2011; Redman, 2018; Tankard & Paluck, 2016), and two articles find evidence that rejects the polarization model. Lastly, due to the fact that public opinion moves in two ways, it might be that the net result of change in public opinion is zero or close to zero. This might suggest that some of the articles that found no evidence for a change in public opinion might be due to the fact that polarization was taking place, and one might consider that these articles that find no result can be evidence supporting the polarization

model. This line of thought is similar to the line of thought in the consensus model. Similarly, we cannot consider these articles evidence, unless they have specifically studied differences in sub-groups.

Thermostatic Model

The thermostatic model by Wlezien (1995, as cited in Jones & Baumgartner, 2003), is, similarly to the polarization model, a combination of the legitimacy and backlash models. However, where the polarization model suggests that different groups react differently, the thermostatic model suggests that the general population reacts to formal institutions like a thermometer, meaning that overall preference will decrease when policy increases and that when policy decreases the overall preference will increase (Bendz, 2015a). According to the thermostatic model, this is proof that democracy works since in the long run formal institutions will represent the public opinion accurately (Bendz, 2015a). For example, when initial legislation legitimizing same-sex marriage is introduced, public opinion will respond in favour of this. When a new policy is introduced that goes too far according to the public (e.g. favouring people in same-sex marriage over others), public opinion will oppose this, and formal institutions will respond to this by removing this law. In the end, this will result in an accurate representation of public opinion by the formal institutions. Three articles have found evidence to support the thermostatic model (Bendz, 2015a; Hakhverdian, 2012; Ura, 2013), and no articles have found evidence rejecting this model.

General overview and new typologies

In the literature, there are five models mentioned; in *Figure 9*, all five models have been visually summarized. The focussing event that has been chosen here (the legalisation of same-sex marriage) has randomly been chosen and does not harbour any meaning.

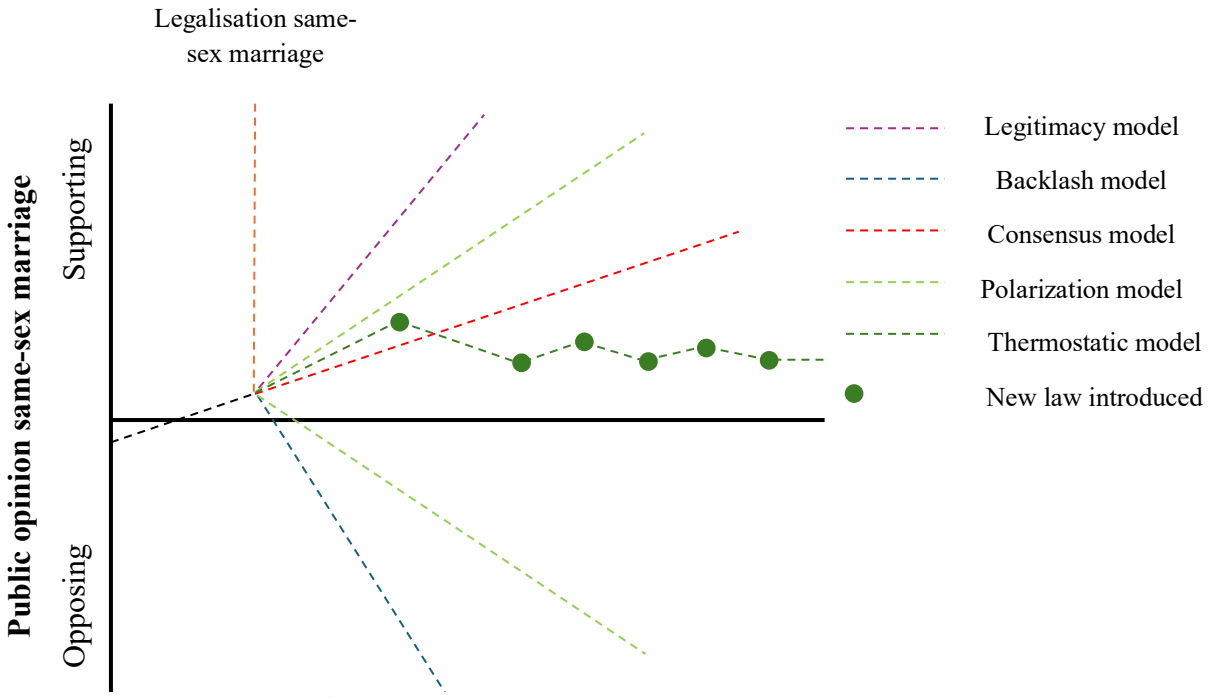


Figure 9 Visual representation of all models

Besides these five models, Busemeyer et al. (2019) attempt to create new typologies based on three characteristics: (1) direction of feedback, (2) broadness/scope of feedback, and (3) time dimension. They provide some proof that these typologies could work. However, these new typologies have not been used or discussed in other literature. Therefore, there are no other articles that provide evidence that these new typologies are superior to the 'classical' ones. Additionally, there is no proof, apart from the proof that Busemeyer et al. (2019) present, that these new typologies are accurate. Therefore, these new typologies have not been included in this analysis.

Conclusion

Now that we have seen all five models, the question remains which of these models accurately depicts reality. First of all, there is not a single answer to this. Due to the complexity of the real world, the direction of the policy feedback is dependent on the factors that have been discussed before. Therefore, we have to rephrase the question to what direction is most likely to occur. For this, one could look at the number of articles that find evidence supporting or rejecting all

five models and count them. Then, the model that has the most papers supporting it would be considered the 'correct' model. However, this would not consider the size of the evidence (e.g. one article that finds evidence for the backlash model of 10% negative policy feedback has a larger effect than 10 articles finding evidence for the legitimacy model of 0.5% positive policy feedback). Furthermore, by simply counting the articles in favour of or rejecting a model, we would not take the level of significance into account. There has been an attempt to discover which model reflects reality the best by Larsen (2018). This meta-analysis shows that a positive policy feedback effect is often found in social policies, hereby stating that for the field of social policy, it is most likely that the legitimacy model is true. However, the size of the effect is relatively small. Additionally, Larsen (2018) remarks that every situation is unique and that the direction of policy feedback is always dependent on the context. Therefore, there is no single direction of policy feedback that is true in all cases. Additionally, it also proofs difficult to predict on the context what the effect of a formal institution will be on the public opinion.

Limitations

There are some limitations in the literature that require discussion. Firstly, there is a lack of coherent terminology in this field that studies the effect of formal institutions on public opinion. This is most visible when it comes to the different names of the models.

Secondly, there are some issues when it comes to what public opinion entails. While most studies argue that a change in attitude is a change in public opinion, some studies argue that this observed change in public opinion is not a change in attitude but rather in behaviour. Flores (2017) argues that the change in formal institutions might motivate individuals to act on their attitudes that remained unchanged but have now been legitimized by this change in formal institutions. Furthermore, it is also argued that formal institutions do not influence public opinion, but rather change the perception of norms (Eisner et al., 2020; Galbiati et al., 2021; Pacheco, 2013; Tankard & Paluck, 2017).

Thirdly, it is difficult for articles to make the claim that the only reason a change in public opinion is observed is due to the change in formal institutions. There might be other, spurious relationships that influence the change in public opinion (e.g. Yörük, 2023). Furthermore, it is also not always clear in which way the relationship works (i.e. if formal institutions influence public opinion or vice versa) (e.g. Hooghe & Meeusen, 2013).

Fourthly, there are some issues with the time frame when looking at the change in public opinion. Not all studies look at the same time frame. Thus, it becomes difficult to compare

studies with each other. One of the few studies that takes both the short-term and long-term into consideration finds surprising evidence. They find that in the short-term, the results provide evidence for the thermostatic model, but in the long-term, they find proof for the legitimacy model (Ura, 2013).

Lastly, there are some methodological issues linked to data collection and data analysis. With respect to data collection, the first problem arises when it comes to the measurement of public opinion. It is difficult to directly measure public opinion. Furthermore, there could be some response bias, especially when it comes to self-reporting, and individuals might be unwilling to share their real opinions on subjects. This might especially be true when it comes to sensitive topics where individuals have an opinion contrary to the norm.

An additional issue when it comes to data collection is that changes in formal institutions can often not be predicted, making it impossible to plan a study. Therefore, most articles draw from general, annual surveys that were conducted before the study took place, without the specific aim to use to results to determine if formal institutions have an effect on public opinion. As a result, articles have to adjust the available data to fit their research. In the surveys, important data is often lost or not asked (e.g. age, sexuality, gender, political views, etc.). This makes it difficult to distinguish between sub-groups, and this might lead to the finding that the study does not find evidence for an effect of formal institutions on public opinion, despite this effect being there in reality (as discussed in the polarization model).

When it comes to data analysis, studies use different statistical tests to perform the statistical analysis. This makes it difficult to compare studies, and even studies on the same topic and with the same data can come to different conclusions (e.g. Franklin & Kosaki, 1989; Hanley et al., 2011).

Conclusion

To answer the question "How do formal institutions influence public opinion?", the research shows that formal institutions can influence public opinion, but they do not always do so. There is no clear proof that different types of formal institutions (like courts, laws, referenda, and presidential actions) affect public opinion in different ways. Each type of institution might change public attitudes, but there is not a consistent pattern.

The direction of change in public opinion is also not straightforward and depends on various factors. These include how visible and close the institution is to people, the information

available, media influence, and personal experiences. Different groups of people might also react differently based on their backgrounds and beliefs.

In summary, formal institutions can influence public opinion, but the effect is not always certain and depends on many factors. Policymakers and researchers need to consider these complexities to understand how formal institutions shape public attitudes.

4.2 Sub-question 2

Continuing with the second sub-question, this section provides an answer to which planning interventions are used in Asten and Deurne when it comes to the management of cars in their city centre.

Governmental documents

Selection of documents

51 documents have been selected based on the search strategy as described in the methodology. A complete list of documents can be found in *Appendix H: List of selected governmental documents*, an overview is presented in *Table 7*.

Table 7 Overview of selected documents per municipality

Database/ municipality	**Regels op de kaart**	**Municipal database**			**Additional documents**	**Total**
		Autovrij	**Autoluw**	**Centrum**		
Asten	5	0	4	8	3	20
Deurne	3	0	0	27	1	31
Total	8	0	4	35	4	51

Coding

After coding, the codes have been grouped into the predetermined code groups. In total 27 codes have been identified belonging to the group of spatial interventions, 4 for the spatial interventions stage/year group. The codebook can be found in *Appendix I: Code book governmental documents*, an overview is presented in

Table 8.

Table 8 Overview of code groups per municipality

	Spatial intervention	**Spatial intervention stage/year**	**Total**
Asten	11	1	12
Deurne	7	3	10
Total	18	4	22

Formal institutions

Based on the coding of the governmental documents, a table has been created showing the spatial interventions, stage of implementation, and the year of implementation, see *Table 9.* Please note that the planning interventions do not necessarily follow the codes since some codes have been merged into one planning interventions, some codes have been split into multiple planning interventions. For a complete overview of the definition of the individual planning interventions see *Appendix J: Fact sheets*. Please note that this appendix contains the complete fact sheets, it might be that due to adaptations some spatial interventions have been

changed/added based on information from the interviews. Furthermore, these fact sheets do also contain information from later sub-questions, which has not been introduced yet. Additionally, for some planning interventions, the year of implementation was not provided in the governmental documents. For this information, other sources then the governmental documents were used.

Table 9 Overview planning interventions, including stage and year of implementation

Municipality of Asten		
Planning intervention	**Stage of implementation**	**Year of implementation**
Free parking (‘blauwe zone’)	After implementation	Unknown
One-way traffic Julianastraat	After implementation	Unknown
Parking facilities around the centre	After implementation	2010 (Siris, 2010)
Pilot placemaking	After implementation	2023 (Gemeente Asten, n.d.)
Placement of flower boxes on the market	After implementation	2017 (Van Horik, 2017)
Redevelopment of Koningsplein	After implementation	2020 (Staatscourant, 2020)
Street posts Eeuwig Leven-plein	After implementation	2012 (Gemeente Asten & Tonnaer, 2012)
Street posts Koningsplein	After implementation	2020 (Staatscourant, 2020)
Window time	Before implementation	Not (yet) implemented
Municipality of Deurne		
Planning intervention	**Stage of implementation**	**Year of implementation**
Ban on freight traffic in centre	After implementation	2019 (Broers, 2019)
Beltway	After implementation	2015 (Gemeente Deurne, 2015)
Secured cycle parking	After implementation	Only plan, not yet implemented
Free parking	After implementation	2024 (Boudewijns, 2023)
Parking facilities around the centre	After implementation	Unknown
Pedestrian area	After implementation	2008 (Gemeente Deurne, 2010)

Interviews

Selection of interviewees

As described in the methodology, for each of the two cases, three interviewees have been selected. One interviewee representing the municipality, one interviewee representing a political party on the left spectrum of the political field in the opposition, and one interviewee representing a political party on the right spectrum of the field. In total six potential interviewees have been selected which all have been contacted trough mail. In total four interviewees agreed to an interview, two for Asten, two for Deurne, and two interviewees did not respond despite numerous attempts to contact them.

Interview guide

The interview guide has been created based on the formal institutions that have been found from the governmental documents. The guide can be found in *Appendix J: Fact sheets.*

Coding

After coding the transcriptions of the interviews 30 codes have been found, 17 for Asten and 13 for Deurne. The full code book can be found in *Appendix L: Code book interviews*.

Analysis

Asten

New or change in spatial interventions

During the interviews it became apparent that one planning intervention was missing form the list, the beltway. This followed from both interviews.

"Yes, yes, yes, the centre ring, yes."[1]

"...then if we broaden it a bit to the ring road, so to speak, around the centre, that is now designed for 50 kilometres per hour..."[2]

From interview Asten 1, it became clear that there was in fact no one-way street in the Julianastraat and that there were much more streets that were one-way traffic in the centre of Asten. As a result, the planning intervention ‘one-way traffic Julianastraat’ will be changed into ‘one-way traffic’, in the adapted table. This adaptation of this planning interventions now includes all streets that are one-way traffic within the centre.

"But that is not in direction. The Julianastraat is not one-way. We are currently considering making that street..."[3]

[1] Snippet from interview Asten 1
[2] Snippet from interview Asten 2
[3] Snippet from interview Asten 1

Furthermore, the year of implementation for the one-way traffic and for free parking needs to be changed in the adapted table.

General

The opinion of the interviewees, from different sides of the political spectrum is not that much different. Both interviewed parties do not want the entire centre of Asten to be car-free. The interviewees give three reasons for this; (1) the centre of Asten is not suitable to be made completely car-free due to its lay-out, (2) there are entrepreneurs in the area that are heavily reliant on cars for their business, and (3) in most areas a car-free centre is not necessary.

"And we have, of course, a mix of chains and independent entrepreneurs in the centre. Yes, the quality, the reason people go to an independent entrepreneur is precisely because good advice is still given. Because there is something for sale that you can't buy elsewhere. Because you can try things on, which you can't do online, and they think that they should derive their added value from things other than having a parking space in front of their door."[4]

"Um, we do find it important that the centre remains accessible by car. Also for people who, um, have limited mobility, um, and for loading/unloading. Yes, there's no other way. So, um, um, we find that very important."[5]

"Yes, we also think that the consideration for that is really about the ratio of whether you want pedestrians there or cars, so you look at whether it's dangerous for a pedestrian to walk there? And, and, and, and the busyness of how many pedestrians are coming. We find that important in the consideration. For example, I can give an example, look at the Markt; there are the terraces, there, um, people can walk, people can take photos, whatever. We think it's important that this area is car-free. But for example, in the Emmastraat, that section between Markt 8 and the old Rabobank, yes, there is a wide sidewalk. Um, there's a street and no one is bothered by the fact that there's a street there. Um, so we do not have the intention to make that area car-free. That's just an example, um, where you can really see that ratio, that there is no problem between traffic and cars, or a car and a pedestrian, um, in our view."[6]

Furthermore, both interviewees highlight the importance that the centre remains accessible by car or that people can at least park their car on the edge of the centre since residents of rural areas are heavily dependent on their car.

"No, no, no, look, we did a parking study last year; you know exactly why people come to the centre. The biggest destinations are supermarkets. Um, that also came out in all the parking studies and at the PLUS and Lidl. It's really busy with cars there. And at Albert Heijn to a lesser extent at ALDI, but they all have good parking spaces. They are also located right on

[4] Snippet from interview Asten 1
[5] Snippet from interview Asten 2
[6] Snippet interview Asten 2

the edges. What we say is low-traffic centre parking at the edges. Well, we have very good parking lots at those edges."[7]

"Um, we do find it important that the centre remains accessible by car. Also, for people who, um, have limited mobility, um, and for loading/unloading. Yes, there's no other option."[8]

Both interviewees want (part of the) centre to be sheltered from cars. One interviewee wants the entire centre to be car-sheltered and only accessible for terminating traffic (traffic to destinations within the centre), which they refer to as local traffic in the interviews. Drivers themselves have to make the decision if they are considered terminating traffic or not.

"Yes, low-traffic is really our preference. That would legally mean that the entire residential area is prohibited for cars, except for local traffic. Um, um, knowing that in the end everyone behind the wheel has to make the decision themselves whether they are local traffic or not."[9]

The other interviewee wants the Markt to become car-free and the other streets to become car-sheltered.

"...and we actually find it necessary at the Markt because there are terraces; it's our characteristic area where, um, everyone actually comes; it's really our village square, so to speak. And yes, to create encounters, we think it's, um, important that the centre, or the Markt, becomes car-free. Um, and yes, look, if it were easy, it would have happened long ago, and it turns out it's not easy, and that has to do with the specific situation in Asten, where multiple roads connect to the Markt. And, um, there isn't actually a solution yet for the side streets. We think it's, um, well, important to look at multiple scenarios to see which solution, um, is best for that, but we do advocate for a car-free Markt, actually from Markt 8, so to speak, up to the Baron. And some people think that the side street by the Rabobank is also the Markt, but that's the Emmastraat, you see. So, there's also a different street name, um, so we really advocate for a car-free Markt..."[10]

"A car-sheltered centre is what we want as well. So, the surrounding streets can be car-sheltered in our opinion, and that can be done by, for example, making certain streets one-way."[11]

Lastly, both parties would prefer to follow a so-called one floor-principle. They explain that would prefer to have the entire centre on the same level (one floor) without any barriers. They would prefer to plan the entire centre using softer planning interventions (e.g. signs, lay-out of streets, green) and avoid hard spatial interventions (e.g. barriers, street posts, elevation).

[7] Snippet interview Asten 1
[8] Snippet interview Asten 2
[9] Snippet interview Asten 1
[10] Snippet interview Asten 2
[11] Snippet interview Asten 2

Simultaneously, throughout the interview they explain that this is their ideal and that they are aware that on some points this ideal is not possible and hard spatial barriers are required.

"...we have very little enforcement capacity, so that's why I said that the design, the fact that you simply don't feel welcome, is even more important to us."[12]

"No, no, no, we absolutely want to erect zero barriers, because those barriers hinder legitimate destinations, you know, those who really need to make a delivery..."[13]

"So, there is actually no obstruction, so to speak, and I would actually prefer to see it as a sort of residential area rather than imposing all sorts of restrictions. Only, yes, I also understand that there is a lot of traffic."[14]

"...that would be the ideal image, but that doesn't necessarily mean we are striving for 100% of that because we also know that there is a reality where there is a lot of traffic. Where everything is mixed together, and if you open it up completely, yes, there could also be people, yes, just young people, I don't know what, who drive fast or, yes, who drive very fast and so on."[15]

Specific interventions

The opinions of the interviewees of the specific interventions are mostly similar to each other and the interviewees agree with most of the interventions that aim to reduce traffic within the centre. A complete overview of the opinion of the interviewees for each specific intervention can be found in *Appendix J: Fact sheets.* Please note that this appendix contains the completed fact sheets, other information that has not yet been discussed within the main text is also there.

Deurne

New or change in spatial interventions

After the interviews, one new planning intervention has been added, one-way traffic. This followed from one interview.

"We are looking into whether we can perhaps make that road structure with one-way traffic."[16]

In interview Deurne 2, it became clear that there was a difference between the beltway going around the municipality Deurne and the beltway going around the centre of Deurne. Therefore, the name needs to be changed to 'beltway around centre', to specify which beltway this research is talking about. Furthermore, the year of implementation that has been found is for the beltway

[12] Snippet interview Asten 1
[13] Snippet interview Asten 1
[14] Snippet interview Asten 2
[15] Snippet interview Asten 2
[16] Snippet from interview Deurne 1

going around the entire municipality, not for the beltway going around the centre. This will be changed.

"Yes, okay, but that wasn't constructed in 2015, it's already there."[17]

General

The interviewees have similar views when it comes to traffic in the centre. Both interviewees argue that, at least, the edge of the centre, where all the parking facilities lie, should be accessible by car. It is argued that this accessibility is crucial since inhabitants of Deurne are reliant on cars.

"Yes, if you're at your supermarket, a supermarket, if you have a supermarket in your centre like we have at the, uh, at the Wolfsberg. Yes, they will do everything to make sure that car can get as close as possible to the store, because that's what interests them. Because the customer likes nothing more, they like, they like. The supermarket customer doesn't go shopping. They go to get their things, and they want to do that as efficiently as possible, so they want their car to be parked right by the store. So, if you were to make that area low-traffic, if you were to turn that parking space into a nice spot, yes, then we would definitely get an uprising from the shopkeepers. Because then the shopkeeper says, 'Hold on a second, the customer will soon have to walk 200 meters before they can get their groceries to the car.' That's not practical, that won't, that won't work."[18]

"Yes, you know, then you also start looking at what kind of facilities there are. And if you're just past the Visser, just, um, past the church, then you very quickly come to the retirement home. Well, you can easily imagine that you want to make such a location easily accessible by car for people, because often older people come there who are much less mobile. So, then you're more likely to make it low-traffic and, and, only for local traffic, not completely car-free."[19]

"Yes, yes, yes, because if the reasoning is really that we want people to come to the centre by bike, and that's why we're going to remove parking spaces, then we think, yeah, but that doesn't fit with a rural municipality. Then you'll only get people, and you can't say, only people from Helenaveen are allowed to park here, so that."[20]

[17] Snippet from interview Deurne 2
[18] Snippet from interview Deurne 1
[19] Snippet from interview Deurne 2
[20] Snippet from interview Deurne 2

When it comes to making the centre car-free or more sheltered from cars, the interviewees do not have an ideal but are more practically minded. They want to create a safer, more attractive, and a more liveable centre. When this means having less cars in the centre, or no cars in the centre they will implement that. They highlight that there is always friction between the visitors of the centre and entrepreneurs with a store in the centre, and that a situation should be created that both parties can be content with.

"No, I think that if you, um, um, look at the shopkeepers, we have two interest groups, that's, that's our residents and the shopkeepers, the entrepreneurs. The entrepreneurs do want to have the feeling that the centre is accessible. There are two things. It's mainly the accessibility of the centre, which people find very important, understandably."[21]

"So, you're always in a dilemma about what kind. Look, here in the centre of Deurne with the shopkeepers on this street, it's often more about shopping. Yes, people actually take time for that. I think you should distinguish that by looking at what kind of shops we have in a certain area. Is it really food? I mean the Albert Heijns and, and, and similar stores, you know. The supermarkets benefit from cars being able to come nearly right to the door."[22]

"Yes, you know, then you also start looking at what kind of facilities there are. And if you're just past the Visser, just, um, past the church, then you very quickly come to the retirement home. Well, you can easily imagine that you want to make such a location easily accessible by car for people, because often older people come there who are much less mobile. So, then you're more likely to make it low-traffic and, and, only for local traffic, not completely car-free."[23]

Lastly, both interviewees said that they wanted to enforce the planning interventions through the use of physical barriers. The interviews thought that this was the only way in which people would follow the rules. This so called ‘not-one floor policy is the complete opposite of the point of view of Asten.

"Yes, people are interested; look, if you keep it accessible, if you remove those barriers, you can bet that cars will drive through. And if we think, and I believe that at this moment, you want a freely shopping public there, then you have to invite that. Parents with small children

[21] Snippet from interview Deurne 1
[22] Snippet from interview Deurne 1
[23] Snippet from interview Deurne 2

should be able to walk freely and shouldn't have to keep looking around to see if a car is coming. No, car-free, really a shopping street, shopping area car-free."[24]

"No, that's not enough. You really have to make it physically impossible at that moment. Because people don't care about that; they think, yes, the chance that I'll get a ticket is very small. And yes, they might even think that's cool. I'm very convinced that if you want a shopping public, you have to regulate it in such a way that it's safe."[25]

"Look, at the moment you are a pedestrian and there is something, um, pink-coloured or something, especially with children, that, that, that you can try, but it's never really a solution. So, then you would have to look for an alternative route, and I don't have that readily available, so that's."[26]

Specific interventions

The opinions of the interviewees of the specific interventions are mostly similar to each other and the interviewees agree with most of the interventions that aim to reduce traffic within the centre. A complete overview of the opinion of the interviewees for each specific intervention can be found in *Appendix J: Fact sheets.* Please note that this appendix contains the completed fact sheets, other information that has not yet been discussed within the main text is also there.

Updated formal institutions

Following from the interviews, the list of formal institutions of *Table 9* needs to be updated. The changes that are made are shown **bold**, when something has been removed it will be ~~crossed out~~. This can be seen in *Table 10*, on the next page.

[24] Snippet from interview Deurne 1
[25] Snippet from interview Deurne 1
[26] Snippet from interview Deurne 2

Table 10 Updated overview planning interventions, including stage and year of implementation

Municipality of Asten		
Spatial intervention	**Stage of implementation**	**Year of implementation**
Free parking (‘blauwe zone’)	After implementation	**1996 (Gemeente Asten, 2001)**
One-way traffic ~~Julianastraat~~	After implementation	**Unknown**
Parking facilities around the centre	After implementation	2010 (Siris, 2010)
Pilot placemaking	After implementation	2023 (Gemeente Asten, n.d.)
Placement of flower boxes on the market	After implementation	2017 (Van Horik, 2017)
Redevelopment of Koningsplein	After implementation	2020 (Staatscourant, 2020)
Street posts Eeuwig Leven-plein	After implementation	2012 (Gemeente Asten & Tonnaer, 2012)
Street posts Koningsplein	After implementation	2020 (Staatscourant, 2020)
Window time	Before implementation	Not (yet) implemented
Beltway around centre	**After implementation**	**Unknown**
Municipality of Deurne		
Ban on freight traffic in centre	After implementation	2019 (Broers, 2019)
Beltway **around centre**	After implementation	**Unknown**
Secured cycle parking	After implementation	Only plan, not yet implemented
Free parking	After implementation	2024 (Boudewijns, 2023)
Parking facilities around the centre	After implementation	Unknown
Pedestrian area	After implementation	2008 (Gemeente Deurne, 2010)

4.3 Sub-question 3

Continuing with sub-question 3, this section classifies the planning interventions that have been identified in the previous sub-question.

Content analysis

Following the field visits, the following observations have been made, see *Table 11*. The spatial manifestations are the things that have been observed during the field visits (e.g. for the planning intervention free parking, 5 different spatial manifestations have been observed). The number of observations is the amount of times that spatial manifestation has been observed.

Table 11 Planning interventions, spatial manifestations, and amount of observations

Municipality of Asten		
Planning interventions	**Spatial manifestation**	**Number of observations**
Free parking (‘blauwe zone’)	Sign start or end parking zone	19
	Parking space with blue linage	13
	Blue line on ground	5
	Yellow line	4
	Blue bumpers	1
One-way traffic	Sign no entry or one way only	19
Parking facilities around the centre	Parking space	12
Pilot placemaking	Temporary signs	3
Placement of flower boxes on the market	Flower boxes	1
Redevelopment of Koningsplein	One way traffic signs	2
Street posts Eeuwig Leven-plein	Street posts	2
Street posts Koningsplein	Street posts	1
Window time	Nothing observed	N/A
Beltway around centre	Signs parking route	3
	Signs priority traffic	2
	Give way road marking	3
	Difference in elevation	2
	Pedestrian crossing (road marking and signs)	11
	Traffic lights	1
	Speed bump	1
Other observations	Other street posts	3
	Speed bump not on beltway-road	1
	Pedestrian crossing not on beltway-road (road marking and sign)	2
	Sign load/unload	1

	Sign ban on freight traffic	2
Municipality of Deurne		
Planning interventions	**Spatial manifestation**	**Number of observations**
Ban on freight traffic in centre	Signs	1
Beltway around centre	Crossings	13
	Elevation	2
	Give way road marking	1
	Parking route	10
	Priority road	2
	Traffic lights	3
Cycle parking	N/A	N/A
Free parking (‘blauwe zone’)	‘Blauwe zone’ line on ground	6
	‘Blauwe zone’ sign	6
	Free parking sign	3
One-way traffic	Sign	33
Parking facilities around the centre	Ban on parking	19
	Parking in residential area	56
	Parking place next to centre	24
	Parking sign	12
Pedestrian area	Elevation	1
	Posts	18
	Signs and window time	13
Other observations	Other posts	9
	Crossing not on beltway	1

Classification

Asten

For the municipality of Asten, the planning interventions have been classified, see *Table 12*. For a complete explanation of the placement of each intervention, see *Appendix J: Fact sheets*.

Table 12 Classification planning interventions in Asten

	Enabling	**Disabling**
Spatial	Free parking (‘blauwe zone’) One-way traffic Parking facilities around the centre Pilot placemaking Placement of flower boxes on the market Redevelopment of Koningsplein	

	Street posts Eeuwig Leven-plein Street posts Koningsplein Beltway around centre	
Non-spatial	Window time	Window time

The table shows that most interventions are spatial and enable a (more) car-free centre. This is in line with the findings in the governmental documents that aim at reducing traffic within the centre and increasing the centre's safety and liveability.

Deurne

For the municipality of Deurne, the planning interventions have been classified, see *Table 13*. For a complete explanation of the placement of each intervention, see *Appendix J: Fact sheets*.

Table 13 Classification planning interventions in Deurne

	Enabling	**Disabling**
Spatial	Ban on freight traffic in centre Beltway around centre Free parking ('blauwe zone') Parking facilities around the centre Pedestrian area One-way traffic	
Non-spatial	Secured cycle parking	

Similarly to the case of Asten, the table shows that most interventions are spatial and enable a (more) car-free centre. This is in line with the findings in the governmental documents that aim at reducing traffic within the centre and increasing the centre's safety and liveability.

Comparison

The planning interventions that have been found have been compared between the two cases based on four components: (1) meaning of the spatial intervention, (2) the observations of the spatial intervention, (3) the view that politicians and government officials have of the spatial intervention, and (4) the classification of the intervention. The overview of this comparison can be found in *Appendix M: Comparison planning interventions*. The main finding is that there are some planning interventions that are roughly similar, but none are completely similar.

4.4 Sub-question 4

For the final sub-question, the following sections provides an answer to what the public opinion is in Asten and Deurne, if the stage of implementation has an effect on public opinion and what other factors influence public opinion.

Survey development

As described in the methodology, the survey will be developed after the acquisition of the information following from the previous sub-questions. Before developing the survey, first we must clarify what we hope to discover through the use of this survey.

Aims of the survey

The survey has three aims:

1. To check if there is a significant difference between the public opinion on the three types of centres (car-free, car-sheltered, and car-accessible) between Asten and Deurne
2. To check if the stage in the policy cycle the planning intervention is in influences opinion
3. To check which other factors, identified by the literature, influence public opinion

Survey development

For the first aim, the survey will directly inquire participants about their opinion regarding the three types of centres (car-free, car-sheltered, and car-accessible) using the following three question:

> *Please note that all the questions in the survey are in Dutch, here the English translation is shown*

1. On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should not have access to the centre of *insert name of case*?
2. On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should have limited access to the centre of *insert name of case*?
3. On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should have full access to the centre of *insert name of case*?

For the second aim, we first need to identify which planning interventions are suitable given the following criteria established in the methodology:

- The planning interventions must be spatial in at least one case
- The planning interventions is only present in one case

  or

  The spatial interventions are in different stages of implementation in both cases and similar to each other

Following the first criteria, there are nine spatial planning interventions in Asten, for Deurne there are six spatial planning interventions remain, see *Table 14*.

Table 14 Spatial planning interventions in Asten and Deurne

Spatial panning interventions Asten	**Spatial planning interventions Deurne**
Free parking (‘blauwe zone’)	Ban on freight traffic in centre
One-way traffic	Beltway around centre
Parking facilities around the centre	Free parking (‘blauwe zone’)
Pilot placemaking	Parking facilities around the centre
Placement of flower boxes on the market	Pedestrian area
Redevelopment of Koningsplein	One-way traffic
Street posts Eeuwig Leven-plein	
Street posts Koningsplein	
Beltway	

There are no spatial interventions that are present in both cases, similar to each other, and in different stages of implementation. There are two spatial planning interventions that are only present in one case, and can therefore be used. These are:

1. ‘Blauwe zone’ implemented in Asten but not in Deurne
2. Pedestrian area implemented in Deurne but not in Asten

The ‘blauwe zone’ is present in some parts of the centre in Deurne, but, as discussed in *Appendix J: Fact sheets*, it can only be found in the residential areas within the borders of the centre. Within the shopping centre of Deurne, a ‘blauwe zone’ cannot be found. Since this is the area this study focusses on, this spatial planning interventions is suitable here.

Since these planning interventions are not present in both cases, we will need questions specifically designed for each case, making a distinction between whether or not the planning

intervention has been implemented in the case. For Asten, this result in the following two questions:

1. On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should have full access to the centre of Asten?
2. On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the blue parking zone in the centre of Asten?

For Deurne, this results in the following two questions:

1. On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the introduction of a blue parking zone in the centre of Deurne?
2. On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with a pedestrian zone in the centre of Deurne?

In order to refrain from having to create two surveys, one for each case, we will use logic in the survey. The first question of the survey will be aimed to divide participants between residents of the municipality of Asten, residents of the municipality of Deurne and residents from other municipalities. A complete overview of the survey and the logic behind this survey can be found in *Appendix N: Survey logic*.

Regarding the third aim, due to the design of this study it is not possible to determine which factors influence a change in public opinion. In order to do this, the study design would need to follow a large group of participants over a certain period of time. Since this study is not longitudinal but compares two cases, this aim cannot be checked. However, it is possible to check if the factors mentioned in the literature have an effect on public opinion. For this, a spatial manifestation will be used to collect the public opinion on. A spatial manifestation is here preferred over a planning intervention since it needs to be present in both cases and similar. As established in *Appendix M: Comparison*, none of the planning interventions are completely similar. Therefore, a spatial manifestation is better suited since they are only a small par of the planning interventions, making it easier to find one that is similar. One of these spatial manifestations that are similar between Asten and Deurne are the street posts. This spatial manifestation will be used to collect the public opinion.

This will be asked using the following question:

1. On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with using street posts to restrict cars in the centre of *insert name of case*?

When it comes to the factors that can influence public opinion, the literature discussed in sub-question 1 argues that there are three factors: visibility, proximity, and sub-groups. This study

will inquire participants about visibility and proximity. Sub-groups would require questions that could be perceived as too invasive (age, level of education, income, political belief, gender, trust in the government, etc.). As a result, asking such questions would lead to a lower response and could mean that the statistical tests would fail to prove any significance due to this low response rate. One exception is made, participants are asked about their age, this is done since the surveys are distributed through the use of social media and local newspapers, which might result in a skewed sample regarding age. By asking this question, it can be checked if there are any abnormalities in the distribution of age.

For the other two factors, the survey will inquire people about how visible they perceive the street posts and about their proximity to the centre. The literature, from sub-question 1, uses two meanings of proximity; spatial and proximity in general (e.g. how connected people feel to something). Therefore, the survey will work with spatial proximity and how often people visit the centre as an operationalization general proximity.

For this, the following questions will be asked:

1. On a scale of 1 (not visible at all) to 10 (very clearly visible), how visible are the street posts in the centre of *insert name of case*?
2. How far do you live from the centre of *insert name of case*?
    a. 0-1 kilometre
    b. 1-3 kilometre
    c. 3-5 kilometre
    d. More than 5 kilometres
3. How often do you visit the centre of *insert name of case*?
    e. Every day
    f. One or multiple days a week
    g. A multiple times a month
    h. A few times a year

Hypothesis

For the three aims, the following hypotheses have been identified.

Hypothesis aim 1: There is no significant difference in public opinion between Asten and Deurne.

Hypothesis aim 2: Stage of implementation influences the change in public opinion

Hypothesis aim 3: Higher visibility and general proximity result in a higher public opinion, spatial proximity does not have an effect on public opinion

Survey participants

In total the survey was filled in by 420 residents of Asten, and 333 residents of Deurne. When looking at the distribution of age, this seems normal. For both cases, there are no participants in the age group of 1 until 18. For all the other age groups there are answers. Please note that the number of respondents in the histograms is a bit lower since some participants did not provide their age

Residents of municipality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Asten	420	55.8	55.8	55.8
	Deurne	333	44.2	44.2	100.0
	Total	753	100.0	100.0	

Figure 12 Number of participants for Asten and Deurne

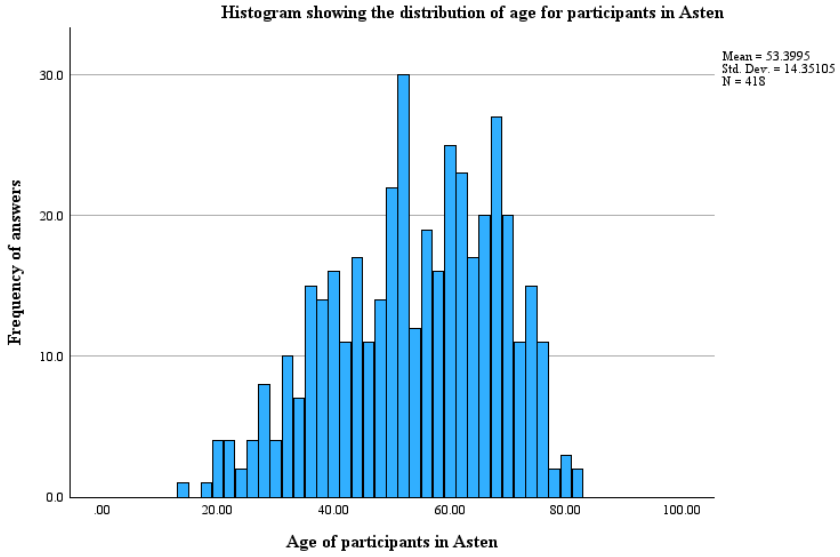


Figure 11 Histogram age of participants in Asten

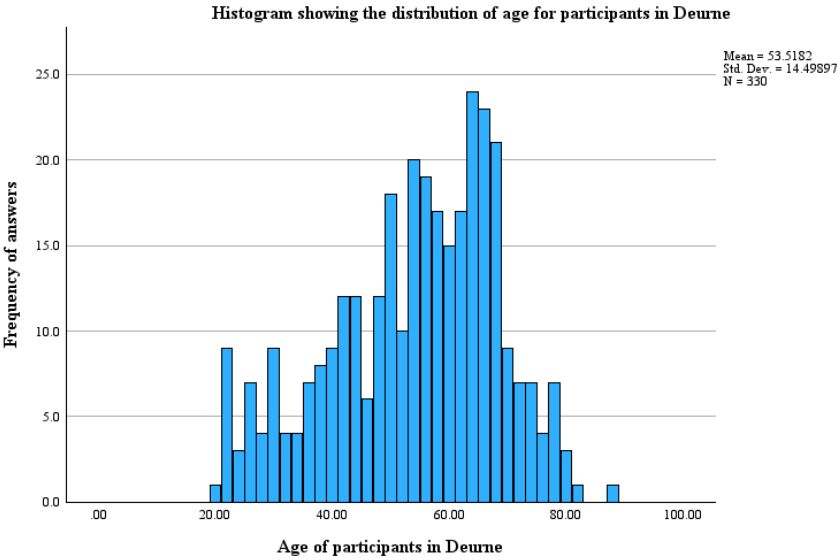


Figure 10 Histogram age of participants in Deurne

Statistical development

Aim 1

To test if there is a significant difference regarding public opinion on the three different types of centres (car-free, car-sheltered, and car-accessible) between the two cases, the first step is to visualize the data. For each type of centre, for each case, a histogram with a normal distribution curve will be created to test if the data is normally distributed. Furthermore, a boxplot is created to show the median, and the interquartile range. This will all happen three times (one time for each type of centre) for both cases. In the end, 6 histograms and 6 boxplots will be created.

To test if there is a significant difference in public opinion on the 3 different types of centres between the two cases. Firstly, it has to be tested if data is normally distributed. This will first be done visually by inspecting the histograms that have been created previously and with Q-Q plots. After this initial visual assessment, the Kolmogorov-Smirnov test will be used with the following hypotheses:

H0: Data is normally distributed

H1: Data is not normally distributed

If the p-value is smaller than 0.05, H0 is rejected, H1 is accepted. The data is not normally distributed. If the p-value is bigger than or equal to 0.05, H0 is accepted. The data is normally distributed. This will happen for all three types of centres for both cases.

The next part of the analysis has 2 routes. If the public opinion on one of the three types of centres is in both cases normally distributed a Welch-t test is conducted. If the data is in one or both cases not normally distributed the Mann-Whitney U-test is used. Both test work with the following hypotheses:

H0: There is no significant difference in public opinion between the two cases for this type of centre

H1: There is a significant difference in public opinion between the two cases for this type of centre

If the p-value is smaller than 0.05, H0 is rejected, H1 is accepted. There is a significant difference in public opinion between the two cases for this type of centre. If the p-value is bigger than or equal to 0.05, H0 is accepted. There is no significant difference in public opinion between the two cases for this type of centre.

Finally, if there is a significant difference between the two groups, the size effect will be calculated, also referred to as R, to see how big the practical difference is.

A visual summary of the statistical analysis of the first aim, and the second aim since this follows the same steps, is present in *Figure 13*.

Aim 1 & 2: Statistical development

Step 1: Visualisation of the data:

- Histogram
- Boxplot
- Q-Q plot

Step 2: Test if data is normally distributed

- Kolmogorov-Smirnov test with the following hypotheses:
  - H0: Data is normally distributed
  - H1: Data is not normally distributed

Step 3: Test if there is a significant difference

- If data is normally distributed conduct a Welch-t test
- If data is not normally distributed conduct a Mann-Whitney U-test
- Both tests use the following hypotheses
  - H0: There is no significant difference in public opinion between the two cases for this type of centre
  - H1: There is a significant difference in public opinion between the two cases for this type of centre
- Calculate R

Figure 13 Visual summary of statistical development of aim 1 and 2

Aim 2

The statistical analyse of aim 2 follows the same principles as the statistical analysis of the first aim. The steps that have to be taken are summarised here. For a complete guideline of these steps see the statistical analysis of aim 1, and the visual summary in *Figure 13*.

1. Visualize the data
   a. Histogram (with a normal distribution curve)
   b. Boxplot

2. Test for normality
    a. Using histogram and Q-Q plot
    b. Test normality using the Kolmogorov-Smirnov
3. Test if there is a significant difference
    a. If data is normally distributed, use a Welch-t test
    b. If data is not normally distributed, use the Mann-Whitney U-test
    c. If there is a significant difference, test R

Aim 3

Data editing

Before the data from the survey is usable, it needs to be edited first. The data regarding proximity needs to be transformed into an ordinal scale, see *Table 15* and *Table 16*. Ordinal data for proximity were coded such that higher scores represent closer spatial proximity and greater general proximity. This coding was chosen to align with the hypothesis 3.

Table 15 Conversion table from answers to numbers to allow statistical analyses for the spatial proximity

Possible answers	**Ordinal scale**
0-1 kilometre	4
1-3 kilometre	3
3-5 kilometre	2
More than 5 kilometres	1

Table 16 Conversion table from answers to numbers to allow statistical analyses for the general proximity

Possible answers	**Ordinal scale**
Every day	4
One or multiple days a week	3
A multiple times a month	2
A few times a year	1

Statistical tests

To begin with, the three factors (perceived visibility, spatial proximity, and general proximity) are separately tested.

Analysis of individual factors

For perceived visibility, the first step is to visually assess whether or not there are signals that there might be a linear relationship. This will be done through the use of a boxplot. Afterwards, Spearman rank correlation is used to test if there is a monotonic relationship (if one variable increases, the other increases as well). The following hypotheses are used for this:

H0: There is no monotonic relationship between public opinion and visibility

H1: There is a monotonic relationship between public opinion and visibility

If the p-value is smaller than 0.05, H0 will be rejected and H1 will be accepted. Thus, there is a monotonic relationship between public opinion and visibility. If the p-value is bigger than 0.05 H0 is accepted, meaning that there is no evidence supporting a monotonic relationship between public opinion and visibility.

Here the analyses split into two routes, the first route has to be taken when there is evidence of a monotonic relationship. In this case, a linear regression will be used to estimate the relationship between public opinion and visibility. The following hypotheses are used.

H0: Visibility has no effect on public opinion

H1: Visibility has effect on public opinion

If the p-value is smaller than 0.05, H0 will be rejected, and H will be accepted. Thus, visibility does have an effect on public opinion. If the p-value is bigger than 0.05, than H0 is accepted, meaning that there is no evidence that visibility does not have an effect on public opinion.

The second route is taken when there is no evidence of a monotonic relationship. In this case, the Kruskal-Wallis test will be used to check if there is a significant difference in public opinion between the visibility categories. The test uses the following hypotheses:

H0: There is no significant difference in public opinion between the visibility categories

H1: There is no significant difference in public opinion between the visibility categories

If the p-value is smaller than 0.05, H0 will be rejected, and H will be accepted. Thus, there is a significant difference in public opinion between the visibility categories. If the p-value is bigger than 0.05, than H0 is accepted, meaning that there is no evidence supporting a significant difference in public opinion between the visibility categories.

For the other two factors, the statistical analysis will function the same, the steps that has to be taken have been summarized in *Figure 14* on the next page.

Aim 3: Statistical development of the independent factors

Step 1: Visual assessment

- Boxplot

Step 2: Test if there is a monotonic relationship

- Spearman rank correlation with the following hypotheses:
  - H0: There is no monotonic relationship between public opinion and visibility
  - H1: There is a monotonic relationship between public opinion and visibility

Step 3: Check if the factor has an effect on public opinion

- If there is a monotonic relationship, use linear regression with the following hypotheses:
  - H0: Visibility has no effect on public opinion
  - H1: Visibility has effect on public opinion
- If there is no monotonic relationship, use the Kruskal-Wallis test with the following hypotheses:
  - H0: There is no significant difference in public opinion between the visibility categories
  - H1: There is no significant difference in public opinion between the visibility categories

Figure 14 Visual summary of statistical development of aim 3

Joint analysis

After the analyses of all three factors individually, a joint analysis will be conducted to test how these factors work together in practice. A joint ordinal regression test will be used with the following hypotheses:

H0: The tested factors do not have a joint effect on public opinion

H1: The tested factors do have a joint effect on public opinion

If the p-value is smaller than 0.05, H0 is rejected and H1 is accepted. Thus, the tested factors do have a joint effect on public opinion. If the p-value is bigger than 0.05, H0 is accepted, meaning that there is no evidence that the tested factors have a joint effect on public opinion.

In order to pick the model that best explains reality, different models with different combinations of factors (e.g. one model with all three factors, one model with spatial proximity and visibility, one model with general and spatial proximity, etc.) will be tested using the joint ordinal regression. The model with the lowest Akaike's information criterion (AIC), the lowest Bayesian information criterion (BIC), and the highest r^2 is the best fit and will be chosen. When this is not possible, theoretical considerations will determine which model is the best fit.

Statistical analyses

Aim 1

For aim 1, the visual analysis and the check for normal distribution will first be shown per case, per type of centre. Afterwards, it will be tested if there is a significant difference in public opinion.

Visual analysis Asten

Car-free centre

The distribution of the public opinion on a car-free centre in Asten can be seen in *Figure 15*. The mean is 6.68, meaning that on average residents of Asten do support a car-free centre. The line in the histogram shows what values would have been expected if the data would be normally distributed. As shown, the data does not follow this line, a sign that the data might not be normally distributed.

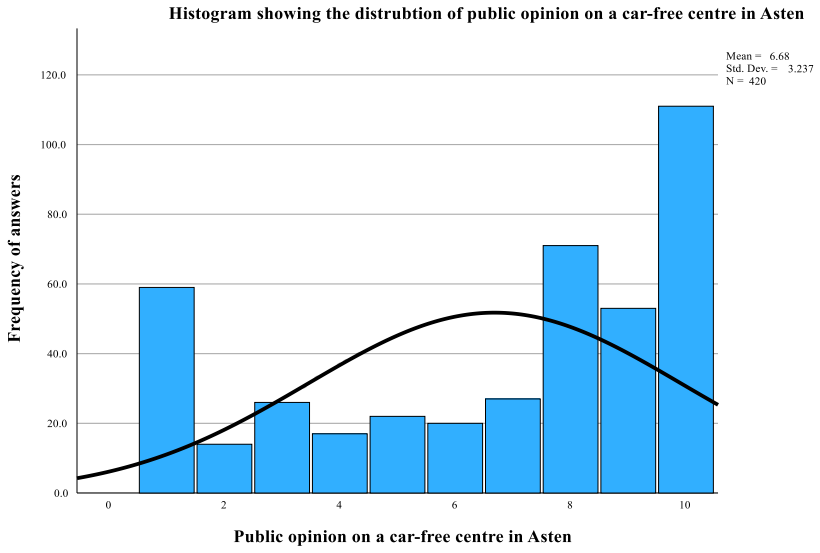


Figure 15 Histogram car-free centre in Asten

The boxplot, see *Figure 16,* illustrates the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

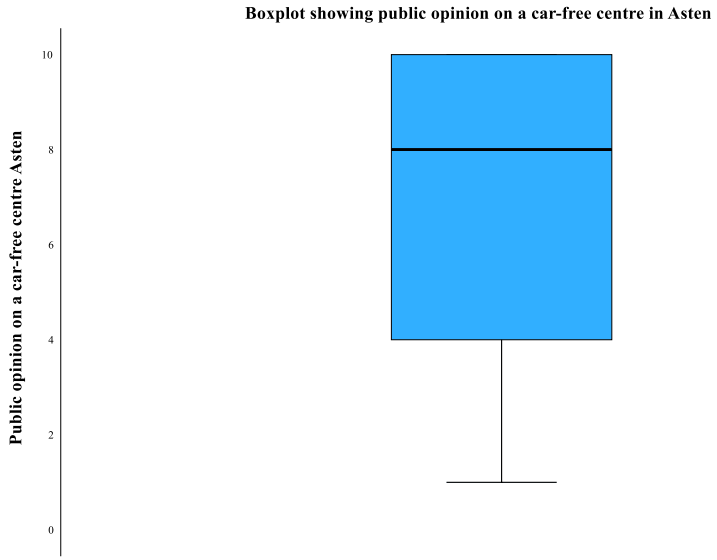


Figure 16 Histogram car-free centre in Asten

The Q-Q plot, see *Figure 17*, supports our conclusion from the histogram that the data is not normally distributed. The points, which shows the observed data, is not on the line that one would expect when the data would be normally distributed.

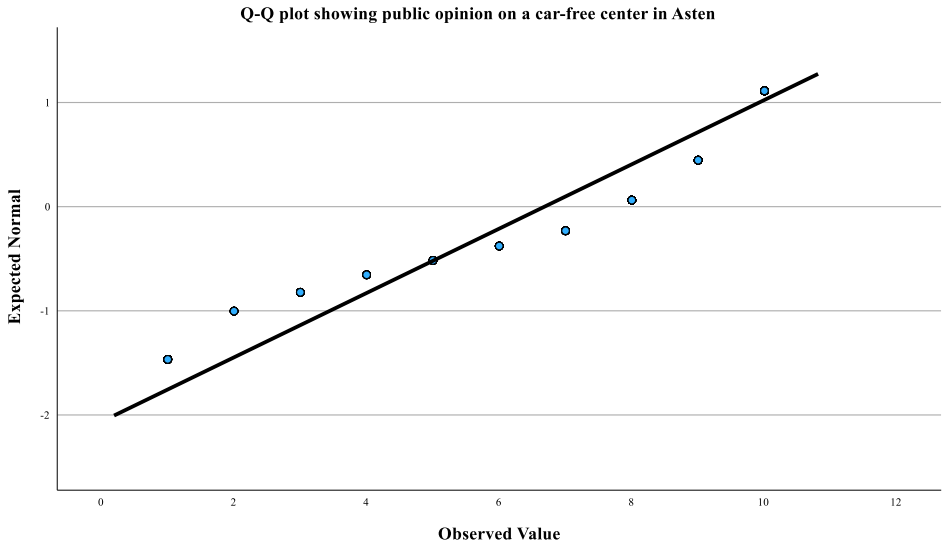


Figure 17 Q-Q plot car-free centre in Asten

Lastly, the test of normality, see *Figure 18,* shows that the significance is smaller than 0.01. Therefore, rejecting H0, H1 is accepted. The data is not normally distributed. Please note that the Kolmogorov-Smirnov test is used for all the tests of normality since the sample size is bigger than 50,

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Car-free centre Asten	.217	420	<.001	.843	420	<.001

a. Lilliefors Significance Correction

Figure 18 Tests of normality car-free centre Asten

Car-sheltered centre

The distribution of the public opinion on a car-free centre in Asten can be seen in *Figure 19* . The mean is 6.19, meaning that on average residents of Asten do support a car-sheltered centre, but slightly prefer a car-free centre. The line in the histogram shows what values would have been expected if the data would be normally distributed. As shown, the data does not follow this line, a sign that the data might not be normally distributed.

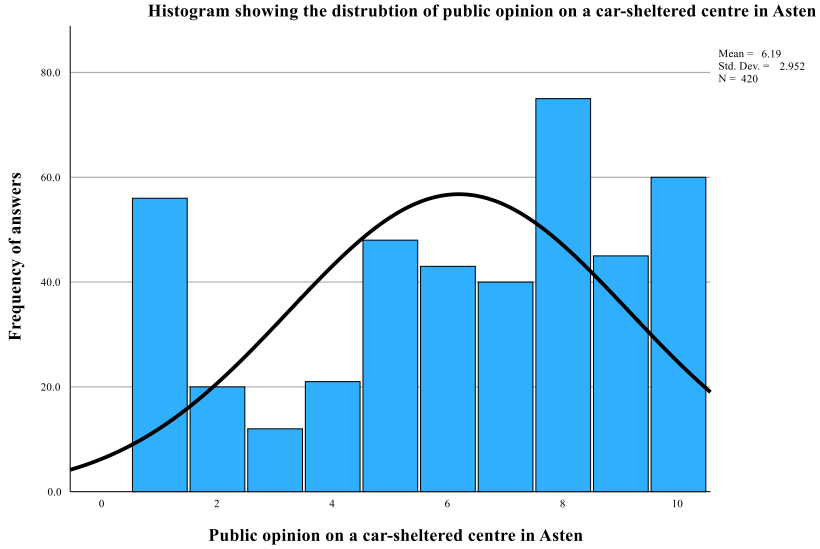


Figure 19 Histogram car-sheltered centre in Asten

The boxplot, see *Figure 20*, illustrates the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

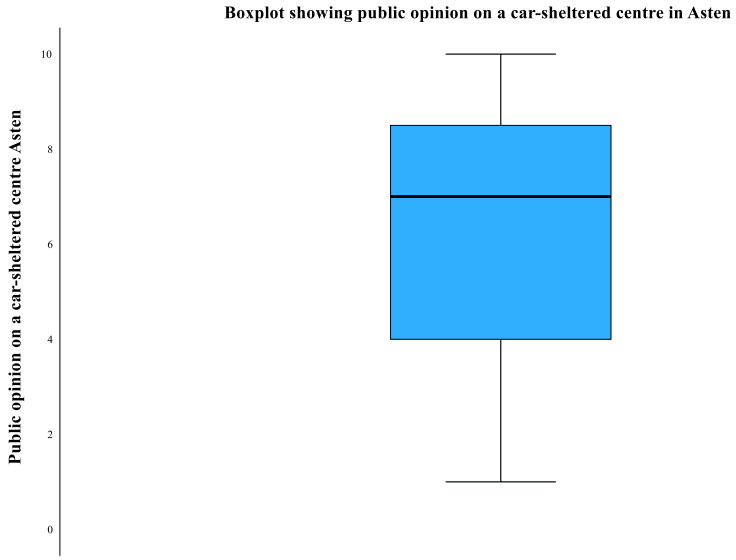


Figure 20 Boxplot car-sheltered centre in Asten

The Q-Q plot, see *Figure 21*, supports our conclusion from the histogram that the data is not normally distributed. The points, which shows the observed data, is not on the line that one would expect when the data would be normally distributed.

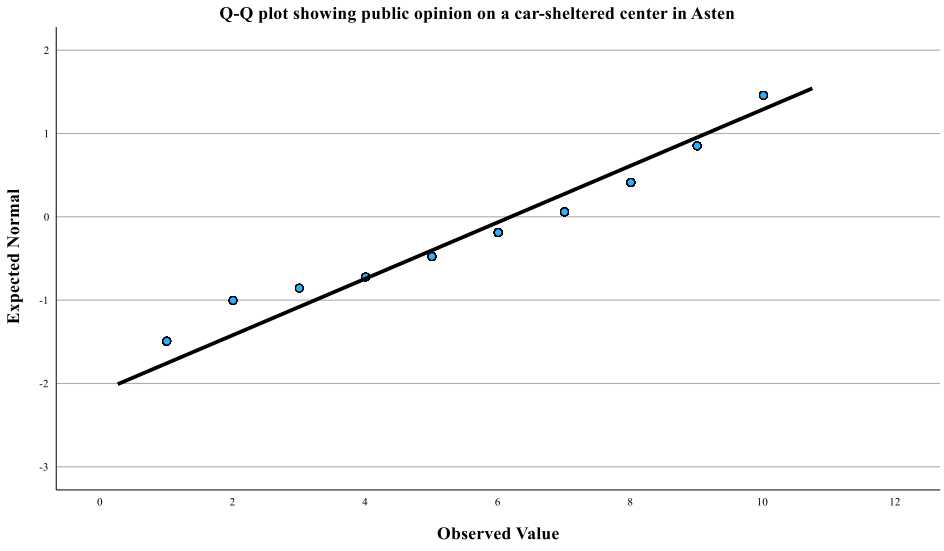


Figure 21 Q-Q plot car-sheltered centre in Asten

Lastly, the test of normality, see shows that the significance is smaller than 0.01. Therefore, rejecting H0, H1 is accepted. The data is not normally distributed.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Car-sheltered centre Asten	.159	420	<.001	.904	420	<.001

a. Lilliefors Significance Correction

Figure 22 Normality tests car-sheltered centre in Asten

Car-accessible centre

The distribution of the public opinion on a car-free centre in Asten can be seen in *Figure 23*. The mean is 3.49, meaning that on average residents of Asten does not support a car-accessible centre. The line in the histogram shows what values would have been expected if the data would be normally distributed. As shown, the data does not follow this line, a sign that the data might not be normally distributed.

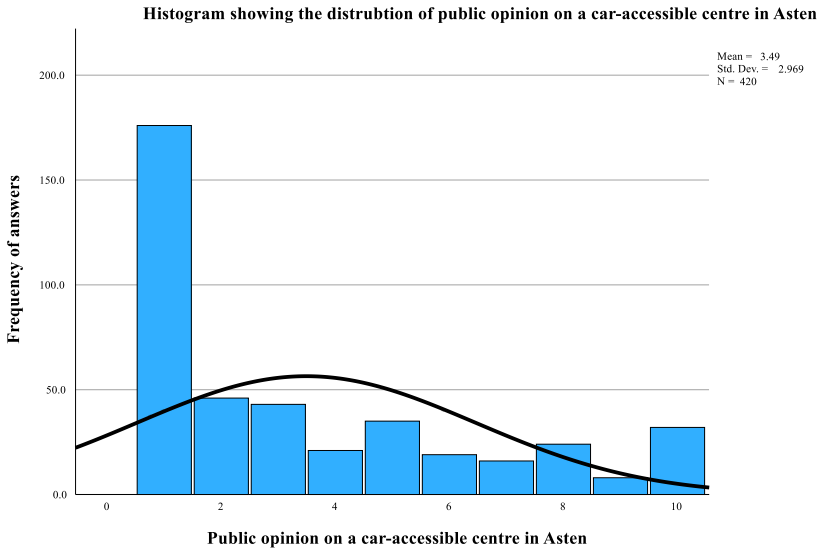


Figure 23 Histogram car-accessible centre in Asten

The boxplot, see *Figure 24*, illustrates the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

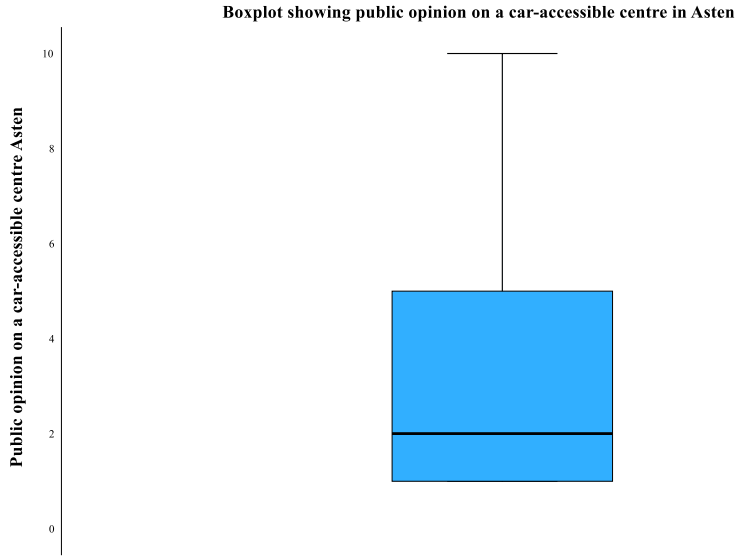


Figure 24 Boxplot car-accessible centre in Asten

The Q-Q plot see *Figure 25*, supports our conclusion from the histogram that the data is not normally distributed. The points, which shows the observed data, is not on the line that one would expect when the data would be normally distributed.

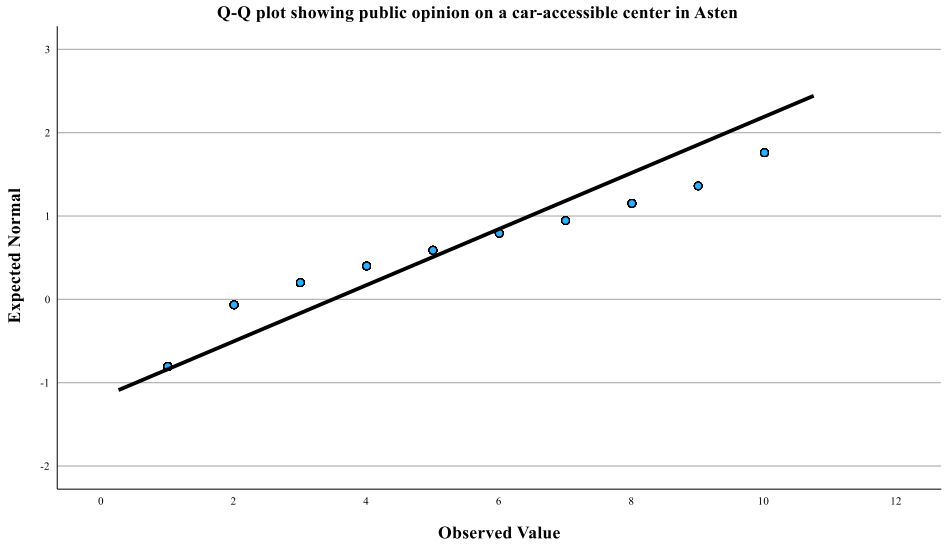


Figure 25 Q-Q plot car-accessible centre in Asten

Lastly, the test of normality, see *Figure 26*, shows that the significance is smaller than 0.01. Therefore, rejecting H0, H1 is accepted. The data is not normally distributed.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Car-accessible centre Asten	.221	420	<.001	.799	420	<.001

a. Lilliefors Significance Correction

Figure 26 Normality tests car-accessible centre in Asten

Visual analysis Deurne

Car-free centre

The distribution of the public opinion on a car-free centre in Deurne can be seen in *Figure 27*. The mean is 5.7, meaning that on average residents of Deurne do slightly support a car-free centre. The line in the histogram shows what values would have been expected if the data would be normally distributed. As shown, the data does not follow this line, a sign that the data might not be normally distributed

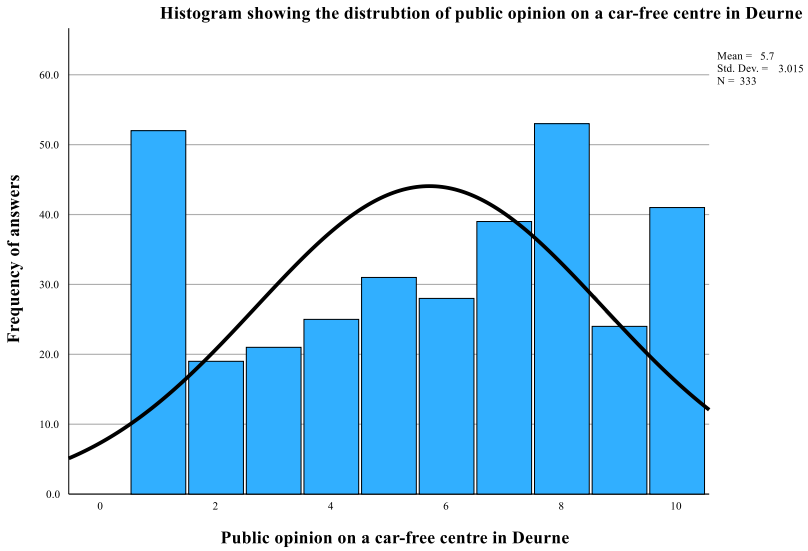


Figure 27 Histogram car-free centre in Deurne

The boxplot, see *Figure 29*, illustrates the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

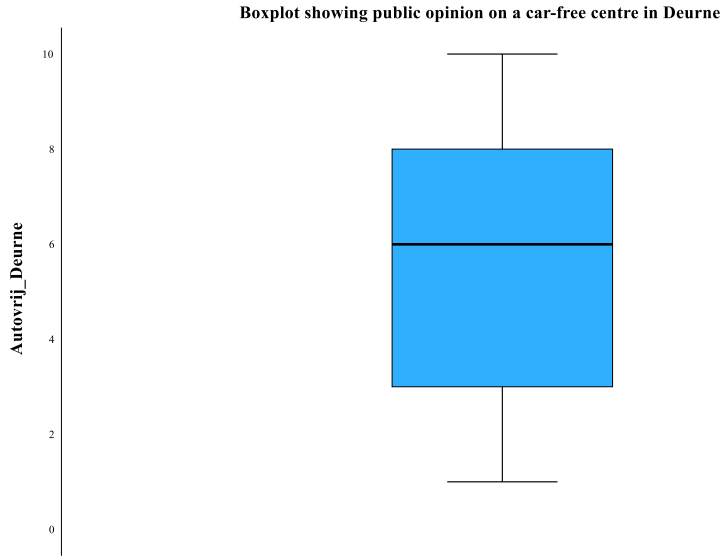


Figure 29 Boxplot car-free centre in Deurne

The Q-Q plot, see *Figure 30*, supports our conclusion from the histogram that the data is not normally distributed. The points, which shows the observed data, is not on the line that one would expect when the data would be normally distributed.

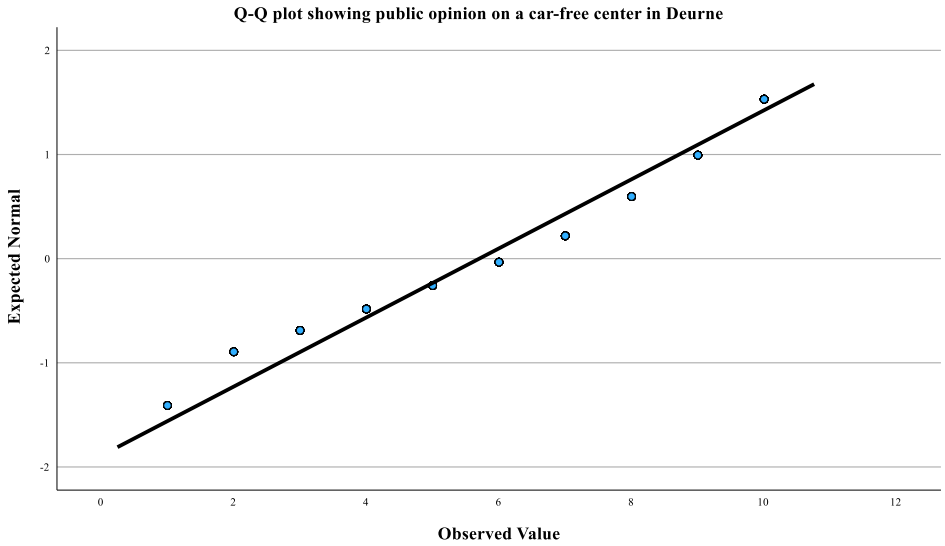


Figure 30 Q-Q plot car-free centre in Deurne

Lastly, the test of normality, see *Figure 31*, shows that the significance is smaller than 0.01. Therefore, rejecting H0, H1 is accepted. The data is not normally distributed.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Car-free centre Deurne	.138	333	<.001	.915	333	<.001

a. Lilliefors Significance Correction

Figure 31 Normality test car-free centre in Deurne

Car-sheltered centre

The distribution of the public opinion on a car-free centre in Deurne can be seen in *Figure 32*. The mean is 6.72, meaning that on average residents of Deurne do support a car-sheltered centre. The line in the histogram shows what values would have been expected if the data would be normally distributed. As shown, the data does not follow this line, a sign that the data might not be normally distributed

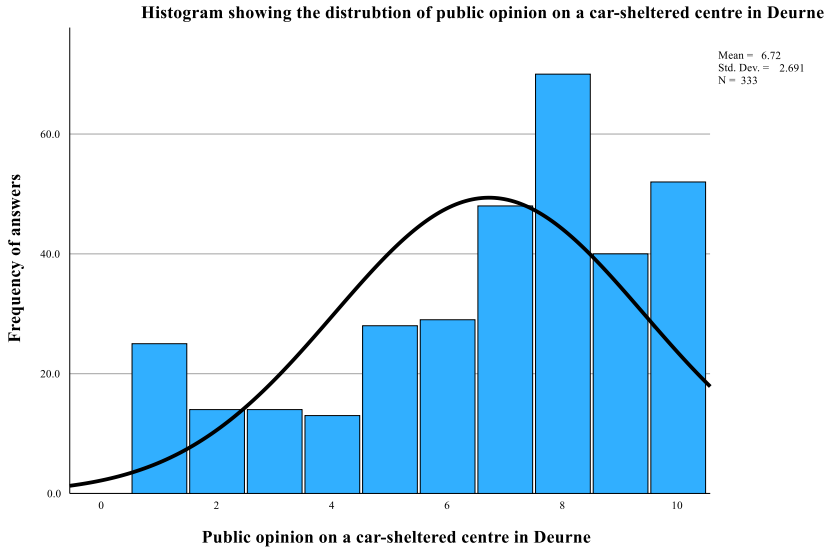


Figure 32 Histogram car-sheltered centre in Deurne

The boxplot, see *Figure 33*, illustrates the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

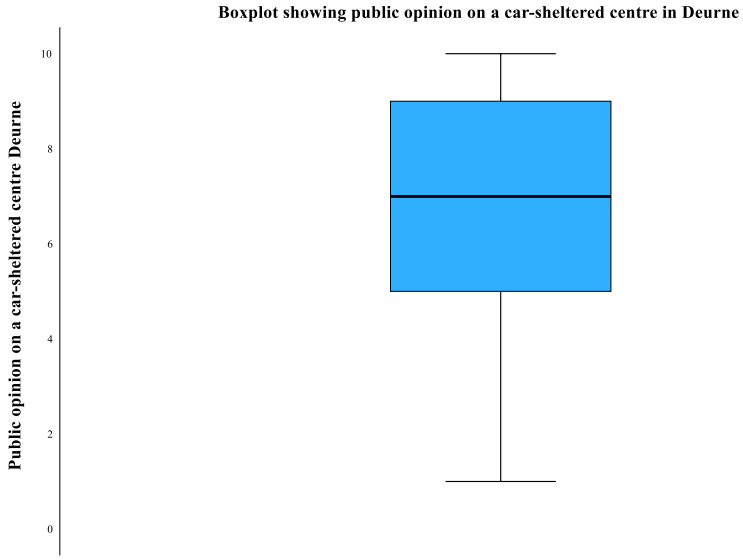


Figure 33 Boxplot car-sheltered centre in Deurne

The Q-Q plot, see *Figure 34*, supports our conclusion from the histogram that the data is not normally distributed. The points, which shows the observed data, is not on the line that one would expect when the data would be normally distributed.

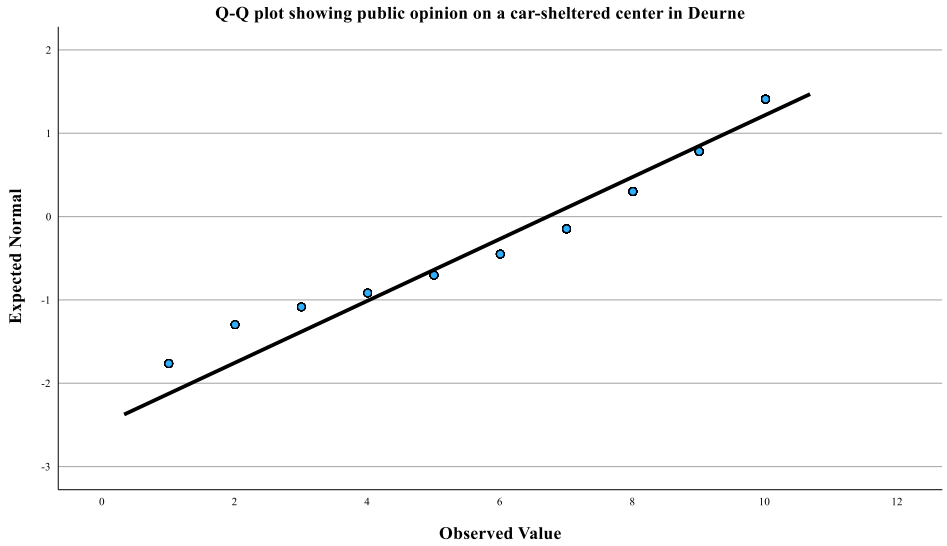


Figure 34 Q-Q plot car-sheltered centre in Deurne

Lastly, the test of normality, see *Figure 35,* shows that the significance is smaller than 0.01. Therefore, rejecting H0, H1 is accepted. The data is not normally distributed

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Car-sheltered centre Deurne	.172	333	<.001	.899	333	<.001

a. Lilliefors Significance Correction

Figure 35 Normality tests car-sheltered centre in Deurne

Car-sheltered centre

The distribution of the public opinion on a car-free centre in Deurne can be seen in *Figure 36*. The mean is 4.14, meaning that on average residents of Deurne do not support a car-accessible centre. The line in the histogram shows what values would have been expected if the data would be normally distributed. As shown, the data does not follow this line, a sign that the data might not be normally distributed

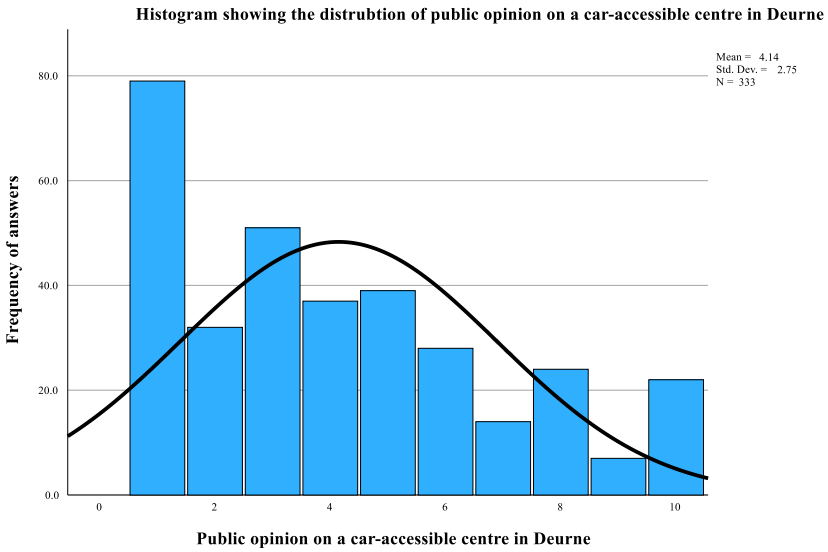


Figure 36 Histogram car-accessible centre in Deurne

The boxplot, see *Figure 37*, illustrates the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

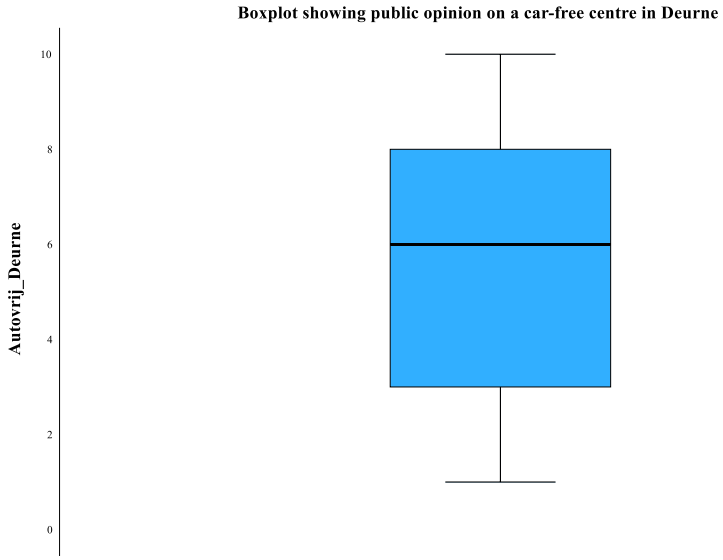


Figure 37 Boxplot plot car-accessible centre in Deurne

The Q-Q plot, see *Figure 38*, supports our conclusion from the histogram that the data is not normally distributed. The points, which shows the observed data, is not on the line that one would expect when the data would be normally distributed.

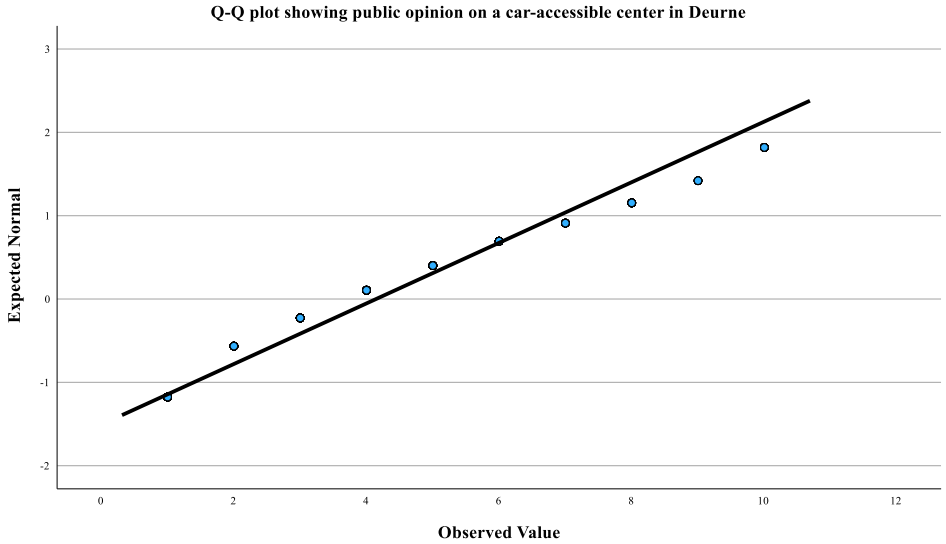


Figure 38 Q-Q plot car-accessible centre in Deurne

Lastly, the test of normality, see *Figure 39*, shows that the significance is smaller than 0.01. Therefore, rejecting H0, H1 is accepted. The data is not normally distributed

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Car-accessible centre Deurne	.148	333	<.001	.902	333	<.001

a. Lilliefors Significance Correction

Figure 39 Normality tests car-accessible centre in Deurne

Difference in public opinion between Asten and Deurne

Since none of the data is normally distributed, the Mann-Whitney U-test is used to test if there is a significant difference between the public opinion of Asten and Deurne.

Car-free centre

For the car-free centre, the Mann-Whitney U test gives the following outcome.

Test Statistics[a]

	Car-free centre
Mann-Whitney U	55462.000
Wilcoxon W	111073.000
Z	-4.927
Asymp. Sig. (2-tailed)	<.001

a. Grouping Variable: Residentsofmunicipality

Figure 40 Mann-Whitney U test car-free centre

The P-value (Asymp. Sig. in *Figure 40*) is smaller than 0.05, reject H0, H1 is accepted. This means that there is a significant difference in public opinion of a car-free centre between Asten and Deurne. Using the Z-value and N, which is 753, R can be calculated. R is -0.179. This shows that the difference between the two cases is statistically significant, but the practical difference is small.

Car-sheltered centre

For the car-sheltered centre, the Mann-Whitney U test gives the following outcome.

Test Statistics[a]

	Car-sheltered centre
Mann-Whitney U	63142.000
Wilcoxon W	151552.000
Z	-2.309
Asymp. Sig. (2-tailed)	.021

a. Grouping Variable: Residentsofmunicipality

Figure 41 Mann-Whitney U test car-sheltered centre

The P-value (Asymp. Sig. in *Figure 41*) is smaller than 0.05, reject H0, H1 is accepted. This means that there is a significant difference in public opinion of a car-sheltered centre between Asten and Deurne. Using the Z-value and N, which is 753, R can be calculated. R is −0.084. This shows that the difference between the two cases is statistically significant, but the practical difference is very small.

Car-accessible

For the car-accessible centre, the Mann-Whitney U test gives the following outcome.

Test Statistics[a]

	Car-accessible centre
Mann-Whitney U	57557.500
Wilcoxon W	145967.500
Z	-4.269
Asymp. Sig. (2-tailed)	<.001

a. Grouping Variable: Residentsofmunicipality

Figure 42 Mann-Whitney U test car-accessible centre

The P-value (Asymp. Sig. in *Figure 42*) is smaller than 0.05, reject H0, H1 is accepted. This means that there is a significant difference in public opinion of a car-accessible centre between Asten and Deurne. Using the Z-value and N, which is 753, R can be calculated. R is -0.156.. This shows that the difference between the two cases is statistically significant, but the practical difference is small.

Conclusion aim 1

For all three types of centres, there is a significant difference between public opinion, although the practical difference is for all three types of centres small, even very small for a car-sheltered centre. This means that the hypothesis for the first aim is rejected. There is in fact a significant difference between public opinion on the three different types of centres, despite the similarities in political views.

Aim 2

‘Blauwe zone’

For the ‘blauwe zone’, it must first be checked if the public opinion is normally distributed, in order to decide which test needs to be used to compare the two cases of Asten and Deurne.

For Asten, the mean of the public opinion is 7.46, for Deurne this is 6.93. The ‘blauwe zone’ is already implemented in Asten, not yet in Deurne. This difference in public opinion is a first clue that implementation might influence public opinion. For both histograms, the data does not follow the normality line, indicating that data is not normally distributed.

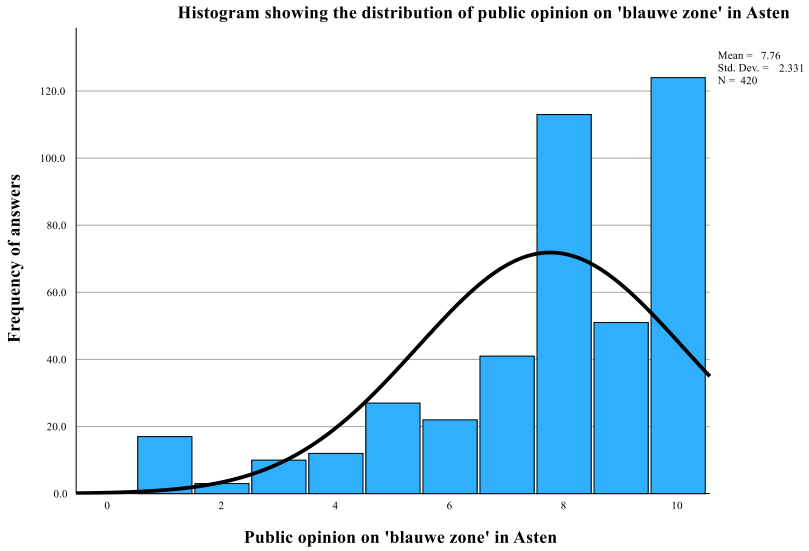


Figure 43 Histogram 'blauwe zone' in Asten

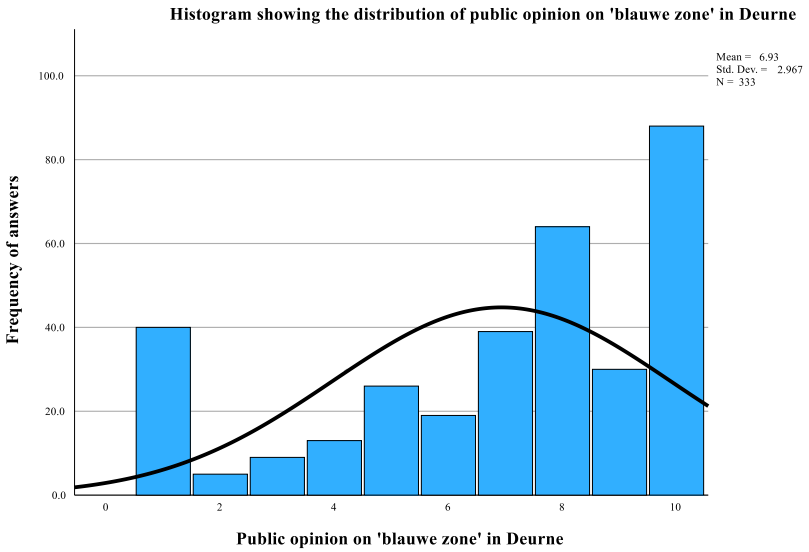


Figure 44 Histogram 'blauwe zone' in Deurne

The boxplots illustrate the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

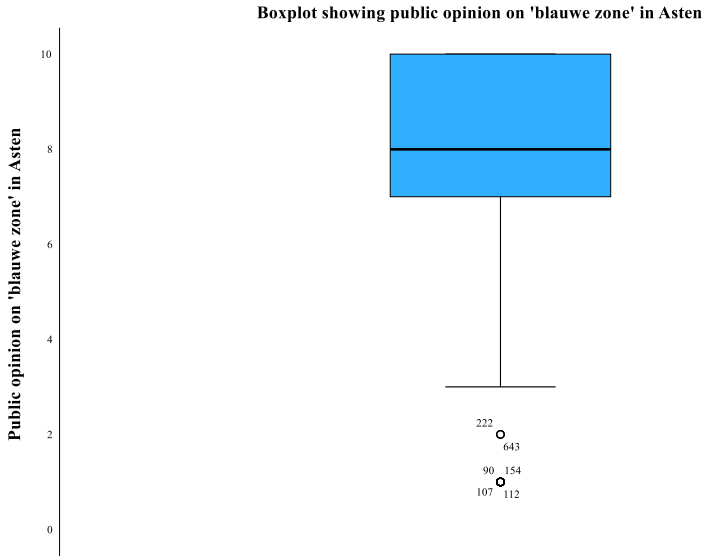


Figure 46 Boxplot 'blauwe zone' in Asten

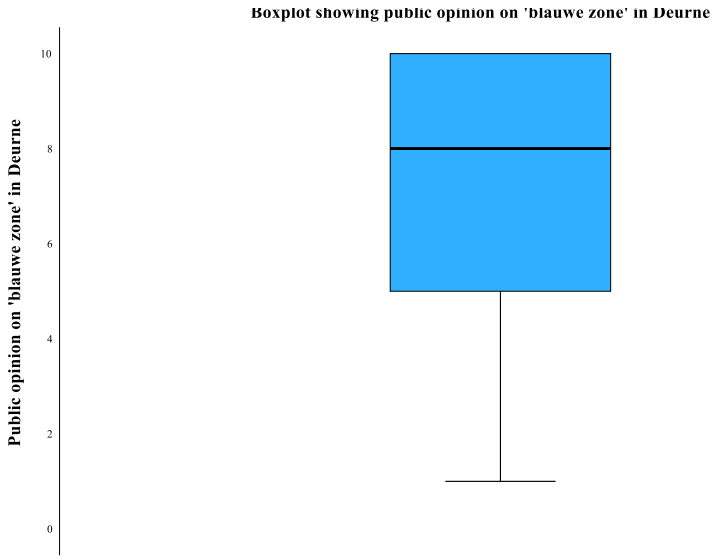


Figure 45 Boxplot 'blauwe zone' in Deurne

The IQR in the boxplot for Asten is smaller than the IQR in the boxplot for Deurne. This show that the data for Asten is more clustered within the middle 50%. For the boxplot of Asten, there are a few outliers, which are shown as a circle, The numbers surrounding these circles are the ID-value of the individual responses related to the outliers and furthermore irrelevant.

For both Q-Q plots, the observed value does not follow the line of the expected normal. This is a further indication that the data is not normally distributed.

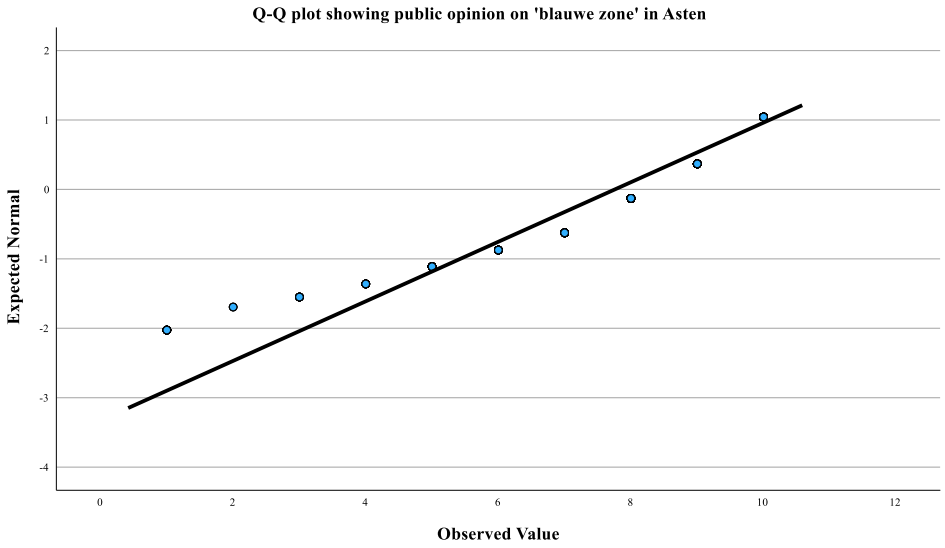


Figure 47 Q-Q plot 'blauwe zone' in Asten

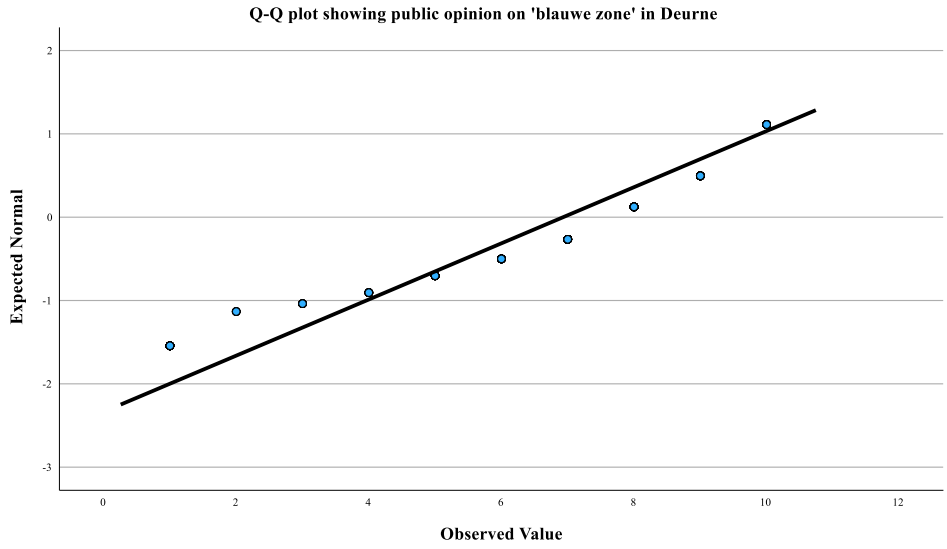


Figure 48 Q-Q plot 'blauwe zone' in Deurne

The significance, as can be seen in *Figure 49* and *Figure 50* is for both cases smaller than 0.05 for the Kolmogrov-Smirnov tests. Therefore, rejecting H0, H1 is accepted. The data is not normally distributed, and the Mann-Whitney U test will be used to compare Asten and Deurne.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
'Blauwe zone' in Asten	.227	420	<.001	.836	420	<.001

a. Lilliefors Significance Correction

Figure 49 Normality tests 'blauwe zone' in Asten

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
'Blauwe zone' Deurne	.187	333	<.001	.855	333	<.001

a. Lilliefors Significance Correction

Figure 50 Normality tests 'blauwe zone' in Deurne

Since this is the case, to compare the two cases, the Mann-Whitney U test is used. The associated P-value with the Mann-Whitney U test (Asymp. Sig. in *Figure 51*) is smaller than 0.05, reject H0, H1 is accepted. This means that there is a significant difference in public opinion on the ‘blauwe zone’ between Asten and Deurne. The associated R-value is -0.123, meaning that the practical difference between public opinion of both cases is small.

Test Statistics[a]

	'Blauwe zone'
Mann-Whitney U	60120.000
Wilcoxon W	115731.000
Z	-3.375
Asymp. Sig. (2-tailed)	<.001

a. Grouping Variable: Residentsofmunicipality

Figure 51 Mann-Whitney U test 'blauwe zone'

Pedestrian area

Before checking if there is a significant difference on the public opinion of the pedestrian area between Asten and Deurne, it first has to be checked if the data is normally distributed.

For Asten, the mean of the public opinion is 7.52, for Deurne this is 7.63. The pedestrian area is already implemented in Deurne, not yet in Asten. This difference in public opinion is a first clue that implementation might influence public opinion. For both histograms, the data does not follow the normality line, indicating that data is not normally distributed.

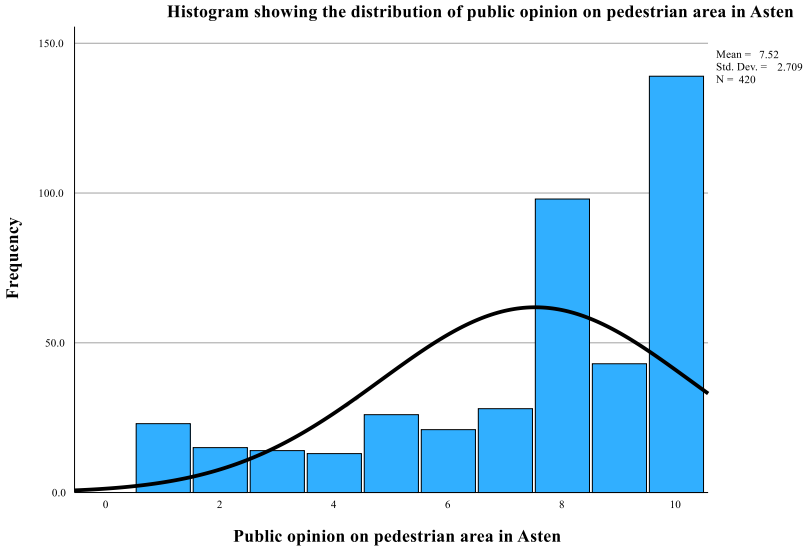


Figure 52 Histogram pedestrian area in Asten

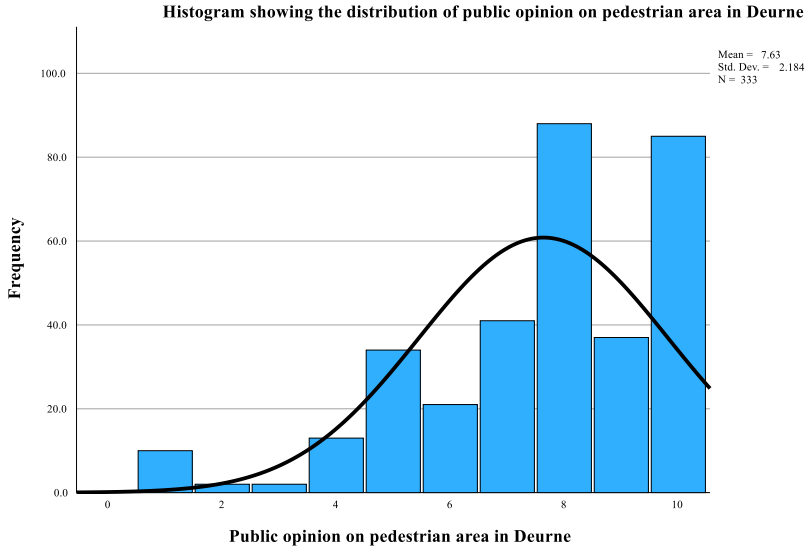


Figure 53 Histogram pedestrian area in Deurne

The boxplots illustrate the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

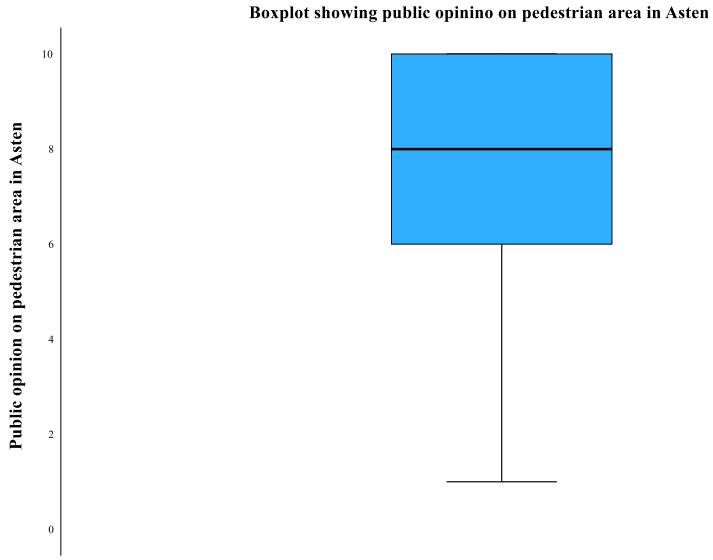


Figure 54 Boxplot pedestrian area in Asten

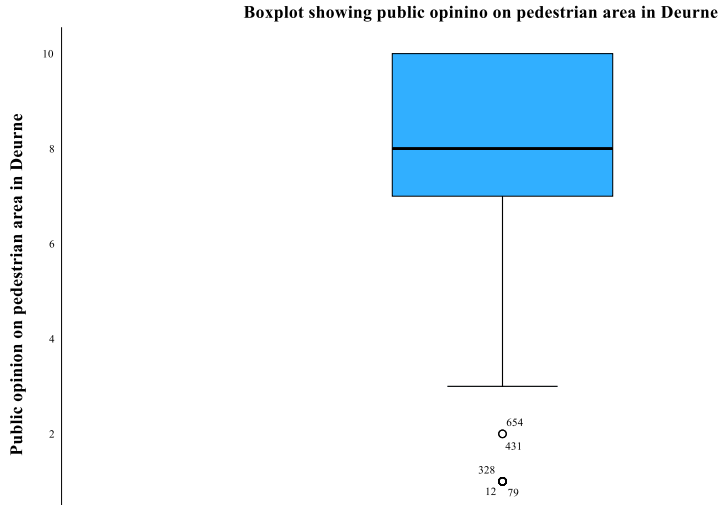


Figure 55 Boxplot pedestrian area in Deurne

The boxplots for Asten and Deurne are quite similar, with the IQR for the boxplot of Deurne being a little bit smaller than Asten. This means that the data for Deurne is more clustered within the middle 50%. For the boxplot of Deurne, there are a few outliers, which are shown as a circle, The numbers surrounding these circles are the ID-value of the individual responses related to these outliers and furthermore irrelevant.

For both Q-Q plots, the observed values do not follow the expected values. This is a further indication that the data is not normally distributed.

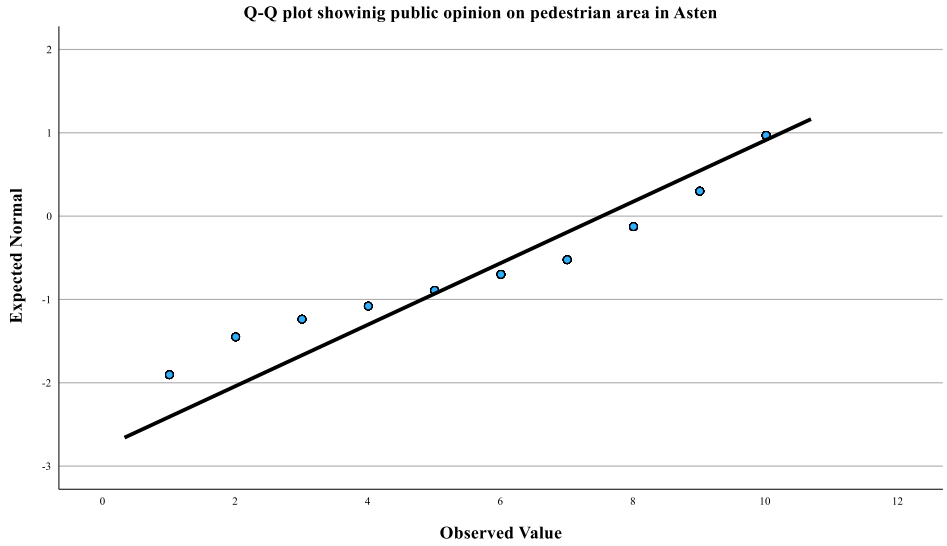


Figure 57 Q-Q plot pedestrian area in Asten

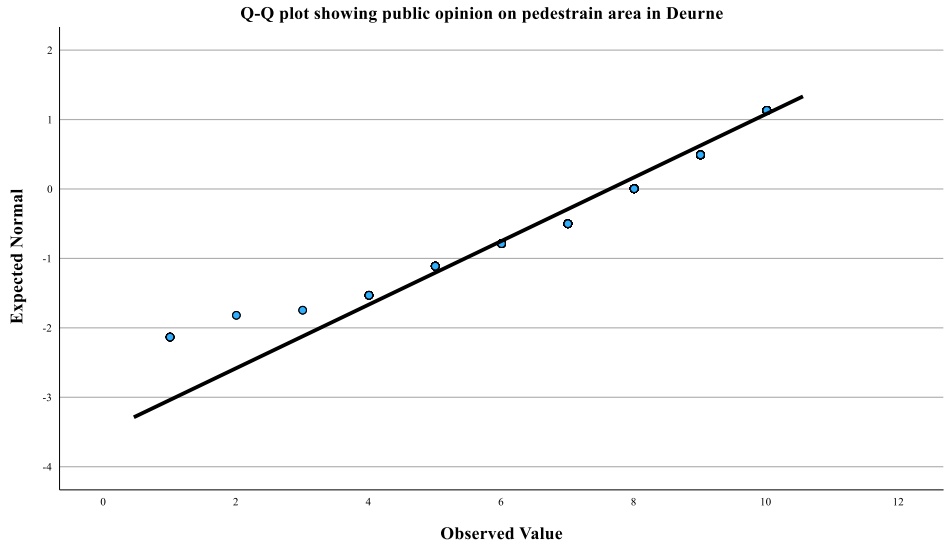


Figure 56 Q-Q plot pedestrian area in Deurne

The significance, as can be seen in *Figure 58* and *Figure 59* ,is for both cases smaller than 0.05 for the Kolmogrov-Smirnov tests. Therefore, rejecting H0, H1 is accepted. The data is not normally distributed. Since this is the case, to compare the two cases, the Mann-Whitney U test is used.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pedestrian area Asten	.236	420	<.001	.825	420	<.001

a. Lilliefors Significance Correction

Figure 58 Tests of normality pedestrian area in Asten

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pedestrian area Deurne	.197	333	<.001	.877	333	<.001

a. Lilliefors Significance Correction

Figure 59 Tests of normality pedestrian area in Deurne

The associated P-value with the Mann-Whitney U test (Asymp. Sig. in *Figure 60*) is bigger than 0.05, H0 is accepted. This means that there is no significant difference of the public opinion on the pedestrian area between Asten and Deurne.

Test Statistics[a]

	Pedestrian area
Mann-Whitney U	67002.000
Wilcoxon W	122613.000
Z	-1.010
Asymp. Sig. (2-tailed)	.312

a. Grouping Variable: Residentsofmunicipality

Figure 60 Mann-Whitney U test pedestrian area

Conclusion aim 2

The conclusion of aim 2 is that it is questionable and unclear whether stage of implementation has an effect on public opinion. For the ‘blauwe zone’, there is a significant difference, but this difference is small. When also considering the results of the first aim, it is not clear whether or not this difference in public opinion is based on the difference in stage of implementation or that this difference has to be accredited to the difference in public opinion. For the pedestrian area, no significant difference on public opinion has been found between both cases.

Aim 3

Perceived visibility

The boxplot shows the public opinion, divided into groups from 1 to 10, plotted against the visibility, divided into groups from 1 to 10. The boxplots illustrate the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

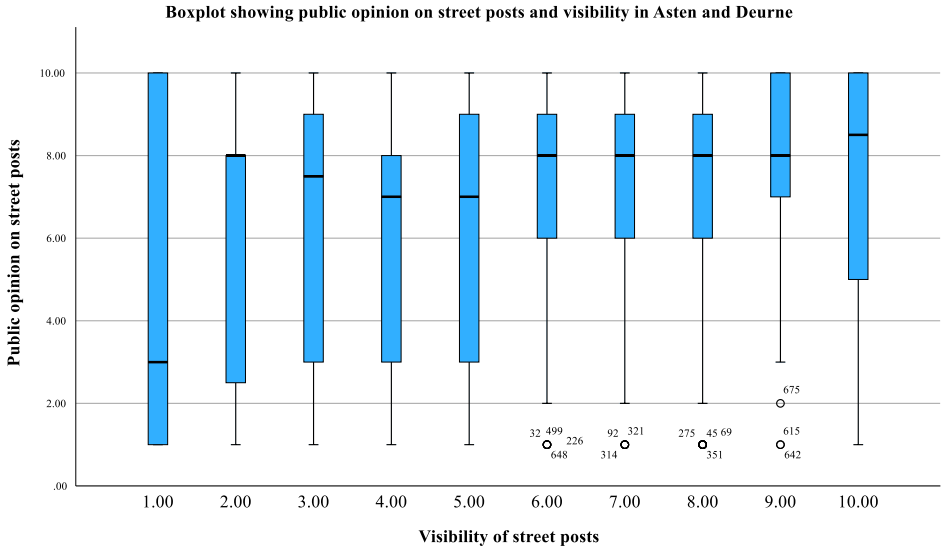


Figure 61 Boxplot public opinion on street posts plotted against visibility of street posts

When looking at the medians in *Figure 61*, there is some sign that the public opinion becomes more in favour of the street posts, the more visible people perceive the street posts. There are a few outliers which are shown as a circle, The numbers surrounding these circles are the ID-value of the individual responses related to these outliers and furthermore irrelevant.

Spearman's rank correlation, see *Figure 62*, confirms the suspicion of the boxplot that there is a monotonic relationship between public opinion on and visibility of street posts in Asten and Deurne. The p-value is smaller than 0.05, meaning that H0 is rejected, H1 is accepted. Thus, there is a monotonic relationship between public opinion on and visibility of street posts. The correlation coefficient is 0.193, meaning that if there is an increase in visibility of street posts, the public opinion on those street posts gets slightly more positive.

Correlations

			Public opinion on street posts	Visibility street posts
Spearman's rho	Public opinion on street posts	Correlation Coefficient	1.000	.193**
		Sig. (2-tailed)	.	<.001
		N	753	753
	Visibility street posts	Correlation Coefficient	.193**	1.000
		Sig. (2-tailed)	<.001	

Figure 62 Spearman's rank correlation public opinion on and visibility of street posts

Since there is a monotonic relationship, a linear regression can be used to test if visibility can be used to predict public opinion. The first question that needs to be answers is the extent to which the model predicts public opinion. This is told by looking at R^2. In *Figure 63*, R^2 is 0.046, meaning that 4.6% of the variation in the public opinion on street posts is explained by the perceived visibility of the street posts. This is a small percentage, meaning that there are other factors that influence the public opinion on street posts.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.214[a]	.046	.044	2.87709

a. Predictors: (Constant), Visibility of street posts

Figure 63 Model summary public opinion on and visibility of street posts

Secondly, it has to be checked if the model is significant. This is done by looking at the ANOVA-table, see *Figure 64*. This shows that the F-value is 35.965, and the p-value is smaller than 0.001. Since the p-value is smaller than 0.005, H0 is rejected, H1 is accepted. Visibility has a significant effect on public opinion in the case of street posts.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	297.707	1	297.707	35.965	<.001[b]
	Residual	6216.526	751	8.278		
	Total	6514.234	752			

a. Dependent Variable: Public opinion on street posts

b. Predictors: (Constant), Visiblity of street posts

Figure 64 ANOVA public opinion on and visibility of street posts

Lastly, it is important to understand how large the effect of visibility on public opinion is. This can be found in *Figure 65*. The coefficient for visibility is (B in the table) 0.256. Meaning that when the perceived visibility of the street posts increases by 1 point, the public opinion increases by 0.256 points on average. This effect is small but significant, as shown by the associated p-value which is smaller than 0.001

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.204	.292		17.827	<.001
	Visibility of street posts	.256	.043	.214	5.997	<.001

a. Dependent Variable: Public opinion on street posts

Figure 65 Coefficients public opinion on and visibility of street posts

Spatial proximity

The boxplot shows the public opinion, divided into groups from 1 to 10, plotted against the distance to centre, divided into groups from 1 to 4 as described in *Table 15*. The boxplots illustrate the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

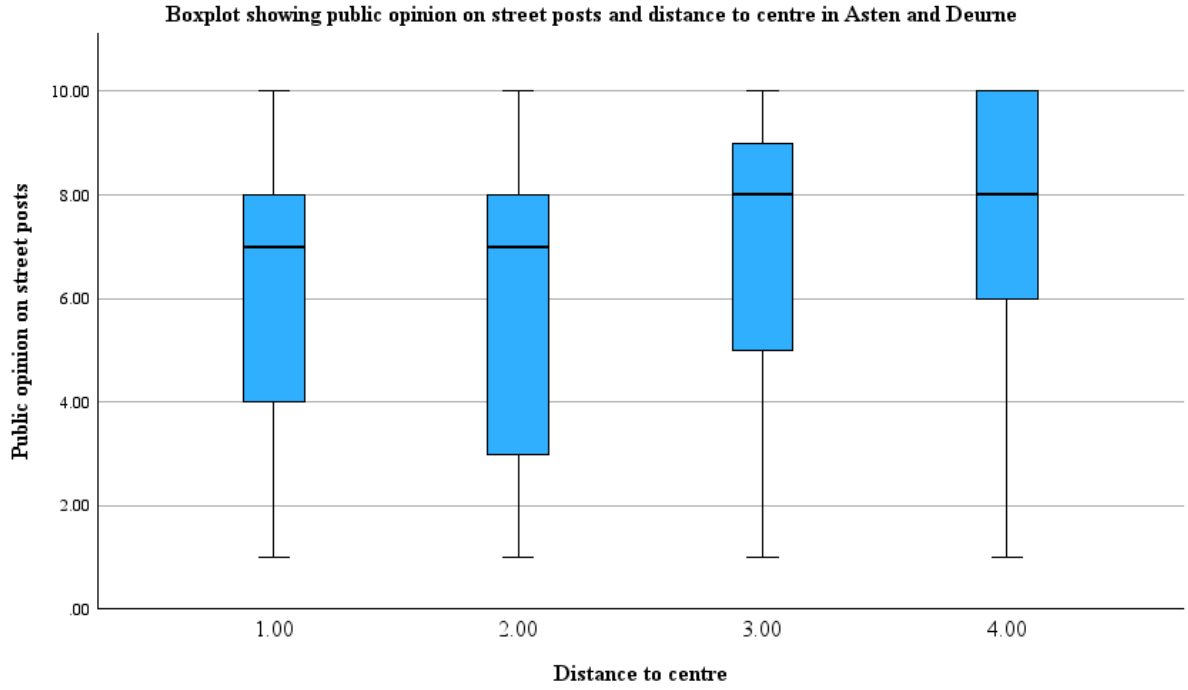


Figure 66 Boxplot public opinion on street posts plotted against distance to centre

When looking at the medians in *Figure 66*, there is some sign that the public opinion becomes more in favour of the street posts, the closer people live to centre. Spearman's rank correlation, see *Figure 67*, confirms the suspicion of the boxplot that there is a monotonic relationship between public opinion on street posts and the distance of people their homes to the centre in Asten and Deurne. The p-value is smaller than 0.05, meaning that H0 is rejected, H1 is accepted. Thus, there is a monotonic relationship between public opinion on the street post and the distance that people live from the centre. The correlation coefficient is 0.121, meaning that if people live closer to the centre, the public opinion on those street posts gets slightly more positive.

Correlations

			Public opinion on street posts	Distance to centre
Spearman's rho	Public opinion on street posts	Correlation Coefficient	1.000	.121**
		Sig. (2-tailed)	.	<.001
		N	753	753
	Distance to centre	Correlation Coefficient	.121**	1.000
		Sig. (2-tailed)	<.001	.
		N	753	753

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 67 Spearman's rank correlation public opinion on street posts and distance to centre

Again, we first look at the extent to which this model explains the public opinion. In *Figure 68* we can see that R^2 is 0.011. This means that 1.1% of the variation in public opinion is explained by distance to the centre. This is a very small percentage, meaning that there are other factors that explain the variation in public opinion.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.103[a]	.011	.009	2.92952

a. Predictors: (Constant), Distance to centre

Figure 68 Model summary public opinion on street posts and distance to centre

Secondly, we look at the significance of this model, see *Figure 69*. It shows that the F-value is 8.050, and the p-value is 0.005. Since the p-value is smaller than 0.05, H0 is rejected, H1 is accepted. Distance to centre has a significant effect on public opinion in the case of street posts.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	69.087	1	69.087	8.050	.005[b]
	Residual	6445.147	751	8.582		
	Total	6514.234	752			

a. Dependent Variable: Public opinion on street posts

b. Predictors: (Constant), Distance to centre

Figure 69 ANOVA summary public opinion on street posts and distance to centre

Lastly, we will look at the coefficients. From *Figure 70*, it follows that the coefficient (B) is 0.371. This means that if the distance to the centre increases by 1, the public opinion increases by 0.371 on average. This effect is weak, but significant since the associated p-value is 0.005.

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	5.651	.432		13.089	<.001
	Distance to centre	.371	.131	.103	2.837	.005

a. Dependent Variable: Public opinion on street posts

Figure 70 Coefficients public opinion on street posts and distance to centre

General proximity

The boxplot shows the public opinion, divided into groups from 1 to 10, plotted against the distance to centre, divided into groups from 1 to 4 as described in *Table 16*. The boxplots illustrate the distribution of data. The whiskers extend from the minimum to the maximum values, representing the entire range of data. The box itself shows the interquartile range (IQR), showing the data between 25% and 75%. The line within the box marks the median, the middle value of the dataset.

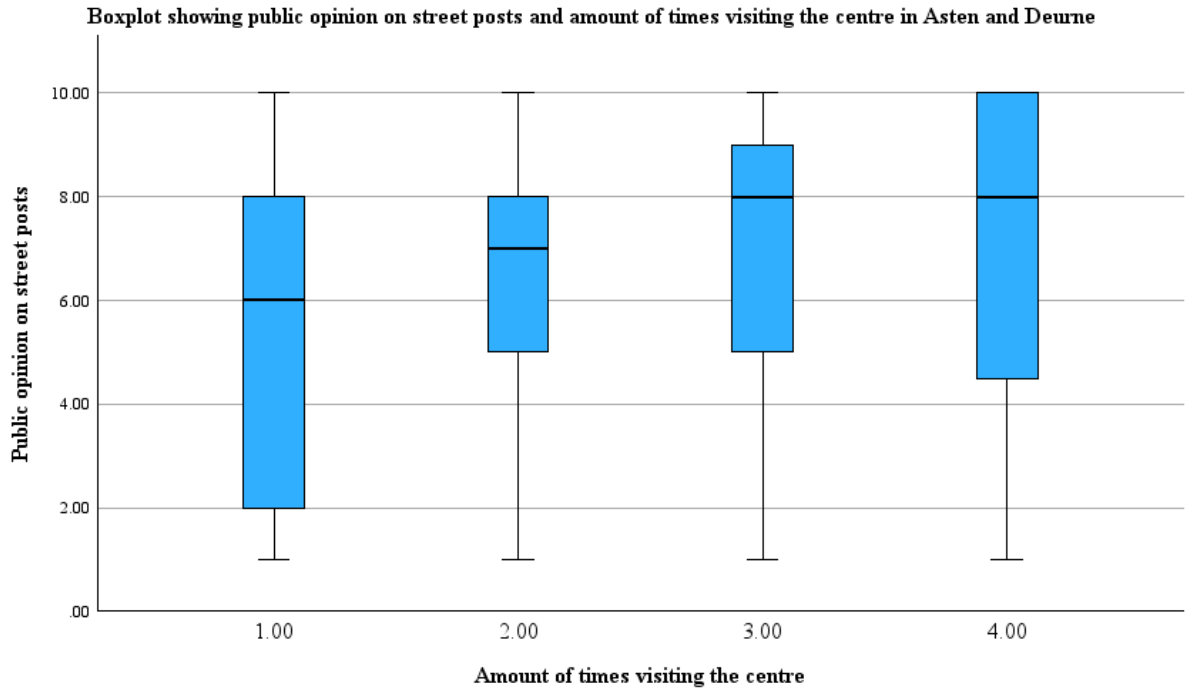


Figure 71 Boxplot public opinion on street posts plotted against amounts of time visiting the centre

When looking at the medians in *Figure 71*, there is some sign that the public opinion becomes more in favour of the street posts, the more times people visit the centre. Spearman's rank correlation gives us a different result. In *Figure 72*, the significance is slightly bigger than 0.05.

Therefore, we can accept H0, there is no monotonic relationship between the public opinion on street posts and the number of times people visit the centre.

Correlations

			Public opinion on street posts	Amount of times visiting the centre
Spearman's rho	Public opinion on street posts	Correlation Coefficient	1.000	.071
		Sig. (2-tailed)	.	.051
		N	753	753
	Amount of times visiting the centre	Correlation Coefficient	.071	1.000
		Sig. (2-tailed)	.051	.
		N	753	753

Figure 72 Correlations public opinion on street posts and number of times visiting the centre

Since there is no monotonic relationship the Kruskal Wallis test will be used. First of all, the mean ranks will be calculated for all different groups, see *Figure 73*.

Ranks

	Amount of times visiting the centre	N	Mean Rank
Public opinion on street posts	1.00	5	290.00
	2.00	82	337.23
	3.00	487	378.20
	4.00	179	394.39
	Total	753	

Figure 73 Ranks public opinion on street posts and number of times visiting the centre

There seems to be some difference between the mean ranks and the 4 groups. However, the test statistics give a p-value of 0.184, see *Figure 74*. Since this is bigger than 0.05, H0 will be accepted. Thus, there is no significant difference between public opinion on street posts and the number of times people visit the centre.

Test Statistics[a,b]

	Public opinion on street posts
Kruskal-Wallis H	4.833
df	3
Asymp. Sig.	.184

a. Kruskal Wallis Test

b. Grouping Variable: Amount of times visiting the centre

Figure 74 Test statistics Kruskal Wallis test Ranks public opinion on street posts and number of times visiting the centre

Joint analysis

For the joint analysis it is important to test which variables explain the variation in public opinion the best. In order to do so, four models have to be tested:

1. Model with visibility of street posts and distance to centre
2. Model with visibility of street posts and number of times visiting the centre
3. Model with distance to centre and number of times visiting the centre
4. Model with all three variables

Despite the fact that the variable 'number of times visiting the centre' has not been found significant, it will be tested within the model since this variable might have an effect in combination with the other variables.

Model 1: Visibility of street posts and distance to centre

Firstly, we will look at the model fitting information. This explains how good the models fit in comparison to the null-model (the model without independent variables). In *Figure 75*, the chi-square of 48.871 with the associated p-value of smaller than 0.001 shows that the model with the independent variables fits significant better than the model without these independent variables. This idea is further supported by the lower -2 Log Likelihood for the model with the dependent variables compared to the null-model.

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	929.881			
Final	881.010	48.871	12	<.001

Link function: Logit.

Figure 75 Model 1 fitting information

Secondly, we will look at the test of parallel lines, see *Figure 76*, this tells us if the effects of the independent variables are consistent over the different categories of the dependent variable (the public opinion on street posts, For model 1, the chi-square of 363.082 with the associated p-value of smaller than 0.001 shows that the effect of the independent variables is not consistent over the different categories of the dependent variable. It is important to keep this in mind when looking at the parameter estimates.

Test of Parallel Lines[a]

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	881.010			
General	517.928[b]	363.082[c]	96	<.001

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.[a]

a. Link function: Logit.

b. The log-likelihood value cannot be further increased after maximum number of step-halving.

c. The Chi-Square statistic is computed based on the log-likelihood value of the last iteration of the general model. Validity of the test is uncertain.

Figure 76 Model 1 test of parallel lines

Thirdly, we will look at the goodness of fit, see *Figure 77*, this tells us how good the model fits with the data. The Pearson chi-square of 405.210 with the associated p-value of smaller than 0.001 shows that there is a significant deviation between the expected and normal values. The deviance chi-square with the associated p-value supports a similar conclusion. In other words, the model cannot perfectly predict the dependent variable.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	405.210	321	<.001
Deviance	425.472	321	<.001

Link function: Logit.

Figure 77 Model 1 goodness of fit

Fourthly, we will look at the parameter estimates, see *Figure 78* on the next page. This shows the specific influence of the independent variables on the dependent variable. Here we first look the thresholds. These thresholds show the boundary when public opinion moves from one to the other value (e.g. when public opinion moves from 1 to 2). Most of the thresholds are significant with a p-value lower than 0001. This means that the independent variables contribute to the change in public opinion. For the threshold of ‘public opinion of street posts’ of 8, the associated p-value (0.788) is not significant. Showing that the influence of the independent variables for this category is less strong. For the threshold of ‘public opinion of street posts’ of 9, the associated p-value (0.021) is significant, but less significant as the other thresholds.

After looking at the thresholds, we will look at the influence of the independent variables. For distance to centre, only the category 2 is significant, with an associated p-value of 0.001. For

this category, the effect is -0.742, showing that the further from the centre, the lower the public opinion is on the street posts. The other categories are not significant. The independent variable ‘visibility of street posts’, shows a stronger influence. All categories are significant with the exception of category 9. The negative effects of the lower categories show that an increased visibility of street posts is associated with a higher public opinion.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Threshold	[Public opinion on street posts = 1,00]	-3.123	.245	163.089	1	<.001	-3.603	-2.644
	[Public opinion on street posts = 2,00]	-2.675	.235	129.788	1	<.001	-3.135	-2.215
	[Public opinion on street posts = 3,00]	-2.294	.229	100.572	1	<.001	-2.742	-1.846
	[Public opinion on street posts = 4,00]	-2.106	.226	86.612	1	<.001	-2.550	-1.663
	[Public opinion on street posts = 5,00]	-1.750	.222	61.880	1	<.001	-2.186	-1.314
	[Public opinion on street posts = 6,00]	-1.477	.220	45.047	1	<.001	-1.908	-1.046
	[Public opinion on street posts = 7,00]	-1.055	.217	23.606	1	<.001	-1.480	-.629
	[Public opinion on street posts = 8,00]	-.058	.213	.073	1	.788	-.476	.361
	[Public opinion on street posts = 9,00]	.497	.215	5.342	1	.021	.075	.918
Location	[Distance to centre=1,00]	-.500	.303	2.722	1	.099	-1.094	.094
	[Distance to centre=2,00]	-.742	.230	10.409	1	.001	-1.192	-.291
	[Distance to centre=3,00]	-.082	.141	.336	1	.562	-.358	.194
	[Distance to centre=4,00]	0[a]	.	.	0	.	.	.
	[Visibility of street posts=1,00]	-1.676	.335	25.057	1	<.001	-2.333	-1.020
	[Visibility of street posts=2,00]	-1.067	.442	5.832	1	.016	-1.933	-.201
	[Visibility of street posts=3,00]	-.928	.339	7.510	1	.006	-1.592	-.264
	[Visibility of street posts=4,00]	-1.070	.308	12.067	1	<.001	-1.674	-.466
	[Visibility of street posts=5,00]	-1.055	.276	14.621	1	<.001	-1.595	-.514
	[Visibility of street posts=6,00]	-.636	.280	5.137	1	.023	-1.185	-.086
	[Visibility of street posts=7,00]	-.635	.260	5.966	1	.015	-1.144	-.125
	[Visibility of street posts=8,00]	-.453	.242	3.509	1	.061	-.927	.021
	[Visibility of street posts=9,00]	-.181	.321	.318	1	.573	-.811	.449
	[Visibility of street posts=10,00]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Figure 78 Model 1 parameter estimates

Lastly, we will look at the Pseudo R-Square, see *Figure 79*, this gives an indication how much the variation in the public opinion on street posts is explained by the model. We will use the Nagelkerke values because this is best fit to assess the model fit and compare models. For model 1, the associated Nagelkerke value is 0.064, this means that 6.4% of the variation in the depended variable is explained by the dependent variables.

Pseudo R-Square

Cox and Snell	.063
Nagelkerke	.064
McFadden	.015

Link function: Logit.

Figure 79 Model 1 pseudo r-squared

Both dependent variables have a significant influence on the public opinion to some extent, all with a negative statistical effect; the less visible the street posts are, the less positive the public opinion. For the distance to the centre, the closer that people are living to the centre, the more positive their opinion on the street posts is. However, the significance for distance to the centre is mixed, only one category is significant. Therefore, it can be argued that visibility is probably the most important factor in the model. Furthermore, this model is not perfect as shown by the goodness of fit and the parallel line tests. This suggest that other, unknown factors do probably have an influence predicting the public opinion on street posts.

Model 2: Visibility of street posts and number of times visiting the centre

For the other models, the same steps will be used as for model 1. To avoid repetition, we will restrain from explaining what each table tells us, and only focus on the results and what this means for the model. Starting with the model fitting information, see *Figure 80*, the chi-square of 40.301 with the associated p-value of smaller than 0.001 shows that the model with the independent variables fits significantly better than the model without these independent variables. This idea is further supported by the lower -2 Log Likelihood for the model with the dependent variables compared to the null-model.

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	835.799			
Final	795.497	40.301	12	<.001

Link function: Logit.

Figure 80 Model 2 fitting information

Secondly, looking at the parallel lines, see *Figure 81*, the chi-square of 387.495 with the associated p-value of smaller than 0.001 shows that the effect of the independent variables is

Figure 81 Model 2 test of parallel lines

not consistent over the different categories of the dependent variable. It is important to keep this in mind when looking at the parameter estimates.

Test of Parallel Lines[a]

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	795.497			
General	408.003[b]	387.495[c]	96	<.001

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories. [a]

a. Link function: Logit.

b. The log-likelihood value cannot be further increased after maximum number of step-halving.

c. The Chi-Square statistic is computed based on the log-likelihood value of the last iteration of the general model. Validity of the test is uncertain.

Thirdly, we will look at the goodness of fit, see *Figure 82*. The Pearson chi-square of 351.655 with the associated p-value of smaller than 0.001 shows that there is a significant deviation between the expected and normal values. The Deviance chi-square with the associated p-value supports a similar conclusion. In other words, the model cannot perfectly predict the dependent variable.

Fourthly, we will look at the parameter estimates, see *Figure 83* on the next page. Here we

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	351.655	276	.001
Deviance	363.441	276	<.001

Link function: Logit.

Figure 82 Model 2 goodness of fit

first look the thresholds. Most of the thresholds are significant with a p-value lower than 0001. This means that the independent variables contribute to the change in public opinion. For the threshold of ‘public opinion of street posts’ of 8, the associated p-value (0.673) shows that this threshold is not significant. For the threshold of ‘public opinion of street posts’ of 9, the p-value is higher than for the other values, but still significant. Despite the fact that the highest threshold is still significant, it shows, in combination with the insignificance of model 8, that the model is less fitting for these higher values.

After looking at the thresholds, we will look at the influence of the independent variables. For ‘visibility of street posts’, shows that all categories are significant with the exception of category 9. The negative effects of the lower categories show that an increased visibility of

street posts is associated with a higher public opinion. The independent variable of 'number of times visiting the centre' is not significant for a single category.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Threshold	[Public opinion on street posts = 1,00]	-3.147	.258	148.899	1	<.001	-3.652	-2.641
	[Public opinion on street posts = 2,00]	-2.699	.249	117.872	1	<.001	-3.186	-2.212
	[Public opinion on street posts = 3,00]	-2.319	.243	91.118	1	<.001	-2.795	-1.843
	[Public opinion on street posts = 4,00]	-2.131	.241	78.449	1	<.001	-2.603	-1.660
	[Public opinion on street posts = 5,00]	-1.777	.237	56.191	1	<.001	-2.241	-1.312
	[Public opinion on street posts = 6,00]	-1.506	.235	41.120	1	<.001	-1.966	-1.045
	[Public opinion on street posts = 7,00]	-1.086	.232	21.911	1	<.001	-1.541	-.631
	[Public opinion on street posts = 8,00]	-.096	.228	.178	1	.673	-.544	.352
	[Public opinion on street posts = 9,00]	.454	.230	3.913	1	.048	.004	.904
Location	[Visibility of street posts=1,00]	-1.722	.333	26.696	1	<.001	-2.376	-1.069
	[Visibility of street posts=2,00]	-1.100	.443	6.175	1	.013	-1.968	-.232
	[Visibility of street posts=3,00]	-.988	.339	8.494	1	.004	-1.652	-.323
	[Visibility of street posts=4,00]	-1.097	.309	12.600	1	<.001	-1.703	-.491
	[Visibility of street posts=5,00]	-1.101	.277	15.749	1	<.001	-1.645	-.557
	[Visibility of street posts=6,00]	-.711	.282	6.369	1	.012	-1.263	-.159
	[Visibility of street posts=7,00]	-.668	.261	6.559	1	.010	-1.179	-.157
	[Visibility of street posts=8,00]	-.480	.242	3.915	1	.048	-.955	-.005
	[Visibility of street posts=9,00]	-.173	.322	.290	1	.590	-.805	.458
	[Visibility of street posts=10,00]	0[a]	.	.	0	.	.	.
	[Amount of times visiting the centre=1,00]	-1.179	.803	2.153	1	.142	-2.754	.396
	[Amount of times visiting the centre=2,00]	-.380	.237	2.567	1	.109	-.845	.085
	[Amount of times visiting the centre=3,00]	-.137	.156	.764	1	.382	-.443	.170
	[Amount of times visiting the centre=4,00]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Figure 83 Model 2 parameter estimates

Lastly, we will look at the Pseudo R-Square, see *Figure 84*. For model 2, the associated Nagelkerke value is 0.053, this means that 5.3% of the variation in the depended variable is

Pseudo R-Square

Cox and Snell	.052
Nagelkerke	.053
McFadden	.013

Link function: Logit.

Figure 84 Model 2 pseudo r-squared

explained by the dependent variables.

Model 3: Distance to centre and number of times visiting the centre

Starting with the model fitting information, see *Figure 85*, the chi-square of 17.255 with the associated p-value of 0.008 shows that the model with the independent variables fits significantly better than the model without these independent variables. This idea is further supported by the lower -2 Log Likelihood for the model with the dependent variables compared to the null-model.

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	408.782			
Final	391.527	17.255	6	.008

Link function: Logit.

Figure 85 Model 3 fitting information

Secondly, looking at the parallel lines, see *Figure 86*, the chi-square of 74.000 with the associated p-value of 0.009 shows that the effect of the independent variables is not consistent over the different categories of the dependent variable. It is important to keep this in mind when looking at the parameter estimates.

Test of Parallel Lines[a]

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	391.527			
General	317.527[b]	74.000[c]	48	.009

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.[a]

a. Link function: Logit.

b. The log-likelihood value cannot be further increased after maximum number of step-halving.

c. The Chi-Square statistic is computed based on the log-likelihood value of the last iteration of the general model. Validity of the test is uncertain.

Figure 86 Model 3 test of parallel lines

Thirdly, we will look at the goodness of fit, see *Figure 87*. The Pearson chi-square of 136.302 with the associated p-value of 0.147 shows that there is no significant deviation between the expected and normal values. The Deviance chi-square with the associated p-value supports a similar conclusion. In other words, the model is suitable at predicting the dependent variable.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	136.302	120	.147
Deviance	138.312	120	.121

Link function: Logit.

Figure 87 Model 3 goodness of fit

Fourthly, we will look at the parameter estimates, see *Figure 88*. Here we first look the thresholds. Most of the thresholds are significant with a p-value lower than 0001. This means that the independent variables contribute to the change in public opinion. For the threshold of 'public opinion of street posts' of 8, the associated p-value (0.673) shows that this threshold is not significant. For the threshold of 'public opinion of street posts' of 9, the p-value is higher than for the other values, but still significant. Despite the fact that the highest threshold is still significant, it shows, in combination with the insignificance of model 8, that the model is less fitting for these higher values.

After looking at the thresholds, we will look at the influence of the independent variables. For 'number of times visiting the centre', shows that all categories are insignificant the independent variable of 'distance to the centre' is only significant for a category 2.

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Threshold	[Public opinion on posts = 1,00]	-2.473	.179	191.748	1	<.001	-2.823	-2.123
	[Public opinion on posts = 2,00]	-2.037	.166	151.124	1	<.001	-2.362	-1.712
	[Public opinion on posts = 3,00]	-1.671	.158	111.920	1	<.001	-1.980	-1.361
	[Public opinion on posts = 4,00]	-1.492	.155	92.717	1	<.001	-1.796	-1.188
	[Public opinion on posts = 5,00]	-1.151	.150	58.551	1	<.001	-1.446	-.856
	[Public opinion on posts = 6,00]	-.888	.148	36.058	1	<.001	-1.178	-.598
	[Public opinion on posts = 7,00]	-.478	.145	10.818	1	.001	-.763	-.193
	[Public opinion on posts = 8,00]	.499	.145	11.776	1	<.001	.214	.784
	[Public opinion on posts = 9,00]	1.044	.150	48.298	1	<.001	.750	1.338
Location	[Amount of times visiting the centre=1,00]	-.452	.816	.306	1	.580	-2.052	1.148
	[Amount of times visiting the centre=2,00]	-.225	.251	.803	1	.370	-.716	.267
	[Amount of times visiting the centre=3,00]	-.049	.160	.093	1	.760	-.362	.264
	[Amount of times visiting the centre=4,00]	0[a]	.	.	0	.	.	.
	[Distance to centre=1,00]	-.552	.320	2.973	1	.085	-1.180	.076
	[Distance to centre=2,00]	-.749	.235	10.148	1	.001	-1.209	-.288
	[Distance to centre=3,00]	-.103	.145	.504	1	.478	-.387	.181
	[Distance to centre=4,00]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Figure 88 Model 3 parameter estimates

Lastly, we will look at the Pseudo R-Square, see *Figure 89*. For model 3, the associated Nagelkerke value is 0.023, this means that 2.3% of the variation in the depended variable is explained by the dependent variables.

Pseudo R-Square

Cox and Snell	.023
Nagelkerke	.023
McFadden	.005

Link function: Logit.

Figure 89 Model 3 pseudo r-squared

Model 4: Model with all three variables

Starting with the model fitting information, see *Figure 90*, the chi-square of 50.286 with the associated p-value of smaller than 0.001 shows that the model with the independent variables fits significantly better than the model without these independent variables. This idea is further supported by the lower -2 Log Likelihood for the model with the dependent variables compared to the null-model.

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	1371.253			
Final	1320.967	50.286	15	<.001

Link function: Logit.

Figure 90 Model 4 fitting information

Secondly, looking at the parallel lines, see *Figure 91*, the chi-square of 253.889 with the associated p-value of smaller than 0.001 shows that the effect of the independent variables is not consistent over the different categories of the dependent variable. It is important to keep this in mind when looking at the parameter estimates.

Test of Parallel Lines[a]

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	1320.967			
General	1067.078[b]	253.889[c]	120	<.001

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

a. Link function: Logit.

b. The log-likelihood value cannot be further increased after maximum number of step-halving.

c. The Chi-Square statistic is computed based on the log-likelihood value of the last iteration of the general model. Validity of the test is uncertain.

Figure 91 Model 4 test of parallel lines

Thirdly, we will look at the goodness of fit, see *Figure 92*. The Pearson chi-square of 890.983 with the associated p-value of 0.047 shows that there is some significant deviation between the expected and normal values. The Deviance chi-square with the associated p-value tells a different story. According to this, the model is, in fact, able to predict the dependent variable. . In other words, the model is quite suitable at predicting the dependent but there might be some points of concern.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	890.983	822	.047
Deviance	781.678	822	.840

Link function: Logit.

Figure 92 Model 4 goodness of fit

Fourthly, we will look at the parameter estimates, see *Figure 94* on the next page. Here we first look the thresholds. Most of the thresholds are significant with a p-value lower than 0001. This means that the independent variables contribute to the change in public opinion. For the threshold of 'public opinion of street posts' of 8 and 9, the associated p-value (respectively 0.624 and 0.058) shows that this threshold is not significant. This shows that the model is less fitting for these higher values.

After looking at the thresholds, we will look at the influence of the independent variables. For 'number of times visiting the centre', shows that all categories are insignificant. The independent variable of 'distance to the centre' is only significant for a category 2. Visibility is only significant up until category 7, meaning that the effect of visibility on public opinion disappears with higher levels of visibility.

Lastly, we will look at the Pseudo R-Square, see *Figure 93*. For model 4, the associated Nagelkerke value is 0.066, this means that 2.3% of the variation in the depended variable is explained by the dependent variables.

Pseudo R-Square

Cox and Snell	.065
Nagelkerke	.066
McFadden	.016

Link function: Logit.

Figure 93 Model 4 pseudo r-squared

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Threshold	[Public opinion on street posts = 1,00]	-3.183	.262	148.057	1	<.001	-3.696	-2.671
	[Public opinion on street posts = 2,00]	-2.734	.252	117.351	1	<.001	-3.229	-2.240
	[Public opinion on street posts = 3,00]	-2.353	.247	90.960	1	<.001	-2.837	-1.870
	[Public opinion on street posts = 4,00]	-2.166	.244	78.469	1	<.001	-2.645	-1.686
	[Public opinion on street posts = 5,00]	-1.809	.241	56.441	1	<.001	-2.281	-1.337
	[Public opinion on street posts = 6,00]	-1.536	.239	41.457	1	<.001	-2.004	-1.068
	[Public opinion on street posts = 7,00]	-1.113	.236	22.289	1	<.001	-1.575	-.651
	[Public opinion on street posts = 8,00]	-.114	.232	.240	1	.624	-.569	.341
	[Public opinion on street posts = 9,00]	.442	.233	3.585	1	.058	-.016	.899
Location	[Visibility of street posts=1,00]	-1.697	.336	25.529	1	<.001	-2.355	-1.038
	[Visibility of street posts=2,00]	-1.073	.444	5.848	1	.016	-1.942	-.203
	[Visibility of street posts=3,00]	-.954	.340	7.885	1	.005	-1.620	-.288
	[Visibility of street posts=4,00]	-1.091	.309	12.432	1	<.001	-1.697	-.484
	[Visibility of street posts=5,00]	-1.060	.278	14.537	1	<.001	-1.605	-.515
	[Visibility of street posts=6,00]	-.654	.283	5.347	1	.021	-1.208	-.100
	[Visibility of street posts=7,00]	-.650	.261	6.204	1	.013	-1.162	-.139
	[Visibility of street posts=8,00]	-.460	.243	3.584	1	.058	-.936	.016
	[Visibility of street posts=9,00]	-.197	.322	.372	1	.542	-.828	.435
	[Visibility of street posts=10,00]	0[a]	.	.	0	.	.	.
	[Amount of times visiting the centre=1,00]	-.796	.823	.934	1	.334	-2.410	.818
	[Amount of times visiting the centre=2,00]	-.206	.253	.661	1	.416	-.702	.290
	[Amount of times visiting the centre=3,00]	-.062	.162	.148	1	.700	-.380	.255
	[Amount of times visiting the centre=4,00]	0[a]	.	.	0	.	.	.
	[Distance to centre=1,00]	-.382	.325	1.381	1	.240	-1.018	.255
	[Distance to centre=2,00]	-.687	.236	8.485	1	.004	-1.149	-.225
	[Distance to centre=3,00]	-.054	.146	.135	1	.713	-.341	.233
	[Distance to centre=4,00]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Figure 94 Model 4 parameter estimates

Conclusion aim 3

In the individual analysis, we have seen that visibility of street posts and distance to centre have a significant influence on public opinion, whilst amount of time visiting the centre is not significant. To see how these variables work together, four models have been created. In order to compare these models and pick the one that best explains reality, we will look at Akaike's Information Criterion (AIC), Bayesian Information Criterion (BIC), and Nagelkerke Pseudo R^2. Looking at these values for all 4 models, this gives the following information:

Table 17 Comparison of the models

Model	AIC	BIC	Nagelkerke Pseudo R^2
1	409.010	439.57	0.064
2	431.497	465.60	0.053
3	407.527	432.10	0.023
4	1351.967	1372.07	0.066

The first conclusion is that all four models can only explain the variation of public opinion to a very low degree as shown by Nagelkerke pseudo r^2 (ranging from 2.3% to 6.6%). This shows that public opinion is determined by more factors than only visibility and proximity. When comparing the models, model 4 explains the most variation (6.6%). However, the AIC and BIC are really high. Model 3 has the lowest AIC and BIC, however this model explains only 2.3% of the variation in public opinion. Model 1 explains the variation in public opinion the best (6.4%), whilst simultaneously having a low AIC and BIC. This leads us to the conclusion that the visibility of the street posts and distance to the centre predicts public opinion the best. Within the model, visibility of street posts is more significant than distance to the centre and therefore a better predictor than distance to the centre. Lastly, this model only explains 6.4% of the variation of public opinion, meaning that there are other factors that have not been measured that influence public opinion.

5. Discussion

5.1 Summary sub-question 1

The first sub-question was ‘How do formal institutions influence the public opinion?’. This examined the effect that implementation of formal institutions has on a change public opinion. The meta-analysis revealed that while formal institutions can change public opinion, the direction of change remains uncertain due to the lack of consensus among the articles. The five theoretical models (legitimacy, backlash, polarization, consensus, and the thermostatic model) each offer a different explanation, but there was insufficient evidence to identify one as the definite explanation. A study by Larsen (2018), which compared different studies found that the legitimacy model might explain reality the best. However, the effect size was relatively small, and the study stated that the direction of change in public opinion is most likely based on its context (Larsen, 2018). No evidence was found that different formal institutions have a different effect on the change in public opinion. Lastly, the literature suggests that a higher level of visibility and a higher level of proximity increase the potential for the public opinion to change. This meta-analysis supports the policy feedback theory of Pierson (1993), but also makes it clear that the direction of change in public opinion cannot be determined by this theory. To predict the change in public opinion, other contextual factors are important and need to be considered. For the field of planning and policy, these results serve as a working hypothesis, especially since no difference was found between different formal institutions. Based on these findings, it can be expected that spatial planning interventions can influence a change in public opinion and that it is most likely that this change will happen according to the legitimacy model.

5.2 Summary sub-question 2 and 3

Sub-questions 2 and 3 were respectively ‘What are the planning interventions used regarding the management of cars in rural centres in the Netherlands?’, and ‘How are the planning interventions aimed at managing cars classified in rural centres of the Netherlands.’ They compared the planning interventions regarding cars and the opinion of the politicians on these planning interventions. Surprisingly, this analysis revealed little difference between Asten and Deurne, despite the difference in labelling the centre (Asten being labelled car-sheltered and Deurne car-free). These findings challenge the validity of these terms and their applicability to describe real-world planning contexts. This finding suggests that the terms car-free, car-sheltered, and car-accessible may be overly simplistic or imprecise. This calls for the creation

of a more robust framework. This indicates a gap between the theoretical categories and the real planning contexts. A more nuanced and robust framework is needed to better describe and compare centres. This new framework would not only be useful for researchers, but can also be used by planners, policymakers, and politicians as a roadmap to guide them towards a more car-free centre.

5.3 Summary sub-question 4

Sub- question 4 was ‘What is the influence of car-reducing spatial interventions on public opinion in rural centres?’. It was aimed at discovering the public opinion of residents in Asten and Deurne. Firstly, the opinion of residents on the three different types of centres was measured. Based on similar political views in both cases, it was hypothesized that there was no significant difference in public opinion between the two cases on the three different types of centres. Contrary to expectations, there was a significant difference between public opinion. While it is common to assume that politics follow public opinion, these results shows that this is not the case given this content. Other factors, such as political view, economic reasons, cultural reasons, etc, might also influence the decision-making process. Another explanation is that politicians might be unaware of the public opinion or that they do not prioritize the public opinion.

Secondly, the research question looked if spatial interventions had an effect on the public opinion. The results showed that after implementation, the public opinion became more favourable for the pedestrian area and the ‘blauwe zone’. However, this difference in public opinion was only significant for the ‘blauwe zone’. There was no significant difference for the pedestrian area, which supports the consensus model. Furthermore, the change in public opinion was for both planning interventions relatively small (no more than 1.0). From these results, it can be concluded that for the ‘blauwe zone’, planning interventions can have an influence on public opinion, similarly to the findings in the literature. Furthermore, the direction of change seems to be following the legitimacy model, as also concluded by Larsen (2018). An explanation of this small effect that planning interventions have on public opinion could be explained by the way people form their opinion, peripheral processing, and central processing, as suggested by Brickman and Peterson (2006). They argue that people are most likely to form their initial opinion through peripheral processing when shortcuts are used to form their opinion. This opinion is relatively unstable and can easily be changed. After more information becomes available, people undergo central processing, they carefully consider the full content and decide how they feel about it. This opinion is more stable and less likely to change. Since the

implementation of the planning interventions is at the end of the policy cycle, the two cases are located next to each other, and the planning interventions used in the analysis are discussed in both cases even when they are not implemented, one could assume that information is already available. Therefore, people have already undergone the central processing and have formed a relatively stable opinion. A second explanation could be that the implementation of planning interventions has a polarizing effect. Since a part of the population becomes less favourable, and another part of the population becomes more favourable, the average effect becomes very small. However, this would probably show a different distribution of public opinion, where both tails of the histogram would show high spikes. This was for both planning interventions not the case. Thus, it seems more likely that the small effect is due to peripheral and central processing than due to the polarization model.

Thirdly, the research question looked at which factors influence public opinion. The literature suggests three factors that influence public opinion; (1) visibility, (2) proximity, which was split into general and spatial proximity, and (3) sub-groups. The third factor, sub-groups, was not tested since this would have required to inquire sensitive information, possibly resulting in lower response rates on the survey. The results showed that, in line with the literature, visibility did have an effect on public opinion. Higher levels of perceived visibility correlated with more favourable opinions. For proximity, the findings contradict the literature. General proximity did not influence public opinion, for spatial proximity there is some evidence that closeness to the centre is associated with higher approval of planning interventions, but this was only found significant for one category. This is reverse from the literature that suggested that spatial proximity did not have an effect on public opinion, but general proximity did have. When combining the variables, the model with the 2 significant variables (perceived visibility and spatial proximity) proofed to predict the public opinion the best. However, this model could only explain 6.4% of the variation in public opinion, showing that there are more factors that influence public opinion.

The results of sub-question 4 shows that spatial interventions can have an influence on public opinion, but due to the fact that implementation of these spatial interventions is towards the end of the policy cycle, this change in opinion is relatively small since people have already formed a relatively stable opinion. Furthermore, there is evidence that visibility does have an effect on public opinion. Based on this, it could be argued that spatial interventions that have a higher level of visibility do have a higher potential to change public opinion, similar to the findings in the literature. However, this has not directly been tested so we cannot make claims on this. The

findings on proximity do, however, challenge the findings of the literature. For spatial interventions, it seems that spatial proximity is more important on the public opinion than general proximity.

For planners, policy makers and politicians these results show that planning interventions that are more visible are more accepted by the public. This could function as a powerful tool to get the public to support a certain planning intervention. However, it is important to consider that this might also work counterproductive. When combining the results of sub-question 4 with the findings in literature, it can be concluded that higher levels of visibility of a planning intervention increases the potential for that planning interventions to change public opinion. In this case, the public opinion became more favourable when visibility increased but higher levels of visibility can also result in a less favourable public opinion.

5.4 Internal validity

Internal validity refers to the extent to which the results of the study accurately reflect the relationship between the variables that were being investigated. In this study, the dependent variable is public opinion, and the independent variables were stage of implementation, visibility, and proximity. This section includes the key factors that determine the internal validity.

The first factor to consider is that this study examines correlation, not causality. While the literature suggests that a causal relationship exists, where the value of the dependent variable is the result of the independent variables, this study does not measure this. Although the results suggests that the policy feedback theory is right in assuming that visibility and proximity can predict public opinion, the study provides no direct evidence to confirm causality, but it does provide evidence for correlation. Moreover, the study focuses on measuring public opinion at a specific point in time, due to its design as a comparative case study. This means that the study cannot observe change in public opinion, and that it cannot be used to make statements about this change in public opinion. This is different from the literature that does make these statements.

Another limitation is that the study has only looked at factors that were deemed important by the literature (stage of implementation, visibility, and proximity). Although the study has collected the political opinion on the different interventions, other factors have not been studied. The results do also show that the factors that were studied only explain the variation in public

opinion to a small extent (no more than 6.6%). Furthermore, the factor sub-groups has not been taken into account, due to concerns about response rate.

A third limitation is that the survey was based on self-selection, people could choose themselves whether or not to participate. This, in combination with the lack of information on potential sub-groups (e.g. gender, political views, income, etc.), could mean that some groups have not participated in the survey. As a result, the data that has been collected in this study has the risk of not being representative of the entire population of both Asten and Deurne.

On the positive side, several factors strengthened the internal validity of the study. The survey was similar in both cases and conducted at the same time. Furthermore, Asten and Deurne did proof to have similar geographical data, increasing comparability. Lastly, the survey has been tested in multiple pilot rounds to test the clarity of questions. During the conduction phase of the survey, the author did not get any questions regarding the interview, which could function as proof that the survey was clear, understandable, and easy to fill out.

The internal validity of the study is generally robust, as it successfully identifies correlations between the dependent variable and the independent variables. However, the results should be interpreted with caution, especially focusing on the fact that the study examines correlation, not causation, the fact that the factors studied only explained the variation in the dependent variable for a very small extent, and the uncertainty regarding the representativeness of the population sample.

5.5 External validity

External validity refers to the extent to which the results of the study can be generalized beyond the specific conditions, sample, and setting of the research. In other words, if the results can be applied to different spatial interventions, in different cities or regions, or in other contexts. This section includes the key factors that influence this external validity.

The first factor to consider here is the sample population. As previously mentioned for the internal validity, it is unknown whether the sample population is representative for the whole population of Asten and Deurne. As a result, it is difficult to examine if the results are applicable for the entire population for Asten and Deurne, and similarly if the results are applicable for other populations. Another factor linked to this is the fact that the survey was based on self-selection, which introduces a possible bias that individuals with a stronger opinion are more likely to participate in the survey. This reduces the external validity since these findings could be less applicable to the broader public.

Another factor is the characteristics of the two selected cases. Although results might be similar for cities and town that are similar to the two cases (rural towns in the Netherlands), one might question if the same results would be found in smaller cities or town that are probably even more dependent on cars, or for bigger cities that will probably have a better offer of public transport. Furthermore, it is questionable whether the same results will be found in places not in the Netherlands due to the differences of planning regimes across the world.

A third factor is linked to the time in which this research was conducted, especially regarding the political climate. In both cases, the issue of dealing with cars in the centre was very prominent, resulting in strong opinions. Furthermore, the research was conducted during a time with a lot of political polarization. This could have affected the results where opinions on the planning interventions would form on both extremes. However, the distribution of public opinion, in the studied cases, did not found proof of this.

The external validity of the study shows that the generalizability of the results is low. First of all, this is shown by the limiting factors regarding the sample population, the specific characteristics of the two selected cases, and the time in which the research was conducted. Furthermore, when looking at the literature of sub-question 1, the results are very mixed, highlighting that the context is extremely important. This, in combination with the limitations of this specific research, it would be false to assume that the results of this study are reality in every situation, without critically considering the specific characteristics of the new context.

5.6 Reliability

Reliability refers to the consistency and the dependability of the research methods, the data, and the research instruments used to collect this data. Reliability is important since it ensures that the results can be reproduced and are not to random error or bias. Reliability is closely linked to validity, but reliability is concerned if the results can be reproduced using the same methodology. This section discusses the key aspects that determines this study's reliability.

Firstly, the methods have been consistently applied in both cases. Although the survey was for both cases different regarding specific words (e.g. the name of the cases), the questions were the same. For the field trips and interviews, the same guide was used for both cases.

Secondly, the methods were tested. For the survey, pilot rounds were conducted to test the clarity and comprehensibility of the survey. Similarly, the interview guide was tested by interviewing a few volunteers, and the field trip was tested in another municipality.

Thirdly, the methodology is well described, including all the steps, ensuring that other researchers can follow these steps. Furthermore, there were no significant external factors or events that could have influenced the results for both Asten and Deurne.

Fourthly, the data has been checked to ensure that there were no typographical errors. Since the survey mostly consisted of multiple-choice questions, this was not a problem for most questions. There were some problems with people entering their year of birth instead of their age, but this has been fixed.

On the negative side, there was some discrepancy between the expected and measures public opinion on the three different types of centres. This was not expected since the results from the interview indicated that the public opinion was similar in both cases. However, this difference in public opinion is most likely not due to an issue with the research instruments, but rather with the political context, as has already been discussed.

Overall, the study demonstrates high levels of reliability due to the consistency in methodology, the pilot-testing of the instruments, the comprehensibility of the methodology section, the careful data-processing, and the absence of significant external factors. This means that the study can be replicated by different researchers, and that the same results will be found, given that the conditions are similar.

6. Conclusion

6.1 Answer main research question

This thesis has looked at the effect of spatial planning interventions on public opinion. It started by doing a meta-analysis for the literature on the effects of formal institutions on public opinion. Afterwards, the study analysed and compared two cases (Asten and Deurne) and finally conducted a survey and analysed the results. The results can be used to answer the main research question: “How do spatial planning interventions influence the public opinion?”. The results show that spatial planning interventions can influence the public opinion, and most likely following the legitimacy model. However, spatial planning interventions do not necessarily have to influence public opinion. Furthermore, the effect of the implementation of the planning intervention does only affect public opinion to a small extent, most likely due to the way opinion is formed. When it comes to the factors influencing public opinion, spatial proximity and visibility seem to have an effect, although they can only explain the variation in public opinion to a small extent (6.4%). Thus, there are other factors influencing public opinion that were not taken into account in this study. To conclude, spatial planning interventions can influence public opinion, but they do not have to. The change of direction is similar to the legitimacy model, but the size of the effect is very small. Visibility and spatial proximity influence public opinion, but only to a very small extent.

6.2 Scientific recommendations

Based on the results, and the limitations, the following sections outlines recommendations for researchers. To begin with, a new, more robust framework should be developed to improve the classification of the types of centres regarding the use of cars. The framework used for this study, as discussed, is not able to capture the complexity of the real world.

Secondly, this study proofs that there are signals that the public opinion might change due to the implementation of planning interventions. However, this study cannot make claims about the change in public opinion due to its design. A longitudinal study is required that follows the same participants through the process of implementation to see how their opinion changes. Such study could also check if there is a causal relationship between the stage of implementation and public opinion.

Thirdly, these results of this study provide some evidence that the legitimacy model explains reality the best. However, there is also some evidence for the other models. More studies are

required to see which models explains reality the best, especially considering the mixed results that the literature has found.

Lastly, this study has focused on two factors that, according to the literature, influences public opinion: visibility and proximity. The results show that these two factors only explain roughly 6% of the variation in public opinion. More studies are needed to check how sub-groups, which was also mentioned by the literature but not taken into account for this study, influence public opinion. Furthermore, other factors, which are not known yet, might also influence public opinion. Future research should also look at other contextual factors, and check if the relationship between public opinion and these factors is causal.

6.3 Societal recommendation

The following section outlines the recommendations for the society, especially for planners, politicians, policy makers or other people in the governmental sector. First of all, it is important to consider, as previously mentioned, that the generalizability of these results is limited due to the fact that the change in public opinion is most likely for a large extent based on the context. However, there are some things that can be learned from this study. First of all, it is important to consider that planning interventions can have an effect on public opinion, showing that the decisions that are made by local governments can influence the thinking of their residents. Furthermore, the results have shown no indication of backlash after implementation of the planning interventions, keeping in mind here that the public opinion was already quite positive. Still, this shows that planners, politicians and policy makers should not longer hide behind the statement that they do not want to implement something because they are afraid of backlash, when they know that the public opinion is positive. This is closely linked to the next recommendation, there is some discrepancy between the political views and the public opinion (e.g. people in Asten are mostly positive to a car-free centre but politicians do not want to implement this). There are clearly other valid factors that play an important role in the decision-making process, that also followed from the interviews. However, this discrepancy can seem as if politicians behave unfair and have a hidden agenda. People might be confused planning interventions are not implemented if the majority is in support of these interventions. It would be better if politicians communicate clearly with their residents why certain decisions were made and what factors played a role in making this decision, or why some interventions can not be implemented. Lastly, it is important to make clear that, although higher levels of visibility are linked to higher levels of public opinion, this does not mean that this would be the case for every spatial intervention. A higher level of visibility will increase the potential to influence or

change public opinion. The direction of that change is dependent on the context.

7. Use of AI

The author declares that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

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9. List of appendices

The rest of this document contains the appendixes, they provide more detailed information that is not required in the main text. Here, an overview of the appendices is presented, including a short summary about what can be found in each appendix.

Appendix A: Information on municipalities in cluster 11 (page 144-163)

This appendix contains information on the six characteristics that influence public opinion (age, education, income, political belief, gender, trust in government), for each of the thirteen municipalities in cluster 11 which has been introduced in the main text.

Appendix B: Comparison between municipalities cluster 11 (page 164-165)

This appendix shows the comparison between the thirteen municipalities in cluster 11, based on the six characteristics that influence public opinion (age, education, income, political belief, gender, trust in government).

Appendix C: English translation of contact protocol (page 166)

This appendix contains the English translation of the contact protocol that has been used to contact the potential interviewees.

Appendix D: Field visit protocol (page 167)

This appendix contains the field visit protocol that has been used to conduct the field visits in Asten and Deurne.

Appendix E: List of articles used for snowball sampling (page 168-173)

This appendix contains a list of all articles that were used for snowball sampling, divided into the five iterations, and a visual overview that shows which papers have been selected from which papers.

Appendix F: Code book scientific literature (page 174-178)

This appendix contains the code book that were found in the articles selected for answering sub-question1, through the use of hybrid coding.

Appendix G: Themes, code groups and codes scientific literature (page 179-183)

This appendix contains the themes, the code groups belonging to those themes and the codes belonging to the code group and themes.

Appendix H: List of selected governmental documents (page 184-189)

This appendix contains the selected governmental documents that have been collected for the cases of Asten and Deurne, including the database/search query in which these documents have been found.

Appendix I: Code book governmental documents (page 191)

This appendix contains the code book that followed from the coding of the governmental documents.

Appendix J: Fact sheets (page 192-280)

This appendix contains the fact sheets where more information about each individual spatial intervention is available. For each intervention, information is present in the fact sheets for the year of implementation, the definition, the points of view on the planning interventions based on the interviews, the material dependency based on the field visits, and the classification.

Appendix K: Interview Guide (page 181-182)

This appendix contains the English translation of the interview guide that has been used to interview politicians and governmental officials.

Appendix L: Code book interviews (page 283-284)

This appendix contains the code book that were found in the interviews.

Appendix M: Comparison planning interventions (page 285-287)

This appendix shows the comparison of the spatial interventions. The interventions are compared on four components: (1) meaning of the spatial intervention, (2) the observations of the spatial intervention, (3) the view that politicians and government officials have of the spatial intervention, and (4) the classification of the intervention.

Appendix N: Survey logic (page 288-292)

This appendix contains the logic that is used in the survey. The questions are the same questions that have been developed in *Survey development* in

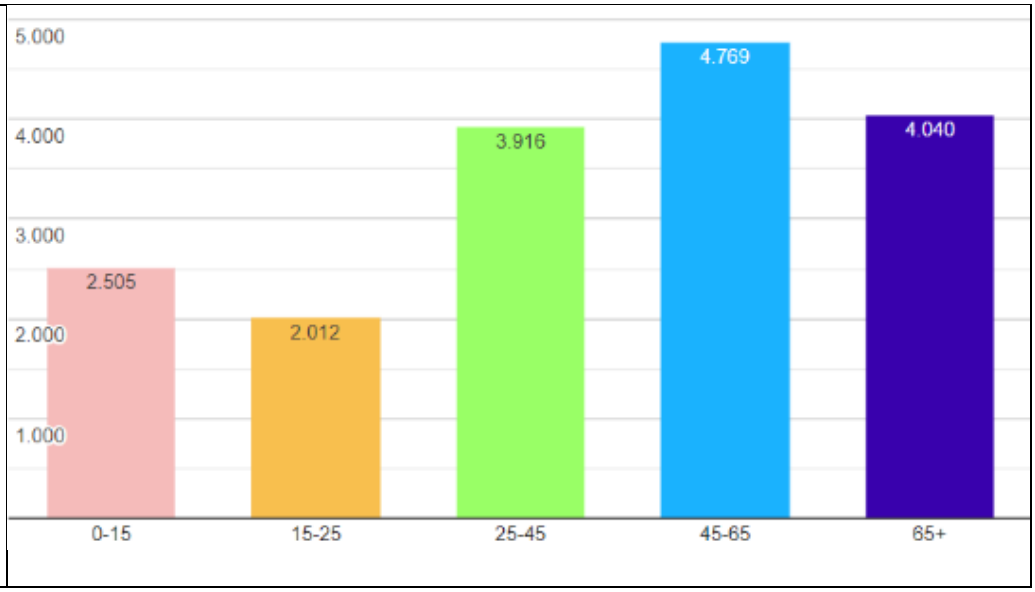
4.4 Sub-question 4.

Appendix A: Information on municipalities in cluster 11

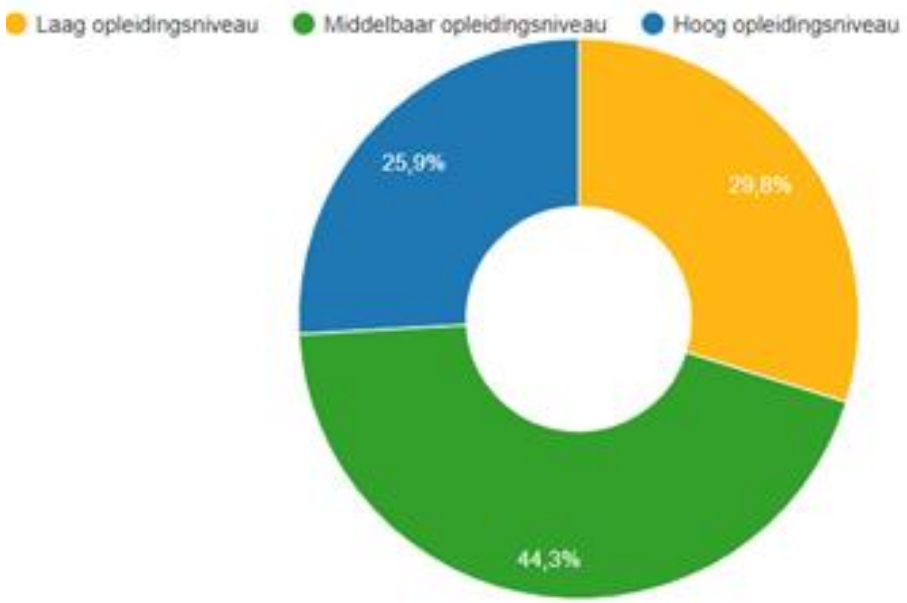
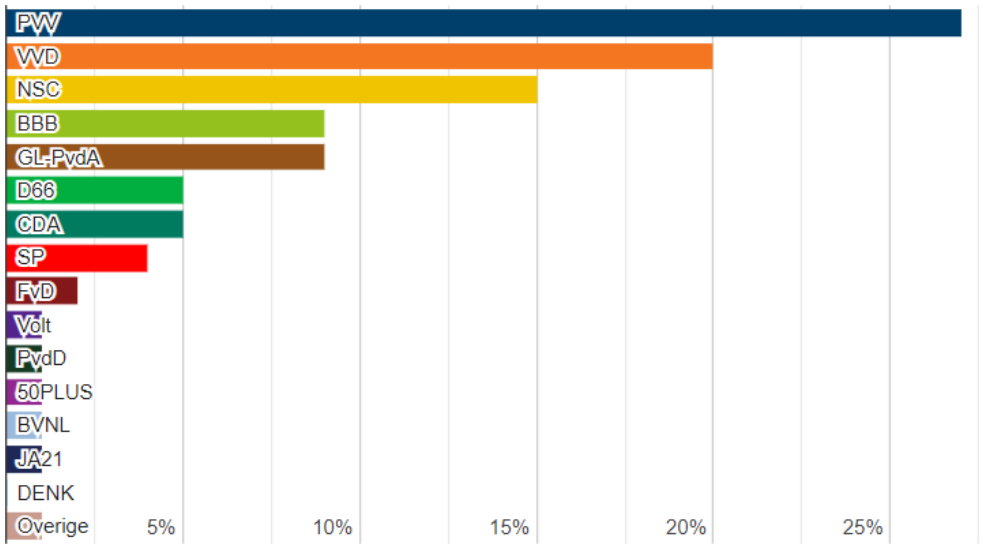
The following appendix contains information on the six characteristics that influence public opinion (age, education, income, political belief, gender, trust in government), for each of the thirteen municipalities in cluster 11 which has been introduced in the main text.

Asten

Table B 1 Information Asten

Age[27]	

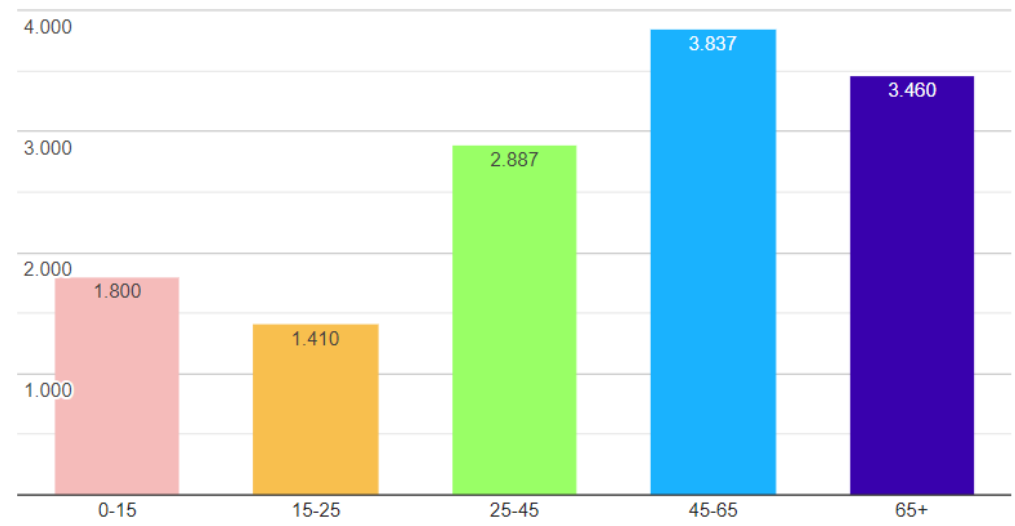
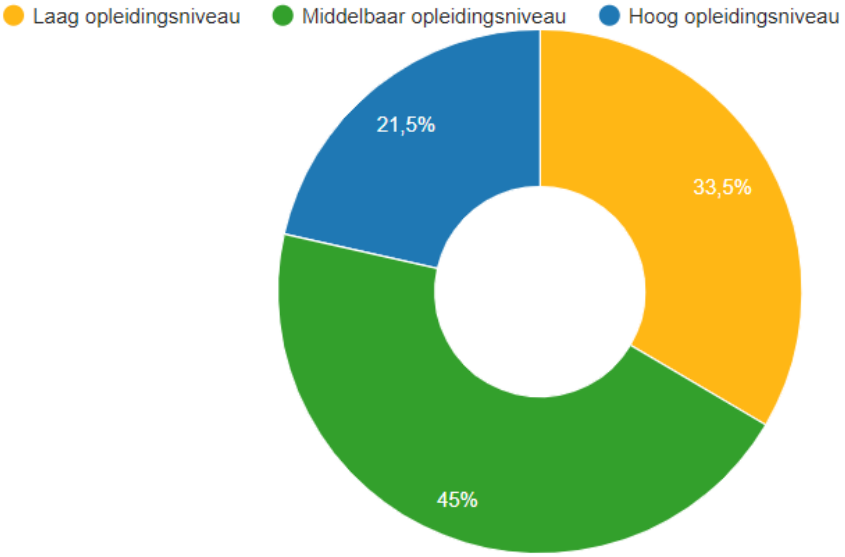
[27] Information retrieved from: AlleCijfers. (2024). Duidelijke informatie in cijfers en grafieken. AlleCijfers.nl. Retrieved May 23, 2024, from https://allecijfers.nl/

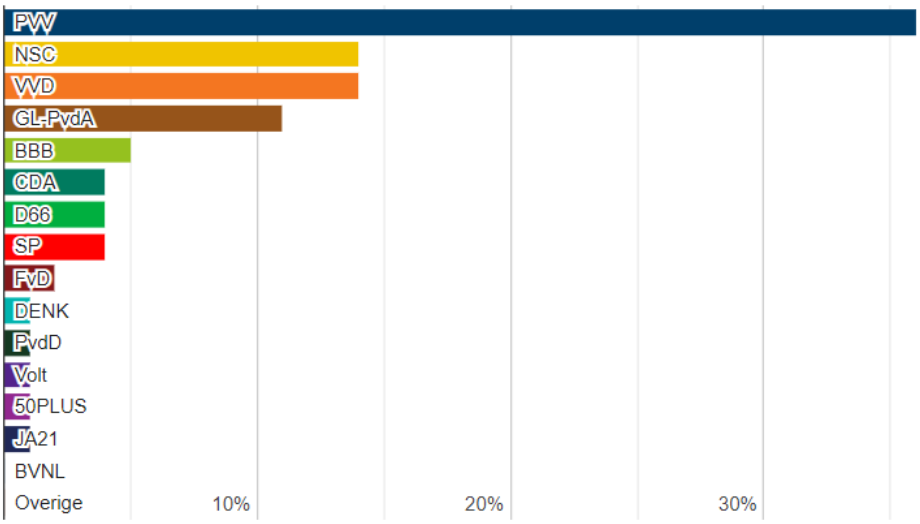
Education[27]	
Income[27]	29.200
Political belief[27]	
Gender[28]	Male: 51.3 % Female: 48.7%
Trust[27]	Average attendance rate: 60.38%

[28] Information retrieved from: CBS. (2024, May 8). CBS Statline. opendate.cbs. Retrieved May 23, 2024, from https://opendata.cbs.nl/#/CBS/nl/dataset/03759ned/table?dl=3F921

Beesel

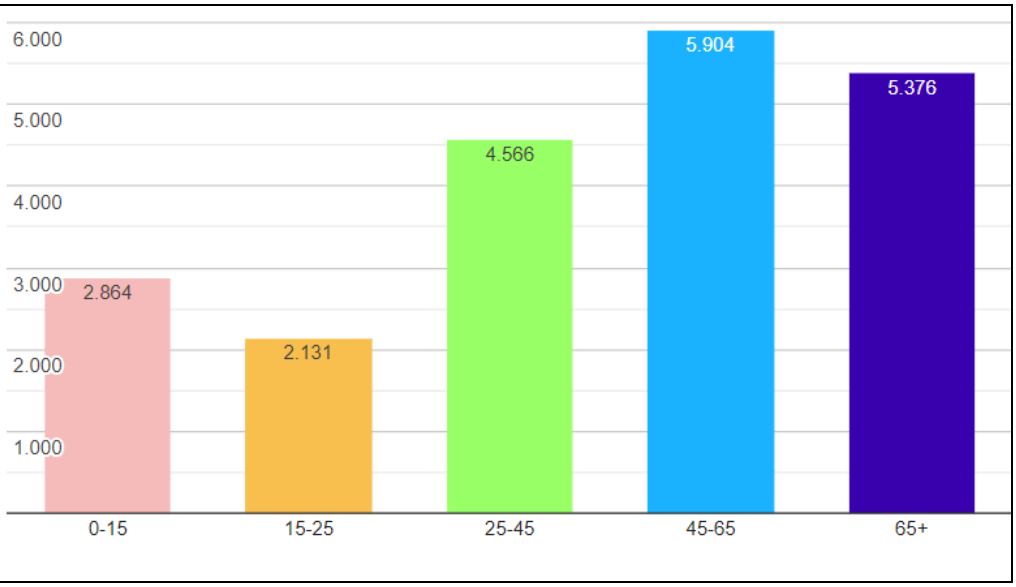
Table B 2 Information Beesel

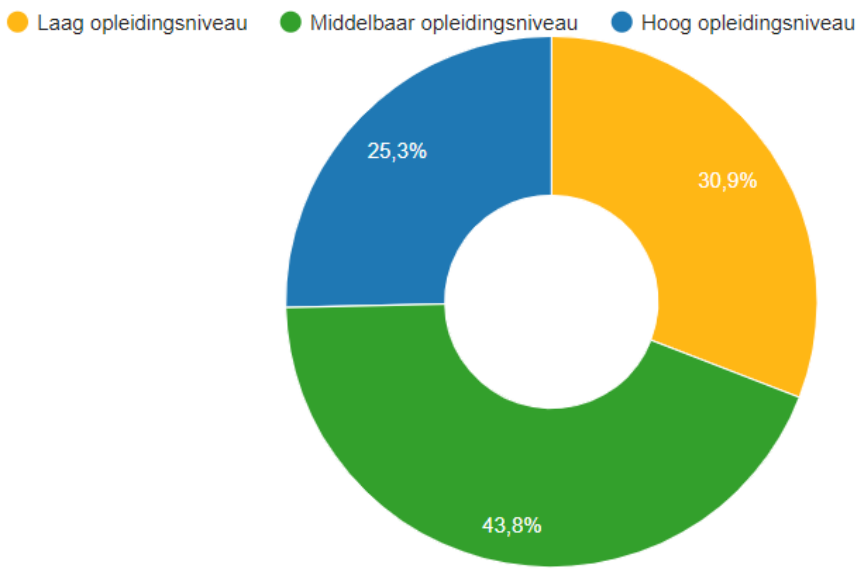
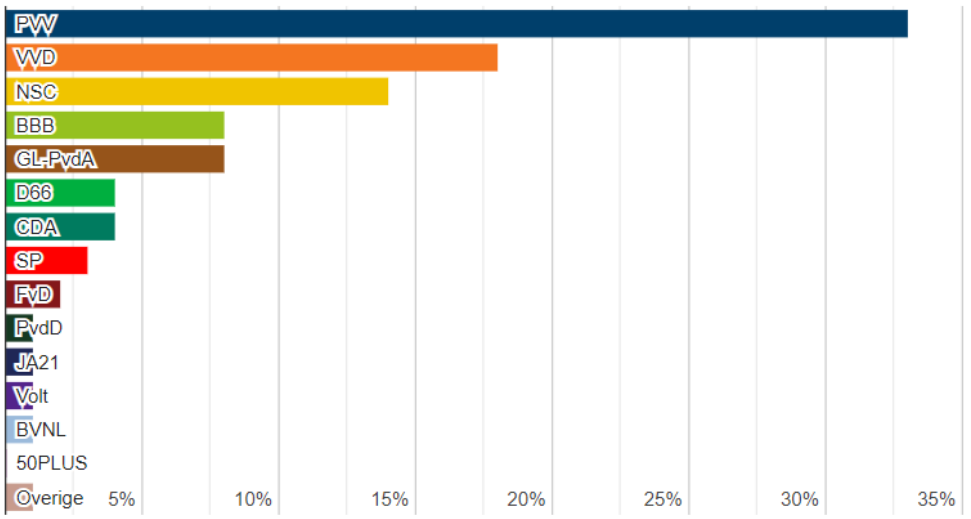
Age[27]	
Education[2] 7	
Income[27]	27.600

Political belief[27]	
Gender[28]	Male: 50.3 % Female: 49.7%
Trust[27]	Average attendance rate: 53.8%

Cranendonck

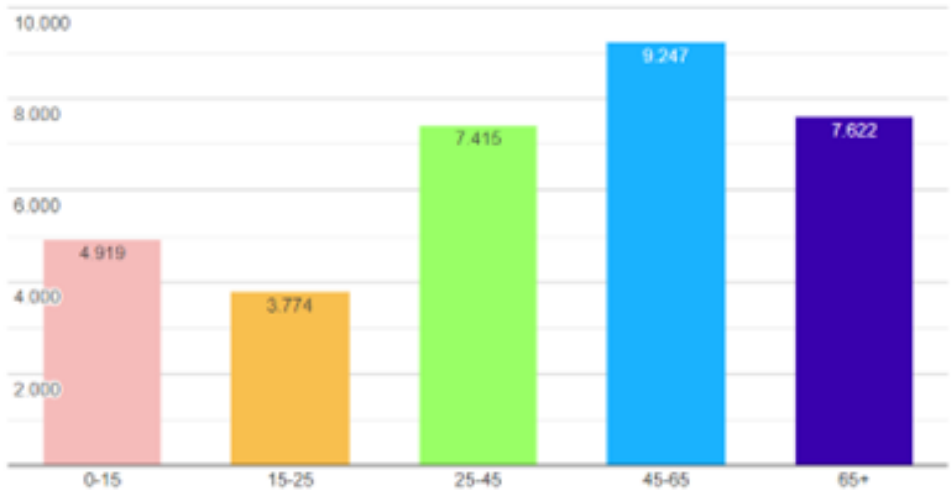
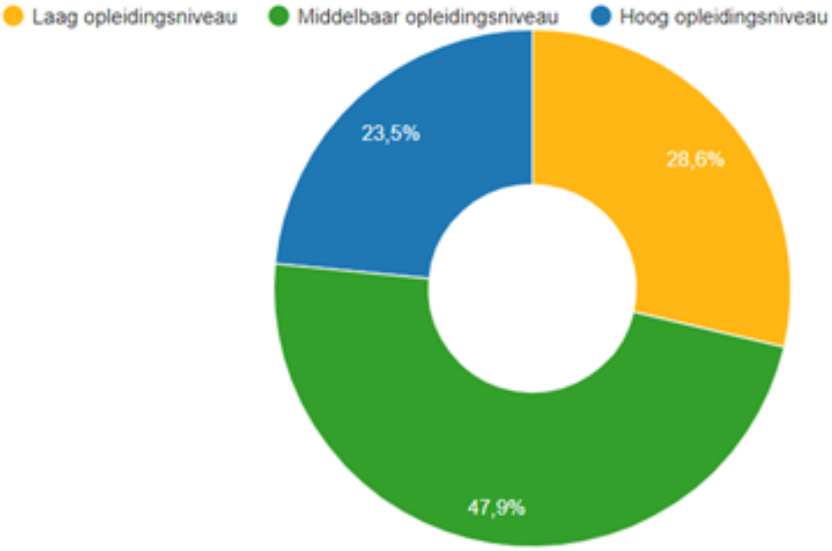
Table B 3 Information Cranendonck

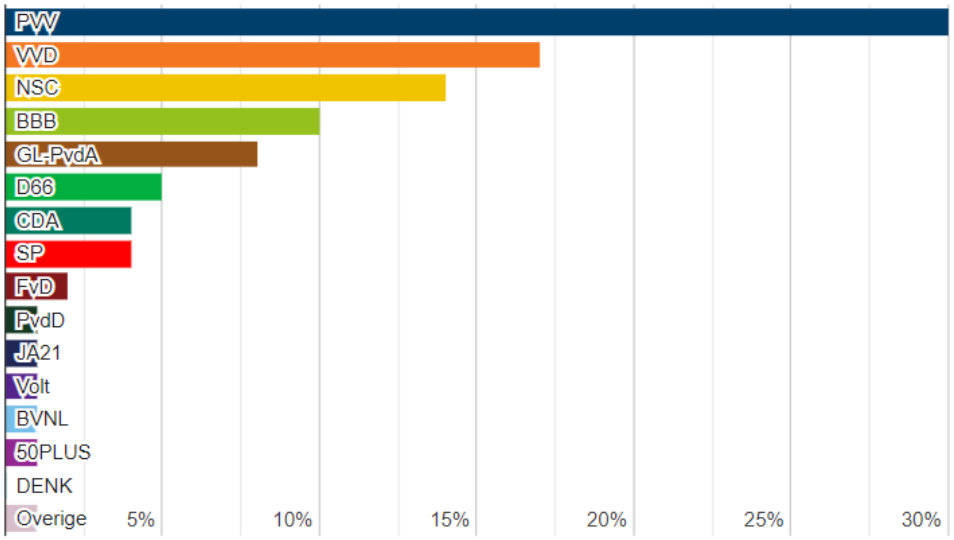
Age[27]	

Education[2] 7	
Income[27]	30.300
Political belief[27]	
Gender[28]	Male: 50.8 % Female: 49.2%
Trust[27]	Average attendance rate: 56.94%

Deurne

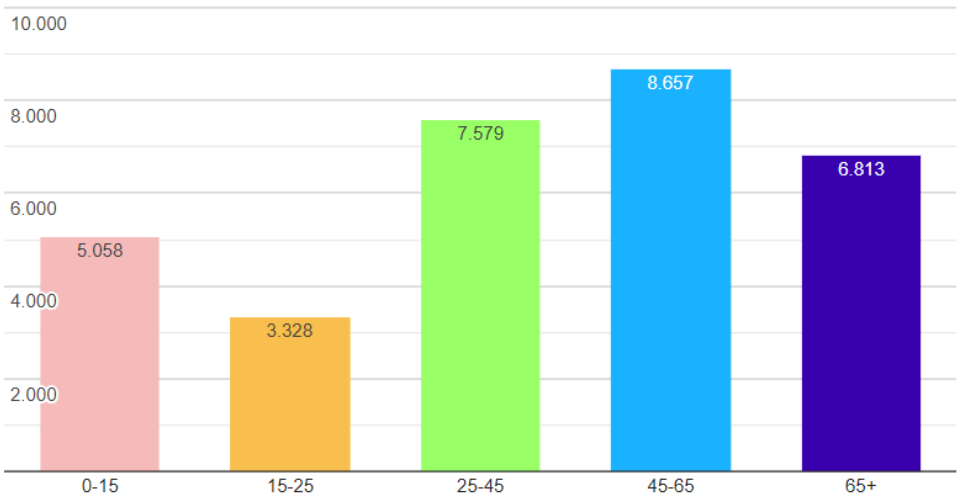
Table B 4 Information Deurne

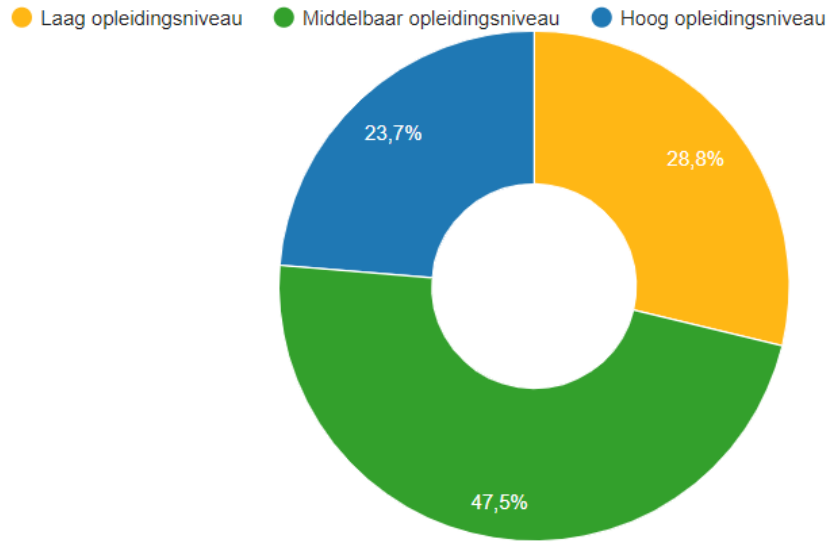
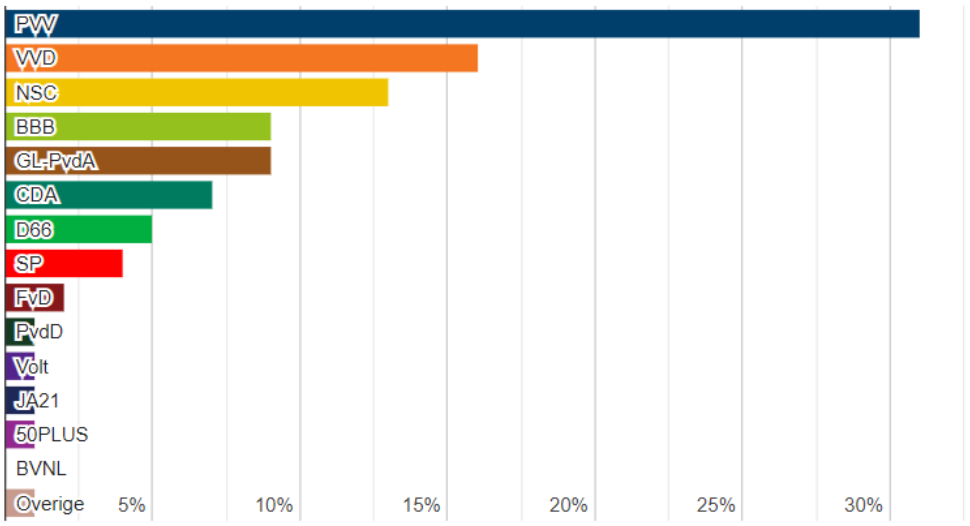
Age[27]	
Education[27]	
Income[27]	29.300

Political belief[27]	
Gender[28]	Male: 50.3% Female: 49.7%
Trust[27]	Average attendance rate: 56.62%

Gemert-Bakel

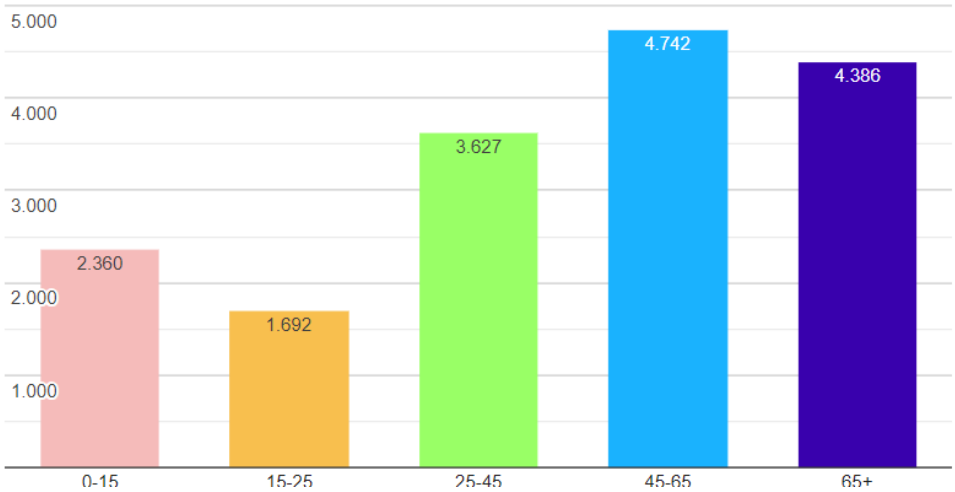
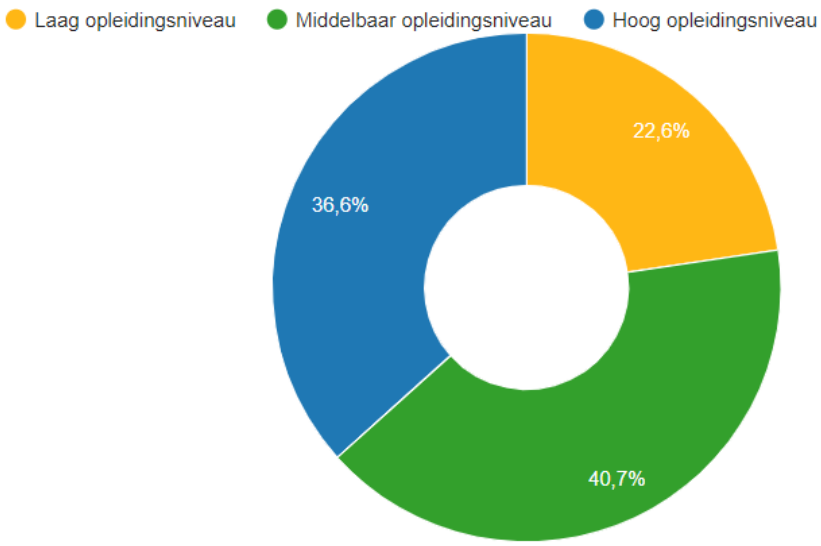
Table B 5 Information Gemert-Bakel

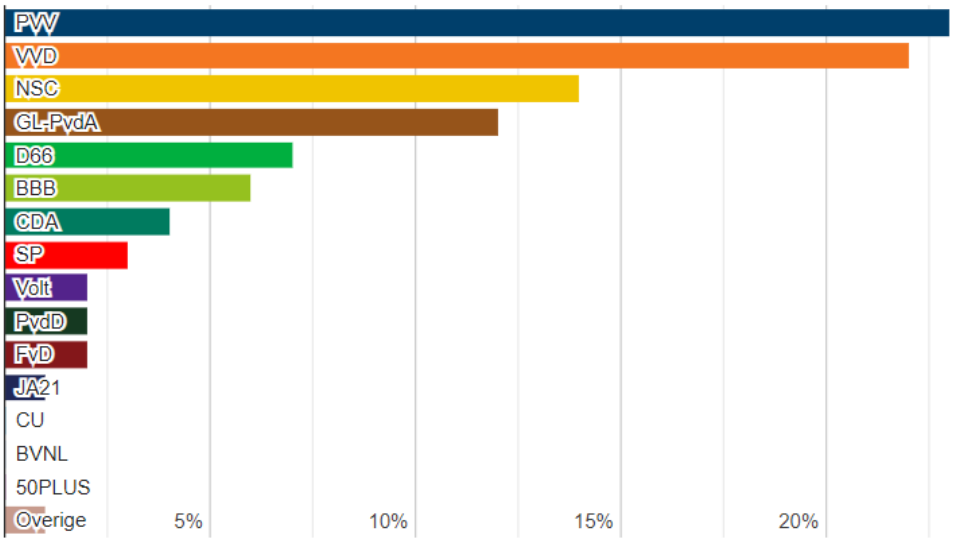
Age[27]	

Education[27]	
Income[27]	28.800
Political belief[27]	
Gender[28]	Male: 50.8% Female: 49.2%
Trust[27]	Average attendance rate: 56.14%

Heeze-Leende

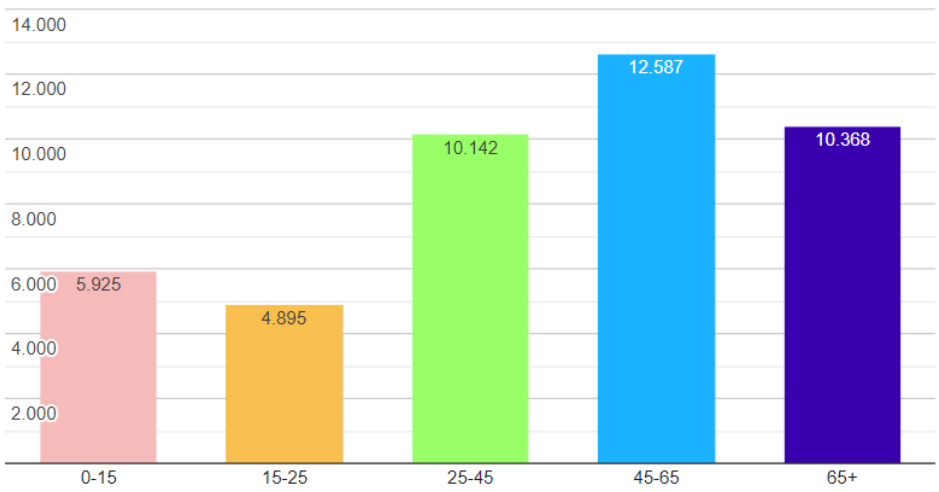
Table B 6 Information Heeze-Leende

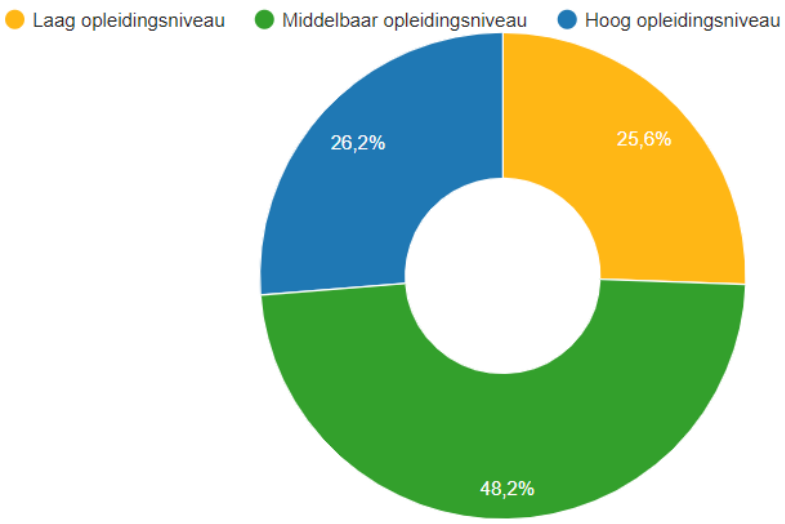
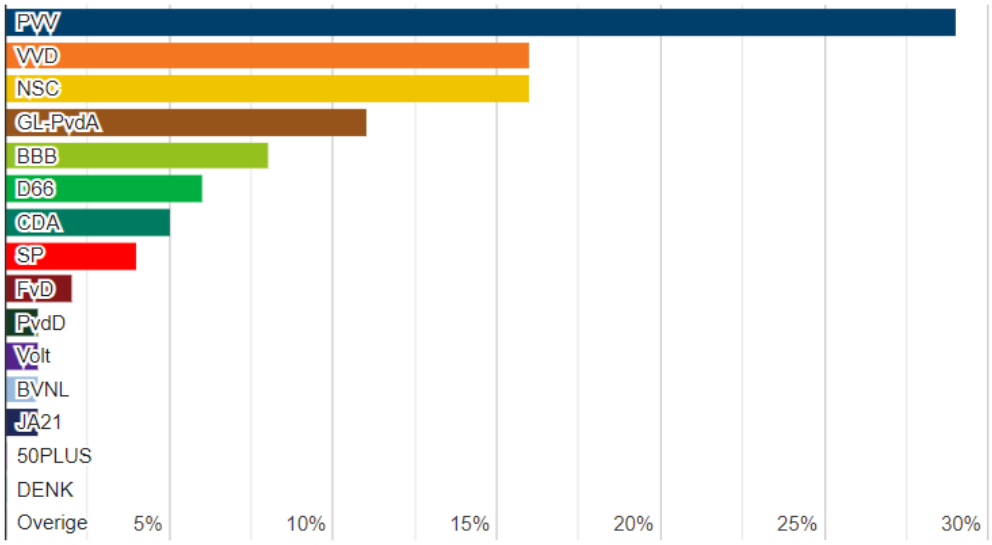
Age[27]	
Education[2] 7	
Income[27]	34.600

Political belief[27]	
Gender[28]	Male: 50.3% Female: 49.7%
Trust[27]	Average attendance rate: 61.98 %

Horst aan de Maas

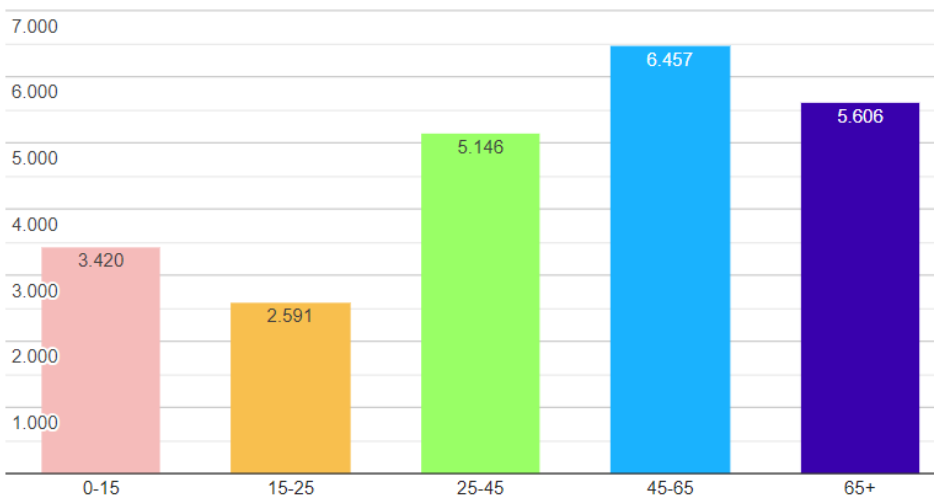
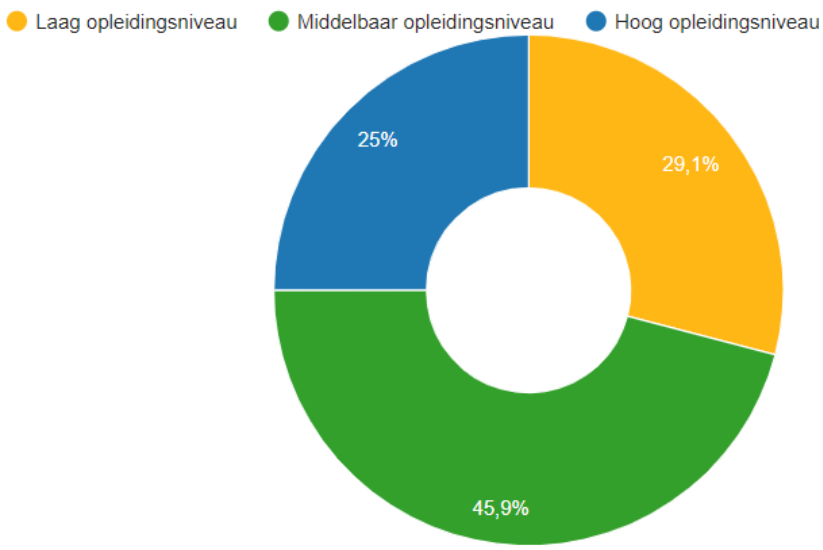
Table B 7 Information Horst aan de Maas

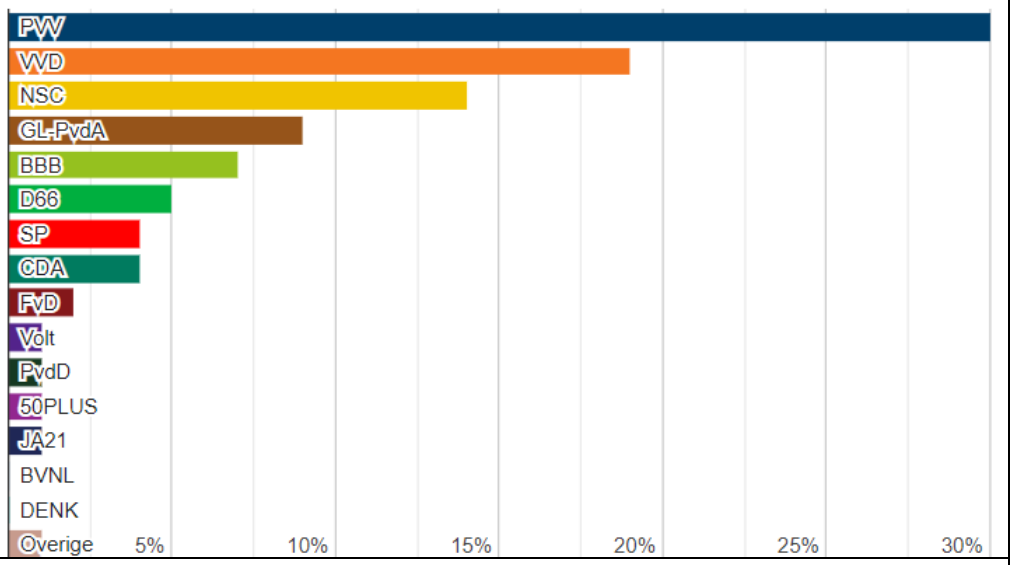
Age[27]	

Education[2] 7	
Income[27]	29.800
Political belief[27]	
Gender[28]	Male: 50.3% Female: 49.7%
Trust[27]	Average attendance rate: 58.2 %

Laarbeek

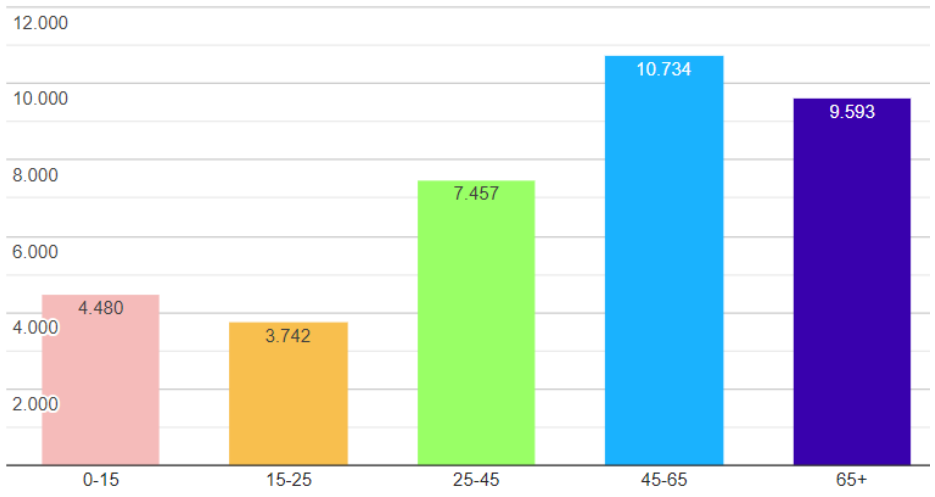
Table B 8 Information Laarbeek

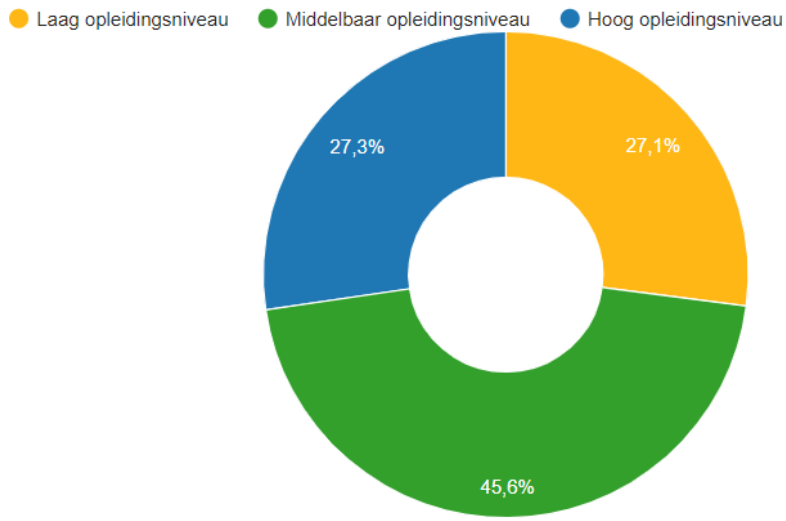
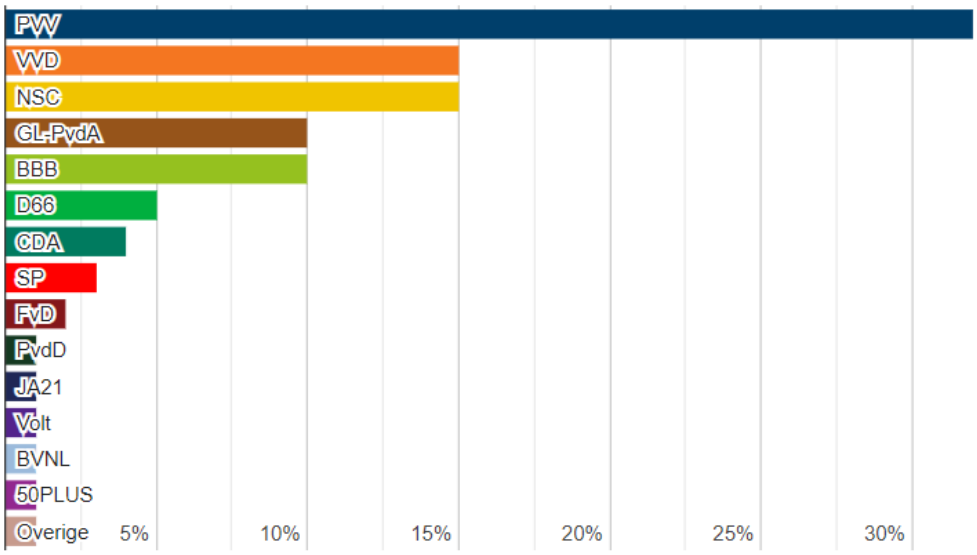
Age[27]	
Education[2] 7	
Income[27]	29.800

Political belief[27]	
Gender[28]	Male: 50.5% Female: 49.5%
Trust[27]	Average attendance rate: 56 %

Leudal

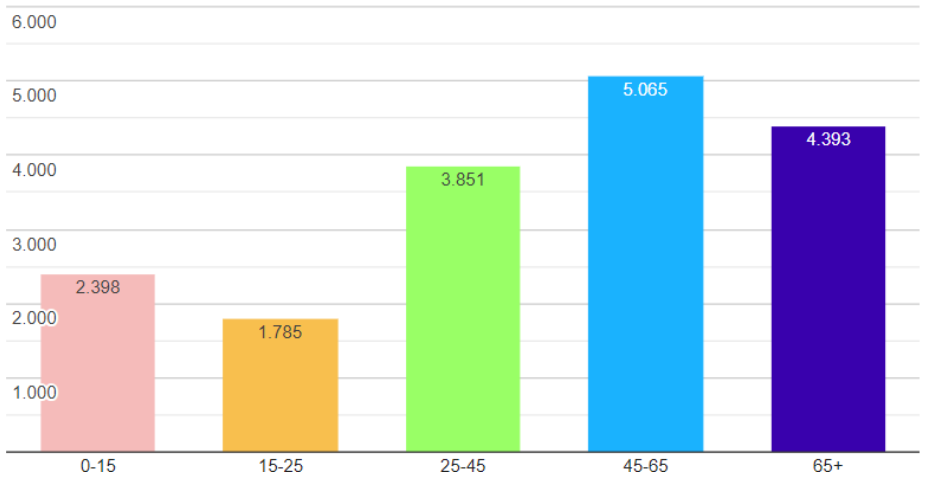
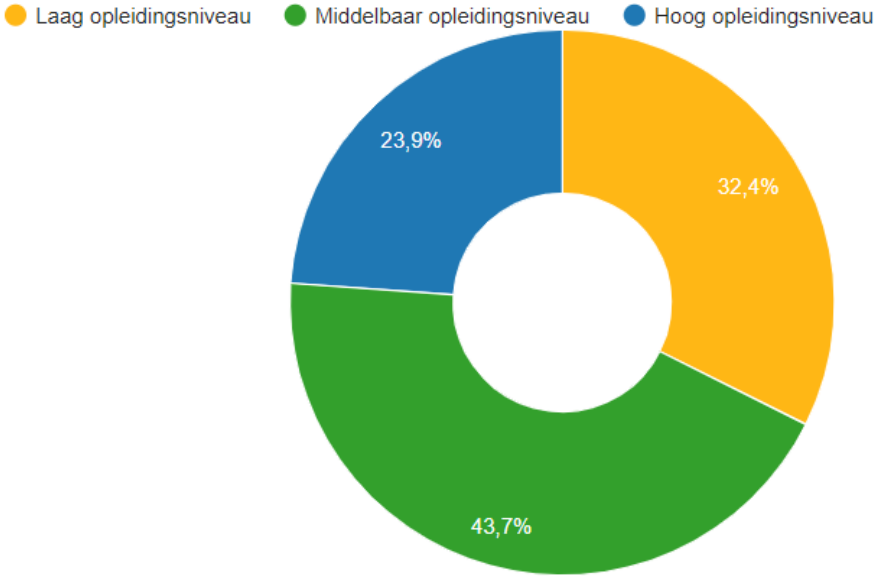
Table B 9 Information Leudal

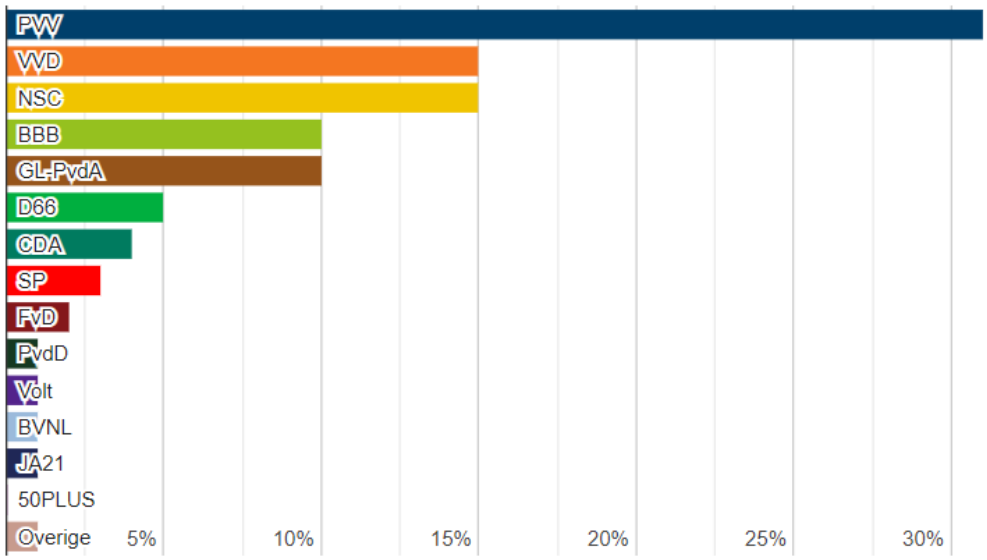
Age[27]	

Education[2] 7	
Income[27]	30.700
Political belief[27]	
Gender[28]	Male: 50.7% Female: 49.3%
Trust[27]	Average attendance rate: 56.2 %

Nederweert

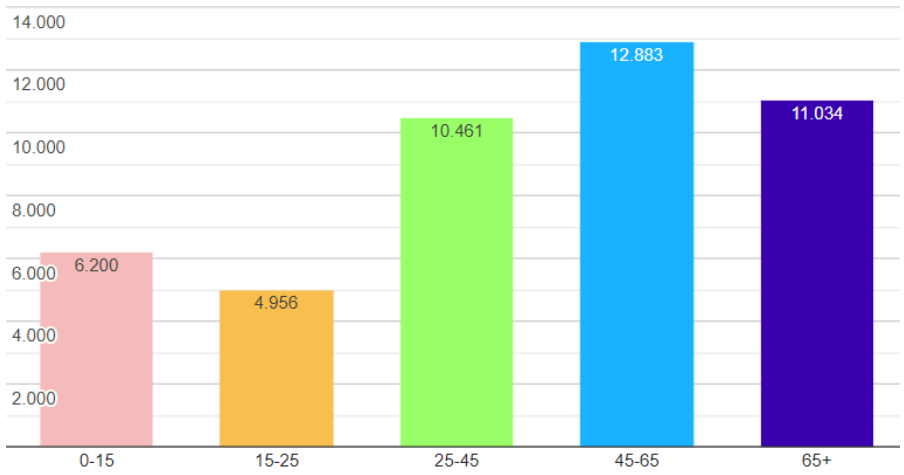
Table B 10 Information Nederweert

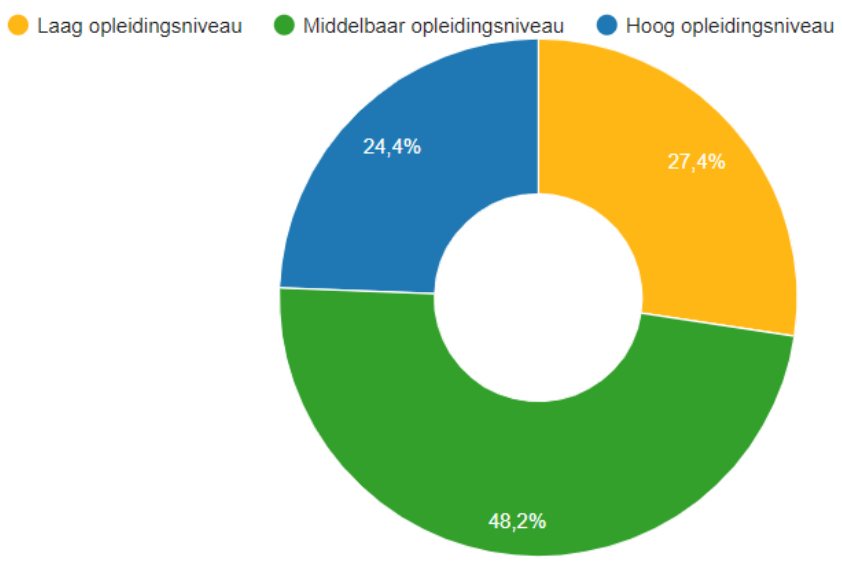
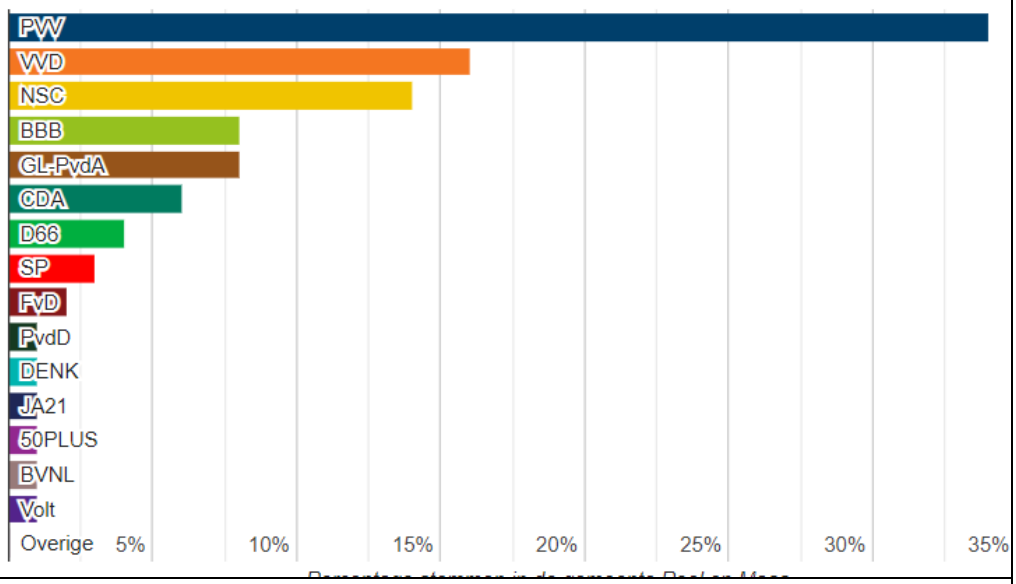
Age[27]	
Education[27]	
Income[27]	30.100

Political belief[27]	
Gender[28]	Male: 50.9% Female: 49.1%
Trust[27]	Average attendance rate: 57.84 %

Peel en Maas

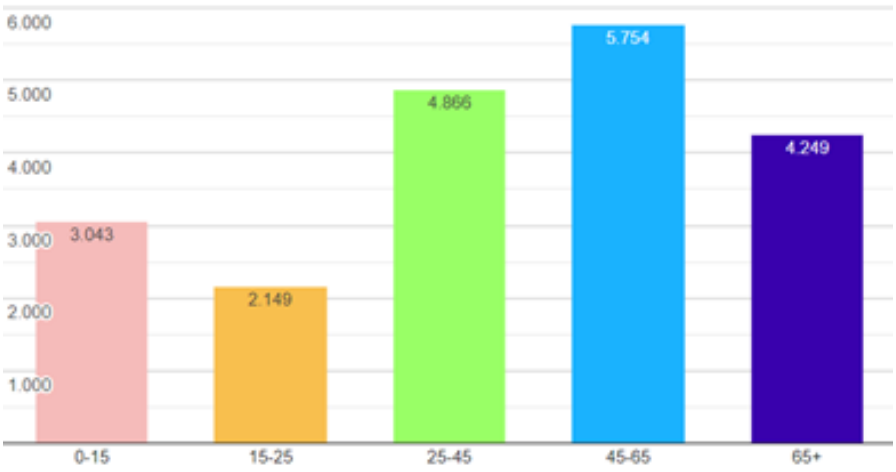
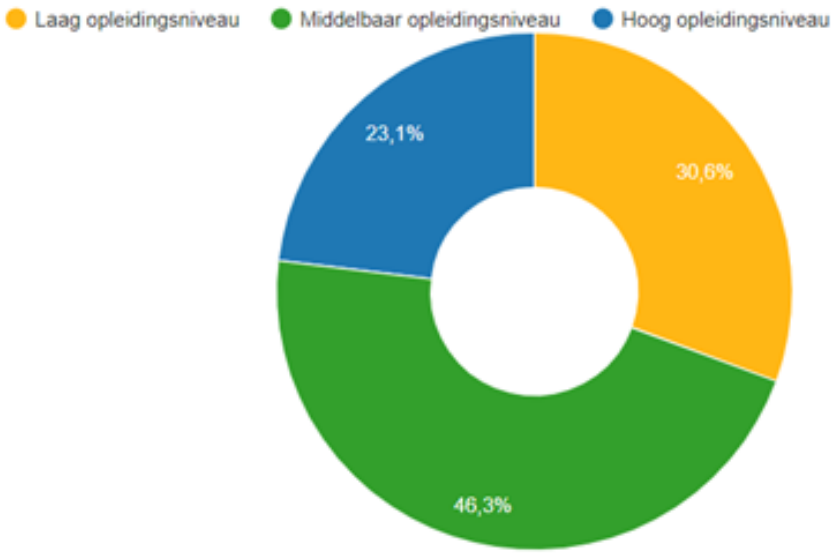
Table B 11 Information Peel en Maas

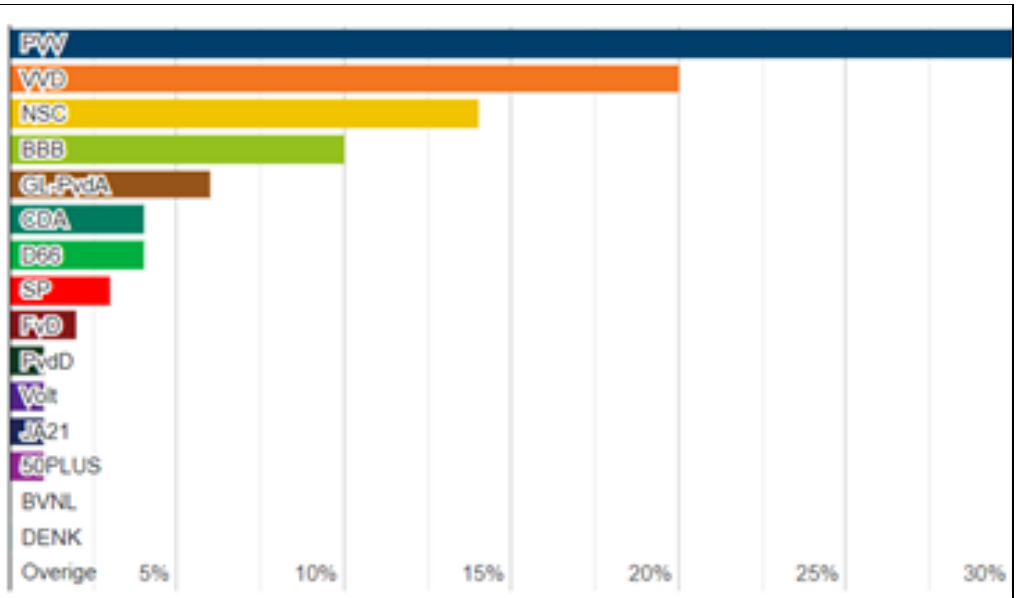
Age[27]	

Education[2] 7	
Income[27]	29.100
Political belief[27]	
Gender[28]	Male: 50.9% Female: 49.1%
Trust[27]	Average attendance rate: 55.74 %

Someren

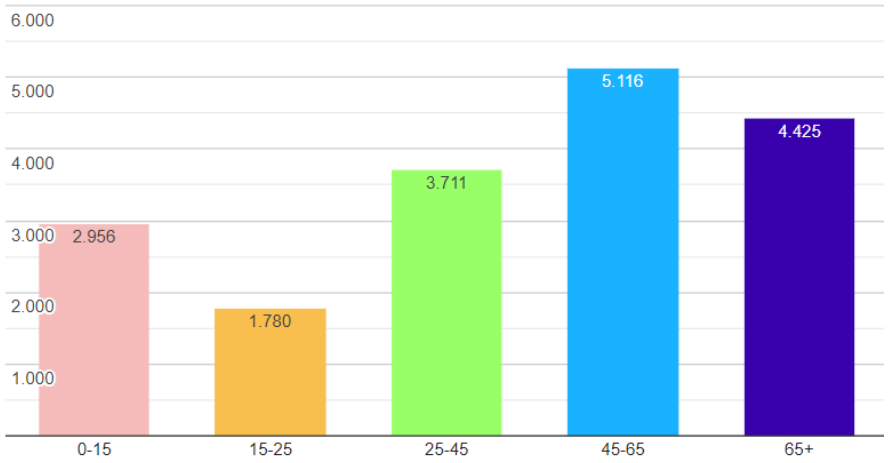
Table B 12 Information Someren

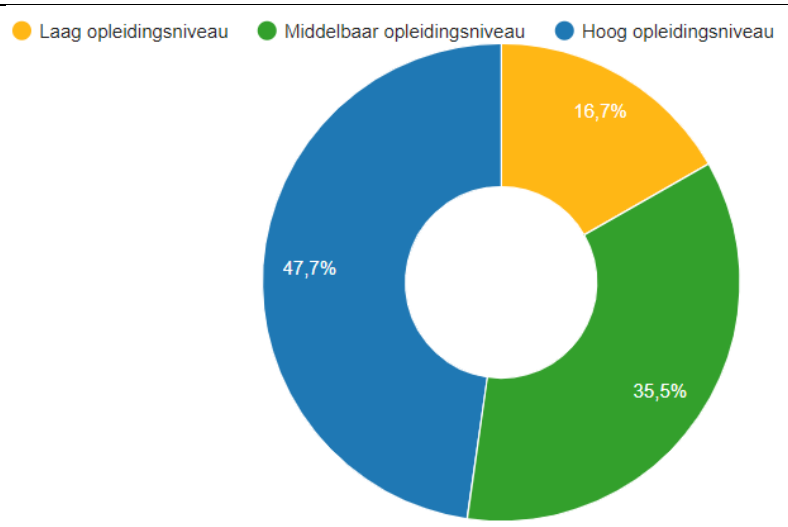
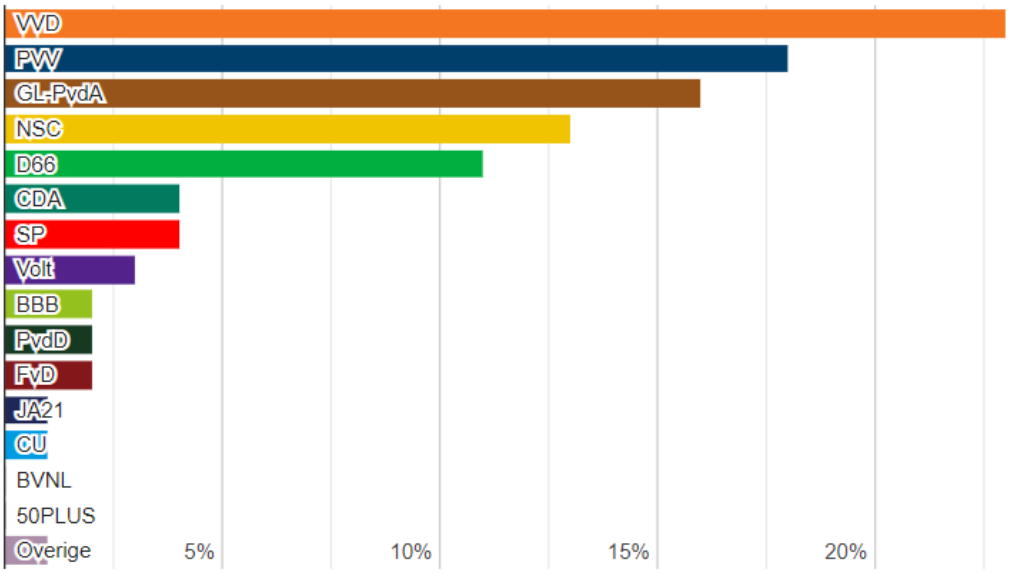
Age[27]	
Education[27]	
Income[27]	29.700

Political belief[27]	
Gender[28]	Male: 50.9% Female: 49.1%
Trust[27]	Average attendance rate: 57%

Waalre

Table B 13 Information Waalre

Age[27]	

Education [27]	
Income[27]	38.300
Political belief[27]	
Gender[28]	Male: 49.7% Female: 50.3%
Trust[27]	Average attendance rate: 62.14%

Appendix B: Comparison between municipalities cluster 11

The following appendix shows the comparison between the thirteen municipalities in cluster 11. When wanting to see how similar, for example, Asten and Beesel are, look where the column of Asten and the row of Beesel intersect. The table in that cell shows to what extent the municipalities are similar. The table within the cell should be read in the following way:

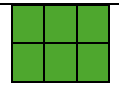
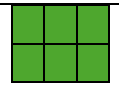
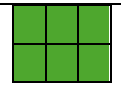
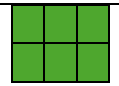
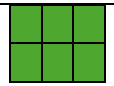
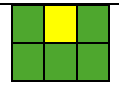
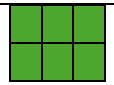
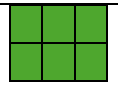
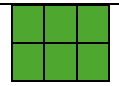
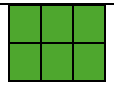
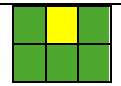
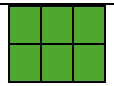
Table C 1 Readers guide for cells within Table C 2

1. Age	2. Education	3. Income
4. Political belief	5. Gender	6. Trust

The colours show the level of similarity. Green meaning very similar, yellow meaning somewhat similar, red meaning not similar.

Table C 2 Comparison between municipalities in cluster 11

Municipality	Asten	Beesel	Cranendonck	Deurne	Gemert-Bakel	Heeze-Leende	Horst aan de Maas	Laarbeek	Leudal	Nederweert	Peel en Maas	Someren	Waalre
Asten													
Beesel													
Cranendonck													
Deurne													

Municipality	Asten	Beesel	Cranendonck	Deurne	Gemert-Bakel	Heeze-Leende	Horst aan de Maas	Laarbeek	Leudal	Nederweert	Peel en Maas	Someren	Waalre
Gemert-Bakel													
Heeze-Leende													
Horst aan de Maas													
Laarbeek													
Leudal													
Nederweert													
Peel en Maas													
Someren													
Waalre													

Appendix C: English translation of contact protocol

Subject: Request for Interview on Car-Free Areas in Rural Netherlands

Dear ____,

My name is Joep Berkers, and I am a master's student in Spatial Planning at Wageningen University. Currently, I am working on my master's thesis, which focuses on public opinion regarding car-free town centres. The aim of this research is to gain insight into how formal planning regimes and the physical enforcement of car-free zones influence public opinion. To explore this, I am comparing several cases in the Netherlands that are at different stages of implementing car-free centres.

I would like to request an interview with you to hear your insights and experiences on this topic as it relates to the municipality of ____. I am hoping to schedule the interview between August 19 and October 10. The interview will take approximately one hour and can take place at a location convenient for you.

If you would like any additional information, please feel free to contact me using the details below.

Kind regards,

Joep Berkers
Wageningen University
[redacted]

Appendix D: Field visit protocol

Material checklist

- Notebook
- 2 pens
- Charged phone
- Clipboard
- A printed. large map (A3 or larger) of the centre.
- A printed version of this protocol

Preparation

- Conduct a route, based on the map of the centre.
    - Select a starting point
    - Start by walking around the perimeter of the centre, with a 50-meter buffer zone outside of the centre.
    - After walking the perimeter (and the buffer zone) go into the centre until you have visited all the streets of the centre.
- Go to the starting point

During observation

- During the observation, take photos and notes of the following things and number them (e.g. when taking a note and a picture give them the same number):
    - Any physical barriers (e.g., bollards, gates) indicating the car-free status.
    - Traffic signs indicating related to allowing/preventing traffic.
- In order to do this systematically, walk 10 meters, look around and work through the list above.

Appendix E: List of articles used for snowball sampling

The following appendix contains a list of all articles that were used for snowball sampling, divided into the five iterations. At the end of this appendix, a visual overview is present. This shows which papers have been selected from which papers.

List of selected articles

Starting set

1. Ofosu, E. K., Chambers, M. K., Chen, J. M., & Hehman, E. (2019). Same-sex marriage legalization associated with reduced implicit and explicit antigay bias. Proceedings of the National Academy of Sciences of the United States of America, 116(18), 8846–8851. https://doi.org/10.1073/pnas.1806000116
2. Kotsadam, A., & Jakobsson, N. (2011). Do laws affect attitudes? An assessment of the Norwegian prostitution law using longitudinal data. International Review of Law and Economics, 31(2), 103–115. https://doi.org/10.1016/j.irle.2011.03.001
3. Aksoy, C. G., Carpenter, C. S., De Haas, R., & Tran, K. D. (2020). Do laws shape attitudes? Evidence from same-sex relationship recognition policies in Europe. European Economic Review, 124, 103399. https://doi.org/10.1016/j.euroecorev.2020.103399

First iteration

4. Kreitzer, R. J., Hamilton, A. J., & Tolbert, C. J. (2014). Does policy adoption change opinions on minority rights? The Effects of Legalizing Same-Sex Marriage. Political Research Quarterly, 67(4), 795–808. https://doi.org/10.1177/1065912914540483
5. Kuosmanen, J. (2011). Attitudes and perceptions about legislation prohibiting the purchase of sexual services in Sweden. European Journal of Social Work, 14(2), 247–263. https://doi.org/10.1080/13691451003744341
6. Bishin, B. G., Hayes, T. J., Incantalupo, M. B., & Smith, C. A. (2016). Opinion backlash and public attitudes: Are political advances in gay rights counterproductive? American Journal of Political Science, 60(3), 625–648. https://doi.org/10.1111/ajps.12181
7. Tankard, M. E., & Paluck, E. L. (2017). The effect of a Supreme Court decision regarding gay marriage on social norms and personal attitudes. Psychological Science, 28(9), 1334–1344. https://doi.org/10.1177/0956797617709594
8. Flores, A. R., & Barclay, S. (2016). Backlash, consensus, legitimacy, or polarization. Political Research Quarterly, 69(1), 43–56. https://doi.org/10.1177/1065912915621175
9. Hoekstra, V. J. (1995). The Supreme Court and opinion change. American Politics Quarterly, 23(1), 109–129. https://doi.org/10.1177/1532673x9502300106
10. Kenny, C., & Patel, D. (2017). Norms and Reform: Legalizing Homosexuality Improves Attitudes. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3062911

11. Uslaner, E. M., & Weber, R. E. (1979). Public Support for Pro-Choice Abortion Policies in the Nation and States: Changes and Stability after the Roe and Doe Decisions. Michigan Law Review, 77(7), 1772. https://doi.org/10.2307/1288042
12. Hooghe, M., & Meeusen, C. (2013). Is Same-Sex Marriage legislation related to attitudes toward homosexuality? Sexuality Research & Social Policy/Sexuality Research and Social Policy, 10(4), 258–268. https://doi.org/10.1007/s13178-013-0125-6
13. Tankard, M. E., & Paluck, E. L. (2016). Norm perception as a vehicle for social change. Social Issues and Policy Review, 10(1), 181–211. https://doi.org/10.1111/sipr.12022
14. Yen, C., Ko, N., Huang, Y., Chen, M., Lin, I., & Lu, W. (2020). Preference about Laws for the Legal Recognition of Same-Sex Relationships in Taiwanese People Before and After Same-Sex Marriage Referenda: A Facebook Survey Study. International Journal of Environmental Research and Public Health/International Journal of Environmental Research and Public Health, 17(6), 2000. https://doi.org/10.3390/ijerph17062000
15. Yörük, B. K. (2023). Does public policy affect attitudes? Evidence from age-based health insurance coverage policies in the United States. Journal of Economic Behavior & Organization, 205, 287–302. https://doi.org/10.1016/j.jebo.2022.11.006
16. Zeev-Wolf, M., & Mentovich, A. (2021). The influence of the legislative and judicial branches on moral judgment and norm perception with the special case of judicial intervention. Regulation & Governance, 16(4), 1211–1232. https://doi.org/10.1111/rego.12404
17. Larsen, E. G. (2018). Policy feedback Effects on Mass Publics: A Quantitative review. Policy Studies Journal, 47(2), 372–394. https://doi.org/10.1111/psj.12280
18. Thompson, J. (2022). Attitudes Towards LGBT Individuals After bostock v. Clayton County: Evidence From a Quasi Experiment. Political Research Quarterly, 75(4), 1374–1385. https://doi.org/10.1177/10659129211068052
19. Deal, C. (2022). Bound by Bostock: The effect of policies on attitudes. Economics Letters, 217, 110656. https://doi.org/10.1016/j.econlet.2022.110656
20. Casoria, F., Galeotti, F., & Villeval, M. C. (2021). Perceived social norm and behavior quickly adjusted to legal changes during the COVID-19 pandemic. Journal of Economic Behavior & Organization, 190, 54–65. https://doi.org/10.1016/j.jebo.2021.07.030

Second iteration

21. Johnson, T. R., & Martin, A. D. (1998). The public's conditional response to Supreme Court decisions. the American Political Science Review, 92(2), 299–309. https://doi.org/10.2307/2585665
22. Pacheco, J. (2013). Attitudinal Policy Feedback and Public Opinion: The Impact of Smoking Bans on Attitudes towards Smokers, Secondhand Smoke, and Antismoking Policies. Public Opinion Quarterly, 77(3), 714–734. https://doi.org/10.1093/poq/nft027

23. Soss, J., & Schram, S. F. (2007). A public transformed? Welfare Reform as policy feedback. the American Political Science Review, 101(1), 111–127. https://doi.org/10.1017/s0003055407070049
24. Stoutenborough, J. W., Haider-Markel, D. P., & Allen, M. D. (2006). Reassessing the impact of Supreme Court decisions on public opinion: gay civil rights cases. Political Research Quarterly, 59(3), 419–433. https://doi.org/10.1177/106591290605900310
25. Unger, M. A. (2008). After the supreme word. American Politics Research, 36(5), 750–775. https://doi.org/10.1177/1532673x08315856
26. Franklin, C. H., & Kosaki, L. C. (1989). Republican schoolmaster: The U.S. Supreme Court, public Opinion, and abortion. the American Political Science Review, 83(3), 751–771. https://doi.org/10.2307/1962059
27. Hanley, J., Salamone, M., & Wright, M. (2011). Reviving the schoolmaster. Political Research Quarterly, 65(2), 408–421. https://doi.org/10.1177/1065912911404564
28. Hoekstra, V. J., & Segal, J. A. (1996). The shepherding of local public opinion: the Supreme Court and Lamb's Chapel. the Journal of Politics/˜the œJournal of Politics, 58(4), 1079–1102. https://doi.org/10.2307/2960150
29. Béland, D. (2010). Reconsidering policy feedback. Administration & Society, 42(5), 568–590. https://doi.org/10.1177/0095399710377444
30. Bendz, A. (2015a). Paying attention to politics: public responsiveness and welfare policy change. Policy Studies Journal, 43(3), 309–332. https://doi.org/10.1111/psj.12098
31. Bendz, A. (2015b). Empowering the People: Public Responses to welfare Policy change. Social Policy & Administration/Social Policy and Administration, 51(1), 1–19. https://doi.org/10.1111/spol.12148
32. Breznau, N. (2016). Positive returns and equilibrium: simultaneous feedback between public opinion and social policy. Policy Studies Journal, 45(4), 583–612. https://doi.org/10.1111/psj.12171
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34. Svallfors, S. (2010). Policy feedback, generational replacement, and attitudes to state intervention: Eastern and Western Germany, 1990–2006. European Political Science Review, 2(01), 119. https://doi.org/10.1017/s1755773909990257
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Third iteration

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Fourth iteration

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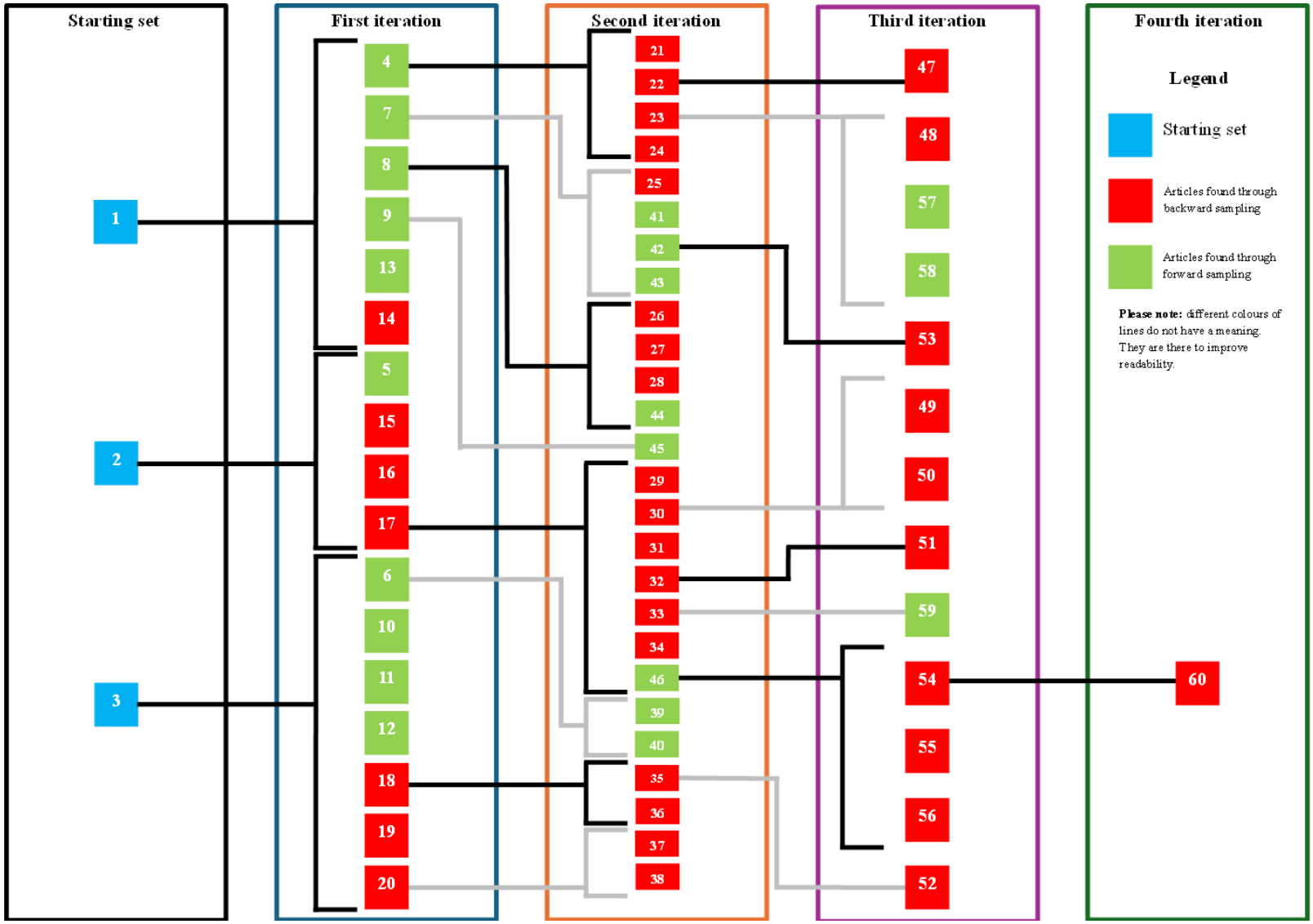
Visual overview of snowball sampling



Appendix F: Code book scientific literature

The following appendix contains the code book that were found in the articles selected for answering sub-question1, through the use of hybrid coding.

Code name	**Code is given when quotation mentions (that)…**	**Annotations**
2 institutions clash	…two institutions clash on a specific matter	1
Abortion	…abortion	1
Across all groups	…findings are not limited to specific sub-groups but are present among all groups	1
Attitude change short term	…there is evidence that attitude changes in the short term as response to a change in formal institutions	1
Backlash in sub-groups	…there is evidence that there is some form of evidence in some sub-groups	3
Backlash model	…the backlash model	27
Behaviour	…behaviour	4
Both legislative and judicial branch can have the same effect on public opinion	…both branches of formal institutions (legislative and judicial) can have the same effect on public opinion.	1
Central processing	…central processing	3
Consensus model	…the consensus model	13
Court affects public opinion	…courts affect public opinion	43
Court as credible and persuasive source	…the court is seen as a credible and persuasive source of information	2
Court as schoolmaster	…the court can function as a schoolmaster	1
Court cases as normative feedback	…verdicts in courts cause normative feedback	5
Court no influence on public opinion	…verdicts by courts do not have an effect on public opinion	14
Court not as persuasive as thought	…verdicts by courts are not as persuasive as theoretically assumed	1
Difference in institutions	…there is an observed difference in formal institutions when it comes to the	2

	effect that formal institutions have on public opinion	
Directions of change	…there are different directions of change or when there is proof of directions of change	2
Dynamic relation	…the relationship between formal institutions and public opinion is dynamic	1
Effect that laws have on perception	…laws have an effect on perception	6
Empowerment	…empowerment matters for the influence that formal institutions have on public opinion	8
Enforcement	…enforcement matters for the influence that formal institutions have on public opinion	1
Experience	…experience matters for the influence that formal institutions have on public opinion	2
Extent to favouring the court matters	…the extent to which individuals favour the court (or disfavourite) matters for the influence that formal institutions have on public opinion	1
Health Insurance Attitudes	…health insurance attitudes	1
Increase in acceptance of LGBTQI+	…there is evidence that there is an increase of the acceptance of the LGBTQI+ community	1
Information	…information matters for the influence that formal institutions have on public opinion	25
Interpretive effects	…interpretive effects	1
Interventions affect attitudes	…there is evidence that interventions affect attitudes	1
Judicial study	…the study is focussed on the judicial branch of formal institutions	1
Laws affect attitudes	…there is proof that laws affect attitudes	33
Laws can be used to change society	…laws can be used to change society	1
Laws represent norms	…laws represent norms	20
Legitimacy	…legitimacy matters for the influence that formal institutions have on public opinion	11
Legitimacy model	…the legitimacy model	30

LGBTQI+-specific finding	…the findings are specific for LGBTQI+	1
Mechanisms for policy feedback	…different mechanisms for policy feedback	9
Media	…media matters for the influence that formal institutions have on public opinion	5
Methodological flaws	…methodological flaws	8
Mixed evidence legitimacy model	…there is mixed evidence for the legitimacy model	1
Mixed evidence polarization model	…there is mixed evidence for the polarization model	1
Mixed proof if court can change attitudes	…there is mixed proof that the court can change attitudes	2
Mixed proof if laws can change attitudes	…there is mixed proof that laws can change attitudes	3
Mixed proof policy changes attitudes	…there is mixed proof that policy can change attitudes	2
Negative feedback	…negative policy feedback	5
New typologies feedback effect	…new typologies for policy feedback	5
No proof that law changes attitude	…there is no proof that laws can change attitudes	20
Norms	…norms	18
Not only the first (landmark) decision affects attitude	…not only the first decision by the court can affect attitudes	2
Only first (landmark) ruling affect public opinion	… only the first decision by the court can affect attitudes	18
Other factors influencing effect of law on attitudes	…other factors influence the effect that law has on attitudes	13
Perception	……perception matters for the influence that formal institutions have on public opinion	5
Peripheral processing	…peripheral processing	1

Persuasion	…persuasion matters for the influence that formal institutions have on public opinion	4
Polarization model	…polarization model	12
Policies have a limited effect on the public	…policies have a limited effect on attitudes	1
Policy as input	…policy can also function as input	1
Policy feedback	…policy feedback	2
Policy feedback meta-analysis	…policy feedback results in a meta-analysis	2
Political elite	…political elite	1
Politicians influence public opinion	…there is evidence that politicians can influence attitudes	1
Positive feedback	…positive feedback	3
Pre-requisites for norm change	…what the pre-requisites are for norm change	7
Presidential interventions	…presidential interventions	1
Proof in some sub-groups	…there is proof that formal institutions can change attitudes in some sub-groups	9
Proof of backlash model	…there is proof of the backlash model	13
Proof of consensus model	…there is proof of the consensus model	6
Proof of legitimacy model	…there is proof of the legitimacy model	76
Proof of polarization model	…there is proof of the polarization model	14
Proof of polarization model in sub-groups	…there is proof of the polarization model in some sub-groups	2
Proof of thermostatic model	…there is proof of the thermostatic model	9
Proximity	…proximity matters for the influence that formal institutions have on public opinion	21
Referendum	…referendum	2
Referendum affects attitudes	…referendum can affect attitudes	5

Rejection of backlash model	…there is proof that rejects the backlash model	21
Rejection of consensus	…there is proof that rejects the consensus model	1
Rejection of legitimacy model	…there is proof that rejects the legitimacy model	2
Rejection of polarization model	…there is proof that rejects the polarization model	2
Relationship between public opinion and attitude, not specified which direction	…there is a relation between formal institutions and attitudes, but it is uncertain in which direction this relationship works	2
Resource effects	…resource effects	4
Salience	…salience matters for the influence that formal institutions have on public opinion	5
Self-interest	…self-interest	1
Small effect	…the effect is small	1
Spurious relations	…spurious relations	1
Sub-groups	…sub-groups	24
Tangibility	…tangibility matters for the influence that formal institutions have on public opinion	5
Theoretical idea why backlash would not occur	…why the backlash model would not occur according to theoretical assumptions	2
Theoretical idea why backlash would occur	…why the backlash model would occur according to theoretical assumptions	2
Thermostatic model	…thermostatic model	16
Time frame	…time frame	17
Trust in politicians no effect on attitude change	…trust in politicians has no effect on change in attitudes	2
Visibility	…visibility matters for the influence that formal institutions have on public opinion	10
Total		702

Appendix G: Themes, code groups and codes scientific literature

The following appendix contains the themes, the code groups belonging to those themes and the codes belonging to the code group and themes. The codes are the same as the codes that have been found in *Appendix F: Code book* .

Theme	**Code group**	**Code**
Introduction	Introduction	Dynamic relation
		Increase in acceptance of LGBTQI+
		Policy as input
		Policy feedback
		Relationship between public opinion and attitude, not specified in which direction
Can policy affect public opinion?	Can policy affect public opinion	Attitude change short term
		Court affects public opinion
		Court as schoolmaster
		Court no influence on public opinion
		Effect that laws have on perception
		Increase in acceptance of LGBTQI+
		Interventions affect attitudes
		Laws affect attitudes
		Laws can be used to change society
		Mixed evidence legitimacy model
		Mixed evidence polarization model
		Mixed proof if court can change attitudes
		Mixed proof if laws can change attitudes
		Mixed proof policy changes attitudes
		Negative feedback
		No proof that law changes attitude
		Policies have a limited effect on the public
		Politicians influence public opinion
		Proof in some sub-groups

		Proof of backlash model
		Proof of consensus model
		Proof of legitimacy model
		Proof of polarization model Proof of polarization model in sub-groups
		Proof of thermostatic model
		Referendum affects attitudes
		Rejection of consensus model
		Rejection of legitimacy model
		Rejection of polarization model
		Relationship between public opinion and attitude, not specified which direction

Do different formal institutions affect public opinion differently?	Different institutions	Both legislative and judicial branch can have the same effect on public opinion
		Court affects public opinion
		Court as credible and persuasive source
		Court as schoolmaster
		Court cases as normative feedback
		Court no influence on public opinion
		Court not as persuasive as thought
		Difference in institutions
		Effect that laws have on perception
		Extent to favouring the court matters
		Interventions affect attitudes
		Judicial study
		Laws affect attitudes
		Laws can be used to change society
		Legitimacy
		Mixed proof if court can change attitudes
		Mixed proof if laws can change attitudes
		Mixed proof policy changes attitudes
		No proof that law changes attitude
		Not only the first (landmark) decision affects attitude
		Only first (landmark) ruling affect public opinion
		Policies have a limited effect on the public
		Political elite
		Presidential interventions
		Referendum
What are the mechanisms behind opinion change?	Mechanisms behind opinion change	Mechanisms for policy feedback
	Educating	Court as schoolmaster
		Information
	Legitimizing	Legitimacy
	First landmark decision	Central processing

		Not only the first (landmark) decision affects attitude
		Only first (landmark) ruling affect public opinion
		Peripheral processing
	Normative feedback	Court cases as normative feedback
		Enforcement
		Laws represent norms
		Norms
		Pre-requisites for norm change
What influences this change in public opinion?	Visibility	Interpretive effects
		Salience
		Visibility
	Information	Information
	Media	Media
	Proximity	Proximity
	Tangibility	Tangibility
	Experience and empowerment	Experience
		Empowerment
	Sub-groups	Backlash in sub-groups
		Proof in some sub-groups
		Proof of polarization model in sub-groups
		Sub-groups
	Persuasion	Persuasion
	Credibility	Court as credible and persuasive source
		Trust in politicians no effect on attitude change
	Legitimacy of institutions	Legitimacy
	Other factors	Other factors influencing effect of law on attitudes
		Self-interest
In what direction do formal institutions change public opinion?	Directions of change	Directions of change
	Legitimacy model	Legitimacy model
		Mixed evidence legitimacy model
		Positive feedback
		Proof of legitimacy model
		Rejection of legitimacy model
	Backlash model	Backlash model
		Negative feedback
		Proof of backlash model
		Rejection of backlash model

		Theoretical idea why backlash would not occur
		Theoretical idea why backlash would occur
	Consensus model	Consensus model
		Proof of consensus model
		Rejection of consensus model
	Polarization model	Mixed evidence polarization model
		Polarization model
		Proof of polarization model
		Proof of polarization model in sub-groups
		Rejection of polarization model
	Thermostatic model	Proof of thermostatic model
		Thermostatic model
	General overview and new typologies	New typologies feedback effect
		Policy feedback meta-analysis
Limitations	Methodological limitations	Both legislative and judical branch can have the same effect on public opinion
		LGBTQI+-specific finding
		Methodological flaws
	Behaviour	Behaviour
	Perception	Effect that laws have on perception
		Perception
	Time frame	Attitude change short term
		Time frame
	Spurious relations	Spurious relations

Appendix H: List of selected governmental documents

The following appendix contains the selected governmental documents that have been collected for the cases of Asten and Deurne, including the database/search query in which these documents have been found.

Asten

Database: Omgevingswet

Gemeente Asten. (2018). Asten Verzamelplan 2018-2: Regels. In Asten.Bestuurlijkeinformatie (NL.IMRO.0743.BP02018001-VS01). Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/6575a027-ce07-42ec-add8-5a7da6abc199?documentId=c1bc748f-8265-45a8-9ed8-47e89b7091ef&agendaItemId=6de4f891-d261-4303-8370-1e1800642fd6

Gemeente Asten. (2019a). Asten Verzamelplan 2019-1 (herstelbesluit): Toelichting. In Asten.Bestuurlijkeinformatie (NL.IMRO.0743.BP02019001-VS02). Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/a61406fd-d7ee-4f70-ad4a-e2cbe068098a?documentId=f2211aa9-cdd3-44b5-91d1-bd64c7a4e6de&agendaItemId=f98ae8ef-e635-4804-8fc4-7539bf0ce7de

Gemeente Asten. (2019b). Asten Verzamelplan 2019-2: Toelichting. In Asten.Bestuurlijkeinformatie (NL.IMRO.0743.BP02019003-VO01). Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/94516519-52d9-42c0-9e49-2c369926fb35?documentId=31808f42-3f09-49d1-88e5-6bfca403ba17&agendaItemId=fcc5ffa5-2e06-4884-851f-f2c4673ccd0d

Gemeente Asten. (2024a, January 2). Omgevingsplan gemeente Asten. Lokaleregelgeving.Overheid. Retrieved August 29, 2024, from https://lokaleregelgeving.overheid.nl/CVDR696388/2

Gemeente Asten & Tonnaer. (2012). Bestemmingsplan Asten Centrumgebied Gemeente Asten: Toelichting (202080R.2003). Retrieved August 21, 2024, from https://www.asten.nl/fileadmin/Asten/PDF-formulieren_producten/Bestemmingsplannen_bijlagen/Geldende_plannen/Asten_centrumgebied/Regels_bp_Asten_centrumgebied_vastgesteld02.pdf

Dtabase: Municipal site

Autovrij

None

Autoluw

Gemeente Asten. (2019c). Tekeningen behorende bij Informatie Avond Autoluw Centrum. In Asten.Bestuurlijkeinformatie (OT-TV-RK DO.22). Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/94516519-52d9-42c0-9e49-

2c369926fb35?documentId=82b919e2-2968-4a1e-8428-40dff5576a58&agendaItemId=f1e47d5d-cb4f-4c11-b4b6-8c7c4cad90e5

Moors, W., & Maas, I. (2019, April 10). Advies ondernemers Baboba en Huyslyk over autoluw centrum. Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/94516519-52d9-42c0-9e49-2c369926fb35?documentId=9c7870f9-e8d4-4da4-af63-58bb6f200bae&agendaItemId=f1e47d5d-cb4f-4c11-b4b6-8c7c4cad90e5

VAC Adviescommissie Wonen Asten-Someren. (2019a). Advies Stichting VAC Asten-Someren. In Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/94516519-52d9-42c0-9e49-2c369926fb35?documentId=212df23f-0993-4a4d-91d0-84fff3c0dcc0&agendaItemId=f1e47d5d-cb4f-4c11-b4b6-8c7c4cad90e5

VAC Adviescommissie Wonen Asten-Someren. (2019b). Advies Stichting VAC Asten-Someren. In Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/94516519-52d9-42c0-9e49-2c369926fb35?documentId=6acb752f-3859-415e-abc1-b5b70b362c56&agendaItemId=f1e47d5d-cb4f-4c11-b4b6-8c7c4cad90e5

Centrum

Gemeente Asten. (n.d.). Centrumvisie Asten 2023. Retrieved August 21, 2024, from https://www.asten.nl/bouwen-en-verbouwen/projecten-en-weg-werkzaamheden/centrumvisie-asten-2023

Gemeente Asten. (2023, December 11). 20231111 uitnodiging informatieavond Centrumprogramma. Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/c849fb11-1b06-4d2b-a737-8fa07500aa88?documentId=558065e8-ba83-4650-86b6-8e8799e77539

Gemeente Asten. (2024b). Plan van aanpak opstellen beeldkwaliteitsplan centrum Astem. In Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/f2d1c97f-838f-4be5-a328-ecea25c9e653?documentId=ae017a0e-2d8d-4c48-9ee2-cdb4487c1fb2&agendaItemId=cc607c53-2c15-4026-a3d7-65e0921f67e8

Gemeente Asten. (2024c). Raadsvoorstel: Bij zaaknummer 2024007853. In Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/f2d1c97f-838f-4be5-a328-ecea25c9e653?documentId=65b35262-baa4-4e60-8e6f-5420f833bfbe&agendaItemId=cc607c53-2c15-4026-a3d7-65e0921f67e8

Moors, W. (2019, April 4). Uitnodiging informatie avond autoluw centrum 11 april 2019. Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/743f7d94-351a-4392-aff3-

4f4c10f73d72?documentId=6b75414e-1c29-48bd-99ce-87acfb2e5e19&agendaItemId=f3ab55b4-6747-4ec4-be91-c8447685a620

Stad & Co. (2023). Deel 1: De klok gelijk zetten: Analyse centrum Asten. In Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/7e94ba87-e292-4a11-92e1-5e887c962302?documentId=b7095a90-34d3-4633-9553-c970fab0e6f0&agendaItemId=fa5a73b8-5cb5-4e46-82c7-9831506fa4fa

Van den Boomen, M. (2019, January 11). Advies VVN Asten inzake informatie avond autoluw centrum van 11 april 2019. Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/94516519-52d9-42c0-9e49-2c369926fb35?documentId=ec779b2c-4bcf-4ab8-a9de-ebc9ff905c5d&agendaItemId=f1e47d5d-cb4f-4c11-b4b6-8c7c4cad90e5

Van der Velden, F. (2019, April 11). Notities dhr. van der Velden over een autovrij - autoluw centrum nav informatie avond op 11 april 2019. Asten.Bestuurlijkeinformatie. Retrieved August 29, 2024, from https://asten.bestuurlijkeinformatie.nl/Agenda/Document/94516519-52d9-42c0-9e49-2c369926fb35?documentId=43255f97-70b6-489f-a8e4-da120c224ffa&agendaItemId=f1e47d5d-cb4f-4c11-b4b6-8c7c4cad90e5

Additional documents

Gemeente Asten. (2007). Gemeente Asten: centrumvisie. In Asten. Retrieved August 29, 2024, from https://www.asten.nl/fileadmin/Asten/PDF-formulieren_producten/Beleid/Economische_zaken_en_toerisme/Centrumvisie_gemeente_Asten.pdf

Gemeente Asten. (2017). Asten 2030. In Asten. Retrieved August 29, 2024, from https://www.asten.nl/fileadmin/Asten/PDF-formulieren_producten/Wonen/20170629_Toekomstagenda_Asten2030_definitief.pdf

Louwers, B. (2015). GVVP Asten: Verkeersvisie. In Asten. Retrieved August 29, 2024, from https://www.asten.nl/fileadmin/Asten/PDF-formulieren_producten/Beleid/Verkeer__vervoer_en_openbare_ruimte/GVVP/GVVP_Verkeersvisie.pdf

Deurne

Database: Omgevingswet

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Database Municipal site

Autovrij

None

Autoluw

None

Centrum

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Appendix I: Code book governmental documents

The following appendix contains the code book that followed from the coding of the governmental documents that have been selected in *Appendix H: List of selected governmental documents*.

Code	Code is given when quotation mentions (that)…	Annotations
Asten		
Spatial intervention		
Accessibility centre Asten	… the accessibility of the centre of Asten	1
Discouraging cars Asten	… the discouragement of cars in the centre of Asten	1
Discouraging parking Asten	… the discouragement of parking in the centre of Asten	6
Flower boxes Markt Asten	… the placement of flower boxen on Markt	1
One way street Julianastraat Asten	… the Julianastraat has to be transformed into a one-way street	2
Parking Asten	… parking facilities in the centre of Asten	4
Placemaking Asten	… placemaking pilot in Asten	3
Posts Eeuwig Leven-plein Asten	… street posts that are/have to be placed on Eeuwig Leven Plein	1
Posts Koningsplein Asten	… street posts that are/have to be placed on Koningsplein	1
Redevelopment Koningsplein Asten	… the redevelopment of Koningsplein	1
Window time Asten	… window times are discussed in Asten	1
Spatial intervention stage/year		
Placemaking Asten year	… the year when the placemaking pilot started in the centre of Asten	1
Deurne		
Spatial intervention		
Ban freight traffic Deurne	… the ban on freight traffic in the centre of Deurne	1
Beltway Deurne	… the beltway surrounding the centre of Deurne	1
‘Blauwe zone’ Deurne	… the ‘blauwe zone’ in the centre of Deurne	1
Cycle parking Deurne	… the parking of bicycles in the centre of Deurne	3
Paid parking Deurne	… paid parking in the centre of Deurne	3
Parking Deurne	… parking in the centre of Deurne	3
Pedestrian area Deurne	… the pedestrian area in the centre of Deurne	1
Spatial intervention stage/year		
Ban freight traffic Deurne Year	… the year the ban on freight traffic in the centre of Deurne started	1
Paid parking Deurne Year	… the year the paid parking in the centre of Deurne started	1
Pedestrian area Deurne Year	… the year the pedestrian area in the centre of Deurne started	1

Appendix J: Fact sheets

The following appendix contains the fact sheets where more information about each individual spatial intervention is available. For each intervention, information is present in the fact sheets for the year of implementation, the definition, the points of view no the planning interventions based on the interviews, the material dependency based on the field visits, and the classification, the following list shows which planning interventions are discussed in the fact sheets and where they can be found.

Asten

Deurne

Please note that this are the completed fact sheet, it might be that the main text refers to this appendix for a specific part (e.g. the explanation of the meaning of spatial interventions, the opinion of the interviewees on the specific spatial interventions). As a result, it could be that

there is more information available in these fact sheets than what has been discussed in the main text until that point. Furthermore, it could be that some spatial interventions have been adapted/added due to new information (e.g. new information following from the interviews or observations). All photographs within this appendix are made by the author.

Asten

Planning intervention

Free parking (‘blauwe zone’)

Year of implementation

1996 (Gemeente Asten, 2001)

Definition of planning intervention

In the centre of Asten, parking is free for a maximum of two hours, or a maximum of 30 minutes (Louwers, 2015), communicated by the use of the colour blue. In the Netherlands such a policy is referred to as a ‘blauwe zone’ (literally translated as blue zone).

Points of view on planning intervention

Both interviewees have a similar view on the ‘blauwe zone’ and see it as something positive. They mention that this helps lower the parking pressure.

"Yes, well, the blue zone functions. We certainly want to maintain that and probably make it smaller, as I just mentioned……So we want to expand the blue zone there, while on the side of the park we actually want to make it a bit smaller to better align with the needs we have. Parking pressure research from Krachten has also shown that the parking pressure is at 65%. Well, that means that you have plenty of parking spaces available, so we also have room to remove parking spaces in the centre and shift everything."[29]

"Yes, we think it's good that this exists in Asten. Um, also to reduce parking pressure, um, and also to encourage people who park longer to park a bit further away. Then, yes, we just think that's good, and, um, we have no further opinion on it."[30]

Both interviewees do also mention that they want to remove some parking spaces within the blue zone and replace these parking spaces with other facilities such as greenery or pedestrian area.

"It is currently still a blue zone, and we are actually going to remove parking spaces, so where you have three parking spaces in front of the Baron and the Compagnon, that’s where everyone always parks. There are always six cars parked there. Hey, that parking space below the building here in front of baker Koolen, we are also really going to remove that gradually over time. And in this way, we will slowly let people get used to the new situation, and not just remove them to push people away."[31]

[29] Snippet from interview Asten 1
[30] Snippet from interview Asten 2
[31] Snippet from interview Asten 1

"I think we still want to have parking along the streets, um, but to a lesser extent, so to speak. So not that you have parking spaces all along the road, um, but that if there are 10, for example, you keep 3 of them. And then you can fill the rest with greenery. Um, it does depend a bit on the street and whether it's a residential street or if there are shops and things like that."[32]

Additionally, the interviewees highlighted that they would prefer that the parking spaces that would remain would mostly be parking spaces reserved for people with health conditions or impairment.

"...we have way too few disabled parking spaces in the centre. Well, if you want to remove a parking space here, then make that parking space for someone with a disabled parking permit, because then people with limited mobility can still get close to the market, which enhances accessibility to the centre for those people instead of reducing it."[33]

"...so, specifically for people with disabilities. Um, in the end, we recently discussed it in the council—I can't remember exactly when or in what context—but we talked about it, and it turned out there are actually quite a few disabled parking spaces, and they're fairly well distributed throughout Asten. So, there's not necessarily a big issue. But it's still something to consider because, um, there are also people who have difficulty walking but aren't officially classified as disabled. Yeah, they might have a better chance of parking here if they're visiting the community centre, while those who are more mobile could park in the parking garage."[34]

Lastly, one interviewee said that they were thinking about a possibility to decrease the blue zone since not all of the zone was used.

"We do have the idea that we want to reduce the blue zone. Because on the edges, like in the Logtenstraat and Tuinstraat, near the Shell station, that area is part of the blue zone. No one ever parks there, and that basically means that the blue zone there, um, yeah, prevents the parking spots from being used. So, we're considering making the blue zone smaller to allow those spots to be used for long-term parking, which would take pressure off the other long-term parking areas. So, we do want to make it smaller..."[35]

[32] Snippet from interview Asten 2
[33] Snippet from interview Asten 1
[34] Snippet from interview Asten 2
[35] Snippet from interview Asten 1

Material dependency

Observations

Sign start or end parking zone

In the centre of Asten, the parking zone (‘blauwe zone’) is communicated through the use of traffic signs highlighting the start or end of the parking zone, as can be seen in the pictures below.







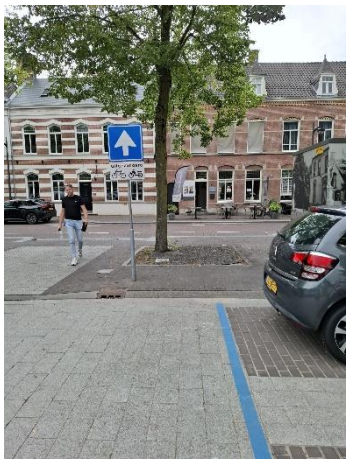

ZONE
max 2h

uitgezonderd



Parking space with blue linage

Besides the signage, the parking zone (‘blauwe zone’) is also communicated through the use of a blue line in the parking spaces on the side of the street, as shown in the pictures below.



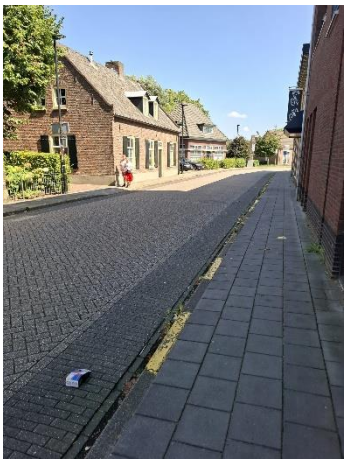


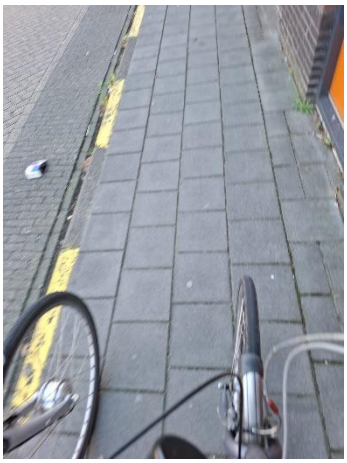

Blue line on road

Another way in which the parking zone (‘blauwe zone’) is communicated is through a blue line that is painted on the road. This can be observed in the pictures below.

Yellow line

In a few places in the centre of Asten, the end of the parking zone (‘blauwe zone’) is communicated through the use of a yellow line on the sidewalk , as shown in the pictures below.





Blue bumper

Lastly, the parking zone (‘blauwe zone’) is at one place communicated by the use of a blue bumper, as seen in the picture below.

Classification

Table K 1 Classification free parking ('blauwe zone')

	Enabling	Disabling
Spatial planning interventions	Free parking (‘blauwe zone’)	
Non-spatial planning intervention		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it allows short term visitors of the centre to park their car and enter the centre on foot.

Planning intervention

One-way traffic

Year of implementation

Unknown

Definition of planning intervention

Multiple streets around the centre have been made so that traffic can only drive in one direction (Staatscourant, 2020).

Points of view on planning intervention

The interviewees look positively at the one-way streets that are currently present in the centre. Additionally, they want to transform more streets into one-way streets since it can be used to reduce traffic and improve the liveability and safety of the centre. They want to achieve this by placing traffic signs and reducing the width of the streets. Furthermore, this frees up space for greenery, separate bike lanes, and pedestrian area. The interviewees do, however, make the notion that you need to think carefully about which streets to transform since they want the centre to remain accessible by car.

"Well, one-way streets—if you want to keep people in the centre—do help create a calmer traffic situation. And we noticed during the traffic trial that by making it car-light, um, there's a chance that some streets could become busier, like the Julianastraat, from Lisse here to the town hall. So, we're leaning towards making some of the narrower streets one-way, to create more space for pedestrians and cyclists, without affecting accessibility. With one-way streets, it's still accessible, but just, yeah, more regulated. We think that can help with accessibility. Especially in older streets, you're dealing with a fixed layout. I mean, it's not a new development where you can widen the road anymore, so we're also reasoning that a normal two-way street is 4.5 meters wide, but with one-way traffic, you can work with a narrower layout, so you actually gain space for greenery, cyclists, and pedestrians. So, it improves the, um, quality of the street."[36]

"So, as far as we're concerned, the surrounding streets can be made car-light, and that can be done by, um, making certain streets one-way. We're even considering, um, for example, the Burgemeester Wijnenstraat and Koningsplein—that street, which is actually part of the ring road—making it one-way, narrowing it down, and planting trees."[37]

"Um, yes, we think it's a good solution to reduce parking and traffic pressure. However, there should be a look at how much detouring is required from the other side. Um, and where you're detouring to, for example, near the Prins Bernhardstraat, um, and I notice it myself, when I, um, go the opposite direction, I end up going through the Bloemenwijk. Yeah, is that

[36] Snippet from interview Asten 1
[37] Snippet from interview Asten 2

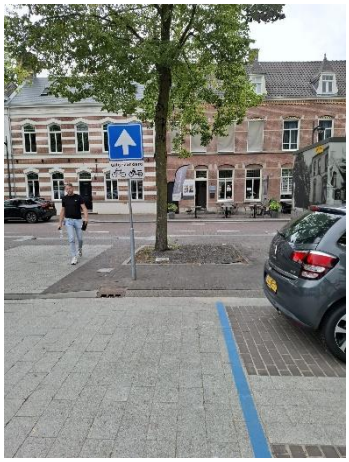
something you want? Um, and I understand, it's not really a big issue because, yeah, the road capacity can handle it, and, um, yeah, I've never really experienced any problems from it. But you could ask whether that's the kind of 'waterbed effect' you want. Um, that needs to be carefully considered, but one-way streets, like I said, we'd even like to add another one at Wijnenstraat/Koningsplein, so you can narrow the road and create a bit more calm in the area, um, and also, um, well, make Koningsplein and Wijnenstraat feel more like part of the centre."[38]

Material dependency

Observations

Sign no entry or one way only

In the centre of Asten, signs communicate when a street is a one-way street. For this, three different types of signs are used: (1) one sign on the side of the street where cars can access the one-way street, (2) on the other side of the street, a sign shows that it is forbidden to enter the street for that side, and (3) the last sign is used in situations when traffic is only allowed to turn one specific way. This is all shown in the pictures below.



[38] Snippet from interview Asten 2


Julianastraat


uitgezonderd


uitgezonderd


uitgezonderd


uitgezonderd


uitgezonderd

Classification

Table K 2 Classification one-way traffic

	Enabling	Disabling
Spatial planning interventions	One-way traffic	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it reduces traffic movements and makes it more difficult for cars to enter the centre.

Planning intervention

Parking facilities around the centre

Year of implementation

2010 (Siris, 2010)

Definition of planning intervention

Big parking facilities are present around the borders of the centre (Louwers, 2015; Siris, 2010)

Points of view on planning intervention

Both interviewees are happy with the fact that there are parking facilities surrounding the centre. They highlight their importance since a lot of people in Asten are dependent on a car. Due to this car dependence, the parking facilities allow for the centre to be or become (more) car-sheltered.

"Yes. Yes. Um, look, you, you see, um, we realize that Asten is a core in a rural area where car ownership is high……But the resident of Asten is simply dependent on the car. Now, if you have a car, you're going to use it. So, if you want that resident of Asten who goes to the centre to be able to park the car in a good way, then you need to provide parking on the outskirts of the centre, and we have enough parking spaces. So, that allows you to make the market area more car-free because there's a good alternative. Without an alternative, you can't do anything."[39]

"Yes, yes, um, yes, it's good that they're there. Um, I also think, for the supermarkets for example, that it's important that there is parking available and that you can comfortably get from the supermarket to your car, especially for the daily or larger groceries."[40]

"The biggest destinations are supermarkets. Um, that was also evident in all the parking studies, and at the PLUS and Lidl, it's really busy with cars. And at the Albert Heijn, to a lesser extent the ALDI, but they all have good parking spaces. They're also located exactly on those edges. What we're saying is a car-free centre with parking on the outskirts. Well, we have really good parking lots on those edges."[41]

One interviewee said that they wanted to increase the parking facilities on the edge of the centre by expanding the underground parking area which is now private property and only accessible for residents of the allocated residential area.

"But we, [redacted], think that if we have the option for a parking garage or the possibility to participate in that, it would be a really good idea. But it just costs a lot of money. That's just

[39] Snippet from interview Asten 1
[40] Snippet from interview Asten 2
[41] Snippet from interview Asten 1

the way it is, it costs money. But we think that if we can make that choice for the next 100 years, then we should go for it."[42]

Material dependency

Observations

Parking facilities around the centre

Around the centre of Asten, parking facilities are provided where people can park their car. This is often for short term parking (no longer than two hours) and is in most cases in combination with a blue zone. The observations are shown in the pictures below.

[42] Snippet from interview Asten 2





BERKVENS

P-ZONE
ALDI



Classification

Table K 3 Classification parking facilities around the centre

	Enabling	Disabling
Spatial planning interventions	Parking facilities around the centre	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it allows short- and long-term visitors of the centre to park their car and enter the centre on foot.

Planning intervention

Pilot placemaking

Year of implementation

2023 (Gemeente Asten, n.d.)

Definition of planning intervention

As a test, a pilot took place in Asten to experiment with different interventions. This included greenery, playgrounds, but also car-reducing interventions. These interventions were temporary to see how people would react to them (Gemeente Asten, n.d.).

Points of view on planning intervention

At the time of the interviews, the politicians and government officials were still waiting on the results of the pilot. Therefore, the interviewees did not really have an opinion. They were happy that an experiment was conducted but they also had the idea that not everyone followed the new rules and would still drive their car on a street that was supposed to be made car-free. Furthermore, one interviewee said that they learnt from the proof that they should not use barriers since people did not accept this.

"Yes, yes, yes, a conclusion has been drawn. That's indeed true. Um, we tested the car-free market, and they made the pilot slightly larger than what we think, um, than we think is necessary because we find the car-free market important. Um, they also included the side streets. I've heard from various directions, including myself, that the pilot was not really properly maintained. So, there were indeed people driving over the market, and we haven't received any results from the research yet. Or we've only had very minimal results. Um, so we are wondering as [redacted] *what it has actually yielded. Um, and we haven't really seen any results from that. Then, at a subsequent thematic meeting, we walked around the centre a few months ago, and the officials already said, yes, we are going to make it a car-free centre. And I thought, wait a minute, hahaha, we made a different decision."*[43]

"I learned that in the trial as well. We had traffic signs with a half barrier on the street. There were barriers that were pulled up all day because people were happy there was a ban, and there were signs that were harshly pulled off the street again by others who wanted to go through."[44]

[43] Snippet from interview Asten 2
[44] Snippet from interview Asten 1

Material dependency

Observations

Temporary signs

During the pilot placemaking, the municipality of Asten placed multiple temporary signs communicating that a few roads were closes or turned into one-way streets. The observations are shown in the pictures below.

Classification

Table K 4 Classification pilot placemaking

	Enabling	Disabling
Spatial planning interventions	Pilot placemaking	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space during the duration of the pilot, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it bans cars from entering the centre.

Planning intervention

Placement of flower boxes on the market

Year of implementation

2017 (Van Horik, 2017)

Definition of planning intervention

To enforce the ban driving movements from Prins Bernhardstraat to the Markt, flower boxes were places to make it impossible for cars to use this route (van der Velden, 2019).

Points of view on planning intervention

The interviewees are happy with the flower boxes since they prevent (most) cars from driving on the square which is usually busy with people and terraces.

"Well, they always do that, so if you didn't have those objects there—and by the way, those are the spots where we think we might want to put a planter—if you didn't have those objects, then everyone would just park their car wherever there is a space."[45]

However, one interviewee mentioned that they would prefer to remove all obstacles, but they understood that these flowerboxes may be necessary.

"Yes, yes, look, in principle we agree that all the things that are there to serve as obstacles are okay. And our dream image, haha, is to just have a flat surface, but, yes, that just doesn't work with the amount of traffic, roads, cars, cyclists, and pedestrians that you have."[46]

Material dependency

Observations

Flower boxes

As a barrier between the Markt and Marktstraat, flower boxes are placed to. This is shown in the picture below.

[45] Snippet from interview Asten 1
[46] Snippet from interview Asten 2

Classification

Table K 5 Classification placement of flower boxes on the market

	Enabling	Disabling
Spatial planning interventions	Placement of flower boxes on the market	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it bans cars driving over the square.

Planning intervention

Redevelopment of Koningsplein

Year of implementation

2020 (Staatscourant, 2020)

Definition of planning intervention

Koningsplein will only be accessible through one access point and can only be exited through one exit point (Staatscourant, 2020)

Points of view on planning intervention

The interviewees are not really happy with the redevelopment of Koningsplein but for two different reasons. One interviewee argued that Koningsplein should keep the function of parking area, but they said that the current lay-out does not work but were unsure how to change it.

"Um, that's one that is still not being followed properly, right. Ultimately, that came about when we first had the exit of the parking lot by the church and the entrance where the ATM is now. Then we turned that around. Technically, you can access it from both sides, right? Practically, you can just go out; that happens too. However, um, especially by the church, you have the Wilhelminastraat that comes out onto that ring road. There's also the speed bump where the Monseigneur Den Dubbeldenstraat actually comes out. You see that it's, um, already very unclear. And if people also come off the parking lot there, yes, then you have so many places to look at, it just becomes really unsafe for traffic. Um, still, we are now critically looking at the Koningsplein again, asking if you shouldn't just completely close off that exit so that you only have two-way traffic at the sides by the ATM. That's still a struggle we have. What's actually good? Because you see that people are still ignoring the rules, so, um, um, something is still not right, right? Because if the intended way you explained with signs were super logical, then everyone would just follow it. The fact that people don't means it's something unnatural."[47]

The other interviewee wanted to change Koningsplein to its former function as a public garden.

"Um, yes, we want to turn that into a green space. Just like it used to be, actually. It was very green, hahaha. Yes, and we think that this is a place where a lot of people in Asten, that's where we shape our image of Asten, that place. This is the Market and the Koningsplein; everyone comes through there at least once a year. The chances are slim that if you live in a suburb, you've never been to the centre of Asten. These are the places where we actually establish our branding. And we think it's important that it has a good appearance. And, yes,

[47] Snippet from interview Asten 1

we find it unfortunate that it is currently used as a parking lot, and we just believe it should be turned into a green space."[48]

Material dependency

Observations

One way traffic signs

The redevelopment of Koningsplein is communicated through the use of one-way traffic signs. There are two types of traffic signs used here. One sign is to show the direction of driving, the other one is to communicate that it is forbidden to enter Koningsplein from that side. This can both be seen in the pictures below.

[48] Snippet from interview Asten 2

Classification

Table K 6 Classification redevelopment of Koningsplein

	Enabling	Disabling
Spatial planning interventions	Redevelopment of Koningsplein	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it aims to improve the traffic situation on the parking place and therefore makes it easier for individuals to park their car and enter the centre on foot.

Planning intervention

Street posts Eeuwig Leven-plein

Year of implementation

2012 (Gemeente Asten & Tonnaer, 2012)

Definition of planning intervention

Street posts will be placed on Eeuwig Leven-plein to ensure that the centre is not directly accessible from the north (Gemeente Asten & Tonnaer, 2012).

Points of view on planning intervention

The interviewees have a similar opinion on the posts on Eeuwig Leven-plein. They would prefer the posts to be removed. However, it is also mentioned that this is 'just' their ideal and that in this case the posts are crucial.

"The posts, the post on the Eeuwig Leven-plein, the Eeuwig Leven-plein has a very strange layout because that post is exactly in the middle. That is really the only movable post we have, right? We can do something about that later. That post is only there for the delivery of Midas, specifically Albert Heijn. That post only goes down for trucks passing by. Actually, our idea is to make the Eeuwig Leven-plein completely car-free. And I just mentioned that there are actually more than enough parking spaces in the Logtenstraat to compensate for that. The idea of that Eeuwig Leven-plein is actually that you want to create terrace space there. There are two pubs there with a nice terrace, right? De Grutter and Pesos, Mykonos has a somewhat smaller terrace, but Toff actually has hardly any terrace. There's also a tent next to it. What is that thing called again? Sphinx Pyramid? Well, you know what I mean, right?"[49]

Yes, yes, look, basically we think it's fine, all, all things that are there to, um, serve as obstacles is okay. And our dream vision, haha, is to just have a flat surface, but, yeah, that, that just doesn't work with the, the amount of traffic, roads, cars, cyclists, pedestrians that you have.[50]

Material dependency

Observations

Street posts

To prevent cars from entering the centre from the north, street posts are placed. One of these posts is movable and can be used to still allow traffic to enter the centre from the north. All of this can be observed in the pictures below.

[49] Snippet from interview Asten 1
[50] Snippet from interview Asten 2

Classification

Table K 7 Classification street posts Eeuwig Leven-Plein

	Enabling	Disabling
Spatial planning interventions	Street posts Eeuwig Leven-Plein	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it prevents cars from entering the centre from the north.

Planning intervention

Street posts Koningsplein

Year of implementation

2020 (Staatscourant, 2020)

Definition of planning intervention

Street posts will be placed between Koningsplein and Julianastraat to make it impossible for cars to take this route (Staatscourant, 2020)

Points of view on planning intervention

The interviewees have a similar opinion on the posts on Koningsplein. They would prefer the posts to be removed. However, it is also mentioned that this is their ideal and that in this case the posts are crucial, especially in combination with the one-way street located next to Koningsplein.

“Yes. Well, let's deal with them separately. Well, the bollards at the Koningsplein, those, those, they are also part of that change at the Marktstraat. We have now said in the traffic trial that, hey, maybe if we don’t want traffic to drive to the Markt, so, you know, parking next to it, right? If those bollards are there, then you force people, right? You physically can't do anything else. Yeah, unless you're going to turn around in the street, but if you want to leave without turning around and you’re standing here in front of Kolen and think, "damn, the parking spaces are full," then you can't physically do anything else. Whereas if you remove the bollards there and you think, "hey, Julianastraat, oh, those parking spaces are full, I’ll drive onto the Koningsplein, then I can leave right away." So those bollards could actually be removed, um, at the moment you’re going to do something. But we have also noticed in the traffic trial that if those two directions were to open up, it would get too busy again in the Julianastraat. So those bollards are very much tied to the one-way system of the Julianastraat.”[51]

"Look, we would prefer that they are not there, um, but yes, you need to direct traffic somewhat because otherwise the centre will just be full. Ehm, and, um, it also becomes unsafe, and you actually want less traffic. Well, with a car-free market and a car-reduced centre, it could be that you no longer need those posts. But then you have to think it through well. Ehm, yes, so preferably not, but if it’s necessary, then, then, but it has to be reasoned."[52]

[51] Snippet from interview Asten 1
[52] Snippet from interview Asten 2

Material dependency

Observations

Street posts

To prevent cars from entering the Julianastraat from Koningsplein, street posts are placed. These posts are shown in the picture below.

Classification

Table K 8 Classification street posts Koningsplein

	Enabling	Disabling
Spatial planning interventions	Street posts Koningsplein	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it prevents cars from entering the centre from the parking space.

Formal institution

Window time

Year of implementation

Not (yet) implemented

Definition of planning intervention

Part of the centre would only be open a few hours of the day and closed the rest of the day.

Points of view on planning intervention

One interviewee was positive regarding window time. They argued that this was crucial for stores to be restocked.

Um, window times—yes, we're fine with them; it makes sense. Look, um, yeah, you need to load and unload. Sometimes there isn't a pedestrian in sight, like in winter, for example. So, in those cases, we're fine with having set times for that. It just needs to serve its purpose, so to speak. You could even take it a step further—you might say there's nothing happening in the winter, so no pedestrians, but actually, you could go the other way and create events in the centre to bring people in. So, yeah, we're fine with window times. Um, if you make the Markt car-free, we're fine with loading and unloading allowed at certain times. Also, if an area becomes car-free, we're okay with that too. No problem.[53]

The other interviewee was negative regarding window time. They argued that it was impossible for a small municipality such as Asten to demand trucks to restock the stores during morning hours. Therefore, they did not see any benefit for introducing window times. Additionally, they had concerns how that would be controlled.

No, no, yes, we've thought about that too. But you notice that it's the large cities that have the power, right? When they have window times, they can negotiate them. Take a city like Eindhoven—they can just say on the Demer, you know, you can only come before 11 a.m. But ultimately, a retail chain like HEMA, um, that supplier is going to say, "Look, I have specific window times in Eindhoven and Helmond, so Asten should just be glad I show up at all." A town like Asten simply doesn't have the leverage to enforce those times, right? And that's true for other retail chains as well, right? For example, Kruidvat or others—if they have specific times in Eindhoven, that's when those trucks are there, and towns like Asten or Deurne just fall in line afterward. So, we don't feel like we have much negotiating power.[54]

[53] Snippet from interview Asten 2
[54] Snippet from interview Asten 1

Material dependency

Observations

No observations have been made.

Classification

Table K 9 Classification window time

	Enabling	Disabling
Spatial planning interventions		
Non-spatial planning interventions	Window time	

This planning intervention is non-spatial since it has not been observed in space. Furthermore, it is between enabling and disabling a (more) car-free centre. By introducing window times, the centre will be accessible some hours or days but inaccessible other hours or days.

Planning intervention

Beltway around centre

Year of implementation

Unknown

Definition of planning intervention

The beltway is the road surrounding the centre that vehicles can use to drive around the centre, instead of driving right through the centre.

Points of view on formal institution

The point of view regarding the beltway are not too different. The interviewees think that the south side of the beltway, which facilitates a bus route, should stay in its current state. For the other side of the beltway, changes are possible to for example remove the speed of traffic or to make it a one-way street. However, this does not have high priority.

"Um, you know, we've made intersections and turns to make them a bit logical. Um, um, well, then you can already see what a monstrosity it is……Um, so a picture is slowly forming in my mind that I think, yeah, that northern centre ring can be a bit quieter for my liking. Whereas the southern ring, where the bus is, really needs to be set up for smooth traffic flow at all times."

Um, no, that's not the idea at all; the idea is to make it a 30 km/h zone. And if you're going to do that, you really need to adjust the layout accordingly. At least, that's how it usually works in the Netherlands, or well, that's how legislation works. So, yeah, if you make it a 30 zone and you adapt the layout to that, then it usually won't be uniform anymore because you might end up placing flower boxes or speed bumps, or whatever. But it can still be uniform in dimensions and such; I don't mean to say it has to be perfect with red bricks or a specific width for the bike path. For instance, the bike path runs all the way around the ring road, that's the idea. But actually, people don't cycle around the ring; they go straight through. And that was also a discussion at the Logtenstraat; we wanted Prins Bernhardstraat to be a bike street, where cyclists could cross directly and have priority over the ring road. But that wasn't allowed, hahaha, because it doesn't fit in the traffic circulation plan. But I do think that's the safest solution because people coming from Ommel to Asten aren't going to turn right or left at the Grutter; they're going straight through. And I find it important that they are facilitated, especially if you turn it into a 30 km/h zone.[55]

Um, no, no, we would basically say that the entire ring road as it is now, except for Wijnenstraat and Koningsplein, is, for now, okay. If you want to create more interaction in the centre and also make it less of an obstacle, then you will still need to adjust the road. However, I think we have other priorities to address before they go and adjust the ring road

[55] Snippet from interview Asten 2

again. Because, yeah, that costs millions of euros. For example, I think we should focus on Koningsplein, the Markt, Wilhelminastraat, and, well, we also want to realize some basic facilities, like schools, a sports hall, and helping associations. In terms of prioritization, I think that adjusting the ring road is not priority number one.[56]

Material dependency

Observations

Parking route

On the beltway, signs are used to show where cars need to go to park, as can be seen in the pictures below.

Signs priority traffic

Traffic on the beltway has priority over the traffic coming from the other streets. This is communicated with the use of signs. Such a sign can be seen in the picture below.

[56] Snippet from interview Asten 2

Give way road marking

Traffic on the beltway has priority over the traffic coming from the other streets. This is communicated with the use of road markings. This is shown in the pictures below.

Difference in elevation

Traffic on the beltway has priority over the traffic coming from the other streets, this is communicated through the difference in elevation

Pedestrian crossing (road marking and signs)

In order to allow pedestrians to safely cross the beltway, pedestrian crossings are implemented all along the beltway. These pedestrian crossings are communicated through road markings and signs. All of this can be observed in the pictures below.

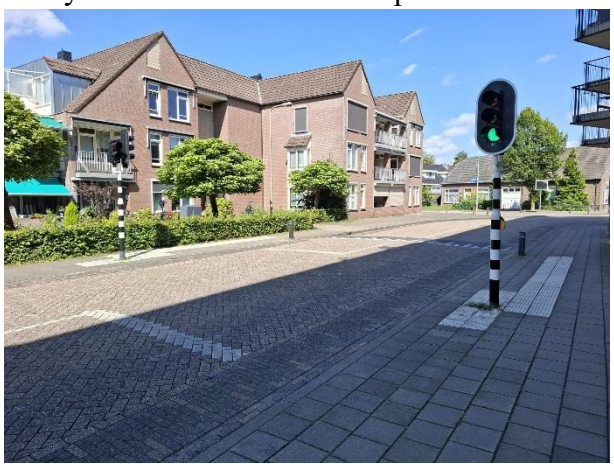







Traffic lights

Near the nursing home, a traffic light is installed to allow elderly people to cross the beltway safely. This can be seen in the picture below.



Speed bump

On a part of the beltway that has recently been redeveloped, a speed bump is installed to force drivers to adhere to the speed limit of 30 kilometres per hour. This can be observed in the picture below.

Classification

Table K 10 Classification beltway

	Enabling	Disabling
Spatial planning interventions	Beltway	
Non-spatial planning interventions		

This formal institution is a spatial intervention since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it takes cars around the centre and makes sure that they do not have to go through the centre.

Other observations

There are some observations that could not be linked to the planning interventions found in the governmental documents, those have been placed here.

Other street posts

Besides the posts mentioned earlier (the posts on Koningsplein and Eeuwig Leven-plein), there are also other street posts in the centre of Asten. These are shown below

Speed bump not on beltway-road

One of the speed bumps that has been observed in the centre of Asten was placed outside of the beltway. This speed bump is shown in the picture below.

Pedestrian crossing not on beltway-road (road marking and sign)

Some of the pedestrian crossings were not placed on the beltway road. These pedestrian crossings are communicated through the use of signs and road markings and are shown in the pictures below.

Sign load/unload

Near the Albert Heijn, a parking space is reserved for loading and unloading of freight traffic. This is communicated with the use of a sign as can be seen below.

Sign ban on freight traffic

In some parts of the centre of Asten, freight traffic is banned. This is communicated through the use of signs as shown below.

Deurne

Planning intervention

Ban on freight traffic in centre

Year of implementation

2019 (Broers, 2019)

Definition of planning intervention

Freight traffic is not allowed to enter the centre of Deurne (Verheijen, 2019).

Points of view on planning intervention

Both interviewees agreed that freight traffic should be banned in the centre. One interviewee mentioned that they felt that the ban did not have a lot of effect since they had the idea that freight traffic would not drive through the centre, with or without a ban.

"Yes, that is indeed, um, that, um, we need to get rid of. They don't come here very much anyway. But that also applies to, um, for example, the Heuvel, where there is a lot of traffic. You need to remove truck traffic from the centre; I am convinced of that. That should be eliminated entirely."[57]

"Look, trucks won't drive past the church here if they don't have to be here. So, I think that can indeed be a ban, but in practice, it will have very little effect because trucks will normally choose the easiest route and won't navigate through a village centre if they don't have to."[58]

One interviewee mentioned that a ban on freight traffic is good but that shops have to be supplied with freight traffic, so that some regulation that allows this needs to be in place. They added that they were not completely sure if such a regulation was already in place.

"Yes, yes, yes. You don't see much traffic here anymore, and, um, I don't know exactly how it works, by the way, because stores need to be supplied. So that is, of course, important, but that should perhaps be done within a certain time frame. Yes, all of that is still to be worked out, um, because I actually don't know how it's currently arranged in the centre, since I don't handle the centre myself entirely. But, yes, then you just need to regulate it, and then see that there needs to be a truck there. Look, Deurne is not so big that you can say that smaller trucks should operate in Deurne; Deurne is too small for that. But it shouldn't be the case that we see a large truck combination driving through Deurne at two o'clock in the afternoon, just happening to need to stop at the store. Then I say, okay, you do that in the morning, before ten o'clock, or in that manner, to supply the stores. I would really advocate for that—regulating

[57] Snippet from interview Deurne 1
[58] Snippet from interview Deurne 2

the incoming and outgoing deliveries and setting it in certain time zones, and that should happen. But the store does need to be supplied."[59]

Such a regulation is in fact already in place and shops can be supplied in the morning or evening following the window times.

Material dependency

Observations

Signs

The ban on freight traffic is communicated with signs, as shown in the picture below.

Classification

Table K 11 Classification ban on freight traffic in centre

	Enabling	Disabling
Spatial planning interventions	Ban on freight traffic in centre	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it bans freight traffic from entering the centre.

[59] Snippet from interview Deurne 1

Planning intervention

Beltway around centre

Year of implementation

2015 (Gemeente Deurne, 2015)

Definition of planning intervention

The roads surrounding the centre are designed to attract traffic to use this beltway instead of driving through the centre (Gemeente Deurne, 2015).

Points of view on planning intervention

The interviewees are happy with the beltway around the centre, they highlight that this beltway is important to keep the centre accessible by cars and it allows cars to park close to the centre.

"You could leave what is currently there as it is, because it does need to be accessible for people, but you should change the road structure."[60]

"No, I just said, um, in principle, you have that pretty well organized. There are only a few pain points. In many places, um, for example, the housing at Houtenhoek is quite far from the ring road, so the access street Toon Kortoom from Liessel has the houses set back a bit, and they are also not facing, um, um, that busy street. And even if you take the Europalaan, yes, the houses are facing the road, but they are all set back a bit, which means that, um, there is generally not too much nuisance from that ring road. Um, yes, it is necessary to, as I said, get from one neighbourhood to another. From the Zeilberg, you can drive along the railway, but from the Heiakker, yes, then you quickly have to rely on that centre ring to reach another part of Deurne."[61]

There are some bottlenecks in this beltway but solving them does not have a high priority and the beltway is necessary for the residents of Deurne.

"Yes, so it's not very strong to say that it needs to be completely overhauled now. I think there are bigger problems in Deurne that you should address first. But when you start thinking about that, we would prefer it to be one-way traffic rather than trying to avoid wrong turns out of Deurne. And that has to do with the fact that it's a bit of a regional centre. Look, people from Helenaveen are reliant on the car to get to Deurne. And that is also the municipality of Deurne, so, um, making it completely car-free and, um, yes, driving cars out of the city seems to us not a practical route, especially for a rural municipality. Public transport is very limited. So, you're reliant on the car, and that's not going to change overnight."[62]

[60] Snippet from interview Deurne 1
[61] Snippet from interview Deurne 2
[62] Snippet from interview Deurne 2

Material dependency

Observations

Crossings

In order to allow pedestrians and cyclists to safely cross the beltway, crossings are implemented all along the beltway. These crossings are communicated through road markings and signs. All of this can be observed in the pictures below.






Difference in elevation

Traffic on the beltway has priority over the traffic coming from the other streets, this is communicated through the difference in elevation.

Give way road marking

Traffic on the beltway has priority over the traffic coming from the other streets. This is communicated with the use of road markings. This is shown in the pictures below.

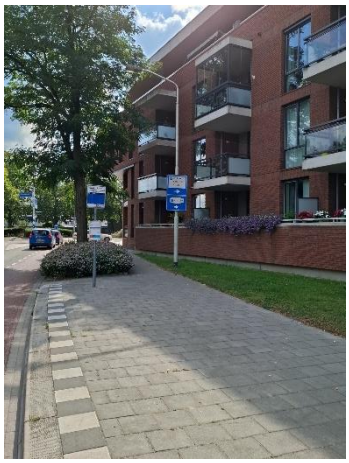
Parking route

On the beltway, signs are used to show where cars need to go to park, as can be seen in the pictures below.





P route


P route

P route

Signs priority road

Traffic on the beltway has priority over the traffic coming from the other streets. This is communicated with the use of signs. Such a sign can be seen in the picture below.

Traffic lights

To ensure a good flow of traffic and to prevent collisions, on three busy places on the beltway traffic lights have been installed. This can be seen in the pictures below.



Classification

Table K 12 Classification beltway around centre

	Enabling	Disabling
Spatial	Beltway around centre	
Non-spatial		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it leads around the centre and gives traffic an option not to travel through the centre.

Planning intervention

Cycle parking

Year of implementation

Not (yet) implemented

Definition of planning intervention

There were some plans to provide cyclists the opportunity to park their bicycles in a protected cycle parking facility (CDA Deurne, 2021). However, after research regarding the need for a protected cycle parking facility, it was decided that there was no need and this formal institution was not implemented (Gemeente Deurne, 2023).

Points of view on planning intervention

The interviewees were both of the opinion that a secured cycle parking was, at the moment, not something that they were in favour for, they were more neutral but did not really see the benefits.

"This is indeed a very relevant question, because a lot has already been discussed about this. Motions have been submitted to potentially create bike parking spaces here. Because when you come here on a Friday or Saturday, or during the Wednesday evening events in the summer, the place is packed with bikes. However, Deurne has still indicated that we are not yet at the point where we have a secured bike parking facility in the centre of Deurne. This is still not applicable in Deurne, because the council continues to say no. When [redacted] *it,* [redacted] *that it is simply too early to set something like that up completely. And the council has never seen an amendment or motion stating that, well, the municipality of Deurne, we want a majority of the council to support a large, secured bike parking facility in Deurne. That is not currently the case. That is a fact, as it has been brought up several times, but there has never been a majority formed to organize a large bike parking facility here."*[63]

"No, not completely meeting the need. Look, if I create a bike parking facility at the Wolfsberg and I need to be at the town hall or I want to go to church or I want to go to the retirement home, then I have no use for a bike parking facility that is located at the Wolfsberg, because I come by bike to park as close as possible to my destination. The question is to what extent does such a bike parking facility sufficiently solve the problem?"[64]

Material dependency

Observations

N/A

[63] Snippet from interview Deurne 1
[64] Snippet from interview Deurne 2

Classification

Table K 13 Classification secured cycle parking

	Enabling	Disabling
Spatial planning interventions		
Non-spatial planning interventions	Secured cycle parking	

This planning intervention is spatial since it cannot be observed in space. It would enable a (more) car-free centre since it would give a greater incentive for people to come by bike to the centre.

Planning intervention

Free parking (‘blauwe zone’)

Year of implementation

2024 (Boudewijns, 2023)

Definition of planning intervention

Cars can park on the parking facilities in Deurne centrum for free since 1 January 2024 (Boudewijns, 2023). Before this, parking was free only in the mornings, Sundays, and holidays (Gemeente Deurne, 2017). Small parts of the centre (i.e. the ‘blue zone’) require the driver to put a parking disk in front of the windshield, in the most parts of the centre cars can park for free (Gemeente Deurne, n.d.).

Points of view on planning intervention

Both of the interviewees had the opinion that free parking created problems in the centre of Deurne, with the comment that this was still being analysed and that their view was only based on their own observations.

"But I believe that, starting from January 1, we have abolished parking fees. We are waiting for an evaluation on that, which is not available yet. The concern is that working people in the centre will now park their cars as quickly as possible, preferably right in front of the door. I’m not sure if that is happening, but people are afraid that it will, and this will be investigated. We will see what the situation looks like, as this is particularly a concern for those who need to work all day in Deurne, as they may park in front of the stores, leaving no space for customers who want to shop. That’s the fear, and I don’t think it’s entirely unfounded. In my opinion, we need to regulate parking. Because if we don’t regulate it, then people will just park their cars anywhere. I’m not sure if that should be through paid parking, but the evaluation will reveal that."[65]

"Well yes, you see, the big problem is that you now have many spots that are just occupied all day. So, employees from the stores or employees from the municipality come to Deurne in the morning around 8 or 9 o'clock and park their cars, effectively taking up a whole..."[66]

Both interviewees were of the opinion that parking should be regulated. However, in which way this should be regulated differed between interviewees. One of the interviewees said that they thought that paid parking was the best solution, and that they did not think that a blue zone would work.

[65] Snippet from interview Deurne 1
[66] Snippet from interview Deurne 2

"Oh, regarding paid parking, you see that there are now calls for a blue zone to prevent people from parking all day somewhere. And then you will still get people who park for, say, 2 or 3 hours, which includes those who work in the stores. They say, 'We'll just feed the meter for a bit, so I can comfortably stay all day.' So, in that respect, we didn't find paid parking to be the worst solution."[67]

The other interviewee thought that both paid parking and the blue zone could work but that it should be made easy for users.

"Um, that's a very relevant question, and that's perhaps also what I just mentioned. Look, around the station, there is free parking; at the station, parking is free. That also attracts travellers, right? Our station is busy. We have a very busy station. We have free parking. But around it, we've set up all blue zones. That is effective; it works because people who take the train in the morning don't park in a blue zone where you can only park for two or three hours. And I recently saw some photos, and that's actually, um, that's actually the best way to see it. You are familiar with the Deurne station, right?"[68]

"But a form of manageability must be organized. And that is the important thing and whether it is free or paid, that doesn't make, I think, not much difference aside from the money it costs. But, and, and, and, and, um, um, but you need to do something with, with, yes, that people with cars, because, yes, we want to have people in Deurne. Well, then you need to make it easy. And there is, I think, the big clue. How can you make it easy for the, the, the, the, the, the shopping public and those who come to do their shopping?"[69]

Material dependency

Observations

'Blauwe zone' line on ground

One way in which the parking zone ('blauwe zone') is communicated is through a blue line that is painted on the road. This can be observed in the pictures below.

[67] Snippet from interview Deurne 2
[68] Snippet from interview Deurne 1
[69] Snippet from interview Deurne 1

“Blauw zone” sign

In the centre of Deurne, the parking zone (‘blauwe zone’) is communicated through the use of traffic signs highlighting the start or end of the parking zone, as can be seen in the pictures below

Free parking sign

On the parking spaces without indication of a ‘blauwe zone’, parking is free. Which is the case in the majority of the centre. This is communicated by signs on the parking meters as can be seen in the pictures below.

Classification

Table K 14 Classification free parking ('blauwe zone')

	Enabling	Disabling
Spatial planning interventions	Free parking (‘blauwe zone’)	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it allows cars to be parked on the edge of the centre, and the users can enter the centre by foot.

Planning intervention

Parking facilities around the centre

Year of implementation

Unknown

Definition of planning intervention

Bigger parking facilities are placed surrounding the centre (Gemeente Deurne, 2015, 2022).

Points of view on planning intervention

Both interviewees are happy with the parking facilities around the centre and highlight that they are important since residents in Deurne are dependent on a car and this allows them to reach the centre but keep the centre itself sheltered from cars.

"Yes, you will have to organize something so that people can also park their cars somewhere, even if it is free. Because in a village like Deurne, people still come a lot by car. And whether that is free or not, that is a choice of the council."[70]

"It is indeed necessary because, yes, you want the centre to be easily accessible, um, and then there is a parking space here on the Molenstraat, which is very unfortunate. Because that also brings traffic that drives straight through the centre, and you have much less of that with the other parking spaces."[71]

Material dependency

Observations

Ban on parking

In some parts of the centre, parking on the side of the road is banned. This is communicated with the use of signs as can be seen in the pictures below.

[70] Snippet from interview Deurne 1
[71] Snippet from interview Deurne 2




ZONE
ZONE
30

ZONE

KERKSTRAAT
ZONE


HAAG
ZONE

ZONE

ZONE
ZONE
30

uitgezonderd
ZONE
ZONE
30

ZONE


Parking place in residential area

In the residential areas situated in the centre of Deurne, cars can be parked in parking spaces. These parking spaces are made visible by the use of a different type of stone and/or the white line separating the parking spaces. This can be seen in the pictures below.



























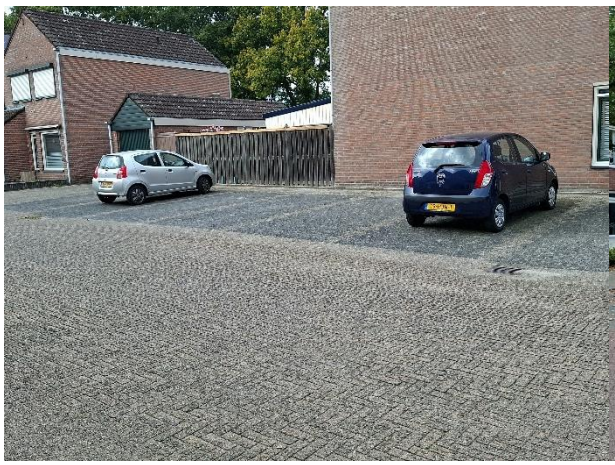
45KM





















Parking place next to centre

Next to the shopping centre of Deurne, cars can be parked in parking spaces. These parking spaces are made visible by the use of a different type of stone and/or the white line separating the parking spaces. This can be seen in the pictures below.



















OMON
DRUKKERS

JUMBO

uitrit
parkeerplaats







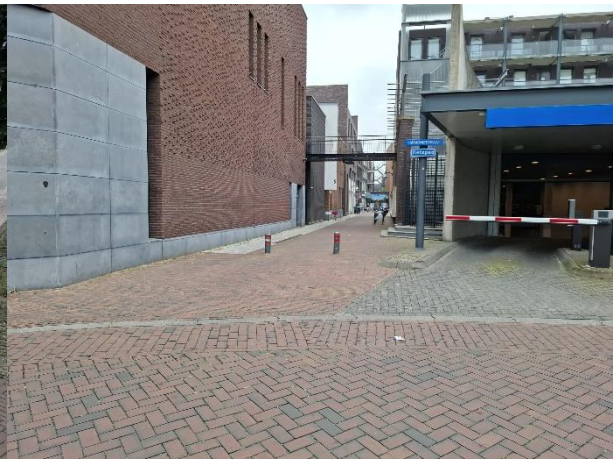


ACTION



P WOLFSBERG





Parking sign

Parking signs are used to guide the user of the car to the closest parking space. This can be seen in the pictures below.






Classification

Table K 15 Classification parking facilities around the centre

	Enabling	Disabling
Spatial planning intervention	Parking facilities around the centre	
Non-spatial planning intervention		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre since it allows cars to be parked on the edge of the centre, and the users can enter the centre by foot.

Planning intervention

Pedestrian area

Year of implementation

2008 (Gemeente Deurne, 2010)

Definition of planning intervention

Part of the centre cannot be accessed, during some parts of the day, by cars, with some exceptions for loading/unloading or emergency service vehicles. (Gemeente Deurne, 2010).

Points of view on planning intervention

The opinion of the interviewees is different. One interviewee thought that the pedestrian area was really successful in promoting the centre.

"Yes, I think we have made quite a few steps in the past to do it this way, right? That we still, um, um, allow the public, um, free, free, um, yes, free passage, easily, safely, so I do think that is really important. Yes, that is part of a shopping area, and the entrepreneurs should understand that, but then there's the other aspect we were just talking about, right? Those who want to shop must be able to park their car somewhere. But I believe that where you want to have your shopping public, you need to make it attractive. And that means car-free, and then, and then car-free, right? Maybe, um, time slots, um, um, time periods during which you can load and unload. That is, of course, part of it in one way or another, but if you really want, further down the street, if you want shopping public to come, car-free."[72]

The other interviewee was less happy since they had the opinion that the pedestrian area was not really a pedestrian area since bicyclists would use it as a cycle route.

"Yes, that is not ideal. Um, it also has to do with, look, the Stationsstraat is both a pedestrian area and, um, a continuous cycling route. So, you can see that when you walk there, you don't always walk calmly, because if you walk right in the middle, some people think, well, some think it's a shopping street, while others think, yes, but this is my cycling route. You have, um, the issue of the connection between the Stationsstraat and the Wolfsberg. Um, and there's no logical connection between the Wolfsberg and the Market. So, you actually have a very attractive market with hospitality and, and, and, and some historical buildings, and from there you can logically follow the Stationsstraat. But yes, the Albert Heijn and the Xenos, and what's in there, InterToys. Yes, they are actually like a sort of little island, um, in a different part of the centre."[73]

[72] Snippet from interview Deurne 1
[73] Snippet from interview Deurne 2

Material dependency

Observations

Difference in elevation

The pedestrian area is separated from the rest of the centre with a difference in elevation. This can be seen in the picture below.

Street posts

The pedestrian area is communicated through the use of posts at every entry of exit of the pedestrian area. In most places, the middle post is movable to allow for the traffic to enter the pedestrian area during certain hours. This can be seen in the pictures below.


DE WEVER


ZONE

ZONE




ZONE

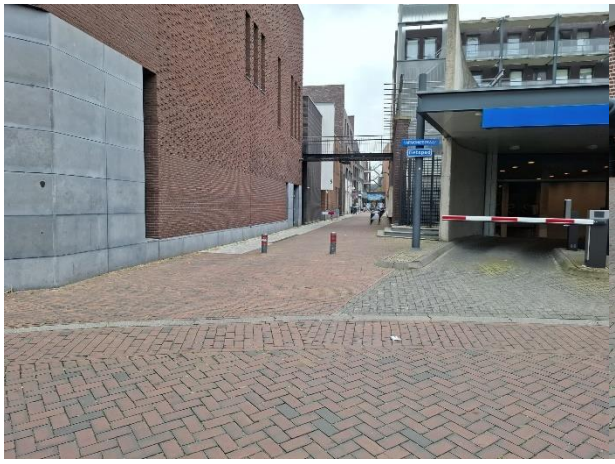


ZONE
ma t/m zo
11.00-6.00 h
en
ontheffing-
houders
toegestaan




SEVEN
10





MEER DAN LEKKER

Signs and window time

The pedestrian area is communicated through the use of signs at every entry of exit of the pedestrian area. This can be seen in the pictures below.



ZONE





ZONE
ma t/m zo
11.00-6.00 h
en
ontheffing-
houders
toegestaan

ZONE
ma t/m zo
11.00-6.00 h
en
ontheffing-
houders
toegestaan



ZONE




TEAM KAPPERS


ZONE

bij groen
een voertuig

Classification

Table K 16 Classification pedestrian area

	Enabling	Disabling
Spatial planning interventions	Pedestrian area	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the picture above. Furthermore, it enables a (more) car-free centre since it bans cars from the centre.

Planning intervention

One-way traffic

Year of implementation

Definition of planning intervention

Some streets in the centre of Deurne are one-way traffic meaning that vehicles can enter and exit the street form only one way and can only drive in one direction.

Points of view on planning intervention

Both interviewees see one-way traffic as a solution to make the centre safer, but they were still considering this and this needs to be further developed.

"We are really looking at that, because look, the moment you make streets one-way, you shouldn't let it happen that the next street, right after that, is a left turn, and the next street is a left again, and then you're back on the same road. You really have to redesign the entire area, traffic-wise, so that traffic can only go one direction towards that ring road. That's a challenge. And people will have to get used to that, because it also means something for those coming home in the evening. Okay, then I have to, oh, I need to pay attention that I can't drive that way anymore, but I have to drive this way, and I might have to detour 100 meters."[74]

"That is, um, and that is more based on a German example. But we don't have that yet. It's still just a rough idea, and it is actually up to a college or city council to examine such an option to see what effects that would have. Yes, we can think about it, but in that regard, we are just laypeople sitting in politics, so we haven't analysed every intersection. The only thing you will get is that there will be a lot of traffic. The majority of the traffic goes from Liessel, over the Heuvel to the Helmondweg. So, at the moment you would make it one-way counterclockwise, the traffic from Helmond would reach it well, but then traffic going the other way would have to go around Deurne, around the centre, and take a longer part of the centre ring. Yes, whether that is desirable, yes. Perhaps the roundabouts, for example, at the Zeilbergseweg would become a bit safer. Yes, those kinds of things, and also the crossing to such a path, my father's garden path, would probably be easier if you introduce one-way traffic."[75]

One interviewee said that the space that would become available by making streets one-way traffic could be used to meet other goals such as making the city greener.

"That would be the starting point; the starting point of [redacted] *is, for example, that we actually say, yes, if we are going to tackle areas during the reconstruction of neighbourhoods, then that means we can possibly narrow that street, allowing for more space for trees to better meet the green standard, while still keeping the neighbourhood accessible through the one-*

[74] Snippet from interview from Deurne 1
[75] Snippet from interview from Deurne 2

way structure. But that is a way of thinking that we are currently examining regarding how we should approach this in the future. And that could, for example, be an elaboration within a ring road structure. Okay, but we need to carefully consider that when we reconstruct roads and carry out maintenance. Well, that means looking at whether we can narrow the road by 3 meters, creating beautiful space for trees or separate bike paths or something like that. You would set it up differently, more green. That should ultimately lead to achieving two goals at once. You remove through traffic, which finds that difficult, and they won't do that anymore. And you make it a lot friendlier. At the same time, you significantly improve an objective in terms of, um, um, liveability. So, you actually hit three birds with one stone when you do that. And that is what we are brainstorming about here. [redacted] *to take steps towards that so that we can eventually shape it in implementation plans. That is the big question now."*[76]

Regarding the one-way streets that are currently within the centre, both interviewees were happy about them.

Material dependency

Observations

Signs

In the centre of Deurne, signs communicate when a street is a one-way street. For this, three different types of signs are used. One sign on the side of the street where cars can access the one-way street. On the other side of the street, a sign shows that it is forbidden to enter the street for that side. The last sign is used in situations when traffic is only allowed to turn one specific way. This is all shown in the pictures below.

[76] Snippet from interview Deurne 1



uitgezonderd

Stationsstraat
uitgezonderd

uitgezonderd

Vlierden
Asten
uitgezonderd




uitgezonderd


uitgezonderd






Bakkerij van Ham



PELIKAANHOF


RAADHUISSTRAAT

Bakkerij Vedder







Classification

Table K 17 Classification one-way traffic

	Enabling	Disabling
Spatial planning interventions	One-way traffic	
Non-spatial planning interventions		

This planning intervention is spatial since it can be observed in space, as can be seen in the pictures above. Furthermore, it enables a (more) car-free centre by limiting the amount of traffic that is allowed to drive through the streets in the centre.

Other observations

There are some observations that could not be linked to the planning interventions found in the governmental documents, those have been placed here.

Other posts

Besides the posts that are placed at the exits/entrances of the pedestrian area, the centre of Deurne also has some posts placed in other positions with a different function, see the pictures below.








Crossing not on beltway

On top of the crossings on the beltway, there is one crossing next to the retirement home. This can be seen in the picture below..

Appendix K: Interview Guide

The following appendix contains the interview guide that has been used to interview politicians and governmental officials.

Preparation

- Confirm time/date/location with the participant by email
- Check equipment: recording device and that you have backup batteries/power banks, writing equipment (pen/paper), list of formal institutions of all cases
- Make sure you have a way to keep track of time (in addition to the phone when recording with the phone)
- Arrive at least 15-30 minutes beforehand to prepare the setting
- Make sure you are dressed appropriately
- Sent the consent form and questions to the interviewee before the interview takes place

Introduction

- Obtain informed consent from the participant before beginning the interview
- Explain how the participants information and interview will be kept/treated
- Introduce yourself and explain the purpose of the interview, which is to understand how the different parties look at a car-free centre and specific regulations.
- Explain the structure of the interview
    - The interview will start with questions about car-free centre in general
    - Afterwards we will focus on some specific interventions
- Explain that the interview will take approximately 1 hour and that the participants responses will be kept confidential and anonymous
- Ask some general information to establish and warm up the conversation
- Obtain informed consent from the participant before beginning the interview
- Start the recording and, again, ask for consent for recording and using the interview

Questions

- *The following questions form the basis for the interview, feel free to ask more detailed questions based on the answers the interviewees give (e.g. when things are unclear, more information is required, etc.)*

Car-free centre

- What is your opinion on a car-free centre in municipality X?

Specific interventions

- *Show the complete list of formal institutions as identified in sub-question 2. Tell the interviewee which formal institutions have been identified in their municipality.*
- Is this list complete? Are any formal institutions on this list not present in municipality x, or are any formal institutions missing?
- What is your opinion on formal institution X.

Concluding

- Ask participant if they want to add anything which they think is important.
- Thank the participant for their time and willingness to participate in the research.
- Remind the participant that their responses will be kept confidential and anonymous.
- Ask the participant if they have any questions or concerns about the interview.

Appendix L: Code book interviews

The following appendix contains the code book that were found in the interviews.

Code group	Code	Code is given when quotation mentions (that)…	Annotations
Asten			
General	Car-accessible	The opinion of the interviewee on a car-accessible centre	4
	Car-free	The opinion of the interviewee on a car-free centre	8
	Car-sheltered	The opinion of the interviewee on a car-sheltered centre	7
	One floor	The opinion of the interviewee on one floor policy	8
New or change in spatial interventions	Change in intervention/year of implementation	A change in the spatial interventions that have been found in the governmental documents or a change in the year of implementation	1
	New planning interventions	New planning interventions that were not found from the governmental documents	4
Specific interventions	Beltway	The opinion of the interviewee on the beltway surrounding the centre	8
	‘Blauwe zone’	The opinion of the interviewee on the ‘blauwe zone’ (blue zone)	8
	Flower boxes	The opinion of the interviewee on the flower boxes placed on Markt	3
	One-way traffic	The opinion of the interviewee on a one-way traffic	8
	Parking facilities	The opinion of the interviewee on the parking facilities	5
	Placemaking	The opinion of the interviewee on the placemaking	5
	Posts	The opinion of the interviewee on the posts	2
	Posts Eeuwig Leven-plein	The opinion of the interviewee on the posts placed on Eeuwig Leven-plein	2
	Posts Koningsplein	The opinion of the interviewee on the posts on Koningsplein	1
	Redevelopment Koningsplein	The opinion of the interviewee on the redevelopment of Koningsplein	2
	Window times	The opinion of the interviewee on window time	5
Deurne			
General	Car-accessible	The opinion of the interviewee on a car-accessible centre	8
	Car-free	The opinion of the interviewee on a car-free centre	8
	Car-sheltered	The opinion of the interviewee on a car-sheltered centre	8
	Not-one floor-policy	The opinion of the interviewee on not-one floor policy	2
New or change in	Change in intervention/year	A change in the spatial interventions that have been found in the governmental documents or a change in the year of implementation	1

spatial interventions	of implementation		
	New planning intervention	New planning interventions that were not found from the governmental documents	1
Specific interventions	Ban freight traffic	The opinion of the interviewees on the ban on freight traffic	5
	Beltway	The opinion of the interviewees on the beltway	10
	Secured cycle parking	The opinion of the interviewees on the cycle parking	3
	Free parking	The opinion of the interviewees on the free parking	14
	One-way traffic	The opinion of the interviewees on one-way traffic	5
	Parking facilities	The opinion of the interviewees on the parking facilities	9
	Pedestrian area	The opinion of the interviewees on the pedestrian area	3

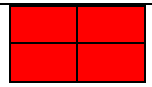
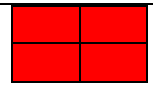
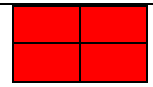
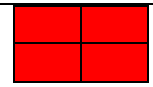
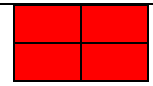
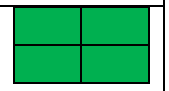
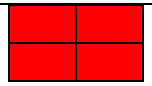
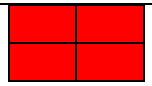
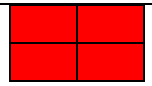
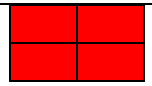
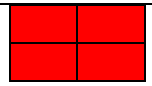
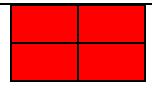
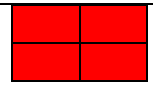
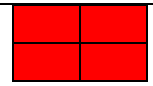
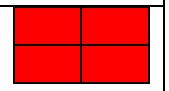
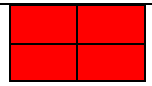
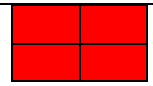
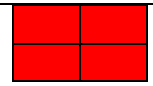
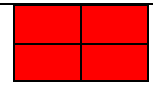
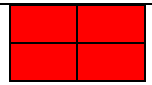
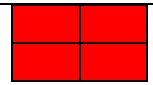
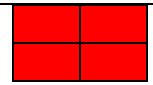
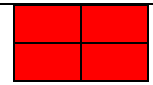
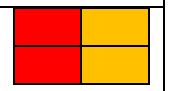
Appendix M: Comparison planning interventions

The following appendix shows the comparison of the spatial interventions. The interventions are compared on four components: (1) meaning of the spatial intervention, (2) the observations of the spatial intervention, (3) the view that politicians and government officials have of the spatial intervention, and (4) the classification of the intervention. Three colours are used, red means that there is no similarity between spatial interventions on that component, orange means that there is some similarity between spatial interventions on that component, green means that the spatial interventions are similar on that component.

Table M 1 Factors used to compare planning interventions

1. Meaning of the spatial intervention	2. The observation of the spatial intervention
3. The view that politicians and government officials have on the spatial intervention	4. The classification of the intervention

Table M 2 Comparison of planning interventions

Interventions Asten → Deurne↓	Free parking (‘blauwe zone’)	One-way traffic	Parking facilities around the centre	Pilot placemaking	Placement of flower boxes on the market	Redevelopment of Koningsplein	Street posts Eeuwig Leven-plein	Street posts Koningsplein	Window time	Beltway
Ban on freight traffic in centre										
Beltway around centre										
Secured cycle parking										
Free parking (‘blauwe zone’)										
Parking facilities around the centre										

	Beltway	Window time	Street posts Koningsplein	Street posts Eeuwig Leven-plein	Redevelopment of Koningsplein	Placement of flower boxes on the market	Pilot placemaking	Parking facilities around the centre	One-way traffic	Free parking (‘blauwe zone’)
Pedestrian area										
One-way traffic										

Appendix N: Survey logic

The following appendix contains the logic that is used in the survey. The questions are the same questions that have been developed in *Survey development* in

4.4 Sub-question 4.

Please note that the actual survey was in Dutch, this appendix shows the English translation.

Dear Participant,

Thank you very much for taking part in this survey.

Important Information:

- Your participation is entirely voluntary and anonymous.

- Completing the survey takes approximately 3 minutes.

- The information you provide will be used solely for research purposes and cannot be traced back to individual persons.

Thank you again for your time and participation. Click on Start below to begin.

I am a resident of...

1. Municipality of Asten
2. Municipality of Deurne
3. Otherwise

If answer is 1 (Municipality of Asten), follow path 1

If answer is 2 (Municipality of Deurne), follow path 2

If answer is 3 (Otherwise), follow path 3

Path 1
On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should not have access to the centre of Asten?
On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should have limited access to the centre of Asten?
On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should have full access to the centre of Asten?

Path 2
On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should not have access to the centre of Deurne?
On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should have limited access to the centre of Deurne?
On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the idea that cars should have full access to the centre of Deurne?

Path 3
This is the end of the survey, thank you for your cooperation in the research!

On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the blue parking zone in the centre of Asten?

On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the introduction of a blue parking zone in the centre of Deurne?

On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with the introduction of a pedestrian zone in the centre of Asten?

On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with a pedestrian zone in the centre of Deurne?

On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with using bollards to restrict cars in the centre of Asten?

On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree with using bollards to restrict cars in the centre of Deurne?

On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree that cars should only be allowed to enter the centre of Asten during certain hours?

On a scale of 1 (completely disagree) to 10 (completely agree), how much do you agree that cars should be allowed to enter the centre of Deurne from 6:00 to 11:00?

On a scale of 1 (not visible at all) to 10 (very clearly visible), how visible are the bollards that restrict cars from entering the centre of Asten to you?

On a scale of 1 (not visible at all) to 10 (very clearly visible), how visible are the bollards that restrict cars from entering the centre of Deurne to you?

On a scale of 1 (not visible at all) to 10 (very clearly visible), how visible is it that cars are allowed to enter the centre of Deurne from 6:00 to 11:00?

How far do you live from the centre of Asten?

1. 0-1 kilometre
2. 1-3 kilometre
3. 3-5 kilometre
4. More than 5 kilometres

How far do you live from the centre of Deurne?

1. 0-1 kilometre
2. 1-3 kilometre
3. 3-5 kilometre
4. More than 5 kilometres

How often do you visit the centre of Asten?

1. Every day
2. One or multiple days a week
3. A multiple times a month
4. A few times a year

How often do you visit the centre of Deurne?

1. Every day
2. One or multiple days a week
3. A multiple times a month
4. A few times a year

What is your age (in years?

This is the end of the survey, thank you for your cooperation in the research!