VISITOR PROFILES OF KWINTELOOIJEN

EXPLORING THE VISITOR PROFILES OF PARK KWINTELOOIJEN IN A DESIRED SHIFT TOWARDS GREEN MOBILITY

Students:
Livia Westgeest
Jimi van Noort
Alejandro Ruiz Sanchez
Fabiënne Hendriksen
Niels Mulder
Wout van der Kemp

Course name: Governance of Tourism and Natural Resources
Course code: ENP31006

Nationaal Park Utrechtse Heuvelrug
WAGENINGEN UNIVERSITY & RESEARCH
Interreg North-West Europe
Co-funded by the European Union
MONA

Executive summary

Kwintelooijen is a natural reserve located in the Utrechtse Heuvelrug National Park that receives visitors mainly from the region, especially from Veenendaal and Rhenen. Most of the visitors, however, choose the car to reach Kwintelooijen, leading to problems such as congestion. A team composed of Master students at the WUR investigates the visitors of Kwintelooijen and identifies their modes of mobility in the pursuit of stimulating alternative, greener mobilities.

Project

Data has been collected via interviews and surveys on the profiles of people who visit the natural reserve to identify the challenges that are at play. In addition, literature has been reviewed to investigate the trends in mobility and green mobility solutions implemented elsewhere. With the data collected the authors determined the dominance of car use in Western Europe and the Netherlands and the abuse of cars among visitors to access the natural reserve of Kwintelooijen. On the other hand, the data supported investigating the potential to shift towards green mobility. The research team presents recommendations that lead to stimulate visitors towards green mobilities.

Objective

The goal is to create an exploratory overview of the visitors and used mobilities of Kwintelooijen. In addition, the report is meant to gain insights into visitor behavior and preferences toward green transportation on Kwintelooijen. In achieving this goal, the focus lies on mapping tourist behavior and addressing the issues on public transportation, walking trails and bicycle lanes. Furthermore, the issues addressed are improvement of the connection to public transportation nodes, cycling infrastructure, parking structure, and education and awareness creation of the impacts of tourist's behavior.

Recommendations

Short-term

- Initiate targeted information campaigns with a focus on influencing the car-users by emphasizing their environmental impact. Use the visitors center to educate and promote sustainability. Use the bus stops to provide route information and include these locations in the campaigns. Conduct an in-depth visitor survey targeting residents of Rhenen and Veenendaal to create strategies to improve overall accessibility. This survey focuses on visitor profiles, behaviors, traits, and preferences and intentions, which can give insights in how to influence them.

Long-term

- Position Kwintelooijen as a gateway by tactically using parking as a spreading strategy and by implementing a fluctuating parking fee system. Compensate those who opt for green transportation and communicate where parking fees are invested in. Improve and expand the bicycle and walking infrastructure. Ensure that public transportation is more accessible and that walking and cycling becomes attractive by enhancing and eventually shortening the routes. Create a follow-up survey to assess the impact of all interventions.

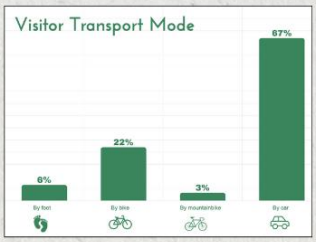
Visitor and green mobility outlook on Kwintelooijen

The research was conducted by a group of six students from the University of Wageningen. The research consists of a literature review, a survey, two interviews, one with a park ranger and one with a Wandelnet marketer. First, the problem will be described, and then the main recommendations will be highlighted.

Problem Description

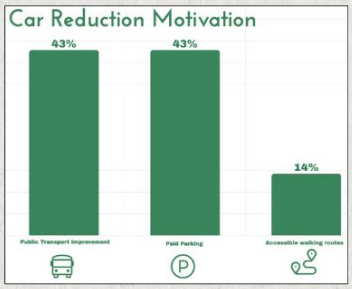
Kwintelooijen is part of National Park Utrechtse Heuvelrug, where it has become very crowded since Covid-19. With visitors mainly arriving by car, there have been prevalent congestion issues.

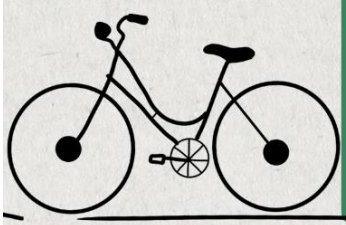
The primary goal of this research is to develop an understanding of the visitor profiles, the types of mobility used to visit the park, and the possibilities to incentivize visitors towards sustainable transportation. The outcomes of the research illustrates multiple long and short term recommendations.



Findings

The survey findings found that most visitors arrive by car, as can be seen in the graph above. For car reduction motivation, visitors indicate to improve public transportation and initiate paid parking, see the graph on the right. Similar findings were found in the interview with the park ranger. The literature identified four visitor profiles that can be connected to the survey findings.





Advice

Short-Term

- Targeted information campaigns focussing on car users, stressing environmental impact.
- Visitors centre as a space to educate and promote sustainability.
- In-depth visitor survey on Rhenen and Veenendaal for future strategies.

Long-Term

- Position Kwintelooijen as a gateway.
- Creating a parking spreading strategy and implement a fluctuating parking fee system.
- Compensate those who opt for green transportation. Improve and expand the bicycle and walking infrastructure.
- Create a follow-up survey to assess the impact of all interventions.

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Introduction

Natural parks are important when it comes to protecting ecological values, as well as enhancing education and leisure opportunities (Jeong et al., 2021). This adheres to the main objective of National Park Utrechtse Heuvelrug (NPUH), which is to preserve the natural area for the future (Utrechtse Heuvelrug, 2023). Yet, the popularity of natural parks for tourism makes this ambition challenging. Many visitors drive the car to reach natural areas, due to the appreciated comfort and flexibility of the car, and the often-lacking public transport connections

(Holding & Kreutner, 1998; Keken et al., 1995). However, the large numbers of cars lead to issues such as traffic congestion, noise, and pollution (See e.g. Beunen et al., 2006; El-Fadel & Sbayti, 2001; Hansen et al., 2013).

In Kwintelooijen, the number of cars arriving at the park is considered problematic as well (Heemsbergen, 2023). Kwintelooijen is part of National Park Utrechtse Heuvelrug, where, especially since COVID-19, it became very crowded (Keugel & Groenewoud, 2022; Unen, 2020). Walking and cycling are the most popular activities in the National Park, yet most people arrive at the park by car (Kantar Public, 2023). In Kwintelooijen, the percentage of visitors arriving by car was for instance 59% in 2019 (Evelien Visser, 2019). The high numbers of cars in and around the park lead to congestion, which is the main issue in Kwintelooijen (Heemsbergen, 2023). To tackle the mobility issue at Kwintelooijen, the report aims to provide actionable insights for establishing a modal shift in green visitor mobility in the Kwintelooijen area. In pursuing these objectives, the report will address the current visitor profiles, the motivations behind mobility, and the barriers and opportunities to shifting towards sustainable visitor transportation through the following research questions:

- Who are the current visitors of Kwintelooijen?
- Why do visitors living in the vicinity visit the park by car (<5km)?
- Can we distinguish different visitor profiles?
- How can these groups of visitors be stimulated to use green transportation?

By employing a mix of methodologies, including visitor surveys, site visits, and an interview with the local ranger, the report aims to provide a nuanced understanding of the current scenario at NPUH – Kwintelooijen and offer practical, science-based recommendations to guide the transition towards a more sustainable and accessible future for both the park and its visitors.

First, a literature review on mobility in natural parks and visitor profiles of national parks will be provided. Additionally, already existing green mobility solutions in national parks will be reviewed. This theoretical foundation, together with data retrieved from surveys and interviews, and input from the stakeholders present at the presentations at the city hall will be used to construct recommendations on opportunities to shift towards greener mobilities for Kwintelooijen.

Literature research

Mobility and national parks

In passenger transport, the car is still very dominant. In the European Union, in 2020, 80,6% of the kilometers travelled for passenger transport was accounted for by cars (European Union, 2022). In the Netherlands, the car also accounted for around 80% of the kilometers travelled in 2022 (KiM, 2023). It might therefore be not surprising that the car is most popular in social-recreational travels (Harms et al., 2015), and in traveling to natural parks the car is highly dominant (Beunen et al., 2008). Most notably, short-distance (less than 10 km) social-recreational travels are mostly travelled by using the car. Furthermore, in the Netherlands, 40% of the times the car is used for this purpose, not more than 5 km is being travelled (Harms et al., 2015).

Private car use provides many benefits for users. It is considered as being a highly convenient (comfortable), pleasurable and social (self-image boosting) way of transportation (Ellaway et al., 2003; Uba & Chatzidakis, 2016). At the same time, car use is a major contributor to carbon emissions (Klöckner & Friedrichsmeier, 2011; Roof, 2002). Furthermore, it contributes to local negative impacts such as increased traffic congestion, noise pollution, and negative effects on plants and wild animals (Beunen et al., 2008; González et al., 2019; Regnerus et al., 2007; Zhang et al., 2018). Despite increasing public awareness on negative effects of cars, it keeps on being difficult to reduce car use among tourists (Davies & Weston, 2015). Especially in Western Europe, natural areas furthermore need to be considered as 'living landscapes', which do not only count for nature preservation and tourism, but also as residential areas, and spaces for farms and roads. The social-recreational traffic adds up to the already existing utilitarian local-bound traffic that is present in and around national parks (Beunen et al., 2008). This problematizes the relationship between outdoor recreation and nature preservation. Therefore, natural parks in the Netherlands, such as Veluwezoom (Regnerus et al., 2007), Posbank (Keken et al., 1995; Regnerus, 2005) and thus Utrechtse Heuvelrug (Heemsbergen, 2023) are seeking opportunities to stimulate sustainable and green mobility.

Green mobility and user profiles of green mobility

The concept of green mobility is described as sustainable modes of transportation that do not contribute to the exhausts of greenhouse gases (Echeverria, Giménez-Nadal & Molina, 2022). Examples of green mobility are cycling and walking, while for this project public transportation is also included as it contributes to more sustainable transportation (Scuttari et al., 2016). Barr and Prillwitz (2012) point out that there is a difference in attitude towards green mobility when mobility is part of a daily routine or part of a holiday activity. People who support sustainable practices in daily life do not necessarily behave as such when doing leisure-related activities (e.g. Becken, 2007 and Dickinson & Dickinson, 2006).

Increasing car use in Kwintelooijen poses many challenges, of which congestion is the main problem. Barr and Prillwitz (2012) identified four different segments that have specific views on sustainable transportation and car usage. The Addicted Car user, Aspiring Green Travelers, Reluctant public transport users and Committed Green Travelers. Important to note is that this research was conducted in the United Kingdom, where infrastructures and attitudes towards green mobility might differ from infrastructures and attitudes in the Netherlands. Barr and Prillwitz (2012) also make the separation between holiday/short breaks and work (daily) routines and modes of transportation.

The Car Addict

The Car Addict is described by Barr and Prillwitz (2012) as someone that generally is not in favor of sustainable modes of transportation. Based on data Barr and Prillwitz (2012) generated, the Car Addict has negative attitudes towards the use of public transport and is very much in favor of 'low-cost' flights.

Aspiring Green Traveler (AGT)

The second profile that is highlighted in the article of Barr and Prillwitz (2012) is described as people that aspire to use sustainable modes of transportation. However, the AGT does recognize the positive and convenient sides of travelling by means of a private car. Results show that the AGT also holds negative attitudes towards the use of public transportation systems. In contrast to this, they do hold positive attitudes towards other more

sustainable modes of transportation such as cycling and walking.

Reluctant Public Transport User (RPTU)

Similar to the AGT, the RTPU is also quite nuanced. Barr and Prillwitz (2012) describe the RPTU as someone that uses green modes of transportation such as walking, cycling and public transportation daily. However, as the results of their research show, the RTPU is ambivalent or holds negative attitudes towards the environmental benefits that green modes of transportation have. Related to this, they are more in favor of using the car for holidays instead of more green modes of transportation. According to the data of Barr and Prillwitz (2012), the RPTU has the lowest rate in car ownership of the four profiles. This explains why they do make use of most green transportation services, as they are not able to take the car.

Committed Green Traveler (CGT)

The CGT holds positive attitudes towards everything that is pro-environmental. Where the other segments might be hesitant or reluctant to use green mobilities, the CGT commits to use all of these. The CGT segment has the highest rate of bike ownership of the four clusters and often lived in the inner city. Also, the car ownership was lower than the Car Addict and the AGT.

Figure 1. shows how the four profiles are organized based on environmental attitude. Although all profiles do recognize that sustainable modes of transportation such as walking and cycling are beneficial for the environment, not all profiles are willing to make changes to their daily behavior. An important notion made by Barr and Prillwitz (2012) is that public transportation is not particularly seen as sustainable by the CGT's, because most public transportation still emits exhausts.

The profiles holding a strong pro-environmental attitude might be more prone to change their travel behavior towards more sustainable practices, in this case the CGT and AGT. Support of this can be found in the research conducted by Anable (2005) who identified similar profiles. According to both Anable (2005) and Barr & Prillwitz (2012) the profiles with strong pro-environmental attitudes were willing to make use of green modes of transportation. In this light, it is useful to identify how these profiles are distributed in the case of Kwintelooijen, as these would be the most interesting profiles to focus on. The survey outcomes will give more detail on the distribution of the profiles.

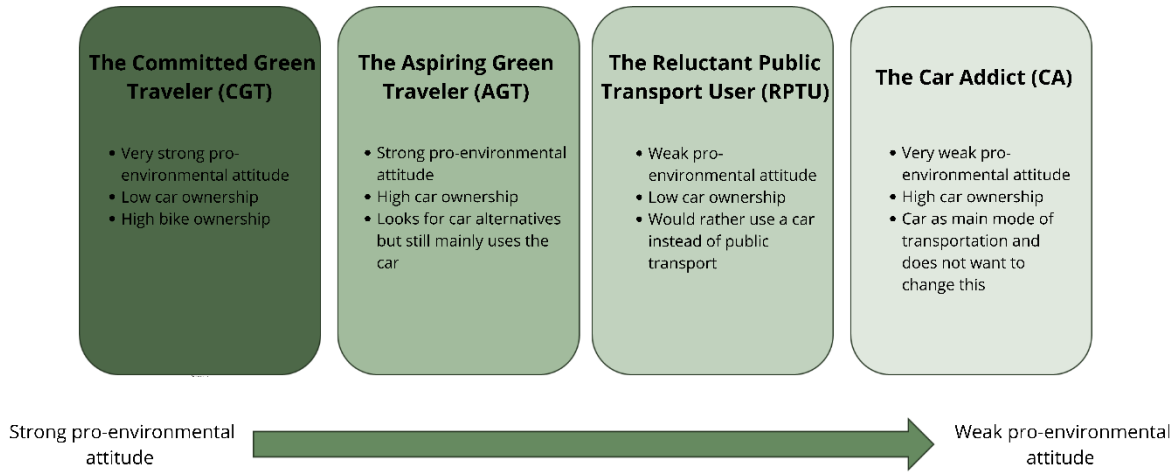

Figure 1. Four visitor profiles organized on environmental attitudes identified by Barr and Prillwitz (2012)

Opportunities and examples of green mobility to national parks

Promoting eco-friendly transportation, as endorsed by Brand et al. (2013), aligns with the goal of cutting carbon emissions from travel. Insights into individual, household, and environmental factors affecting carbon dioxide emissions guide effective strategies for reducing the environmental impact of car travel to parks. Pot et al.'s (2021) study emphasizes the benefits of focusing on individual accessibility, like transport-related well-being.

For example, Mayer et al. (2010) stress the economic impact of tourism in German national parks, advocating for upgraded services. This supports the idea that promoting green mobility can enhance tourist services and align with sustainable tourism goals. Similarly, González et al. (2021) conducted a study at El Teide National Park, visitors participated in a stated choice experiment simulating a park shuttle bus. Results revealed their willingness-to-pay (WTP) for time-saving parking solutions, reduced waiting times on the shuttle bus, and lower CO2 emissions. Visitors expressed a WTP of approximately €11 to cut parking search time, €9 for shorter shuttle waiting times, and €3 for a 20-gram reduction in CO2 emissions per occupant in one hour. Factors influencing WTP included gender, regular bike ridership, and age, with the highest WTP among those aged 55 to 60. These findings inform transport management policies, aiming to decrease personal vehicle dependence, improve visit quality, and mitigate negative environmental impacts in the park.

González et al.'s (2021) research on travel time values advocates for e-public transport, emphasizing the role of innovative transportation solutions. This aligns with the success of Pripyatsky's implementation, which is described by Habina et al. (2022). In Belarus, these researchers emphasized green routes and ecotourism clusters, akin to public transport-friendly routes in National Park Pripyatsky. In the Netherlands, similar initiatives to cluster public transport and nature recreation have arisen such as the popular NS-Routes and the implementation of the Openbaar Vervoer-fiets (OV-fiets) system. These initiatives have been aimed at increasing the number of passengers on the Dutch railway. This initiative is part of a broader effort to limit the negative impacts of automobile-based mobility and encourage the use of public transportation (Villwock-Witte & Grol, 2015). The OV-fiets system is an example of a mobility policy that has the potential to influence travel behavior and land use, as observed in a comparative case study of Flanders and the Netherlands (Forouhar & Lierop, 2021).

Additionally, Wandelnet (2022) researched recreational walks and concluded that the majority (62%) of recreational walks (over 1 hour, including travel time) commence either directly from the walker's home address (47%) or by walking to the starting point (15%). In 27% of walks, the car is used to reach the starting point, while 6% opt for bike. Public transport (PT) accounts for 4% of the transportation modes used. Interestingly, accessibility via train or public transport is not a significant factor for most walkers (67%), potentially influenced by the fact that only a small proportion (8.6%) of all Dutch individuals (aged 6+) use public transport. Nevertheless, 14% of walkers consider it important that a walking destination is reachable by train or public transport. Moreover, the Rijksoverheid (2018) concluded that half of all car trips are shorter than 7.5 kilometers. In many cases, these trips could be covered by bicycle, purely based on distance. The importance of well-established bicycle facilities and connections is highlighted as a crucial prerequisite for increasing bicycle usage.

Promoting green mobility centers on two key aspects: behavior change and establishing a comprehensive, accessible infrastructural framework. Effective communication strategies, including personalized engagement and community involvement, play a vital role in building support for these changes. The emphasis on infrastructure development underscores the need for a robust cycling framework. This involves improving existing routes, creating new connections, and overcoming barriers like highways through innovative solutions such as bike tunnels. Moreover, parking policies could be implemented like how the Meijendal and Amsterdam Waterwork dunes implemented these. With good communication strategies these

lower the number of cars (Beunen et. al, 2006). Longer term communication strategies to optimize the parking policies and incorporating behavioral strategies and improving the infrastructure helps with implementing the modal shift.

This theoretical section showed that in reaching natural parks or committing other leisure-like trips, the car is a very dominant mode of transportation. Various user profiles exist when it comes to mobility, of which the Car Addict is an example of someone who tends to always use the car. Other cases in the Netherlands and Europe showed that with transport management and parking policies in combination with parking policies a shift towards green mobility can be stimulated. The next section goes deeper into the survey insights in which data on visitors is investigated.

Survey outcomes

The research group conducted the survey in pairs during the months November and December 2023, by questioning visitors walking around Kwintelooijen. In addition, a link to the survey was posted on Kwintelooijen Facebook groups to reach more respondents. A number of 35 respondents were received, of which 27 were usable for the final output. While the insights gathered represent a snapshot of visitor preferences during this specific time frame, it is crucial to recognize the inherent limitations. The small sample size makes it unsignificant and seasonal limitations may affect the generalizability of the findings to the broader unique visitor number of 153.000 (Kantar Public, 2023). In addition, the briefness of the survey questions and its answers may not reflect the full spectrum of visitor characteristics and their intentions. Given this limitation, it is essential to recognize possible seasonal, demographic and overall influences on the outcomes of the survey. Nevertheless, the survey provides interesting insights into a snapshot moment of how visitors could possibly be motivated and incentivized to reduce their car usage and move towards a more sustainable transportation mode.

The survey predominantly captured responses from Dutch participants, residing mainly within a 5 km radius of Kwintelooijen, including areas like Veenendaal, Leersum, and Rhenen. The gender distribution among respondents was diverse, with approximately 36% male and 64% female participants. Visitors varied in age, with a mix of young children accompanied by their parents and elderly individuals engaged in walking activities.

Respondents visited Kwintelooijen primarily for walking and relaxation, engaging in activities such as strolling and occasional sports like running and mountain biking. The seasonal preference showed variation, with a leaning towards Summer and Autumn, despite the survey being conducted in winter. Most preferred visits were on the weekends, predominantly during the afternoons.

The majority arrived at Kwintelooijen by car, see figure 2, citing reasons such as accessibility, comfort, and speed, where biking and walking were fewer common modes of transportation as the car was seen as the best way to visit the park.

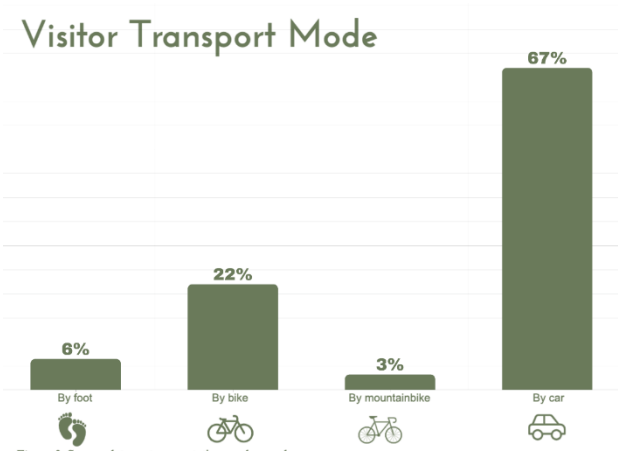

Figure 2: Survey data on transportation modes used

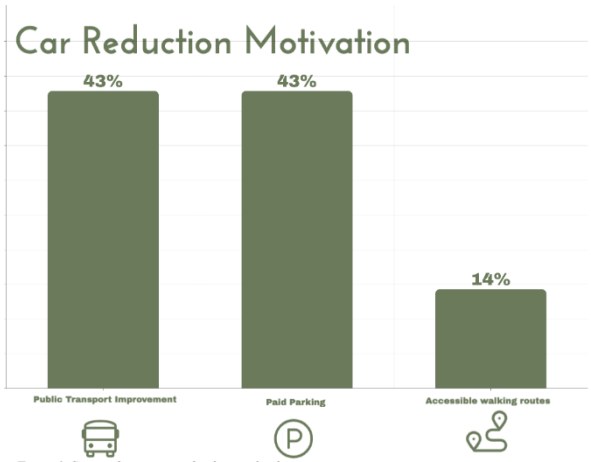

Figure 3: Survey data on car reduction motivation

Interestingly, motivations for sustainable transportation were largely absent from the survey outcomes, with a lack of perceived connection to such alternatives as the main reason. External factors like weather conditions played a significant role in influencing transportation choices, and resistance to change was notable, with about half expressing little motivation to switch from cars. As is portrayed in figure 3, survey participants perceived better bus-train connections as the most influential intervention to reduce car usage, followed by paid parking for cars. Improved walking paths were moderately influential, sharing a similar influence level with a discount for local restaurants. Enhanced access routes were perceived as the least influential in influencing visitors to opt for alternative modes of transportation.

The data underscores the importance of better public transportation options, emphasizing the need for improved bus-train connections. However, implementing the theoretical framework of user profiles by Barr and Prillwitz (2012), shows that Car Addicts and Aspiring Green Travelers are seen as the most accurate in this case study, offering valuable insights into the complexities of sustainable travel behavior, especially in terms of changing behavior of visitors and residents of the nearby areas. The nuanced responses and varied preferences among visitors make it challenging to neatly categorize them into identified stereotypes, as proposed by Barr and Prillwitz (2012).

The survey results highlight different attitudes and behaviors toward sustainable travel and underscore the need for tailored interventions to encourage more environmentally friendly transportation choices on Kwintelooijen. However, within this small sample survey, data is still lacking on how these profiles are distributed. Nevertheless, we would like to suggest that small-scale interventions, which will be elaborated on later, have the potential to change the behavior of the now more predominant car users in the survey data, a.k.a. the Car Addicts into Aspiring Green travelers and shift mobility around Kwintelooijen from car-intensive to greener, safer and friendlier.

Interviews

Interview with park ranger of Kwintelooijen

We conducted an interview with the park ranger who is responsible for Kwintelooijen. He gave us some very useful insights on the challenges and opportunities that Kwintelooijen faces regarding visitations. In this section several key insights that were discussed in the interview will be highlighted:

The ranger notices that there is a very broad scale of people visiting Kwintelooijen. From young families with little kids to elderly in sports groups. In all these groups, people visit Kwintelooijen by car. During the interview he acknowledges the problems these car visits bring

in forms of congestion, pollution due to emissions, and noise pollution. In this light, it is important to motivate visitors to leave the car at home and travel to Kwintelooijen by other means of 'greener' transportation. The ranger has some useful insights on how to do this:

Parking

The ranger was still in doubt whether paid parking is a good idea. On the one hand paid parking raises money that can be used for maintenance of the park. He acknowledges that paid parking could exclude people that do not have much money, but if you keep the fees low and communicate on how the money contributes to a better environment of Kwintelooijen, people would be willing to pay for it. On the other hand, paid parking is not the only incentive that should be implemented to solve the car problem. Furthermore, the ranger argues that in order to relieve pressure of Kwintelooijen, one should try to spread the parking. So, what should be attempted is to invite people to not just walk the Kwintelooijen route, but to take a turn left or right and walk in other parts of the Utrechtse Heuvelrug.

Communication:

This was already briefly mentioned in the section above, but communication is very important according to the ranger. He proposes good communication in three ways:

1. Use the new visitor center as a place for education and communicate to the visitors about the problem with people visiting by car and teach them about the great biodiversity the Kwintelooijen has to offer.
2. Communicate with regular visitors, such as sports groups from Veenendaal or Rhenen, to try and get them to visit the park by bike or carpooling. As for now, they often arrive in separate cars, do their exercises, and drive off by car again.
3. Communicate on how a parking fee contributes to the maintenance of Kwintelooijen and how it contributes to the health of the park.

Interview with Wandelnet

An interview that was conducted with a Wandelnet marketer centered on behavioral changes among recreational visitors in Dutch national parks. Wandelnet is the License holder of the Long-distance trails in the Netherlands and a key partner for governmental organizations in optimizing their pedestrian infrastructure. Their current focus is the behavior of recreational hikers and the distribution of hikers. Key emphasis was placed on creating awareness, with collaborative efforts highlighted, particularly with ANWB. A specific campaign targeting office workers was discussed, showing a notable shift in recreational walking habits. The interview underscored the importance of walking in political discussions, advocating for a balanced use of natural spaces and challenging the prevalent reliance on automobiles. The normalization of walking in daily life in combination with better infrastructure improves the willingness of people to use soft mobility options such as walking or cycling. Overall, it revealed ongoing efforts to enhance walking experiences and infrastructure in the Netherlands.

Conclusions

This advisory report addresses the complicated balance between conservation goals, increasing visitor numbers and environmental pressures at Kwintelooijen in the Utrechtse Heuvelrug National Park (NPUH). In view of the main challenge posed by increasing car use, congestion, the focus is on encouraging a modal shift to green mobility. Through an extensive literature review, a survey, an interview and theoretical framework, this report highlights the

multifaceted dimensions of the mobility issue and presents practical recommendations for a more sustainable future in Kwintelooijen.

Firstly, the literature review highlights the dominance of the automobile in passenger transport, especially in terms of social-recreational trips to nature parks. Despite its advantages, such as comfort and flexibility, car use raises environmental concerns as it contributes to congestion, noise and carbon emissions. The concept of green mobility is emerging as a crucial solution, focusing on sustainable modes of transportation. Furthermore, implementing the theoretical framework of user profiles by Barr and Prillwitz (2012), shows that Car Addicts and Aspiring Green Travelers are seen as the most occurring visitor profiles in this case study, However, as was stated in the literature of Anable (2005) and Barr & Prillwitz (2012), the profiles with strong pro-environmental attitudes were the profiles that were willing to choose alternatives for the car as mode of transportation. This would mean that the Aspiring Green Travelers and Committed Green Travelers are the profiles to focus on when implementing measures, as they are the most willing groups. In case future research shows that the occurrence of these two groups is too small for significant change, other measures should be found to motivate the groups that have little attention for environmentally friendly behavior.

The report examines opportunities and examples of green mobility in national parks Europe-wide and highlights successful initiatives such as shuttle services, establishing gateways and public transport-friendly clusters. Lessons from other parks, such as El Teide and Pripyatsky, demonstrate the effectiveness of interventions such as improved public transport links and users' willingness to pay for sustainable options.

An interview with the park ranger of Kwintelooijen adds a qualitative dimension to the report, highlighting the importance of communication, education and spreading parking to reduce congestion. His insights highlight the need for multi-faceted strategies, with both incentives and educational efforts to achieve modal shift. In addition, the survey results, although limited by a small sample size and seasonal limitations, offer important insights into visitor characteristics and preferences. The varied motivations for car use, resistance to change and the influence of external factors underscore the need for tailored interventions. Improved public transportation options, paid parking and improved walking paths emerge as influential measures, highlighting the nuanced preferences of Kwintelooijen visitors.

In conclusion, Kwintelooijen faces a delicate balancing act between preserving its natural beauty and accommodating a growing number of visitors. By integrating short-term measures, such as targeted education campaigns and small-scale interventions, with long-term strategies such as parking fee systems and improved infrastructure, the report outlines a comprehensive roadmap for a sustainable and accessible future. Recognizing the diversity of visitor profiles and motivations, the proposed interventions focus not only on behavior change but also on fostering a community of environmentally conscious visitors committed to the well-being of Kwintelooijen and the National Park Utrechtse Heuvelrug.

Recommendations

The recommendations are a result from the theoretical framework, the interview, researcher’s observations, the visitor’s survey and the input from the discussion on the presentations in the city hall. Firstly, short-term recommendations will be provided. These recommendations can be implemented within a year. Secondly, the report elaborates on the long-term recommendations, which should be implemented over a period of 1-5 years, followed by a clear and summarizing list of the recommendations.

Short term recommendations (Within 1 year)

Looking at the visitor dynamics at Kwintelooijen, where Car Addicts and Aspiring Green Travelers are the main profiles, it becomes necessary to encourage sustainable mobility, as these are the groups traveling by car the most. Although the Car Addicts seem to have little interest in changing their travel behavior, they are a large group, meaning they should be considered. This group could be stimulated by changing infrastructure, pushing these car users towards using green modes of transport. In addition, the visitor's center can play a pivotal role in educating and promoting sustainability. By using this center as a platform to engage and inform visitors about the benefits of green mobility, it becomes a valuable tool in steering behaviors towards more eco-friendly alternatives. Within the realm of strategic interventions, an educational paradigm, primarily facilitated by the visitor center, emerges as a centerpiece. On the timespan of less than a year, setting up a structure of campaigns is recommended. Through targeted information campaigns, this initiative seeks to make car addicts aware of the ecological consequences of their transportation choices, thus encouraging a conscious change in attitude. More concrete, these educational campaigns would exist of infographics on the impact of the car and humans on nature, carbon dioxide but also noise, safety, and congestion.

In parallel, small-scale interventions, including providing information at bus stops, route information and the development of strategies to spread parking, can be rapidly implemented to address immediate accessibility concerns and enhance the overall visitor experience. The key is to assess the sensitivity of visitors to these measures and gauge their effectiveness in improving overall accessibility and visitor experience. To investigate this, a survey should be initiated. This survey could be part of a more extensive visitor survey that can be designed and launched in the coming year. Building further on the results in this report, this new survey can fulfil a need to investigate visitor profiles over the course of all seasons more extensively. The survey should determine for instance the reasons of visiting Kwintelooijen; the activities that are being undertaken; where visitors depart from; why they choose for a particular mode of mobility to get to the park etc. Most importantly, however, the alignment with Barr & Prillwitz's (2012) archetypes should be explored to help visitors make a relevant decision in their pursuit of a modal shift. The visitor traits, intentions, their willingness to change and awareness should be investigated and reported. In addition, more information on how these four profiles are distributed is useful for deciding what measures are needed to motivate visitors to use green mobilities. Also, by carefully analyzing the impact of the visitors and the small-scale interventions in a survey, the park management, the municipality Rhenen and municipality Veenendaal can fine-tune strategies and interventions to align with the preferences and behaviors of visitors, ensuring a thoughtful and well-received approach in enhancing Kwintelooijen's accessibility. These measures collectively contribute to a gradual shift in visitor behavior, fostering a more sustainable and enjoyable environment at Kwintelooijen.

Long-term recommendations (1-5 years)

Over a period of one to five years, setting up a parking fee system and a change of the parking structure is recommended. While installing a parking fee might only have a temporary or small effect, implementing this system-wide enhances the possibilities for success. Policymakers could think for example about fluid pricing, with higher prices on busy locations at busy times. Furthermore, it is important to consider changing the structure of parking places on parking lots. Reducing the number of parking spots and nudging car users towards other parking locations will reduce the number of cars in Kwintelooijen. Specific parts of NPUH could also serve as a gateway to other parts, such as Kwintelooijen, to lower the pressure on Kwintelooijen. To improve the effectiveness of sustainable mobility measures, it is recommended that transparent communication channels are established towards visitors about

the use of funds generated by parking fees. Clearly communicating how revenues are spent, such as on park maintenance, environmental preservation or the development of additional environmentally friendly amenities promotes transparency and builds a sense of shared responsibility among visitors. This approach not only aligns with the principles of sustainability, but also ensures that visitors understand the direct positive impact of their contribution to the preservation and enhancement of Kwintelooijen and are therefore more willingly to change their behavior.

In addition, it would be recommended to optimize walking and cycling routes within the park and improving connectivity to external locations, particularly Veenendaal and Rhenen, is essential. By addressing the existing lack of viable alternatives, these interventions reach beyond the boundaries of the park, target potential car addicts, and offer both pragmatic and tempting alternatives. For example, from the bus station and small road “Rhenendael-west, turning into Oude Veenendaalsegrindweg could be an important road to look at improvemensts of connectivity by creating more attractive and safer bike lanes, as well as a pedestrian crossing that should be feasible.

To meet the needs of AGTs, the park's bicycle infrastructure should be simultaneously expanded to include additional bicycle racks and electric bicycle charging stations. This nuanced approach aligns with the preferences of AGTs, making cycling a more attractive and environmentally friendly alternative. Furthermore, involving stakeholders owning the surrounding lands that currently halt pedestrians and cyclists to take much shorter routes to Kwintelooijen also can contribute to the accessibility to the park. Besides, this action can enhance public transport accessibility as well as decreasing the distances to bus stops and the train station. In addition, a small survey should be conducted to assess the impact of the changes of route structures. This survey should focus on the effects of the interventions that were implemented and can also be used to determine the type of visitors coming from Rhenen and Veenendaal, forming the basis for long-term impact measurement.

To encourage sustainable mobility, implementing measures such as compensating visitors who opt for green transportation and actively promoting biking as a preferred mode of commuting will contribute significantly. Spreading parking spots strategically, establishing Kwintelooijen as a gateway, and introducing parking fees align with both revenue sustainability and long-term visitor profile management. This multifaceted strategy thus aims to bring about a change in behavior, cultivate a community of visitors who are aware of environmental concerns, and gradually shift from reliance on the car to sustainable ways of exploring Kwintelooijen.

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Appendices

Appendix I: Interview guide ranger

Bezoekersprofielen

- Hoe zou u de verschillende bezoekers in Kwintelooijen omschrijven? (Leeftijd, geslacht, Nederlands? (Aantal ouderen vs. Kinderen etc.)
- Welk type bezoeker komt het meeste voor? (Bijv. Ouderen, kinderen etc.)
- Heeft u een idee waar menig bezoeker vandaan komt? Uit de buurt (Veenendaal, Achterberg), of juist ver weg? Zijn er ook buitenlandse toeristen (Duitsers, Fransen, Belgen)?
- Wat voor verschillende activiteit ondernemen de bezoekers van Kwintelooijen? (hardlopen, wandelen, hond uitlaten, buitenspelen, mountainbiken, nordic walking, sporten, motor crossen)
- Hoe kijkt u naar de drukte rondom de Kwintelooijen?
- Denkt u dat men alleen de kwintelooijen bezoekt of is de Kwintelooijen echt een 'gateway' voor de rest van de UHR? (bijv. Parkeren bij de Kwintelooijen en wandelen door heel de UHR.)

Duurzaamheid

- Denkt u dat er een verschil zit in 'duurzame' en 'niet duurzame' bezoekers van Kwintelooijen?
- Hoe denkt u dat de "niet duurzame" bezoekers aangespoord kunnen worden om hun bezoek "duurzamer" te maken. (Denk aan minder parkeerplaatsen etc.)

Groene mobiliteit:

- Hoe ziet u de meeste bezoekers arriveren in het park? (Met welk type vervoer).
- Wat is er nodig / Hoe denkt u dat we het auto gebruik van de bezoekers kunnen veranderen?
- Ontvangt u wel eens klachten over de bereikbaarheid van Kwintelooijen (zoals de slechte bereikbaarheid met OV)

Overig

- Hoe ziet u de ontwikkeling van het nieuwe informatie/bezoekers centrum? (Is dit positief/ negatief voor Kwintelooijen en omgeving?)

Appendix II: Survey outcomes / interpretations

1. **What is your nationality?**
   26 Dutch; 1 GB-Dutch
2. **What is your age?**
   The mean age is approximately; 38.36 years old; oldest is 76, youngest is 21.
   0-18: 0
   18-30: 5
   30-50: 7
   50-70: 8
   70 + : 7
3. **What city or village are you from?**

Almost all participants are from various locations within 15 km of Kwintelooijen including Veenendaal, Leersum, Rhenen, Wadenoijen, Wageningen, Elst (Utrecht provincie), and Utrecht.
(10 unique cities / villages in the neighborhood)

4. **What gender do you identify with?**

11 male, 16 female so 41/59%

5. **With whom do you visit the park Kwintelooijen?**

Categories mentioned; partners (19) (73%); Alone (9); parents (2) with dogs (2) kids (3)

6. **In what season do you visit park Kwintelooijen most often?**

The park is visited in different seasons, with preferences for Summer (9), Autumn (9), Spring (5, and Winter (4)

7. **Which day(s) do you visit the park most often (Please also specify in morning/afternoon/evening)**

Weekends (17) Weekdays (10);
Morning (10), Afternoon (13); all day / doesn't matter 4

8. **What is your reason for visiting the park?**

Walk (stroll) (clean head from fork, relaxation etc.) (21) running (3), walk the dog (2) mountain bike (1)

9. **Why do you choose to go to Kwintelooijen?**

Because its close, healthy reasons, simply beautiful area, the quality of paths, the unique mountain bike path, birdwatching, nice views, the sandy hills are playground for my children

10. **What activities do you undertake while visiting this park?**

Walk (stroll) (24)
running (2)

mountainbike (1)

11. **What transportation did you use to get to Kwintelooijen?**

Car (21)
by bike (4)
by foot (2)
mountainbike 0 (1)
PT (0)

12. Why do you prefer this type of transportation? (multiple answers were possible)

Car:
Accessibility (9)
Comfort (8)
Easy (7),
Accessibility (6),
Car faster than train (4)
stroller (kinderwagen) can come along (2)
Bike:
ONLY if the children can cycle well I will go by bike (2)
ONLY in case of good weather(1)
Healthier (1)

13. What would motivate you to use a sustainable(er) form of transportation (than the car etc.)?

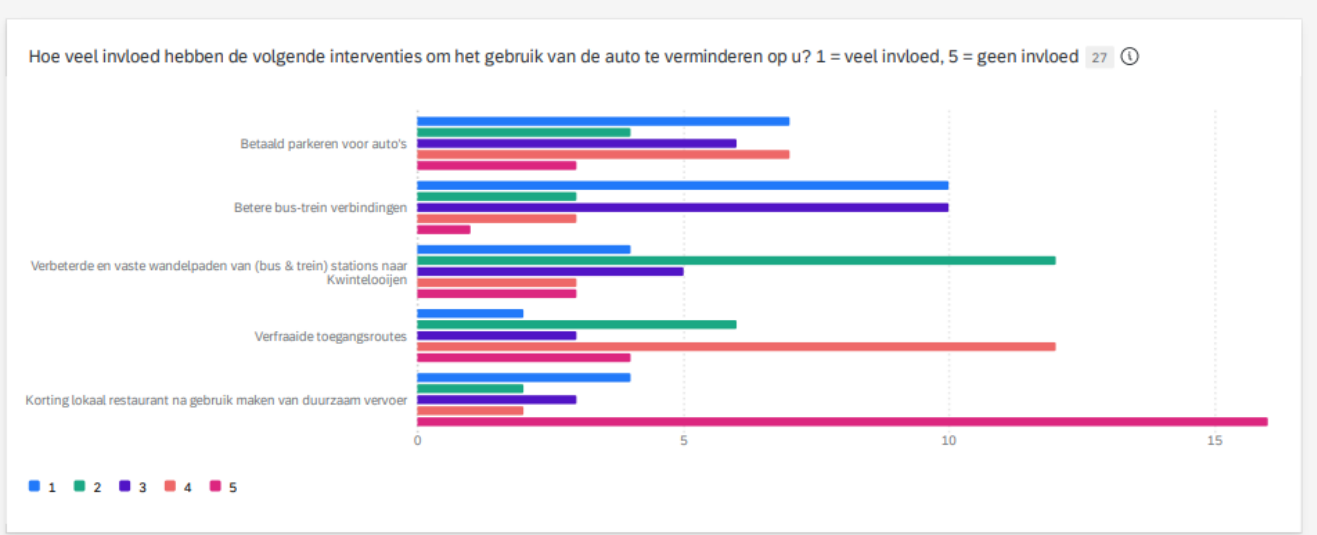
Weather: 11
No specific motivation/Nothing mentioned: 7
Public transport (Ov)/Better train-bus connections: 4; reason; I want better public transport from Wageningen; e.g. Cycling is too far
Prefer walking, but concerns about sore feet/foot problems: 1
Wanting to be healthier: 1
Personal benefit, but unsure about specifics: 1
Electric car considerations: 1
Cost considerations: 1

14. What would motivate you not to use the car (anymore) to visit Kwintelooijen?

Little to nothing: (9)
Better organised PT: (7)
Weather: (5)
No specific motivation/Nothing mentioned: (4)
Paid parking; (2)
No other possibilities; 3 km from home is too much on top of the walk in Kwintelooijen: (1)
If my children are able to cycle well, we will go by bike: (1)
More hiking trails: (1)
If it is forbidden to come by car, then I probably won't go anymore: (1)

15. How much influence do the following interventions to reduce car use have on you?

a) Paid parking for cars
b) Improved bus-train connections
c) Improved and established walking paths from (bus & train) stations to Kwintelooijen
d) Refurbished access routes
e) Discount local restaurant after using sustainable transportation



The ranking of interventions based on averages and respondent ratings provides valuable insights into the perceived influence of different strategies aimed at reducing car use on Kwintelooijen.

Better bus-train connections emerge as the most influential intervention, supported by both the lowest mean and highest number of respondents assigning this intervention the highest influence. Paid parking for cars follows closely behind, ranking second in terms of perceived influence. Initiatives to provide discounts to local restaurants receive the highest number of "5" ratings, despite sharing an average with improved walkways, indicating that they are seen as the least influential. Improved access roads consistently score lower in perceived influence. This nuanced analysis underscores the importance of targeted interventions and strategic planning to effectively change visitor behavior at Kwintelooijen toward more sustainable transportation options.

Appendix III: Interview guide Wandelnet

1. **Duurzame Mobiliteit:**
    - Hoe integreert Wandelnet duurzame mobiliteit in haar wandelinitiatieven?
    - Zijn er specifieke programma's die gericht zijn op het verminderen van het gebruik van auto's en het bevorderen van milieuvriendelijke vervoersopties?
2. **Partnerschappen met Openbaar Vervoer:**
    - Zijn er samenwerkingen met openbaarvervoersbedrijven om wandelaars gemakkelijke toegang te bieden tot wandellocaties zoals Kwintelooijen?
    - Worden er kortings- of promotieprogramma's aangeboden in samenwerking met openbaar vervoer om duurzaam reizen te stimuleren?
3. **Bewustwording en Educatie:**
    - Hoe informeert Wandelnet wandelaars over de impact van hun vervoerskeuzes op het milieu?
    - Zijn er educatieve initiatieven om bewustzijn te vergroten over duurzame mobiliteit onder de wandelgemeenschap?
4. **Innovatieve Technologieën:**
    - Zijn er technologische oplossingen geïmplementeerd om wandelaars te helpen bij het plannen van duurzame routes en vervoersopties?
    - Zijn er apps of platforms die specifiek zijn ontworpen om duurzaam transport te bevorderen in combinatie met wandelactiviteiten?
5. **Aanbevelingen**
    - Is er data over de effecten van betaald parkeren op het gedrag van de reizigers?
    - Wat zijn jullie aanbevelingen voor gebieden zoals `kwintelooijen indien zij willen investeren in de modal shift?