Interreg North-West Europe

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MONA

MONA – Activity 1.2 General inventory of nature areas

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Author(s)	Thomas Oorschot
Co-author(s)	Paul van de Coevering, Stijn Kanters
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Management summary

Background and aim

This report presents the results of Activity 1.2 of the MONA project. It involves conducting a **general inventory** of eight nature areas to assess the **sustainability** of **visitor flows** and identifying **opportunities** and **challenges**. The report aims to provide a shared understanding of these issues, which will inform the development of sustainable tourism **strategies** and **monitoring** frameworks to measure the impact of pilot interventions.

Structure and methods

The inventory is structured around four key questions regarding: 1) the general **characteristics** and **attractions** of the parks, 2) **visitor profiles**, 3) **multimodal accessibility**, and 4) **challenges** and **opportunities** related to **sustainable visitor flows** and **carrying capacity**. These questions were addressed through a combination of literature review, data analysis, spatial assessments using GIS, as well as interviews and inventory sessions.

Characteristics: mix of nature, ecology, culture and recreation

The inventory reveals that the parks offer much **more** than **natural** assets, incorporating a **mix** of ecological, cultural, and recreational features and, in some cases, significant urban and rural/agricultural areas. **Balancing** the often conflicting **interests** of **stakeholders** and visitors poses a challenge for many of the parks.

Visitor profiles: an interesting mix

Due to their mix of functions, the parks attract a **broad range** of **visitors,** including eco-tourists, families, and local recreational users. Most people visit the parks to **walk** and **enjoy nature,** and many also visit catering to enjoy food and a drink. Most visitors come from **nearby** municipalities, but a significant portion also comes from further away.

Multimodal accessibility: limited alternatives to car use

The analysis of **multimodal accessibility** shows that for most visitors the **car** is, by far, the **most convenient** mode of transportation. The heavy reliance on cars leads to congestion, and parking issues and worsens environmental impacts during overcrowding in peak times. **Public transport** accessibility is more limited, mainly serving areas around major **transport corridors**, with reduced service on weekends. While some parks plan to improve public transport, it alone may not sufficiently address the needs of most car-dependent visitors. Since many visitors come from nearby areas, **cycling**—also when combined with public transport—may offer **greater potential** to improve multimodal accessibility.

Challenges: overcrowding, visitor behaviour and stakeholders

Despite the **differences** between the parks, their **challenges** related to visitor flows are **strikingly similar**. Most parks experience **overcrowding** during peak times and at hotspots, causing parking issues, congestion, ecological damage, user conflicts, and strain on facilities. These problems are worsened by **car dependency** and the lack of sustainable transport options. Visitor **behaviour**, such as littering and straying off paths, further harms sensitive ecosystems. Additionally, parks struggle to align the diverse **interests of stakeholders,** particularly when balancing recreational, cultural, ecological, and tourism goals. Parks **near borders**, like Kalmthoutse Heide and Scarpe-Escaut, also face unique challenges in managing **cross-border** accessibility and route continuity.

Opportunities: visitor and stakeholder management and promoting sustainable mobility and behaviour

The opportunities identified across the parks are also **similar** and include targeted **visitor management** through zoning, digital tools, and improved entry points to ease pressure on hotspots. Upgrading **visitor facilities** and **communication** about **accessibility** can enhance the tourism experience and reduce conflicts. **Monitoring** and **data collection** can inform decision-making. Promoting **sustainable mobility**, such as shuttle services, green bus stops, and cycling facilities, can reduce car dependency. **Educational campaigns** can raise awareness of ecosystem vulnerability and sustainable behaviour. Effective **stakeholder engagement** and collaboration among municipalities, conservation groups, and businesses is essential for developing shared goals and strategies.

Recommendations: focus on mutual learning and evidence-based solutions

The report concludes with recommendations for the MONA project, including organising **cross-organizational** collaboration, facilitating **mutual learning** between parks, and ensuring that all initiatives are informed by **robust data collection** and **monitoring**. By sharing experiences and successes, parks can develop more effective interventions and avoid **reinventing solutions**. Additionally, focusing on **inclusivity** and ensuring accessibility for all visitors, including those with disabilities, will be critical for achieving long-term, sustainable tourism in nature parks.

In the next phases of the MONA project and beyond, **continued collaboration** and **evidence-based decision-making** will be key to striking an effective balance between the interests of tourism and nature conservation.

1. About MONA

1.1 Aim of the project

Nature areas in North-West Europe (NWE) face an increasing number of visitors (intensified by COVID-19) resulting in an increased pressure on nature, negative environmental impacts, higher management costs, and nuisance for local residents and visitors. The high share of car use exaggerates these impacts, including peak pressures. Furthermore, the almost exclusive access by car excludes disadvantaged people, specifically those without access to a car. At the same time, the urbanised character of NWE, its dense public transport network, well-developed tourism & recreation sector, and presence of shared mobility providers offer ample opportunities for more sustainable tourism.

MONA aims to promote sustainable tourism in and around nature areas in NWE which benefits nature, the environment, visitors, and the local economy. MONA will do so by encouraging a modal shift through facilitating sustainable transport modes, providing inclusive routing to and within nature areas, and nudging visitors and stakeholders towards more sustainable behaviour. These are the key solutions to manage visitor flows, reduce negative impacts and stimulate inclusive access. Eight nature areas and three knowledge & dissemination partners work together to:

- Assess the impact of visitors & mobility on nature areas and develop strategies to reduce this impact;
- Jointly pilot solutions on the modal shift, routing and nudging;
- Provide capacity building for stakeholders across NWE.

1.2 Pilot groups

Within MONA, the nature parks are divided into three transnational pilot groups. Table 1 shows an overview of the different pilot groups and associated parks/partners. The partners in each pilot group test the effect of interventions and solutions to encourage more sustainable tourism among their visitors. Lessons learned from these pilots will be shared with the other partners to enhance mutual learning.

Table 1: Overview of pilot groups and associated parks/partners

Pilot A: Modal shift towards sustainability	Pilot B: Improving Accessibility through Routing	Pilot C: Nudging towards sustainable choices
National Park Utrechtse Heuvelrug (NL)	Van Gogh National Park (NL)	Tourismus Zentrale Saarland GmbH – Bliesgau Biosphere Reserve (DE)
BENEGO - Grenspark Kalmthoutse Heide (BE)	Natuurmonumenten – National Park Veluwezoom (NL)	Scarpe-Escaut Regional Nature Park (FR)
Montagne de Reims Regional Park (FR)	Tourism Province of Antwerp (TPA)	Montagne de Reims Regional Park (FR)

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Pilot A Modal shift towards sustainability

Pilot A is focused on the creation of an action plan for facilitating and stimulating a **modal shift** towards sustainable mobility. This pilot involves collaboration between National Park Utrechtse Heuvelrug, Grenspark Kalmthoutse Heide, and Montagne de Reims Regional Park. Its primary aim is to shift from car-centered travel to sustainable alternatives such as walking and cycling. Key objectives include transforming railway stations into gateways to natural areas, promoting sustainable mobility, and providing guidance to visitors.

Pilot B Improving Accessibility through Routing

Pilot B is focused on modifying **routing** networks and improving access points to improve visitor distribution and accessibility. This pilot is conducted by VisitBrabant, Natuurmonumenten – National Park Veluwezoom and Tourism Province of Antwerp. One of the aims is to inventory the entry points to the nature areas and the (re)design of route networks.

Pilot C Nudging towards sustainable choices

Pilot C focuses on the implementation of a comprehensive set of **nudging** measures to encourage sustainable visitor choices and disperse visitor flows. This pilot involves a collaboration between Tourismus Zentrale Saarland GmbH, Scarpe-Escaut Regional Nature Park, and Montagne de Reims Regional Park. A key objective is to create a joint vision and messages for communicating sustainable tourism projects, the advantages of sustainable tourism development for tourism service providers, residents, and guests, as well as the value of conservation and appropriate behaviour in nature.

The general inventory of the nature parks in this report will be structured around these pilot groups.

2. This report

This report presents the results of activity 1.2: the general inventory of nature areas. The rationale for this activity arises from the lack of a shared understanding of the current sustainability of visitor flows, as well as the associated opportunities and challenges. A common and detailed understanding of these issues is a prerequisite for developing effective strategies to change the current status quo. The general inventory aims to provide this evidence base, providing the groundwork for other activities in work package 1 that should culminate in effective sustainable tourism strategies and a monitoring framework to measure the impact of pilot interventions.

For each nature park, the following research questions have been addressed:

1. What are the general characteristics and distinctive functions and attractions of the park?
2. What are the key visitor profiles, including activities and transport modes used?
3. What is the level of multimodal accessibility of the nature parks for car, public transport, cycling and walking?
4. What challenges and opportunities regarding visitor flows and carrying capacity are identified by relevant stakeholders?

The information from the individual parks will be used to define implications and recommendations for the next phases of the MONA project.

Figure 2.1. shows the overall map with the eight different case studies and nature areas.

Figure 2.1 General overview of the nature parks researched within this document

2.1 Methods

Literature and data research

At the start of the MONA project, the nature areas provided a wide variety of information and data collected by project partners or third parties operating in and around the nature areas. This information has been used to create a general description of the characteristics of each nature area and, where available, to describe the current visitor profiles. Moreover, information on the opportunities and challenges related to sustainable visitor flows is combined with the results of the stakeholder engagement.

Accessibility analysis

Based on available data and information, an inventory of multimodal accessibility was conducted for all nature areas. This included an analysis of the network availability and connectivity for walking, cycling, public transport and car travel. This reveals the availability and the density of the infrastructure networks for each transport mode. Subsequently, the quality of each network was evaluated based on travel time. For the accessibility analyses, the Travel Time QGIS plug-in was utilised. This plug-in uses real-time data from various sources, allowing us to assess how far visitors can travel with each transport mode from a certain starting point (Travel Time, 2021). This analysis

enabled the determination of the catchment areas for key entry points to the nature parks within specific time intervals (e.g., 15, 30, or 60 minutes).

We selected three modes of transport for this analysis. The first mode is the car, usually the fastest transportation mode especially in more rural areas. The second mode is biking, which is particularly relevant for the Netherlands due to its extensive cycling infrastructure. Lastly, we considered accessibility by public transport, including buses and trains.

Inventory sessions

To gain a deeper understanding of the challenges and opportunities in the case study areas, inventory sessions were planned in collaboration with the individual nature areas. As part of the preparation, a meeting was scheduled with stakeholders from each nature area to interview them about initial challenges and potential opportunities and to discuss the setup of the stakeholder engagement during the inventory session.

The inventory session's main aim was to provide an in-depth overview of the perceived challenges regarding visitor flows in and towards the nature area. The inventory was organised in a workshop setting where the participants were first asked to define suitable tourism for nature areas and parks for themselves. The second item of the workshop aimed to identify the most prominent challenges. The last part of the session focused on possible solutions. Additionally, several field visits were held, and observational analyses were conducted to gain a better understanding of the challenges at specific locations.

Over the course of 2023 and 2024, inventory sessions were organised in all nature areas, including active involvement of local stakeholders and experts. Table 2 provides an overview of the planning of these sessions.

Table 2: Planning of the inventory sessions

Name of nature area	Location	Date of session
Bliesgau Biosphere Reserve (DE)	Gersheim, Orchid Garden	21-11-2023
Van Gogh National Park (NL)	De Sprankenhof, Udenhout	29-11-2023
Scarpe-Escaut Regional Nature Park (FR)	Maison du Parc Naturel Régional Scarpe-Escaut, Saint-Amand-les-Eaux, France	19-12-2023
Montagne de Reims (FR)	Pressoria, Aÿ-Champagne, France	21-12-2023
Utrechtse Heuvelrug (NL)	Train station, Den Dolder	21-02-2024
Grenspark Kalmthoutse Heide (BE)	Serrehuis, Kalmthoutse Heide	04-03-2024
Tourist board Antwerp (BE)	Bezoekerscentrum Vallei van het Merkske - Natuurpunt Markvallei	15-04-2024
Veluwezoom (NL)	Bezoekerscentrum Veluwezoom, Rheden	17-06-2024

The information gathered from these sessions provides a backbone for the subsequent research activities in the MONA project.

2.2 Report Outline

This report provides a comprehensive overview of the natural areas and parks included in the MONA project. The report starts with a description of the nature areas from pilot group A, followed by the parks from groups B and C. Each chapter begins by detailing the key characteristics of these areas and the general features of the specific case studies. Subsequently, multimodal accessibility of the nature areas is assessed, including walking, cycling, public transport (train and buses) and car travel. The chapter will conclude with an analysis of the current challenges and opportunities identified, primarily based on the inventory sessions that were organised in collaboration with the nature areas. The report ends with a summary of the main conclusions and recommendations for the next phases of the MONA project.

3. Utrechtse Heuvelrug (The Netherlands)

3.1 Characteristics and attractions

General characteristics

The Utrechtse Heuvelrug is a national nature park in the centre of the Netherlands, located between Utrecht, Amersfoort, and Wageningen. It is often described as "An oasis of calm, just outside the suburbs" due to its proximity to the Randstad and the centrality within the Netherlands (Nationaal Park Utrechtse Heuvelrug, sd).

Founded in 2003, the national park initially encompassed its southernmost area and later expanded to the northern parts. It covers 10 municipalities across two provinces - Utrecht and North-Holland – and involves four land management organisations and numerous private estate owners (Ulug et al., 2023).

The Utrechtse Heuvelrug spans about 50 kilometres and was formed during the last ice age. It is known for its varied landscape, which consists of vast forests, heathlands, sand drifts and rolling hills. It also has cultural and historical significance, with historic estates, castles and archaeological sites dating back to prehistoric times and is well known within the Netherlands (Bureau voor Ruimte & Vrije Tijd, 2017).

The Heuvelrug covers 20,000 hectares of contiguous forest and heathland. Including the flanks, it is around 40,000 hectares, including valuable wetlands. The southern part of the Heuvelrug, an area of about 10,000 hectares, has held National Park status since 2003 (see figure 3.1).

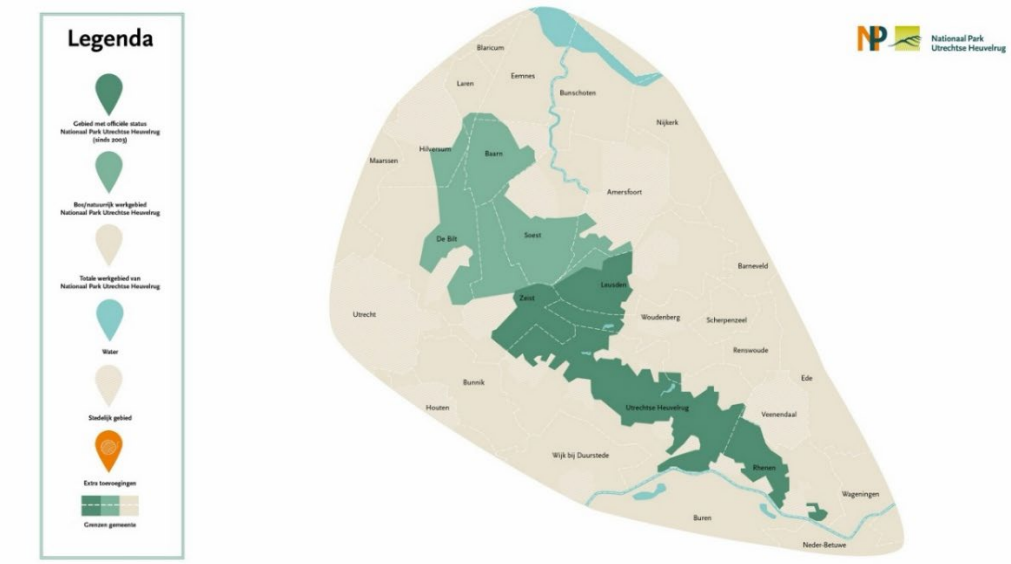

Figure 3.1 Map of the Utrechtse Heuvelrug National Park and the working area. Source: (Nationaal Park Utrechtse Heuvelrug, n.d.)

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Focus Area- **Park Vliegbasis Soesterberg**

Vliegbasis Soesterberg, a **former military airfield,** is centrally located within the Utrechtse Heuvelrug near Soesterberg, between Utrecht and Amersfoort in the municipalities of Soest and Zeist. The airfield was established in 1913 and played a crucial role in both World Wars and the Cold War before being closed due to defence cuts in 2008 (Nationaal Militair Museum, 2024).

After its closure, the site was transformed into a nature area, spanning 375 hectares, managed by Utrechts Landschap (Utrechts Landschap, 2024). It opened to the public in 2014, offering a unique combination of military heritage, natural landscapes and leisure.

Functions and attractions

NPUH offers a variety of activities and attractions. The combination of recreational, cultural, and adventure-focused activities ensures that the area caters for a wide array of visitor interests. For millions of people, the Heuvelrug is very close by. The recreational options are diverse and in demand: museums, country estates, and extensive cycling and hiking paths, all connected to TOPs (tourist transfer points, see Figure 3.2 for all the TOPs) and dining establishments. Famous attractions include the forests and Lunapark around the pyramid of Auterlitz, the combination of heritage, nature and viewpoint De Kaap in the Kaapse Bossen, the stately residences, castles, palaces, lush gardens and expansive park forests around Lage Vuursche and the highest point of the province, the Amerongse Berg (Nationaal Park Heuvelrug, 2018).

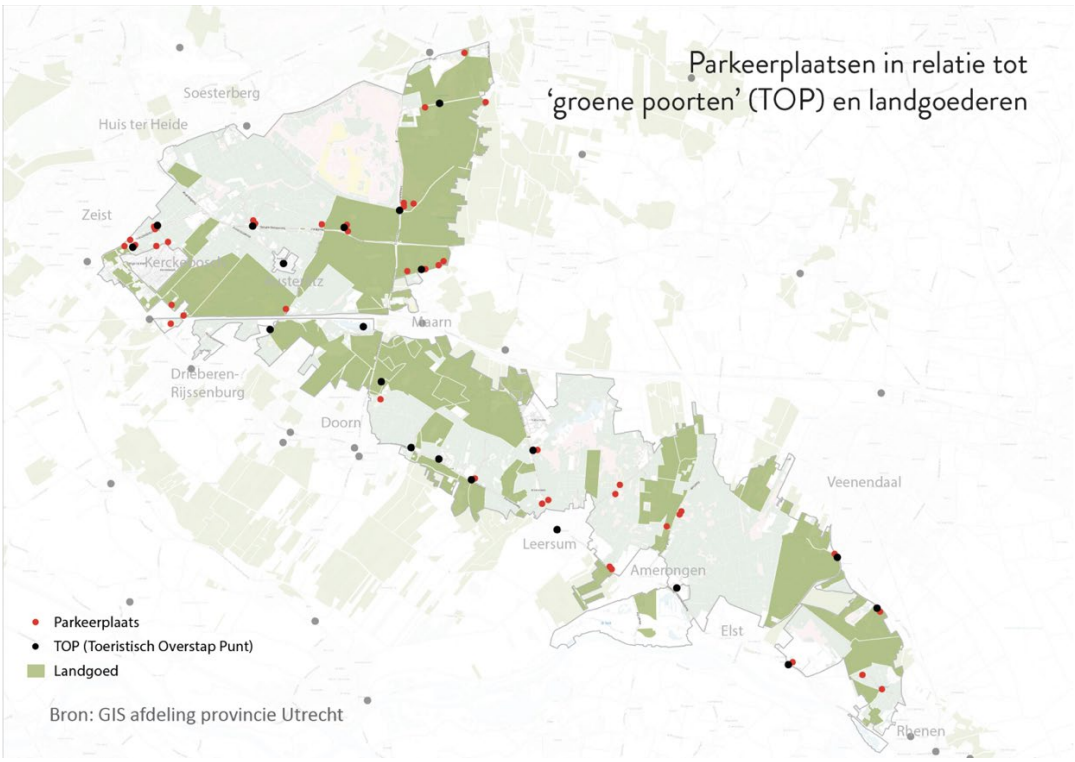

Figure 3.2 Parking in relationship to TOP points. Source: (PARK Provincie Utrecht, 2023)

The focus area **Park Vliegbasis Soesterberg** features a rich variety of plants and animals. It includes habitats like heathlands, grasslands, and forests (figure 3.3). Notable species include the sand lizard, various birds of prey, and rare fungi. In addition, it honours the past of the former Soesterberg Air Base. Visitors can engage in numerous activities, including hiking, cycling along the Netherlands' widest path (a former runway), and birdwatching. The park also hosts the National Military Museum, along with historical military structures and ample trails for discovering both the natural and historical scenery (Utrechts Landschap, 2024; Nationaal Park Utrechtse Heuvelrug, 2023).

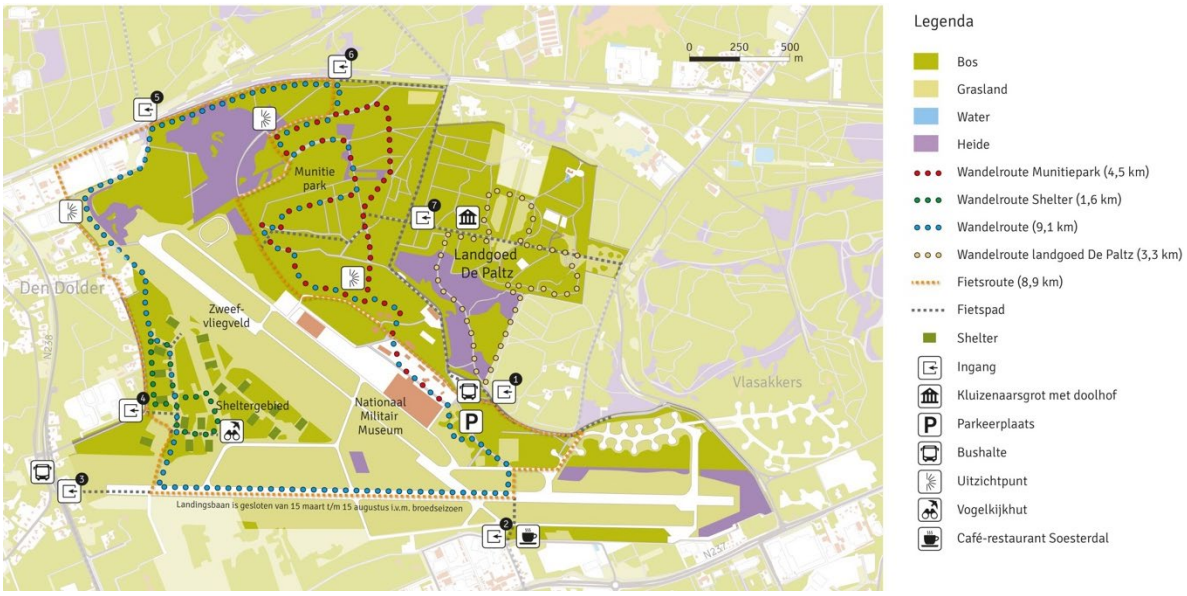

Figure 3.3 General map of Park Vliegbasis Soesterberg. Source: (Utrechts Landschap, 2024)

3.2 Visitor profiles and activities

Visitor profiles

The nature areas in Utrecht are among the most visited nature areas in the Netherlands. Research by NBTC-NIPO (2020) indicates that around 1 in 5 Dutch people visited one of the 32 recreational areas in the province of Utrecht between December 2018 and December 2019. A more recent study from Kantar Public (2023) arrived at comparable conclusions (figure 3.4). For the 16 main recreational areas on the Utrechtse Heuvelrug (see Figure 4.4), survey results indicated a total of 5,273,000 visitors in 2022, marking an increase from 4,890,160 visitors in 2019 (Monitor Utrechtse Heuvelrug, 2023). The annual number of visits to Vliegbasis Soesterberg ranged between 1 and 1.25 million, of which 581,000 were unique visitors (Kantar Public, 2023).

Visitor origins vary significantly. Most visitors to NPUH come from nearby regions, with **60%** travelling from Utrecht, Amersfoort, and neighbouring municipalities. Approximately **30%** travel from other parts of the Netherlands, and around **10%** are international visitors, predominantly from Germany and Belgium (Kantar Public, 2023).

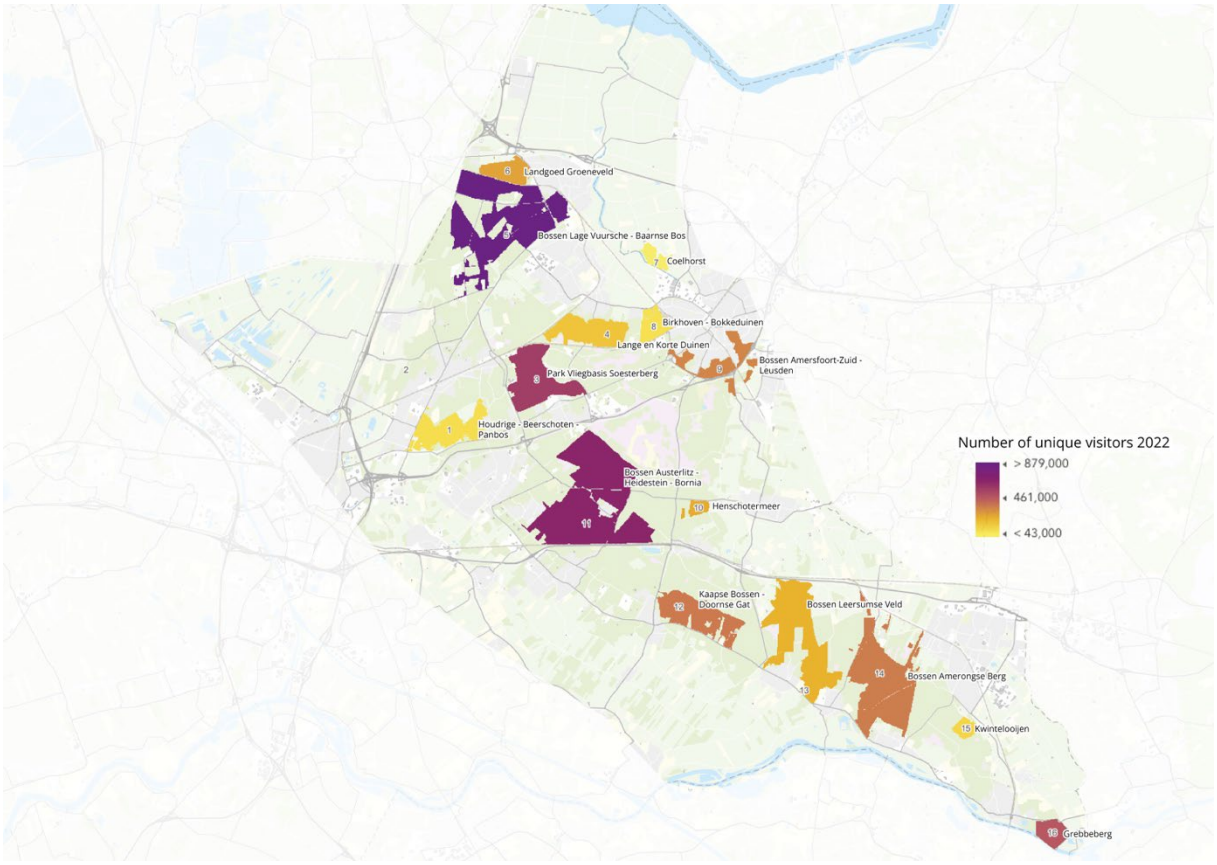

Figure 3.4 Number of unique visitors 2022 (Nationaal Park Utrechtse Heuvelrug, 2023)

Type of activities

Walking is the most popular activity, with **42%** of visitors engaging in this activity across all parks in Utrecht. This is followed closely by **cycling**, which attracts **32%** of visitors, including e-bike users and race/mountain bikers exploring routes in areas like De Leijen/Beukenberg and Bossen Amerongse Berg. **Cultural exploration (18%)** is another critical activity, particularly at Vliegbasis Soesterberg, where visitors engage in aviation history tours, and Grebbeberg, a World War II memorial site (Kantar Public, 2023; NBTC - NIPO Research, 2020).

Seasonal activities include water-based recreation at **Henschotermeer**, which draws families for swimming and picnicking, accounting for a significant portion of summer visits. The park also accommodates niche activities such as nature photography and birdwatching, which are popular in quieter areas like **Bossen Lage Vuursche** and **Houdringe/Beerschoten/Panbos**.

With the wide array of activities, the parks in NPUH serve a diverse audience ranging from **families** enjoying water-based recreation at Henschotermeer and leisure activities around the pyramid of Austerlitz to **adventure seekers** cycling through Bossen Amerongse Berg. Visitors interested in heritage can indulge in the rich history of cultural and historical hotspots like Vliegbasis Soesterberg and Grebbeberg, **while nature**

enthusiasts are drawn to serene forested areas like Bossen Lage Vuursche and Houdringe/Beerschoten/Panbos.

Visitors to the focus area, **Park Vliegbasis Soesterberg,** mostly visit the area once (63%) or twice (24%) a year. With a share of 54% of visitors of 55 years or older, the visitors are relatively old in comparison with the general visitors to nature areas in Utrecht. Figure 3.5 shows the main activities undertaken during their visit. In line with the overall results for nature areas in Utrecht, walking and cycling are the most popular activities, followed by more relaxing activities such as restaurant and event visits and (general) recreation (Kantar Public, 2023; Utrechts Landschap, 2024).

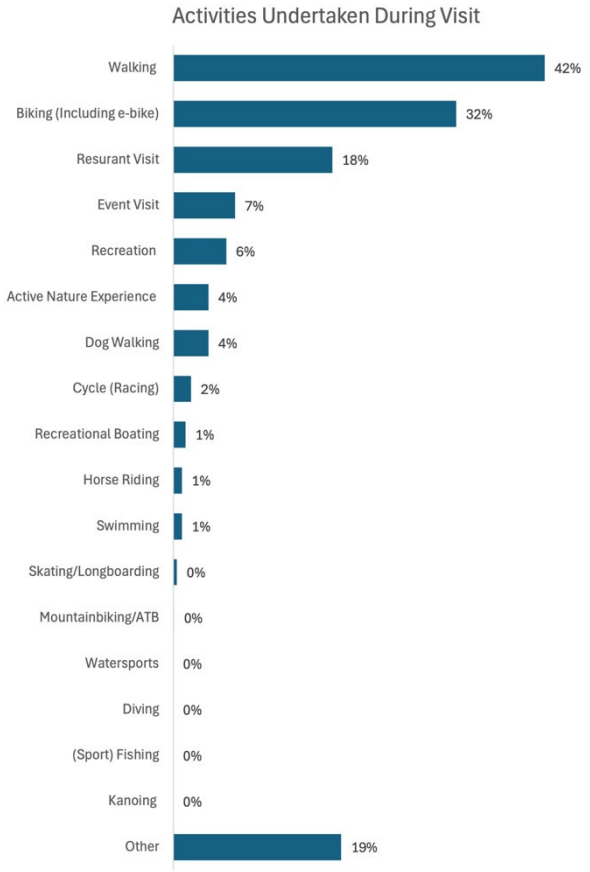

Figure 3.5 Activities undertaken during the most recent visit to Park Vliegbasis Soesterberg (Kantar Public, 2023)

The majority of visitors (59%) arrive by car, followed by cyclists (29%). Walking and scooters each account for 5% of visitors, while public transport plays a minimal role, contributing just 1% (Nationaal Park Utrechtse Heuvelrug, 2023).

3.3 Multimodal accessibility

This paragraph analyses the multimodal accessibility of Utrechtse Heuvelrug National Park, particularly at specific entrance points, for cars, public transport (including trains and buses), cycling, and walking. For each transport mode, the availability and density of

the networks are presented, and accessibility maps are developed to illustrate which areas are within reach of the park's main entrance points.

Car accessibility

Utrechtse Heuvelrug National Park is well-equipped for car accessibility, catering to a significant portion of visitors arriving by private vehicles due to the availability of free parking spots. The park features designated parking areas strategically located near popular attractions such as Kaapse Bossen and Vliegbasis Soesterberg, ensuring convenience for drivers (figure 3.6).

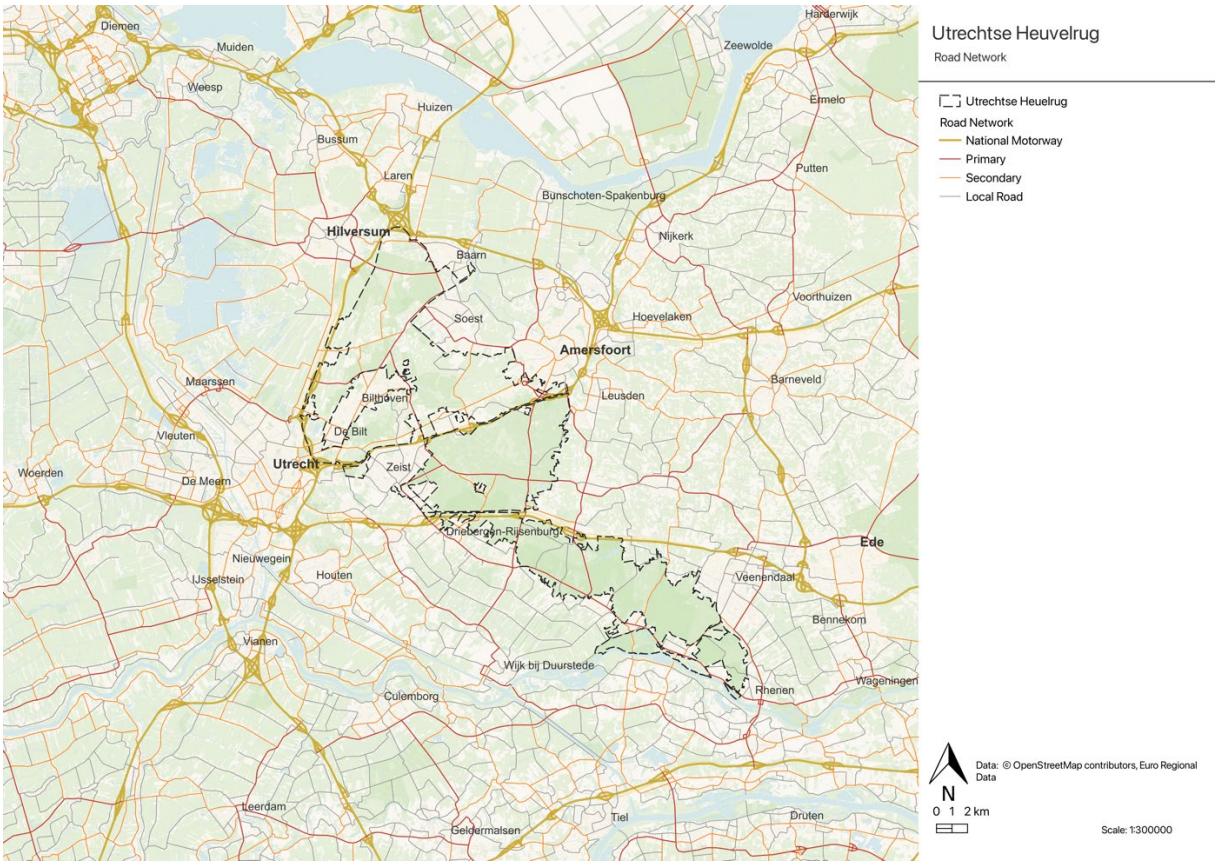

Figure 3.6 Car infrastructure around Nationaal Park Utrechtse Heuvelrug

The central location of Utrechtse Heuvelrug, together with its well-developed infrastructure, including the national highways that cross the park (A12 and A28) and provincial roads, allows for a high level of car accessibility to the TOP starting points (figure 3.7). Cities in all directions—south, north, west, and east—such as 's- Utrecht, Veenendaal, Hilversum, Hertogenbosch, Nijmegen, and Amsterdam, are reachable within or just over a 30-minute drive. Furthermore, a substantial part of the Netherlands is accessible within a 60-minute drive, with only the northern and southern provinces requiring slightly longer travel times.

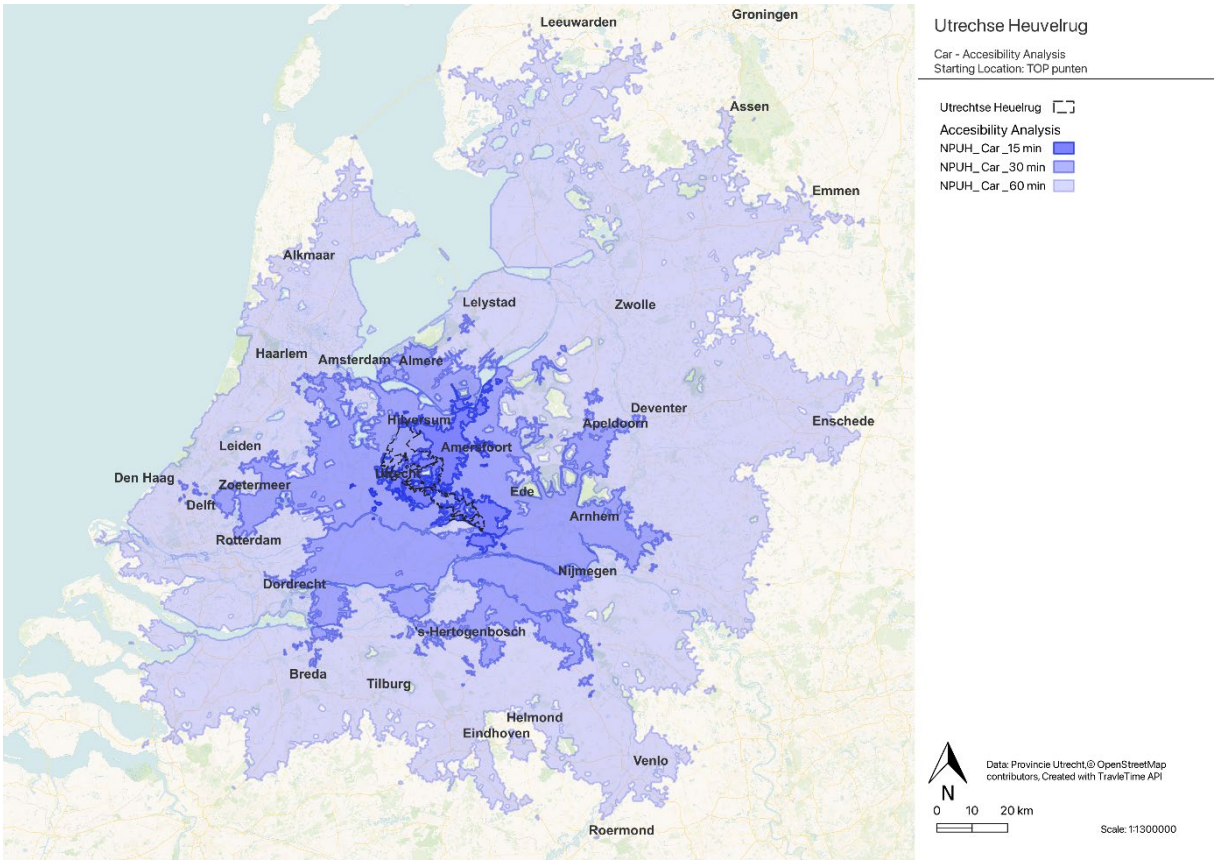

Figure 3.7 Car accessibility Nationaal Park Utrechtse Heuvelrug

Public transport accessibility

The Utrechtse Heuvelrug National Park has a well-integrated public transport system that facilitates sustainable visitor access (figure 3.8). Key train stations, such as Driebergen-Zeist and Rhenen, provide direct connections to major urban centres like Utrecht, Hilversum, Amersfoort, Arnhem, and Amsterdam, making the park easily accessible for local and international visitors. Train stations act as primary gateways to the park's entry points and popular areas, providing the quickest access to nature on foot (direct access or approximately 10 minutes) these are: Baarn, Hollandsche Rading, Soest-Zuid, Den Dolder, Driebergen-Zeist, and Maarn. Additionally, stations located in the Utrechtse Heuvelrug area, such as Amersfoort Centraal, Bilthoven, Soestdijk, Veenendaal Centrum, Veenendaal West, and Rhenen, are a bit further away but still provide access to nature. Most of these stations offer OV bicycles (rental bikes linked to train stations) for convenience. With Driebergen-Zeist using OV e-bikes (Nationaal Park Utrechtse Heuvelrug, 2023). Regional buses complement the train network and connect smaller towns and villages to the park's key access points, including popular destinations like Kaapse Bossen and Vliegbasis Soesterberg. These bus services ensure that visitors without cars can conveniently reach various parts of the park. Lastly, bike rentals are available at major train stations to facilitate the last-mile connections and recreational cycling in and around the national park.

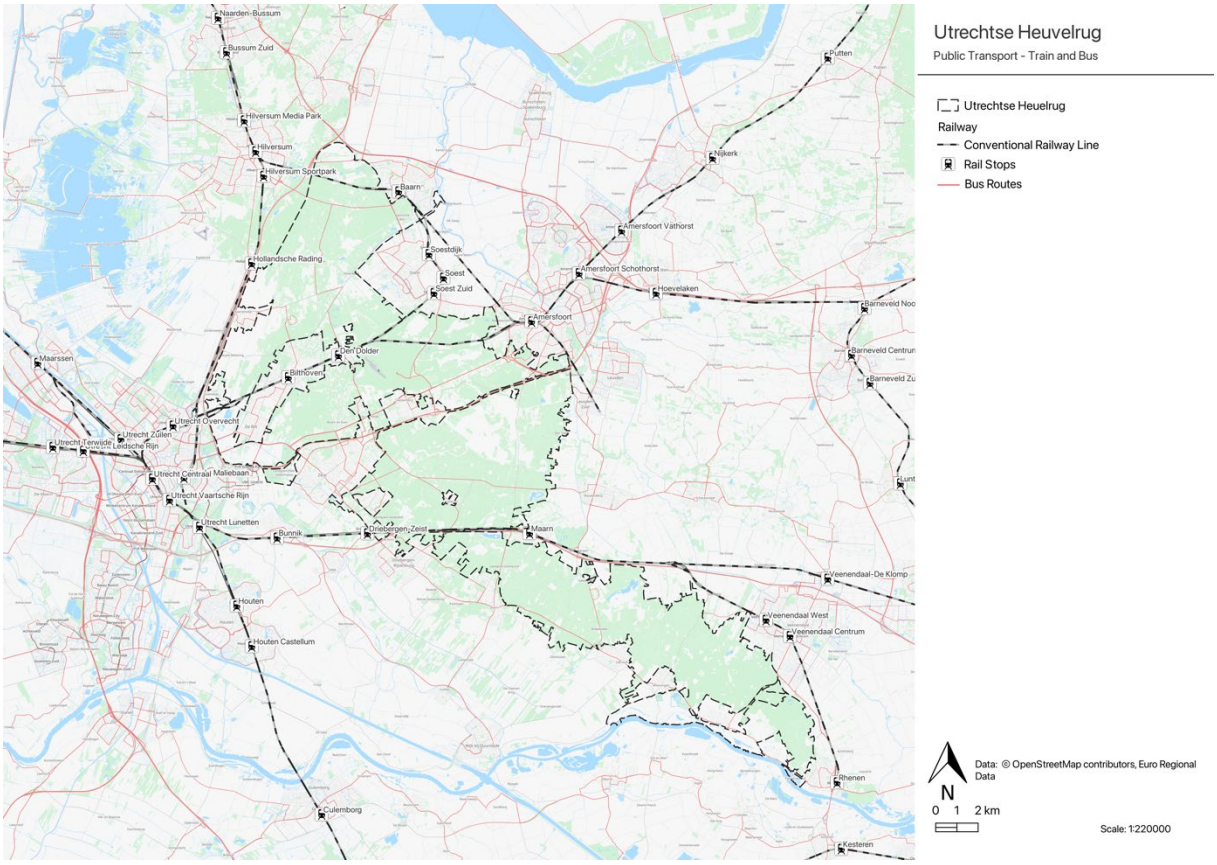

Figure 3.8 Public transportation map Nationaal Park Utrechtse Heuvelrug

Figure 3.9 illustrates the coverage areas by public transport within 30, 60, and 90 minutes for the combination of TOP starting points. The data reveals that public transportation access is more selective compared to car accessibility. The bus network provides good accessibility in areas directly to the national park, enabling accessibility of the nearest TOP entry points within 30 minutes. The train network offers a decent connection to major cities such as Amsterdam, Rotterdam, Arnhem, and 's-Hertogenbosch, all of which are accessible within 90 minutes. However, this is significantly less convenient compared to the accessibility provided by car.

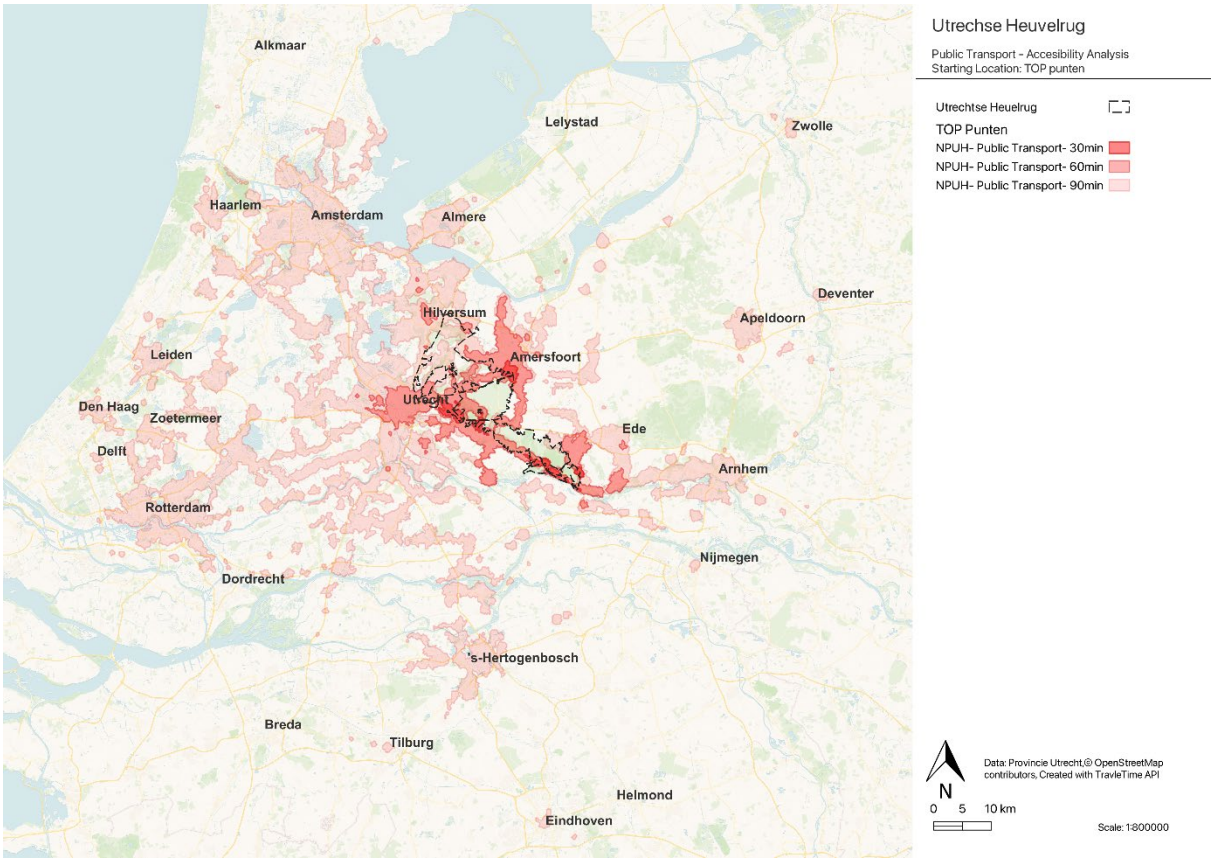

Figure 3.9 Public transport accessibility Nationaal Park Utrechtse Heuvelrug

Cycling accessibility

Utrechtse Heuvelrug National Park strongly promotes cycling as a sustainable and enjoyable way to explore its diverse landscapes. The park features an extensive network of well-maintained cycling and mountain bike paths that connect key attractions, including Kaapse Bossen, the Pyramid of Austerlitz and Vliegbasis Soesterberg, with surrounding towns and villages (figure 3.10). Additionally, as mentioned earlier, bicycles are promoted as a convenient last-mile solution from train stations like Driebergen-Zeist.

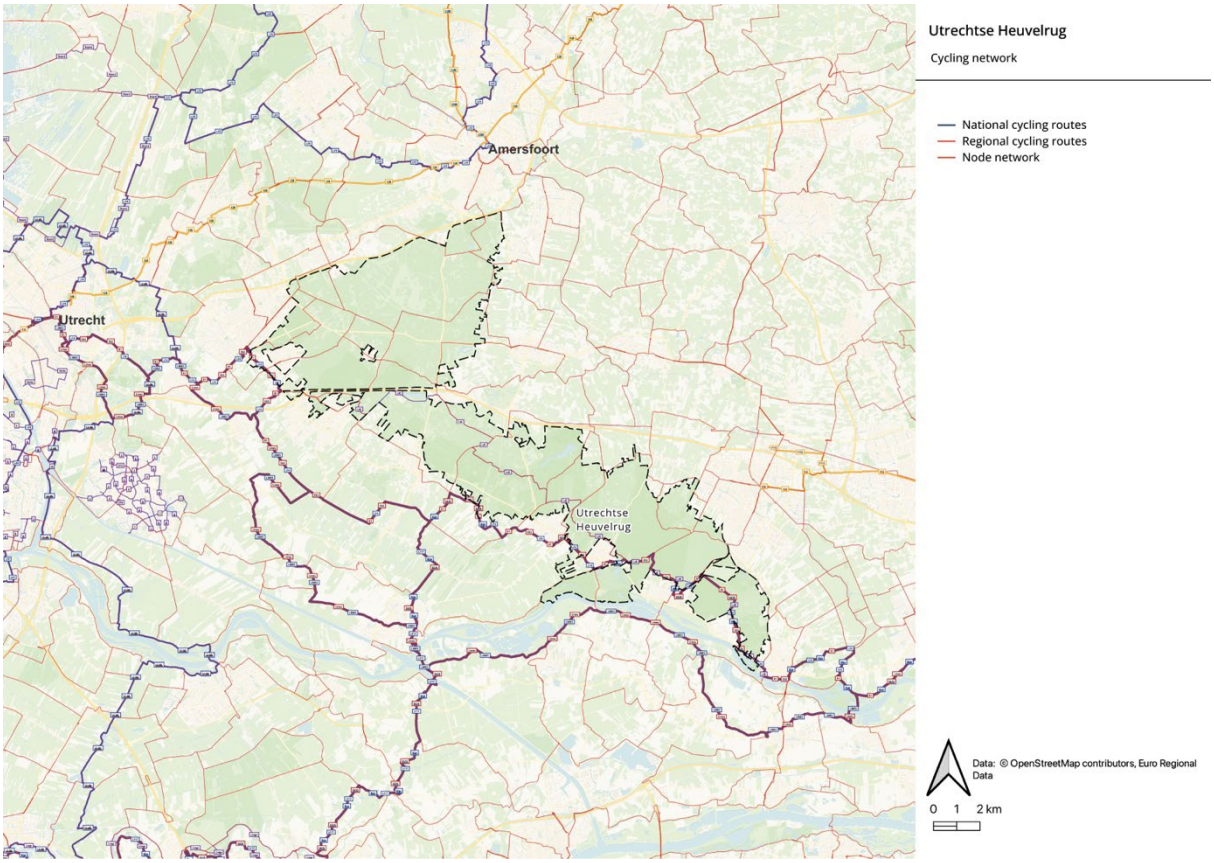

Figure 3.10 Bicycle infrastructure Nationaal Park Utrechtse Heuvelrug

Figure 3.11 shows the travel time map for the areas accessible by bicycle within 15, 30 and 60 minutes. Cities like Amersfoort and Utrecht are accessible within a 15-minute bike ride from the nearest park entry points. Many other municipalities fall within the 30- or 60-minute cycling range, facilitating recreation cycling that can be combined with nature walks in the park. Given that a significant portion of visitors come from these surrounding areas, this creates opportunities for a sustainable shift from car travel to cycling.

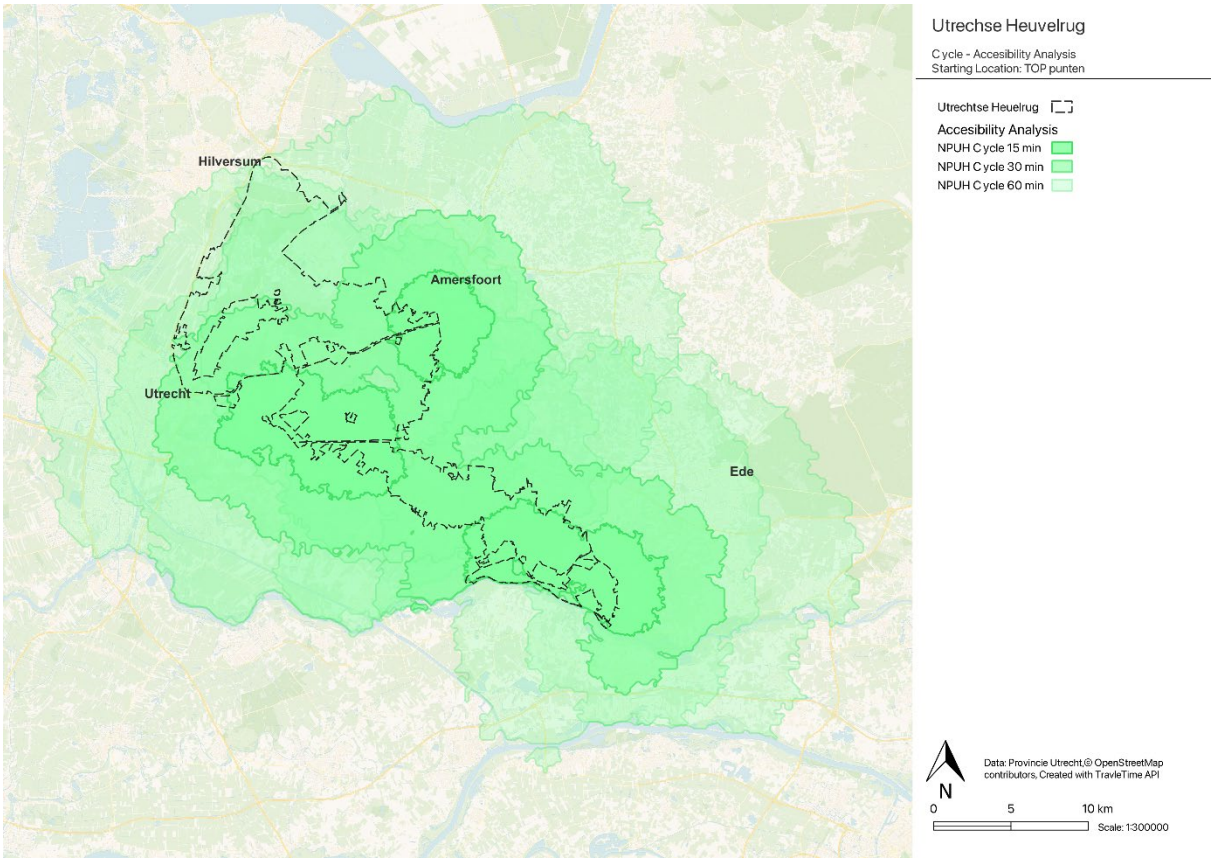

Figure 3.11 Bicycle accessibility Nationaal Park Utrechtse Heuvelrug

Pedestrian accessibility

The Utrechtse Heuvelrug National Park boasts an extensive network of walking trails starting from the entry points and train stations (see figure 3.12). The park has over **50 well-maintained routes** spanning diverse landscapes such as dense forests, rolling hills, heathlands, and sandy plains. These trails vary in length and difficulty, from 2 to 21 km, catering to casual walkers as well as seasoned hikers (Nationaal Park Utrechtse Heuvelrug, sd). Additionally, several NS-wandelingen (National railways hikes) are offered, such as a scenic route from Driebergen-Zeist to Maarn (NS, 2023), covering 8 to 15 km and passing through diverse landscapes like forests, heaths, and sand drifts, making it a popular choice for visitors arriving by train (e.g. walking route De Vuursche and Lange Duinen).

Figure 3.12 Walking routes Nationaal Park Utrechtse Heuvelrug

3.4 Challenges and (potential) opportunities

This section describes the challenges and potential opportunities for the NPUH to promote sustainable visitor flows. First, knowledge from previous studies is summarised. Subsequently, the results from the inventory session are shared.

Background knowledge

In recent years, NPUH has collaborated with students from multiple universities and research institutes, such as Utrecht University and Wageningen University. Together with Utrecht University, NPUH has established the Utrechtse Heuvelrug Research and Education Hub[1]. This initiative fosters intensive cooperation in alignment with the themes outlined in the National Park's research agenda, focusing on understanding the landscape's dynamics and the transitions necessary for a sustainable future in the region.

The reports are used to provide an overview of the current status quo regarding challenges and opportunities in the area. Overall, the reports highlight that NPUH faces increasing pressures from growing visitor numbers, environmental concerns,

[1] https://www.uu.nl/onderzoek/onderzoeks-onderwijshub-utrechtse-heuvelrug

urbanisation and the need to balance accessibility with sustainability. Specifically, the following challenges are identified by the students:

- **Overcrowding and unbalanced visitor distribution**: especially at the weekends and holidays, this leads to congestion, air and noise pollution and decreased visitor satisfaction, as well as nuisance for residents. Furthermore, it contributes to environmental degradation due to disturbance to vulnerable areas and soil erosion.
- **Unsustainable visitor flows:** The overwhelming majority of visitors arrive by car, partly due to inconvenient public transport at certain locations. The availability of cars is substantial, with the majority of parking spots, which creates significant challenges regarding congestion and insufficient parking spaces. Furthermore, it contributes to environmental and noise pollution. Finally, it creates issues for disadvantaged groups who do not have access to a car.
- **Insufficient facilities:** during visitor peaks, visitor facilities such as restrooms, signage and restaurants/catering often cannot meet the demand, which creates challenges, especially for people with disabilities.
- **Environmental pressure:** The current visitor flows exceed the park's carrying capacity and undermine the park's ecological health and its unique appeal. Threats are related to noise and littering, habitat fragmentation caused by unregulated visitor activities and environmental pollution and climate change, which exacerbates these vulnerabilities.
- **Diverse stakeholder interests:** different stakeholders, such as landowners, visitors, and local communities, may have conflicting interests, making a joint approach more challenging.

The following opportunities have been mentioned to improve the situation:

- **Alleviate overcrowding and even visitor distribution:** zoning strategies can be implemented to develop dedicated less-visitor areas to draw away visitors from hotspots. Also, reservation systems with dedicated timeslots can be implemented during peak hours in high-traffic zones. Furthermore, enhanced visitor information with tools like the Druktemonitor (crowd monitor), could encourage people to visit less crowded areas.
- **Improving alternatives for car use**: The park has potential to encourage cycling among nearby residents by improving and expanding bicycle infrastructure. There is a potential for further expansion and rollout of OV-fietsen and OV e-fietsen at NS stations in and around the Utrechtse Heuvelrug. This includes increasing the number of available OV-fietsen at current stations and introducing new OV-fiets locations, such as at Maarn station, where bikes are not yet available. The pilot program for OV e-bikes may also be scaled up, with NS noting that these electric bikes are particularly popular for recreational use, such as at Driebergen-Zeist station. These developments are important for visitors who

wish to access the park sustainably, bridging the last mile of their journey. In addition, the Province of Utrecht, through the "Goedopweg" program, is exploring the expansion of a regional shared two-wheeler network, including bicycles, e-bikes, cargo e-bikes, and scooters (Provincie Utrecht, 2021). Furthermore, public transport can be enhanced by redeveloping train stations into green entrances, developing dedicated shuttle services, or improving bus routes and frequencies, particularly on weekends, to reduce the pressure on the area by car.

- **Improve infrastructure and facilities.** Increase capacity and maintenance of restrooms, and catering. Enhance wayfinding and accessibility, especially for people with disabilities. This also includes the development of inclusive digital apps that feature all transport options, walking routes, catering establishments and real-time updates.
- **Implement conservation and awareness campaigns**. Encourage eco-friendly behaviour among visitors with nudging, educational programs and engagement opportunities.
- **Collaborate with stakeholders:** develop a shared ambition and vision for sustainable visitor mobility with stakeholders.

Inventory session

To develop a better understanding of the key challenges and opportunities, an inventory session was organised by BUAS in collaboration with Utrechtse Heuvelrug in Den Dolder in February 2024. A wide variety of stakeholders, including Natuurmonumenten, Province of Utrecht, Staatsbosbeheer, NS (National railways), Nationale Parken Bureau and several landowners and surrounding municipalities, were invited in order to develop a comprehensive picture of the current status quo.

Key challenges

During the session, stakeholders addressed and discussed key challenges. The most prominent ones are:

- **Excessive car accessibility:** currently, car access is the default among many visitors, and its convenience is easily accommodated. Numerous parking spots are available throughout the Heuvelrug, with most providing free access parking. Leading to congestion, parking issues, air and noise pollution, and disturbances for residents, all of which negatively impact the environment. This is partly because the alternatives to the car, such as bicycles and public transport, are currently not up to standard.
- **Increased visitor pressure:** not only due to an increase in visitor numbers but also as a result of a declining acceptance of regulations among visitors and enforcement ("handhaving") is limited.
- **The need for balancing:**

  - **Nature and recreation**: Balancing recreational use with the preservation of natural areas is necessary due to the negative impacts of visitor flows on nature areas, especially related to excessive car use.
  - **Economic values and natural values**. At the same time, recreation has considerable value for the local economy, and maintenance costs should be balanced with income sources.
  - **' Carrots and sticks'**: the negative impact of car use calls for restrictive measures, but at the same time, nature should remain accessible. Soft measures, such as information and awareness campaigns highlighting the impact of people's visits to natural areas, could also contribute to sustainability goals, along with the introduction of paid parking (as a pilot) in the most visited recreational areas. Finding the right balance is a challenge.
- **Demographic trends**: future trends in urbanisation, population growth and ageing could increase the number of visitors and pressure on nature areas while potentially also increasing the demand for accessible facilities for disabled people.
- **Effective stakeholder collaboration.** The size of the NPUH requires multilevel and cross-disciplinary stakeholder collaboration. The alignment of various needs and interests among stakeholders in a common vision is a challenge.
- **Routing and Information**: Online routing information becomes outdated very quickly, and its easy availability could attract additional visitors, which might be undesirable.
- **Catering for different visitor types:** the needs and preferences of different types of visitors may vary significantly, and the question is how these can be managed without sacrificing natural values and without unnecessary conflicts between users.

Opportunities

In a subsequent workshop round, the stakeholders were asked to develop and discuss potential solutions. The most prominent ones are:

- **Restrict car use and improve alternatives:** A potential solution could be found in paid parking and more focus on attractive alternatives for the car, such as bike parking, improved connectivity to stations and more frequent connectivity for bus transport and shared e-bikes/scooters for last mile connectivity. Also, public transport costs can be reduced for park visitors.
- **Increase the attractiveness of ' Touristic transfer nodes' (TOPs) and entry points** by creating park-and-ride (P&R) facilities with shuttle busses further away from the park and developing new TOPs around train and bus stations. The following stations are mentioned as promising green entry points: Den Dolder,

Zeist, Amersfoort, Maarn and P&R Driebergen-Zeist as well as Baarn, Hollandsche Rading. These TOPs and green entry points should include bicycle rental for the last mile connection and should be connected to the nature park with high-quality bicycle routes.

- **Implement awareness campaigns:** Use campaigns to promote alternative travel methods, educate visitors on their environmental impact and encourage acceptance of rules. This can be targeted to specific visitor types and behaviours and can be combined with pricing measures to discourage car use.
- **Effective information and communication.** Manage online routing information to prevent outdated data and ensure that routes in the parks are clearly signposted.
- **Visitor dispersal and zoning:** develop measures to disperse visitors, especially during peak times. For this purpose, zoning can be considered to protect vulnerable areas. Also, new connections to existing and new visitor areas can be developed to alleviate pressure from existing areas. The Hollandse Waterlinie and several locations south of NPUH have been mentioned explicitly. Lastly, city and village residents can be encouraged to recreate closer to home and/or avoid busy destinations at peak times (e.g. with the app 'Druktemeter).
- **Effective stakeholder collaboration**: develop strategies to address challenges related to demographic development and urbanisation and collaborate to create a policy that aligns with the vision of all stakeholders.

It can be concluded that the results from the workshops are aligned quite well with the available background information. Some accents are different, and the workshop provided more detailed information and local knowledge regarding potential solutions.

After the workshop, a guided tour to the former Soesterberg Airbase area was arranged by Utrechts Landschap. The area was accessed via Den Dolder station, which includes a P&R facility with plenty of parking spaces and option for shared (public transport) bicycles. Furthermore, different ways of signage and wayfinding were discussed.

3.5 Summary of findings

- **The Utrechtse Heuvelrug** is a 50-kilometer national park known for its 1) varied landscapes such as forests, heathlands, sand dunes, and hills, 2) historical significance with castles and estates, 3) a mix of recreational, cultural, and adventure activities, such as hiking and cycling and 4) key attractions as the former military airfield Vliegbasis Soesterberg.
- The park is one of the **most visited nature areas** in the Netherlands, with 5.3 million **visitors** annually. Walking and cycling are the most popular activities, followed by cultural exploration. Visitors mainly come from nearby regions, with the **majority** travelling by **car**, followed by those using bicycles. **Public transport** only plays a **minor** role.

- The analysis of **multimodal accessibility** shows that the park is **highly** accessible by car. There is also a **robust public transport** network, including train and bus **connections, complemented with bike rentals at train stations for the last mile. The cycling network** is also **extensive** and well-maintained. This reduces the car dependency, although the car remains the easiest mode of transportation for many visitors.
- Key **challenges** include **overcrowding** and **car use,** which lead to congestion, parking problems, nuisance to residents, negative visitor experience, air and noise pollution, and soil erosion and disturbance of vulnerable ecosystems, especially during the weekend and holidays.
- Furthermore, at peak times the capacity of the **facilities** is not sufficient, which poses challenges in particular for disabled visitors. The undesired **behaviour** amongst visitors, such as littering and unregulated activities, also negatively impacts the quality of the natural habitats. Finally, collaborative decision-making is challenging due to conflicting interests among stakeholders.
- **Opportunities** include better visitor **distribution** through zoning and the use of apps such as the Druktemonitor. Enhancing and actively **promoting transport alternatives** to cars by improving infrastructure, shuttle buses and the expansion of bike rentals at key stations could reduce (perceived) car dependency. Furthermore, **visitor management** can be improved by upgrading visitor facilities, improving signage and providing accurate and real-time information about transport, routes and services. Finally, **awareness campaigns** can promote sustainable behaviour among visitors, and the development of a **shared vision** could enable more effective stakeholder collaboration.

4. Grenspark Kalmthoutse Heide (Belgium)

4.1 Characteristics and attractions

General characteristics

Grenspark Kalmthoutse Heide (GKH) is part of a large open space area, which stretches across the border between the cities of Bergen op Zoom and Roosendaal on the Dutch side, and the city of Antwerp with the Antwerpse Haven and the peripheral built-up area to which Kapellen, Brasschaat and Schoten belong on the Flemish side (see figure 4.1). In the larger context, the area caters to around one million inhabitants. The Heide is one of the oldest and largest nature areas in Flanders and is sometimes referred to as "achtertuin van de Antwerpenaren" ('backyard of Antwerpers') (Agentschap voor Natuur en Bos, sd). The park covers about 60 km^2 and is known for its diversity and considerable ecological and cultural-historical value. Within the reserve, vast and unspoilt landscapes alternate with heathlands, fens, land dunes, forests, meadows, and polders. GKH is part of the Natura 2000 network (BENEGO – Grenspark De Zoom – Kalmthoutse Heide, 2014).

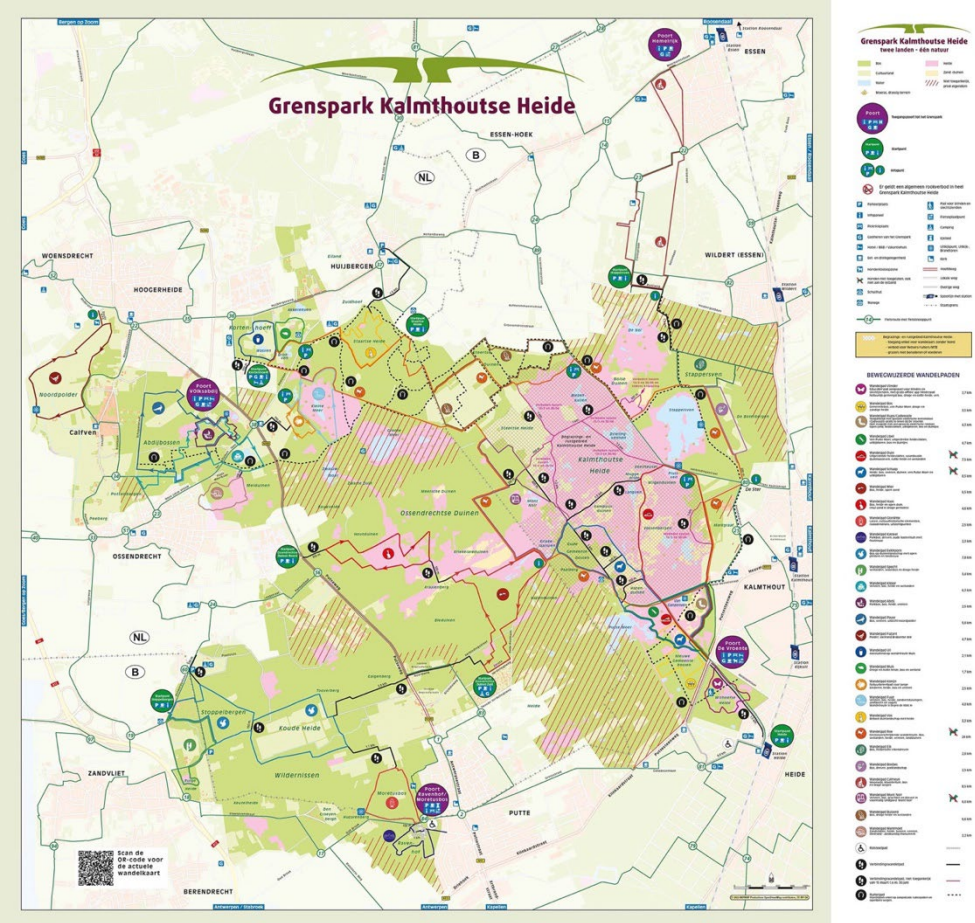

Figure 4.1 Functions in Grenspark Kalmthoutse Heide

Grenspark Kalmthoutse Heide is officially a 'Silence Area'. The Province of Noord-Brabant (2010) on the Dutch side and the Province of Antwerp on the Flemish side (2015) carried out extensive noise measurements to establish this. The Border Park is now officially a cross-border area of silence (Grenspark Kalmthoutse Heide, 2025).

Entry gates

Visitors can access the park through various locations, with GKH featuring four primary entry points (see figure 4.2):

1. Volksabdij – Ossendrecht (NL)
2. Hemelrijk – Essen (B)
3. De Vroente – Kalmthout (B)
4. Ravenhof – Putte / Stabroek (NL/B)

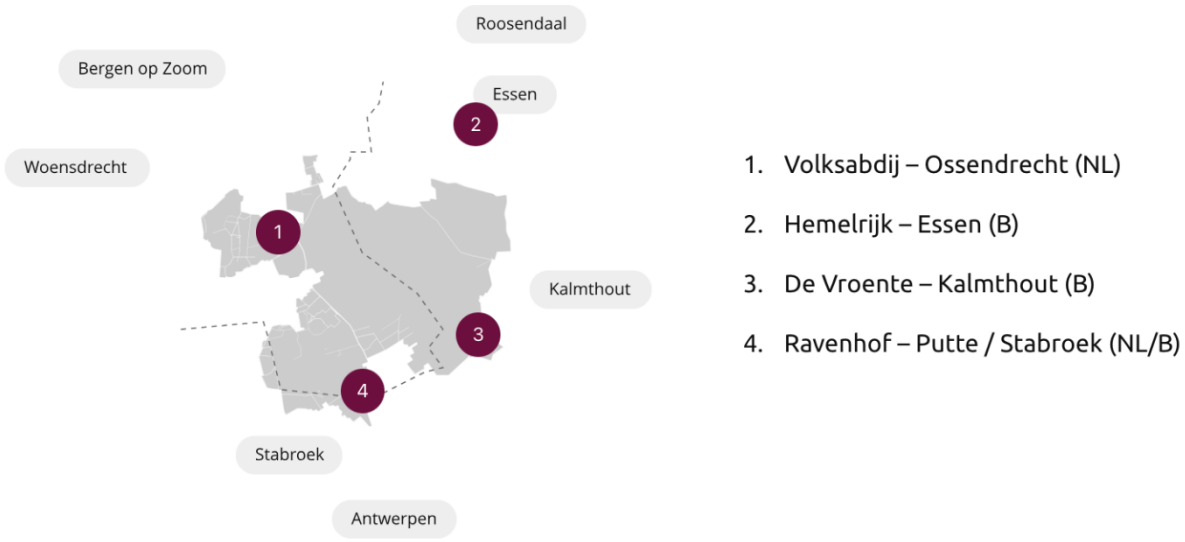

Figure 4.2 Entry Gates of Grenspark Kalmthoutse Heide. Source: (Grenspark Kalmthoutse Heide, 2023)

These gates serve as starting points for walking and cycling routes, providing information about the park's offerings, including. People can also park their car at these locations. The four distinct gates each serve a unique purpose, and selecting a different gate each time reveals the variety of experiences available within the same nature area (Grenspark Kalmthoutse Heide, 2023).

Visitor Centre De Vroente is part of the entrance gate De Vroente and is the only gate with a functioning visitor centre. Besides, it is an educational centre that promotes and supports education and training around the environment, nature and sustainable development. It is also the visitor centre of the Grenspark Kalmthoutse Heide and the info gateway for UNESCO Geopark Schelde Delta.

Moreover, GKH features dozens of hosts (“gastheren”) who act as ambassadors, guiding visitors to the most beautiful spots of Grenspark Kalmthoutse Heide. These hosts operate businesses in recreation, catering, relaxation, bike rentals, tourist information, and museums (Grenspark Kalmthoutse Heide, 2024).

Functions and attractions

GKH presents a variety of activities that highlight its natural beauty and recreational opportunities on both the Dutch and the Belgian sides of the border. The park has 28 designated walking trails, ranging from 1,7 km to 24 km. these trails meander through heathlands, forests, and fens, with routes designed explicitly for accessibility and family outings. Cyclists and mountain bikers can enjoy multiple signalised routes, including four dedicated technical single mountain bike tracks: Stoppelbergen, Wildernissen, Volksabdij, and Staartse Duinen. These routes are maintained by volunteers whose work is regularly acknowledged. Since 2021, a vignette is required to ride these tracks, offering annual and day passes. In 2023, 5,078 annual vignettes were sold, while day pass sales reached 1,361, marking a fourfold increase compared to 2022. For equestrians there are several designated trails to experience the park's diverse landscape.

Family-oriented events, such as interactive nature camps, encourage children to engage with local biodiversity, and specialised programs, such as quiet days and guided tours, underscore the ecological significance of the park. Sustainable recreation is promoted through adherence to the park's "buitencode" (outdoor code), which safeguards its habitats while fostering a culture of respectful and shared-use facilities. Furthermore, from mid-March to July 1st, the breeding season takes place, and certain areas become inaccessible to allow nature the necessary peace and quiet.

One of the most visited attractions in the park is the Brandtoren (“fire tower”). The Brandtoren, the municipality of Kalmthout, the Nature and Forest Agency and Astrid (telecom operator of the emergency and security services) jointly invested in a new fire tower on the Kalmthoutse Heide. The old fire tower was outdated, too low for fire detection and too low to establish good communication links between emergency services in the area. The Fire Tower is 42 metres high and has several functions. It provides a better and higher workplace for the fire tower keepers; as a visitor, you can also enjoy a beautiful view over the heath landscape.

4.2 Visitor profiles and activities

Several areas have been analysed in recent years to assess visitor numbers and tourism trends. This analysis aims to gain initial insights into visitor traffic and later use this data to optimise zoning and the distribution of recreational activities. The focus has been placed on the visitor centre and entry gate at De Vroente in Kalmthout, as well as the new fire and lookout tower in Kalmthout and the second location at De Stapper. These sites were chosen because both towers serve as landmarks and attractions for visitors.

Activity 1.2 General inventory of nature areas

From January 1 to December 31, 2023, 140.000 visitors entered the park via entrance gate De Vroente.

Additionally, from February 2 to December 31, 2023, the counter at "De Stapper" recorded 30,961 visitors, while the counter at "Brandtoren" registered approximately 58,924 visitors (Grenspark Kalmthoutse Heide, 2024). An inventory of the visitor centre revealed that in 2022, there were 19,985 visitors at the desk. There is no detailed information available about the visitors' modal choice. But the car is probably dominant as there is parking pressure at the entrance gates, especially at De Vroente, during busy days (Grenspark Kalmthoutse Heide, 2023).

The park is experiencing a year-over-year increase in tourism, which includes both domestic and international visitors (Gemeente Kalmthout, 2023). The following types of visitors can be distinguished:

1. **Local Visitors**:
    - Predominantly from **Antwerp and Flemish Brabant**, indicating strong regional interest.
    - These visitors are likely drawn to the park's accessibility and opportunities for short, nature-oriented day trips.
2. **International Tourists**:
    - Key countries of origin include **the Netherlands, Germany, and France**, with smaller but notable interest from English-speaking countries and emerging markets like Poland and Russia.
    - Motivations include **biodiversity, scenic landscapes**, and the opportunity to engage in outdoor activities like hiking and cycling.
3. **Activity-Specific Enthusiasts**:
    - Visitors engaged in **cycling, mountain biking, and hiking** represent a core demographic, supported by the popularity of cycling maps and mountain biking events.

4.3 Multimodal accessibility

This paragraph analyses the multimodal accessibility of Kalmthoutse Heide, particularly at specific entrance points, for cars, public transport (including trains and buses), cycling, and walking. For each transport mode, the availability and density of the networks are presented, and accessibility maps are developed to illustrate which areas are within reach of the park's main entrance points.

Car accessibility

The primary entry points to Kalmthoutse Heide are easily accessible by car via both primary and secondary roads. Its close proximity to the national motorway further enhances accessibility for travellers coming from greater distances (figure 4.3).

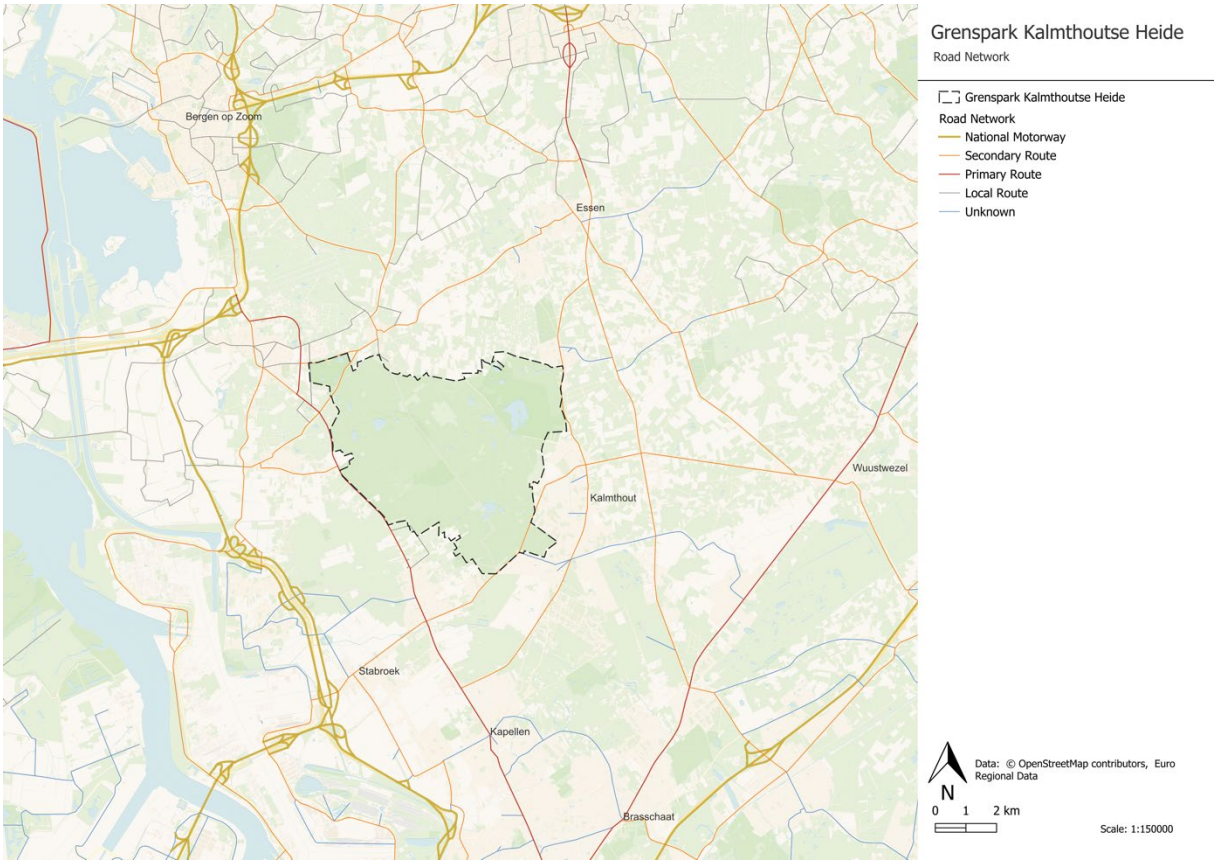

Figure 4.3 Car infrastructure Grenspark Kalmthoutse Heide

Figure 4.4 illustrates the car accessibility of the starting points. Within a 15-minute drive, only smaller municipalities in close proximity to the park are accessible. Cities such as Antwerpen, Bergen op Zoom, and Roosendaal can be reached within, or just over, a 30-minute drive. The accessible area expands considerably with the 60-minute threshold reaching cities like Eindhoven, Breda, Dordrecht, Gent, and a significant portion of Flanders.

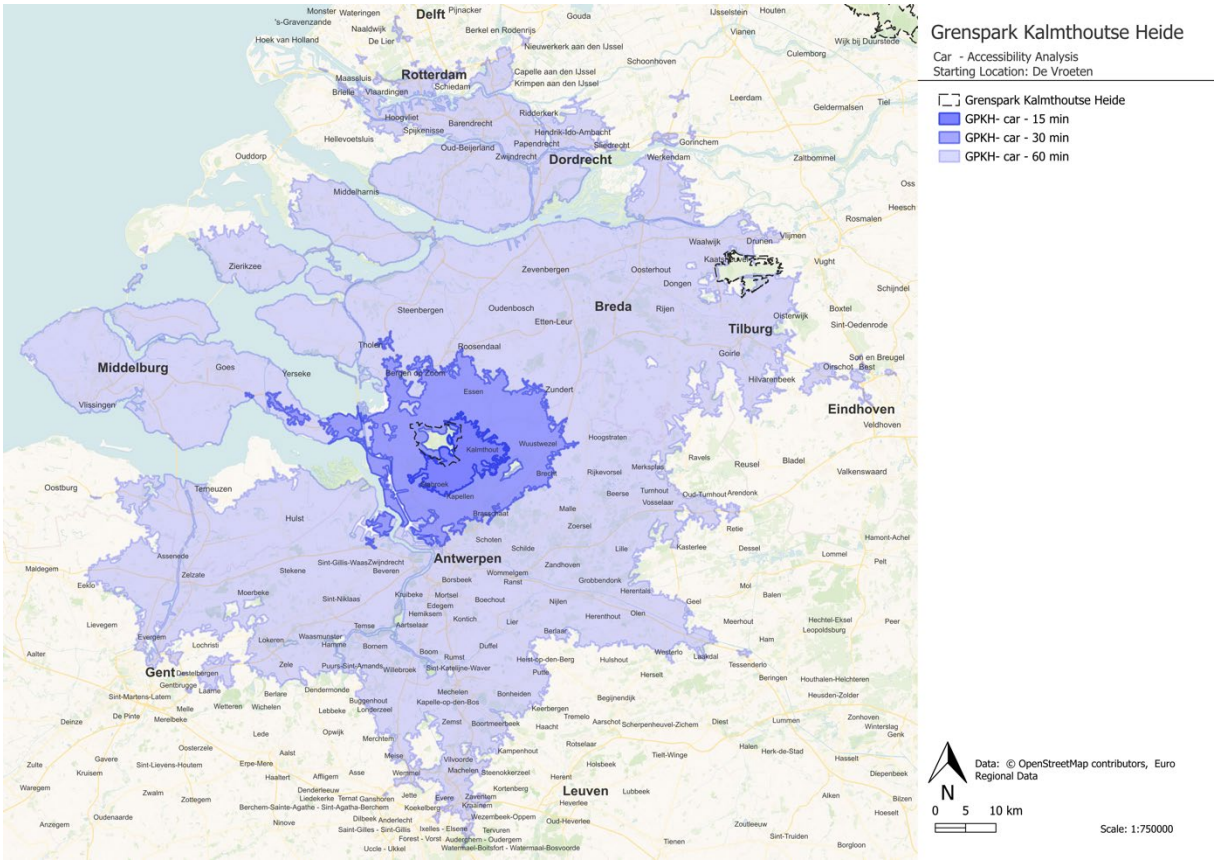

Figure 4.4 Car accessibility Grenspark Kalmthoutse Heide

Public transport accessibility

According to GKH, taking the train is the best way to reach the Nature area. Between 6:00 AM and 11:00 PM, trains operate to and from Puurs, Antwerp, and Roosendaal. The stations at Heide, Kijkuit, Kalmthout, Wildert, and Essen are all within walking and cycling distance of the park, allowing you to choose your entry point based on the route you prefer to take. You are also allowed to take your bike onto the train as each train has a special carriage where you can place your bike for a small fee. Travelling by bus is also an option with multiple types of providers: De Lijnbus, Flexbus (an additional 'on demand' service provided by De Lijn) and Arrivabus. They have a stop at one or more entrance gates of the park. (see figure 4.5).

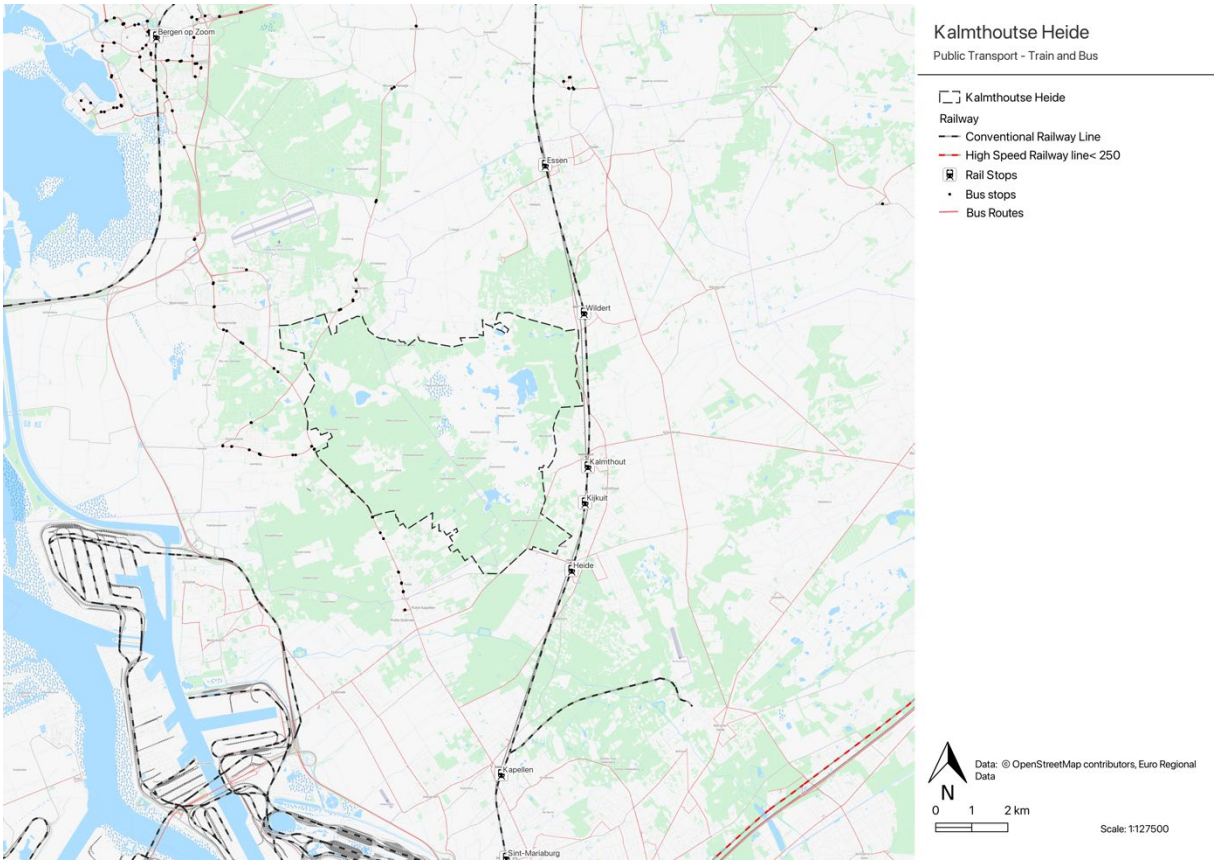

Figure 4.5 Public transport provision Grenspark Kalmthoutse Heide

Figure 4.6 illustrates accessibility by public transport within 30, 60, and 90 minutes. The map shows that public transportation access is most convenient along the north-to-south corridor from Essen to Antwerp. Only select areas around Kalmthout, Essen, and Slabroek/Kapellen are accessible within 30 minutes. Essen and Antwerp can be reached within 60 minutes, while the 90-minute interval extends further to include Mechelen, Sint-Niklaas, and Herentals.

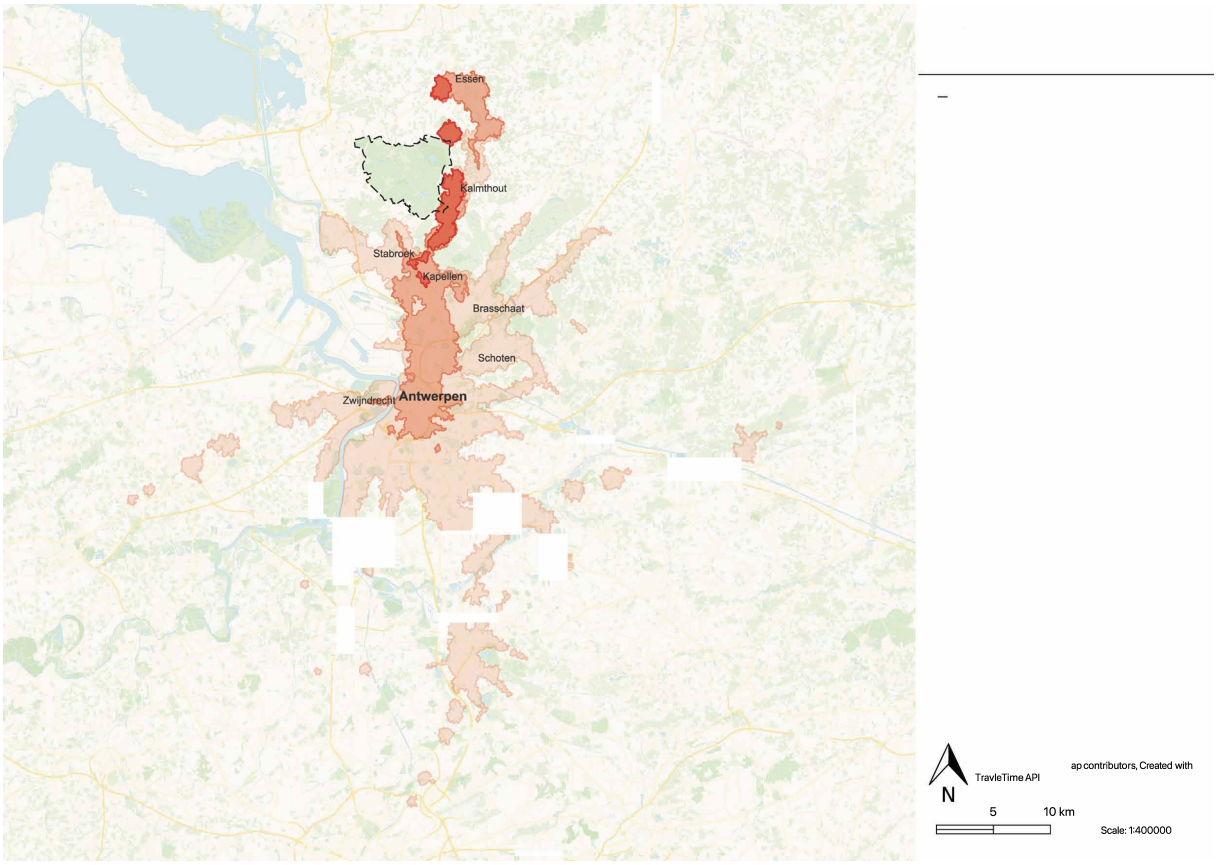

Figure 4.6: Public transport accessibility Grenspark Kalmthoutse Heide

Cycling accessibility

Figure 4.7 illustrates the bicycle network. The cycling routes for standard bicycles are primarily concentrated along the edges of the nature park, extending into the surrounding areas. The mountain biking routes are located in specific zones, but users can connect them through a separate linking route.

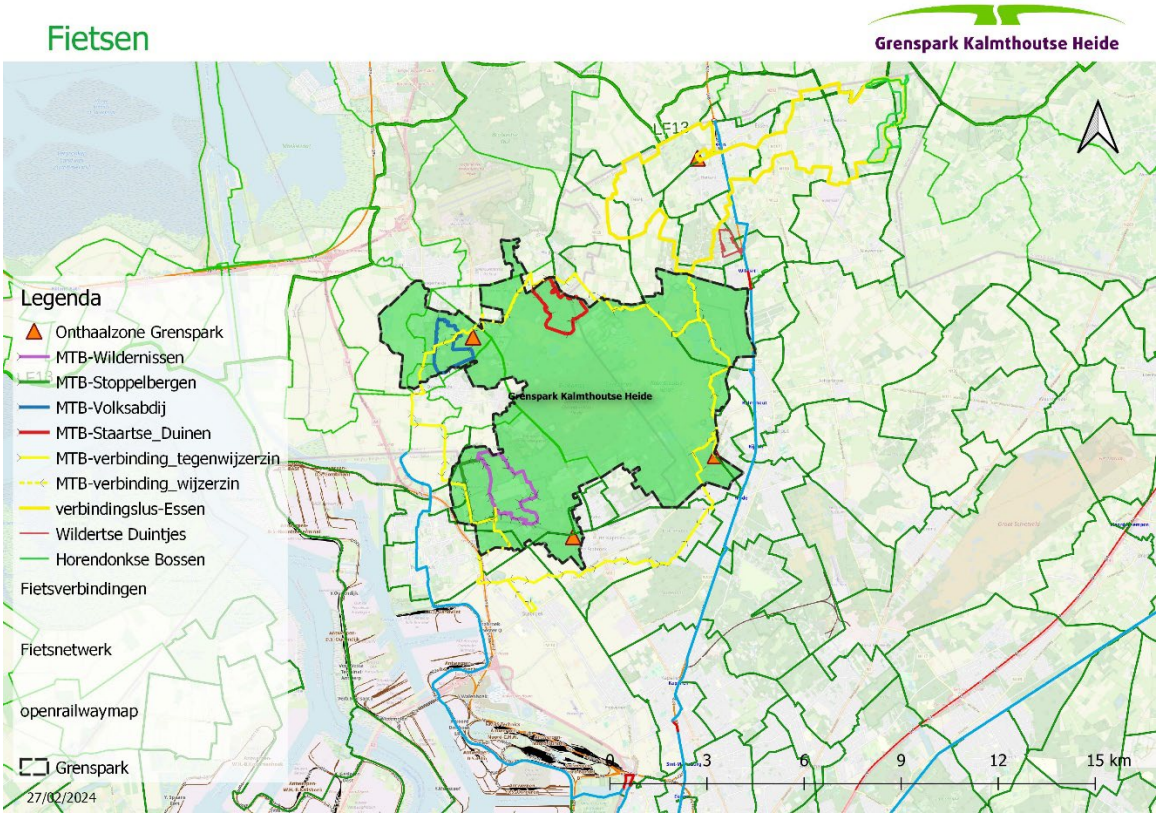

Figure 4.7 Cycling infrastructure Grenspark Kalmthoutse Heide

The accessibility map for cycling in figure 4.8 shows that the surrounding areas are well accessible by bicycle. Especially in the east and west directions, cycling has the potential to complement to a sustainable modal shift as public transport accessibility is limited in these areas. The northern areas of Antwerp and significant parts of the Netherlands around Bergen op Zoom can also be reached within a 60 minute bicycle ride.

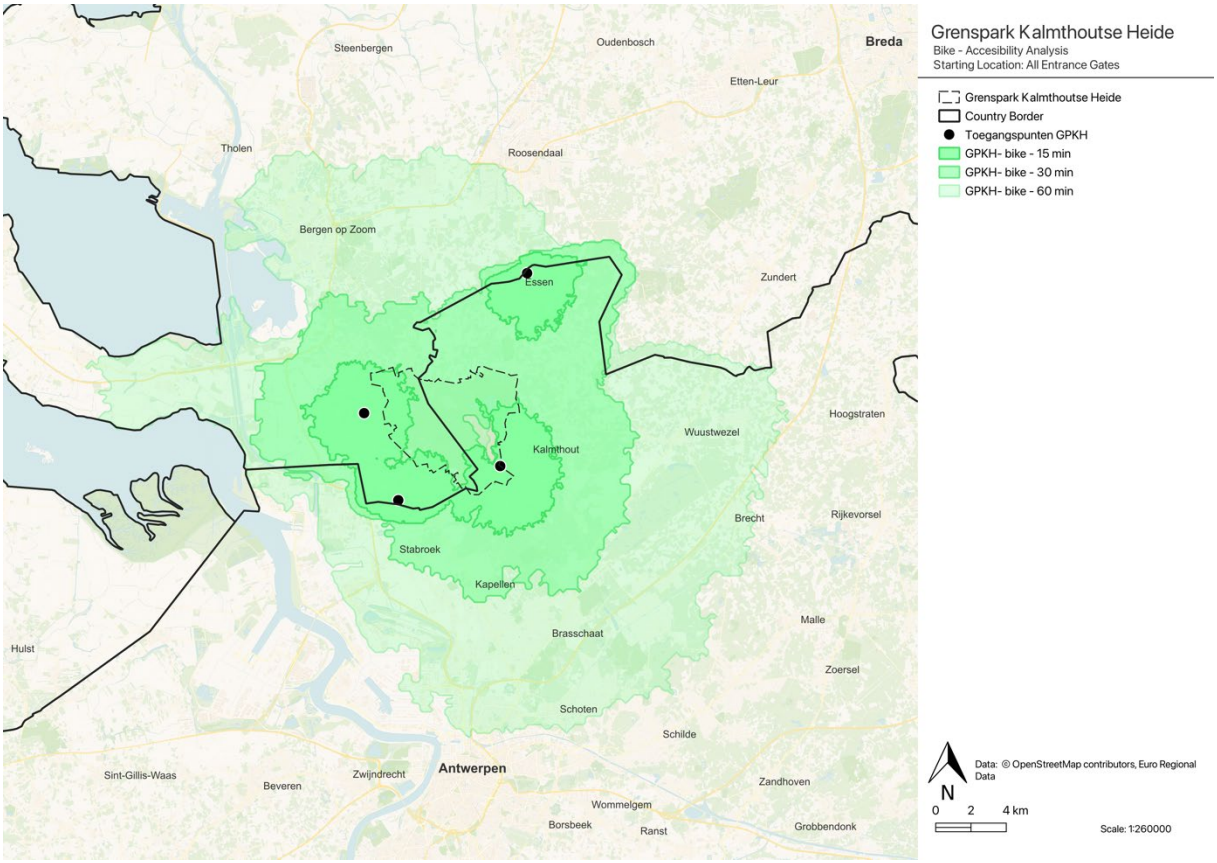

Figure 4.8 Bicycle accessibility Grenspark Kalmthoutse Heide

Pedestrian accessibility

Figure 4.9 depicts the walking facilities, which begin at various park entrances. The network is most dense around the edges of the park, gradually thinning out along dedicated walking routes that provide opportunities to experience the park's beautiful sand dunes and nature. The map also reveals private areas within the park where few or no walking routes are available.

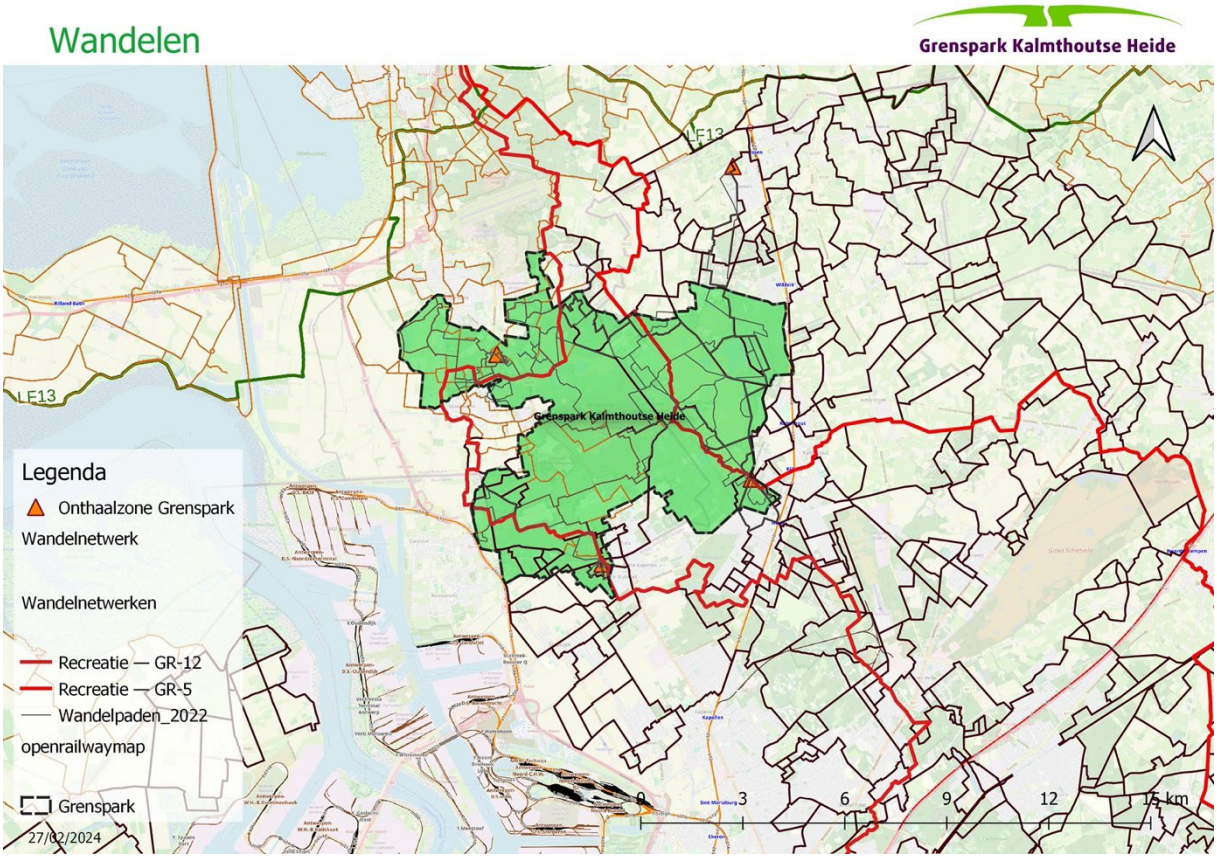

Figure 4.9 Map of walking and recreational routes in Grenspark Kalmthoutse Heide

4.4 Challenges and (potential) opportunities

This section describes the challenges and potential opportunities for the GKH to encourage sustainable tourism and reduce the impact of visitor flows. First, knowledge from previous studies and activities is summarised. Subsequently, the results from the inventory session are shared.

Background knowledge

In 2022–2023, GKH developed a 24-year Masterplan aligned with the policy frameworks of Nationale Parken Vlaanderen and Nationale Parken Nederland. The plan prioritises nature conservation while integrating objectives for landscape management, tourism, recreation, education, and research. It also proposes a new governance structure to ensure the park's sustainable future and reflects a cross-border vision, addressing policy goals in both Belgium and the Netherlands (Grenspark Kalmthoutse Heide, 2023).

Although the park decided against applying for National Park Vlaanderen status due to limited support from agricultural and private landowners, the process fostered stronger collaboration with local managers and municipalities. The Masterplan now serves as a solid foundation for future partnerships and development within the park. The Masterplan for Grenspark Kalmthoutse Heide outlines several concerns regarding tourism and accessibility:

Activity 1.2 General inventory of nature areas

- **Environmental Impact**: Balancing increased visitor numbers with the preservation of sensitive natural habitats is a significant concern. Unregulated tourism can lead to habitat degradation and disturb local wildlife.
- **Infrastructure Limitations**: Existing facilities may be inadequate to accommodate a growing number of visitors, potentially leading to overcrowding and diminished visitor experience.
- **Accessibility Constraints**: Ensuring that all areas of the park are accessible to individuals with varying mobility levels requires substantial infrastructural adjustments.

The masterplan also highlights opportunities for more sustainable tourism:

- **Sustainable Tourism Development**: Implementing eco-friendly tourism practices can enhance visitor experience while minimizing environmental impact. This includes developing guided tours that educate visitors on the park's ecological significance.
- **Enhanced Infrastructure:** Investing in visitor centres, signage, and pathways can improve accessibility and manage visitor flow more effectively. This also presents opportunities to create facilities that cater to individuals with disabilities.
- **Community Engagement:** Collaborating with local communities to develop tourism initiatives can foster economic growth and promote cultural heritage, creating a more enriching experience for visitors.
- **Educational Programs:** Establishing educational initiatives focused on the park's natural and cultural assets can attract a diverse visitor base and promote conservation awareness.

Inventory session

To develop a better understanding of the key challenges and opportunities, an inventory session was organised by BUAS in collaboration with Grenspark Kalmthoutse Heide in March 2024. A wide variety of stakeholders, including Staatbosbeheer, Arboretum, ANB, Grote Routepaden, KU Leuven, Tourism Province of Antwerp, visitor centre de Vroente, Province of Antwerp, as well the municipalities of Stabroek (BE), Kalmthout (BE) and Woensdrecht (NL) were invited in order to develop a comprehensive picture of the current status quo.

Key challenges

During the session, stakeholders addressed and discussed key challenges. The most prominent ones are listed below.

Difference in pressure at the entry points

The entrances to the park and visitor activities differ widely across different entry points. Some entry points face overcrowding, highlighting the need to determine the visitor capacity for each location. Notably, the southernmost entrance, Poort De Vroente,

experiences high activity levels of activity and pressure. The demand for parking in this area is heightened due to the numerous facilities available.

During the session, participants discussed this diversity in relation to how these entry points can be utilised, focusing on alternative modes of arrival and ways to communicate about these access points. While some entry points appear overcrowded, the visitor capacity for each remains somewhat unclear.

Zoning and pressure and nature

In line with this arising issue of the diversity of use between entry points, this can also be seen in the park itself. The more fragile nature, the heather landscape, is closest to the most commonly used entries and is most frequently visited. Organisations within the park share concerns about the amount of visitors being too high, but there is no data to motivate these concerns clearly.

Cross-border differences

The Belgian-Dutch border crossing through the nature park creates differences in organisation, usage, information, and route connectivity. The Belgian side is more frequently used and has better-connected entry points, while the Dutch side involves more stakeholders and smaller land areas. Dutch routes are one-way, unlike the bidirectional routes in Belgium, and there are no cross-border routes. The border acts as an invisible barrier, particularly affecting the connection between Wildert and Grenspark.

Last-mile transportation and car usage

Within the session, the participants indicated that Grenspark faces challenges with most visitors arriving by private cars despite available public transport connections. Participants mentioned that the train and bus services around the park are unreliable and infrequent, especially on weekends, making the last-mile journey to the park difficult. Moreover, there is a lack of clear information on which train station (Kalmthout or Heide) is best connected to the park, and signage and facilities for those arriving by train are insufficient. Public information about the park prioritises car access, encouraging visitors to use cars over alternative transport modes.

Opportunities

During the session, participants were encouraged to explore potential opportunities to address the identified challenges.

Spreading of visitors and pressure over the entry points in time and space

One of the primary challenges encountered is the significant pressure experienced at certain entry points, particularly at De Vroente. The participants indicated that obtaining a clearer understanding of which areas can accommodate a higher number of visitors

than others, where the landscape considerations are a crucial factor of concern. One of the concrete ideas was to create a (nature) zoning connected to vulnerability, dividing the park into A, B and C zones. A-zones would be rest areas, and zones B and C could be busier and have different types of activities. To create this division, clearer insights into the carrying capacity of the different areas of the park should be obtained through data. A focus could be placed on a more balanced distribution between forested and heathland areas. The latter, being the more favoured by visitors, suggests that it is expected to spread these visitors into the forested regions. In this lies also the opportunity to work as a Druktemeter or Druktemonitor (crowd monitor.

Improved provision of sustainable travel modes

During the session, the participants focused on the potential to improve sustainable transportation to the park, such as better train access, shuttle services, enhanced bus connections, and improved biking infrastructure to reduce the focus on car mobility. The participants indicted the following specific examples:

- **Train Access**: Improving train connectivity requires cooperation with train services. Renaming the 'Heide' station to 'Kalmthoutse Heide' could make it clearer that this station serves the park. Better public transport information and initiatives like 'treinstappers' (hiking routes starting and ending at train stations) could enhance accessibility. The last mile from the station to the park should be made more attractive, possibly integrating with existing hiking networks.
- **Shuttle Services**: Adding shuttles to the existing public transport network could provide a recreational experience, allowing visitors to hop on and off at various points and hike between stops.
- **New biking Infrastructure**: A cycling loop through or around the park could improve accessibility and offer recreational opportunities. Specific bike entry points and facilities like bike parking should be marked on tourist maps.

Branding, information provision and connecting to nearby attractions

During the session, the branding of nature protective visits was linked to various activities. Participants highlighted the importance of **connecting the park to nearby attractions**, such as the Arboretum in Kalmthout and the Karrenmuseum in Essen, both enhancing the overall visitor experience and promote the park's natural and cultural heritage.

Additionally, there was a suggestion to create a higher resolution map that provides comprehensive information about the park and its surroundings. This map could prioritise alternative transportation options, such as train stations and bicycle parking, over car parking, encouraging more sustainable travel methods.

Branding efforts could also focus on **influencing and steering the positive impact** of visitors. By providing clear and engaging information, the park can guide visitors

towards behaviours that protect and preserve the natural environment. This approach aims to enhance the visitor experience while maintaining the park's ecological integrity.

4.5 Summary of findings

- **Grenspark Kalmthoutse Heide** is a unique nature park designated as part of the **Natura 2000** network and recognised as a **silence area** for its low noise levels. It spans 60 km² across the Dutch and Belgian borders, serving approximately one million inhabitants. It is known for its **unique landscapes,** including heathlands, forests, fens, dunes, and polders. Key attractions include a variety of scenic **walking** trails, challenging **mountain biking** routes, designated paths for **equestrian** activities, a **fire tower** for panoramic views and family-oriented **nature camps.**
- The park is popular among residents of **Antwerp and Flemish Brabant** and also receives visits from the **Netherlands, Germany and France**. Most people visit the park for **walking, cycling and mountain biking**. Guided tours and biodiversity-focused events are also popular. There is no indication of the total visitor number, but popular attractions such as the visitor centre (140.000), the fire tower (59.000), and Se Stopper (31.000) attracted a significant number of visitors in 2023. There is no data on visitors' modal shifts; however, **parking pressure** at certain entrance points suggests that **cars** are frequently the preferred mode of transportation.
- The analysis of **multimodal accessibility** shows good **car** accessibility within 15-60 minutes from nearby municipalities and cities. Several entry points are also within a reasonable distance from **railway stations,** and it is allowed to bring a bicycle on the train. Furthermore, the main entry points are serviced by **bus** and there are dense **walking** and **cycling** networks, extending into surrounding areas.
- Key **challenges** include **overcrowding** and, despite the availability of sustainable transport alternatives, heavy reliance on private **car use.** This may be related to more limited public transport services during weekends and insufficient signage and facilities for people who don't arrive by car. This leads to (parking) **pressure** at the entry points, and disturbance of **vulnerable habitats**, especially heather landscapes. Furthermore, a particular challenge for this 'Grenspark' are the **cross-border differences** in **route** connectivity and **management**.
- **Opportunities** include **zoning** based on ecological vulnerability (e.g. rest areas versus activity zones) to improve visitor **distribution**. Improve sustainable **transport options** by utilising the proximity to the train stations and improving bus shuttle and cycling facilities. Furthermore, **educational** and **eco-tourism** initiatives can foster conservation **awareness** among visitors. Lastly, enhancing **branding** and **connectivity** with **nearby attractions** like the Arboretum and Karrenmuseum provides opportunities to promote the park's **natural and cultural heritage** and enhance the overall visitor **experience** and **sustainable** tourism in the region.

5. Van Gogh National Park (The Netherlands)

5.1 Characteristics and attractions

General characteristics

Van Gogh National Park, located in North Brabant, Netherlands, is a new-style park that integrates protected nature areas with cultural landscapes, agricultural land, and urban areas. This approach aims to create opportunities to reduce visitor pressure on vulnerable natural areas.

Van Gogh National Park covers an area of approximately 100,000 hectares. The formal national park, spanning around 50,000 hectares, is located between Eindhoven, Tilburg, and Den Bosch, while the broader collaboration area extends to Breda and Helmond (see figure 5.1). It is home to nearly 1.5 million people and features several of Natura 2000 sites like Loonse en Drunense Duinen, Kampina, and Oisterwijkse Vennen (Van Gogh Nationaal Park, 2020).

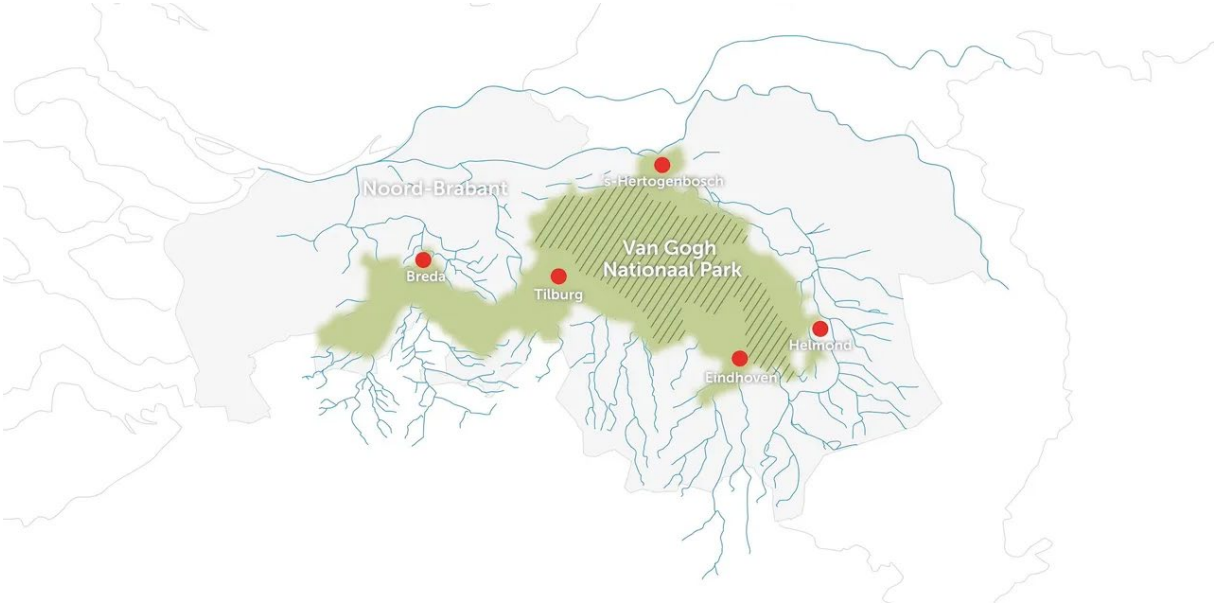

Figure 5.1 Map of Van Gogh National Park in the wider context. Source: (Van Gogh Nationaal Park, sd)

Within the development of this new-style park, Van Gogh National Park defined a few key pillars (Van Gogh Nationaal Park, 2024), which are:

1. Strengthening nature, landscape and heritage in coherence,
2. Offering new prospects for agricultural entrepreneurs and sustainable (food) production,
3. Develop nature and landscape into the heart of the city and village,
4. Stimulate nature experience and sustainable (cultural) tourism.

Focus area– Loonse Drunense Duinen

The focus area for the MONA project in Van Gogh Park is the national park of Loonse en

Drunense Duinen (LDD), known for its sand dunes, sometimes called “Brabant Sahara”. Formed during the last Ice Age, it’s one of the largest natural sand drift areas in Europe and an officially protected national park in the Netherlands. The area was designated as a Natura 2000 site in May 2013 (Ministerie van Economische Zaken, 2013).

LDD features extensive pine and oak forests, connecting to De Brand, a stream valley with alluvial forests, marshes, and fens. Nearby are the Leemkuilen, with excavated ponds surrounded by swamp forest, rich in amphibians like the Great Crested Newt and the European Tree Frog (Ministerie van Landbouw, Natuur en Voedselkwaliteit, n.d.).

Functions and attractions

LDD offers various facilities and attractions, including walking routes, horse riding, and mountain biking. There are also places to eat and drink. Compared to other national parks, LDD has fewer recreational opportunities provided by entrepreneurs, with most activities facilitated by the owner, Natuurmonumenten. IVN Brabant has trained many entrepreneurs around LDD as ‘Host of the Landscape’. These entrepreneurs are able to inform visitors and guests about the nature, landscape and cultural history of the area. Figure 5.2 illustrates the park’s activities and facilities, as well as information points. The park features several official entrances, marked by ‘i’ signs, known as ‘gates’ (van Eldik, During, Schoop, & Makkinga, 2021).

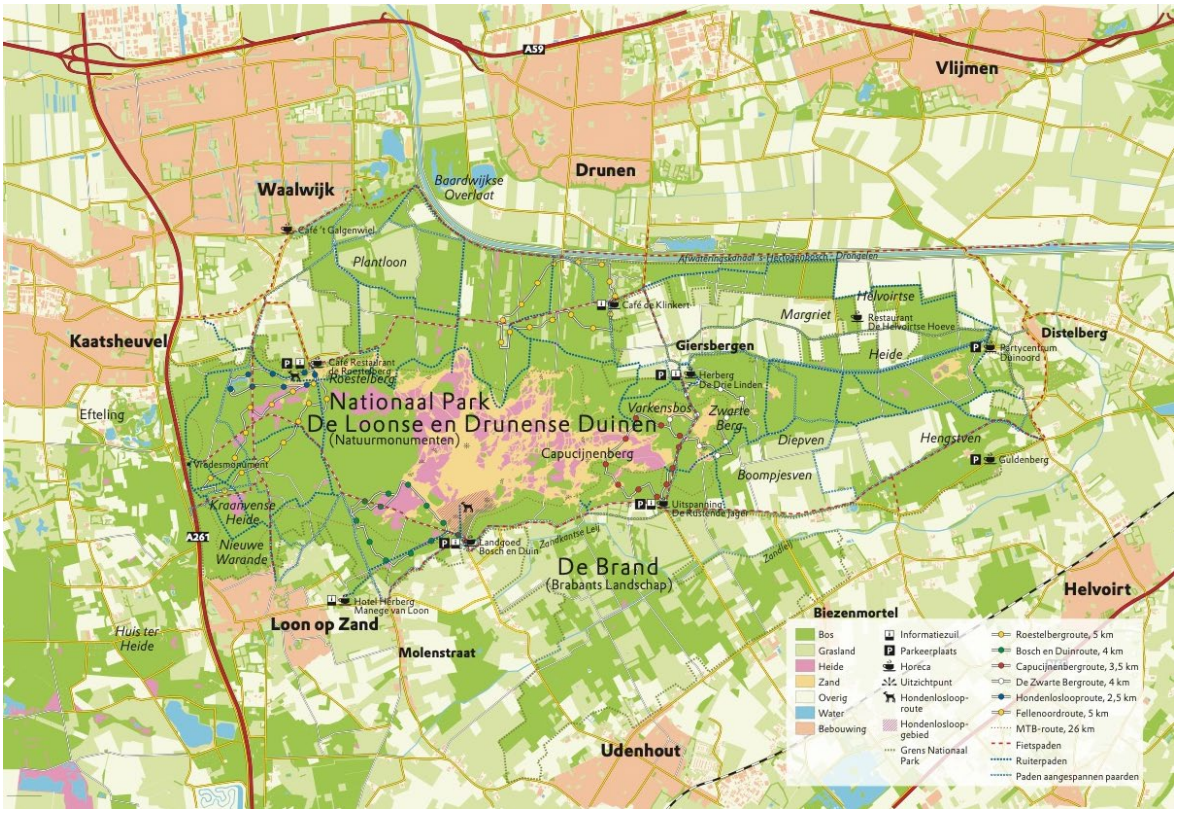

Figure 5.2 Functions and attractions in LDD. Source: (Natuurmonumenten, nd)

Figure 5.3 shows the zoning for various types of recreation. Dark red areas are designated for intensive nature-related activities, whereas lighter red areas are for extensive nature-related recreation. The light-coloured zones, known as “rustgebieden” or resting areas, represent the most vulnerable natural regions.

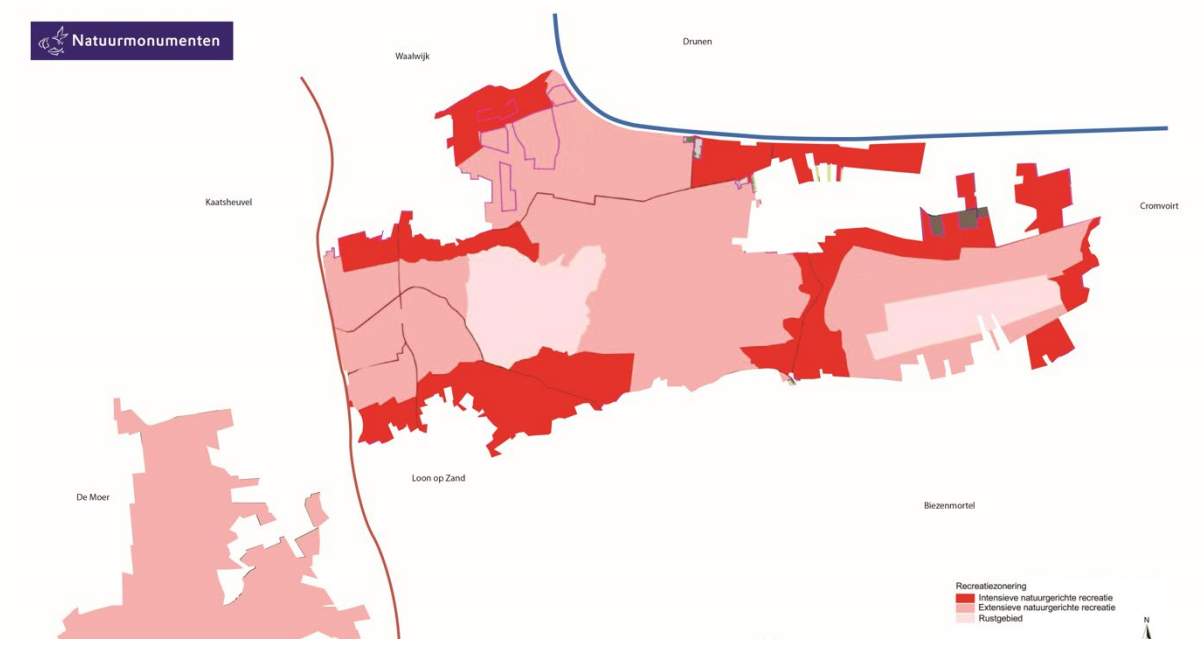

Figure 5.3 Zoning map recreation nature vision Source: (Natuurmonumenten, nd)

5.2 Visitor profiles and activities

Visitor profiles

The number of visitors is between 1 and 1.5 million per year, with up to 25,000 people in the area on peak days. Between November 2014 and November 2015, the LDD was the most visited park in the province of North-Brabant with 1,21 million unique visitors. Most of these visitors visit the area once (47%), 2-3 times (34%) or 4 to 9 times (13%) a year. Higher visiting frequencies are rare (NBTC-NIPO Research, 2015). Most of these visitors come from the North Brabant, with 60% originating from the direct environment of the park. The majority of these visitors (81%) currently come by car or motorbike. LDD attracts a diverse range of visitors, including:

1. **Nature Enthusiasts**: These visitors are drawn to the park’s unique sand dunes, forests, and heathlands. They, for example, engage in activities like bird watching and hiking.
2. **Families**: Families visit the park for recreational activities and educational experiences. They can enjoy the open spaces, playgrounds, and family-friendly trails.
3. **Recreational Users**: This group includes cyclists, walkers, and horse riders who use the park’s extensive network of trails and paths (see also the cycling network map).

4. **Adventure Seekers**: Visitors looking for more active pursuits such as mountain biking, sandboarding, and orienteering.
5. **Local Residents**: People living in nearby urban areas like Tilburg and Waalwijk visit the park for daily recreation and relaxation.
6. **Tourists**: Tourists, including international visitors, are attracted to the park's unique landscapes and its status as a national park.

Type of activities

A study surveyed visitors of LDD about their activities (NBTC-NIPO Research, 2015). As shown in Figure 5.4, walking is the most popular activity, undertaken by 79% of visitors, followed by visiting catering establishments (30%) and cycling (19%). Most of these are day recreationists who are attracted to the unique sand dunes in the LDD. These findings are corroborated by a study conducted by HAS students (Molin, Grobben, & Goedkoop, 2009), which revealed that the area primarily serves as the 'backyard' for nearby residential neighbourhoods. Most visitors do not venture far beyond the edge, often combining a short walk with a visit to one of the hospitality establishments at the park's perimeter. A study by SAMR (2016) reached similar conclusions and identified other leisure activities, such as photography, spotting flora and fauna, and playing with children.

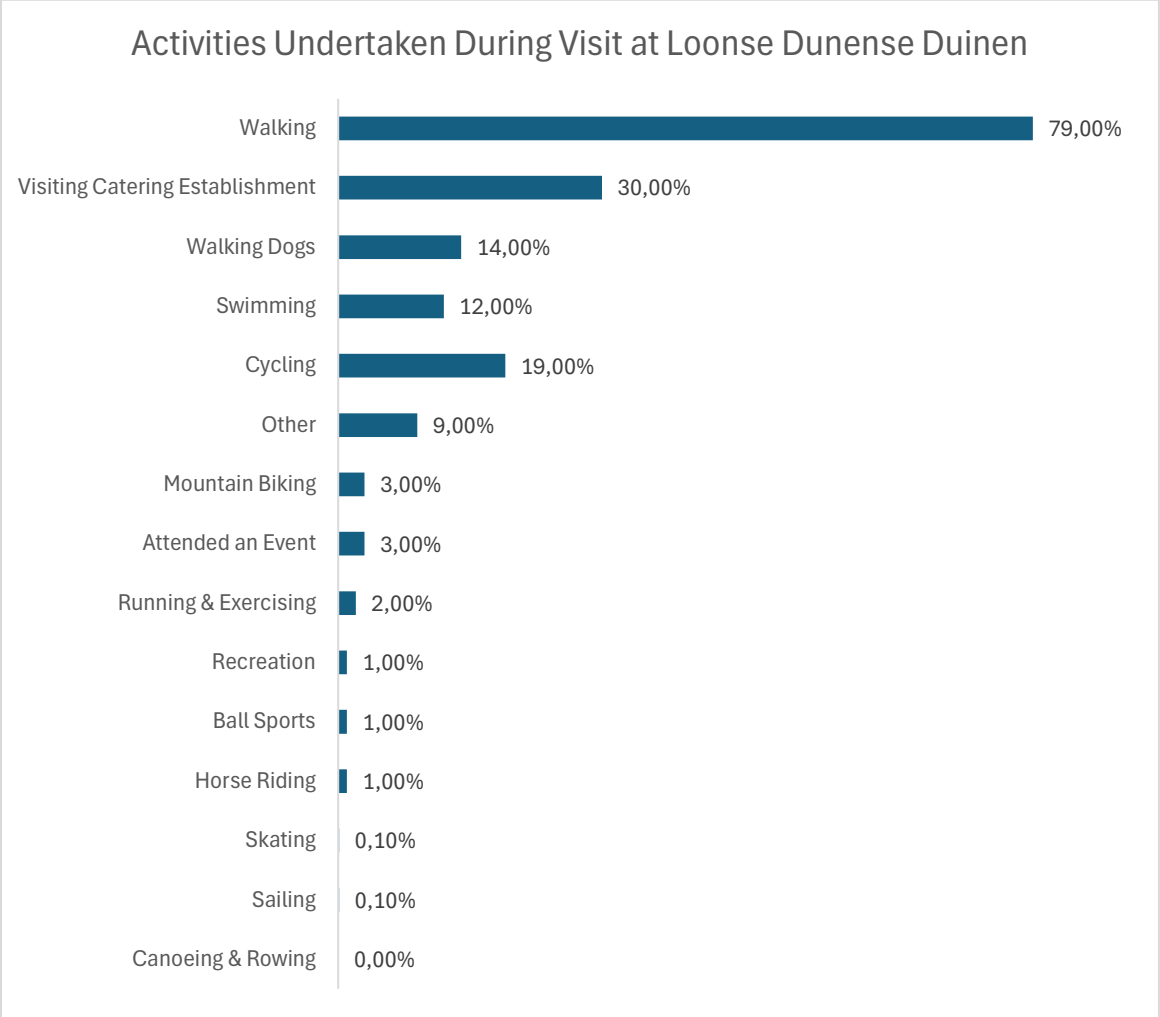

Figure 5.4 Activities undertaken during the most recent visit in the Loonse en Drunense Duinen. Source: (NBTC-NIPO Research, 2015)

Distribution and crowding

STRAVA data was used to generate a heat map highlighting user activity along various routes (STRAVA, nd). This data was used to create a map illustrating the relative crowdedness of different areas. Figure 5.5 shows the density of recreational use per 250m square, where lighter colours indicate low usage and red marks recreational hotspots. The map reveals most crowding around the entry points and along specific walking and cycling routes. The minimal activity in the resting areas suggests that protective measures for these vulnerable zones are effective.

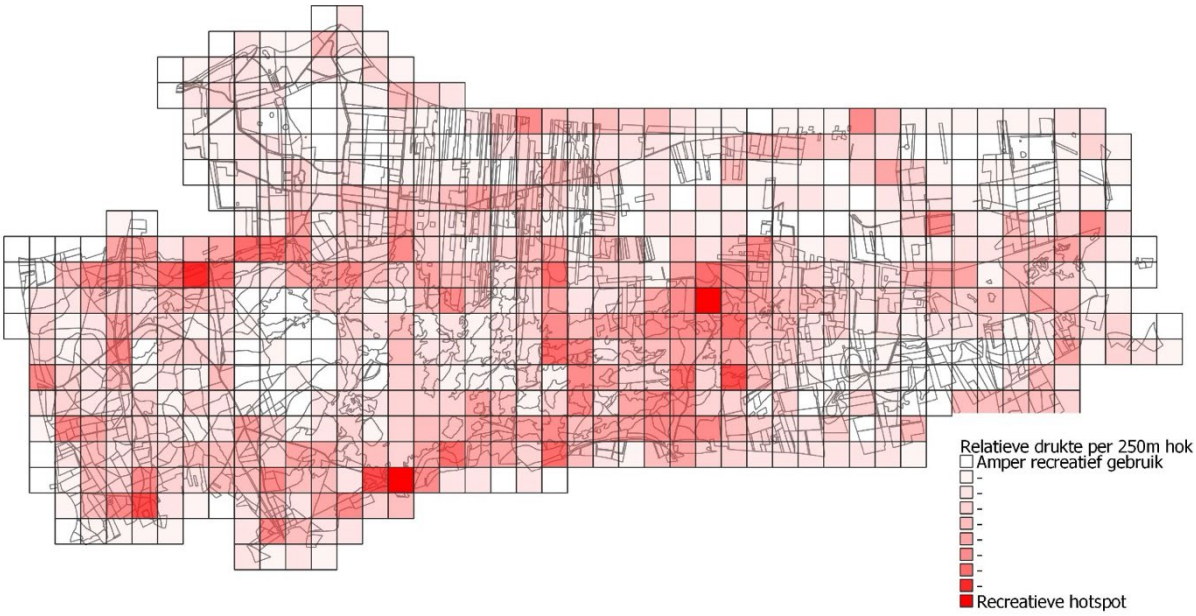

Figure 5.5 Relative crowdedness in the Loonse en Drunese Duinen per 250m squares. Source: (STRAVA, nd).

5.3 Multimodal accessibility

This paragraph analyses the multimodal accessibility of the Loonse en Drunense Duinen, particularly at specific entrance points, for cars, public transport (including trains and buses), cycling, and walking. For each transport mode, the availability and density of the networks are presented, and accessibility maps are developed to illustrate which areas are within reach of the park's main entrance points.

Car accessibility

The most common way to reach the park is by car. Multiple parking facilities are located around the entire perimeter of the LDD, with the majority situated on the western side of the park (see figure 5.6). No car traffic is allowed inside or through Loonse en Drunense Duinen, visitors get to the main attractions within the park by foot or by bicycle.

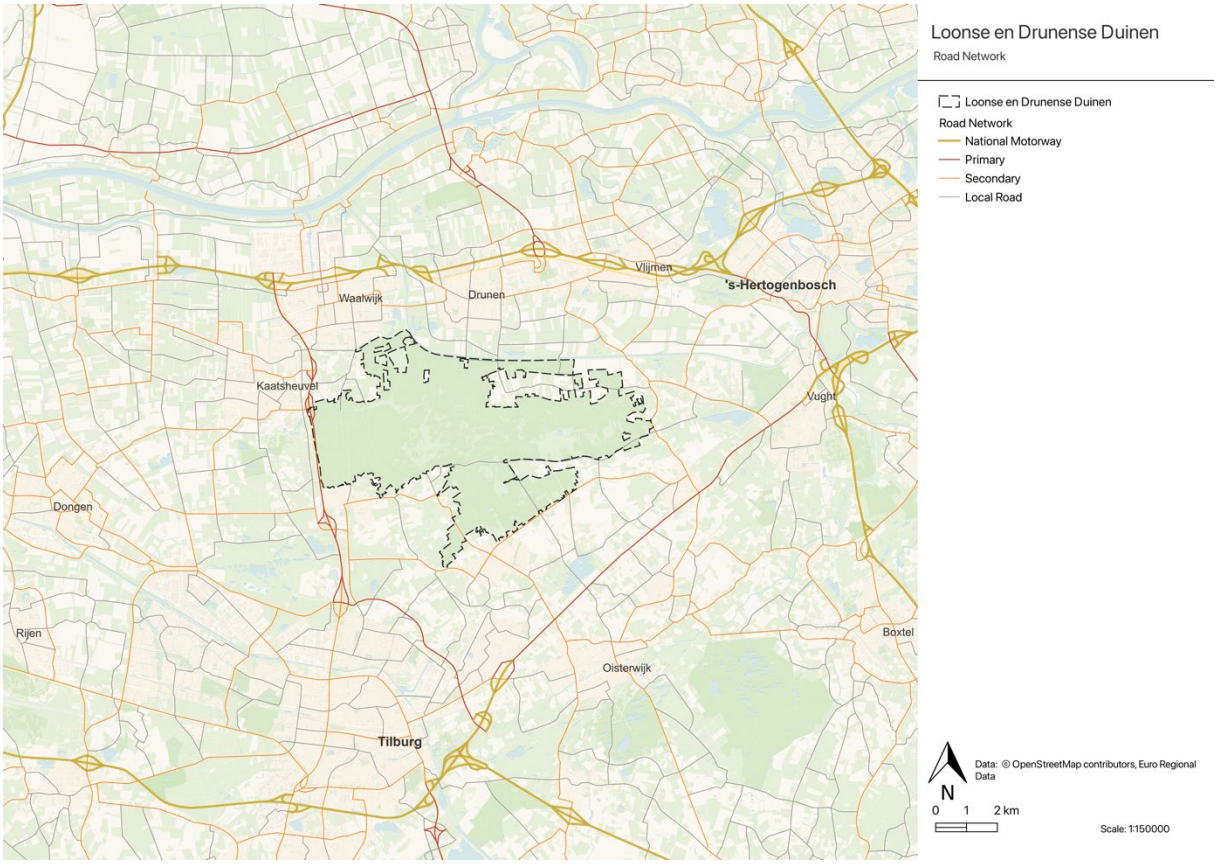

Figure 5.6 Car infrastructure Loonse en Drunense Duinen

Preliminary research estimates the parking capacity at the park's entrances to be around 930 spots. However, visitors frequently noted that the official parking lot fills up on busy days, forcing cars to park along the roadside (NBTC-NIPO Research, 2015)

In terms of car accessibility, the park is centrally located within North Brabant, making it easily reachable from major cities such as Eindhoven, Rotterdam, and Utrecht. Its extensive catchment area enhances its appeal both regionally and beyond. Figure 5.7 illustrates the park's coverage by car, displaying travel times of 15, 30, and 60 minutes. The map demonstrates that most major cities in Brabant are within a 30-minute drive from the park. Additionally, large portions of Utrecht, Gelderland, and the southern part of the Randstad are accessible within an hour's drive.

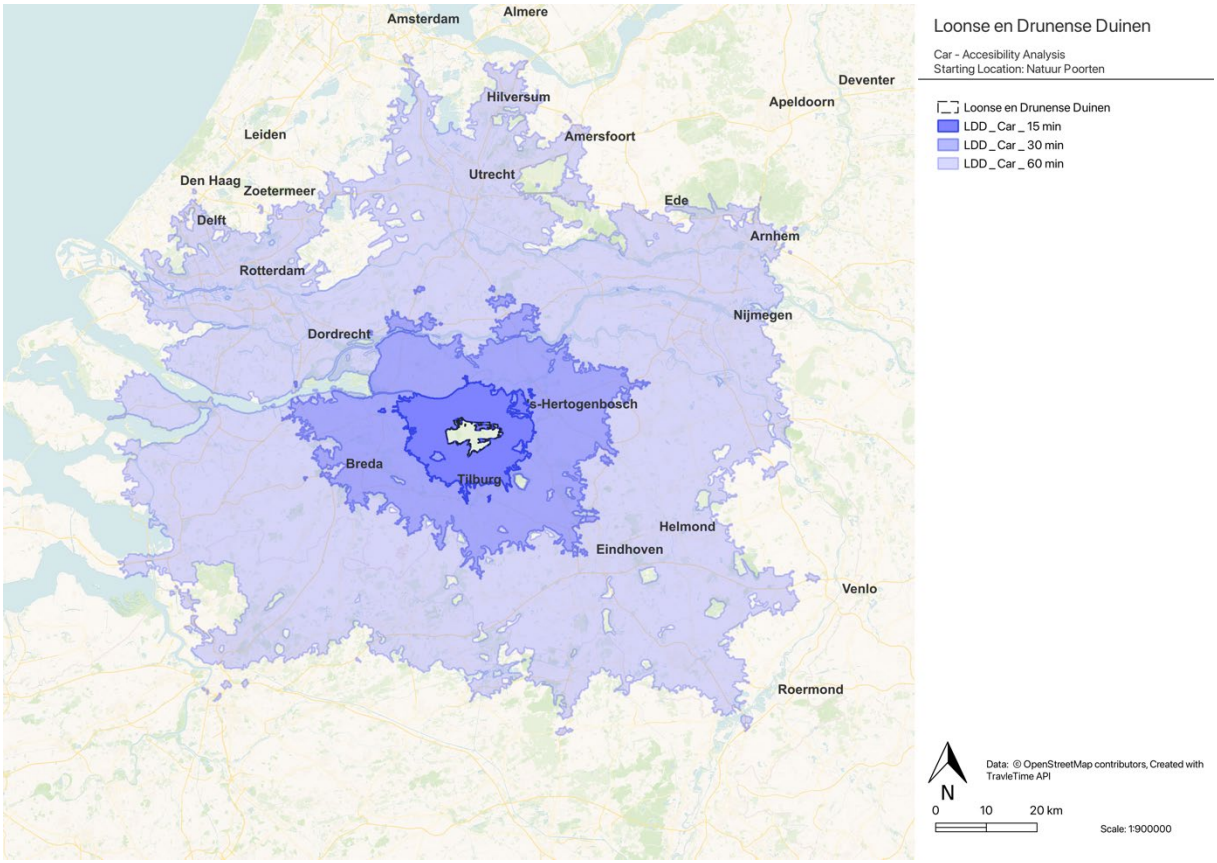

Figure 5.7 Car accessibility Loonse en Drunense Duinen

Public transport accessibility

Compared to the car, accessibility of Loonse en Drunense Duinen by public transport is more limited and selective. There are no direct train stations in the vicinity of the park and no direct bus services to the main entrances of the area. The official website of the park instructs visitors who are planning to use public transport to take a bus from Tilburg or 's Hertogenbosch to a so-called green stop (Groene halte), which is located 3,5 km to the west of sand dunes – the main attraction of the park (see figure 5.8). Several walking routes start and end at the stop, which can be found on the Natuurmonumenten website. This green stop is part of a larger, North Brabant-wide initiative to motivate nature parks' visitors to opt for public transport instead of cars.

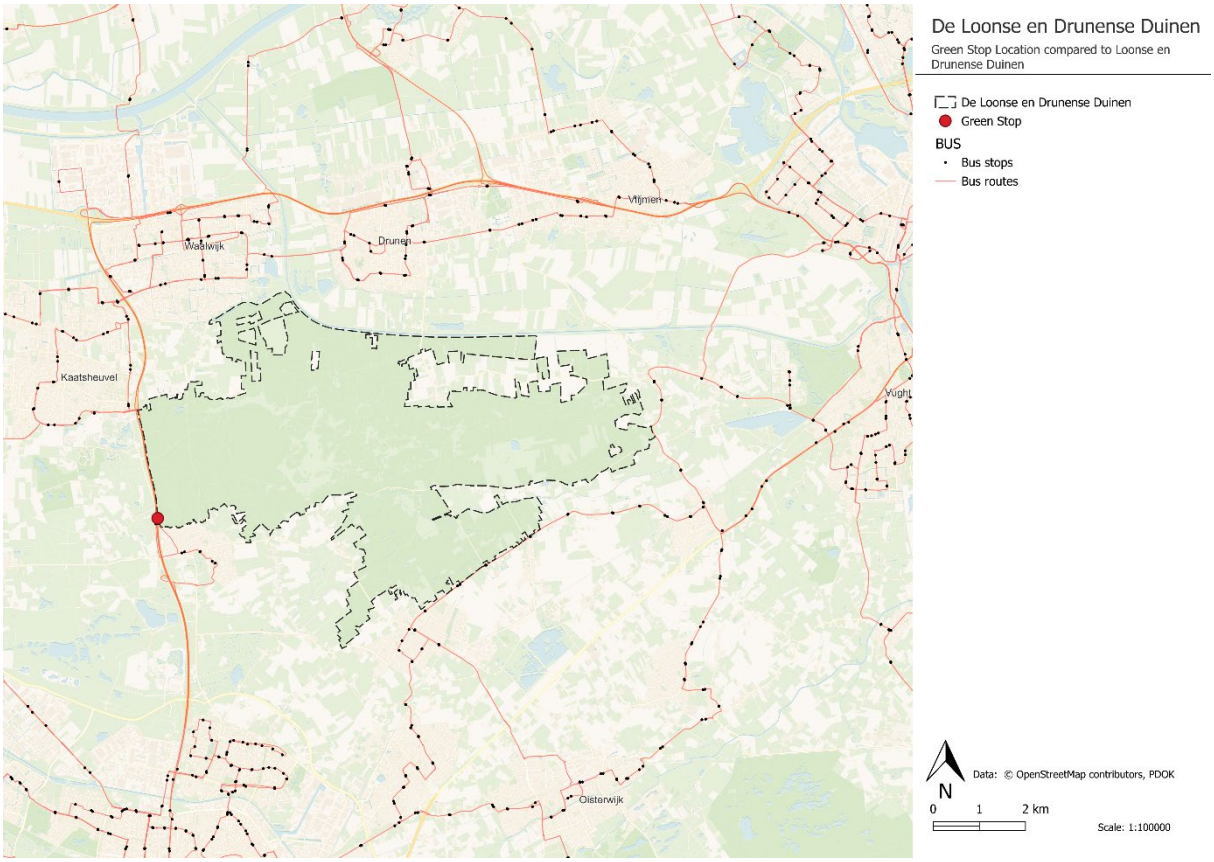

Figure 5.8 Public transportation map Loonse en Drunense Duinen

Figure 5.9 illustrates the coverage areas by public transport within 30, 60, and 90 minutes. The data reveals that public transportation access is significantly more limited and selective compared to car accessibility. While areas around Tilburg, Waalwijk, and Drunen are still reachable within 60 minutes, other nearby areas take 90 minutes or more, making public transport considerably less competitive compared to travelling by car.

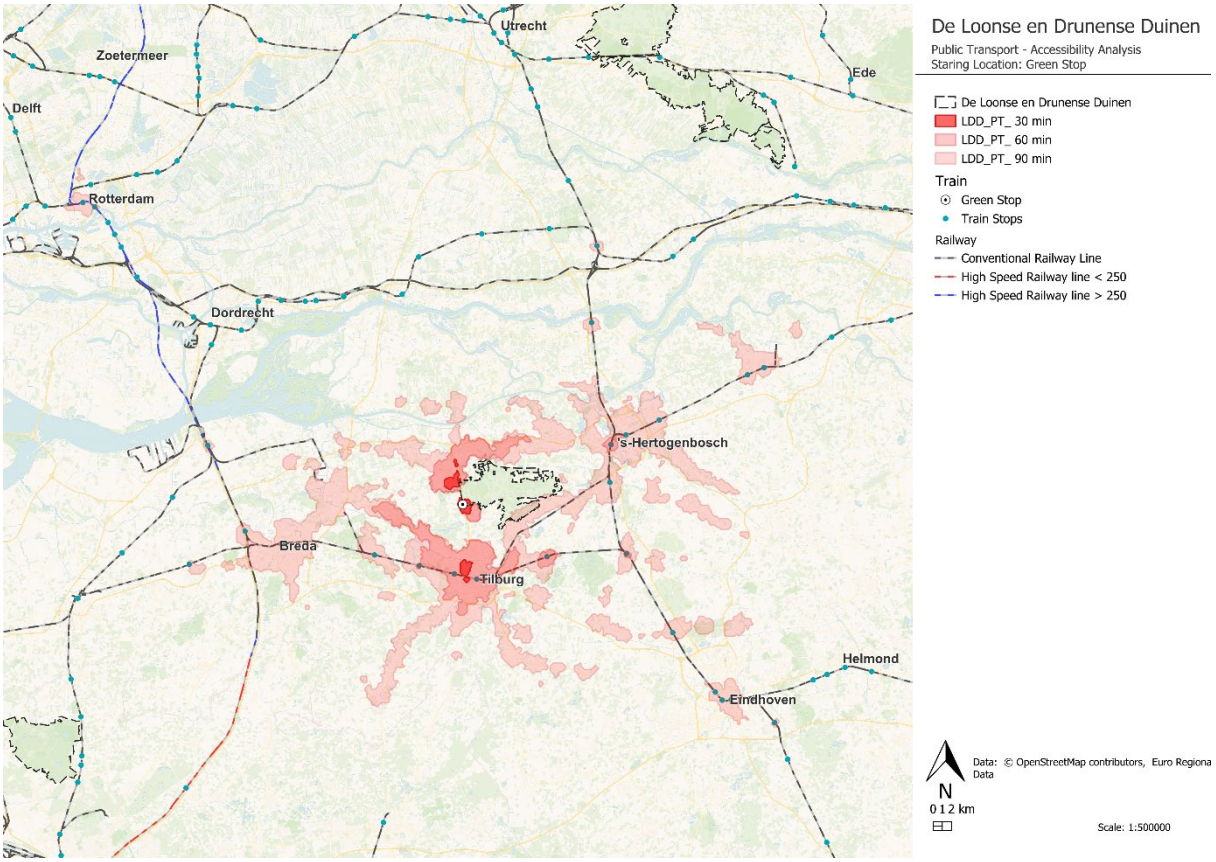

Figure 5.9 Public transport accessibility Loonse en Drunense Duinen

Cycling accessibility

LDD is well accessible by bicycle. Most larger roads leading to the area have dedicated cycling infrastructure. There appears to be limited parking availability for bicycles. Still, it might not be necessary because cyclists coming to the park tend to use their bicycles to move around the nature area as well. Most recreational cycling routes are concentrated along the park's perimeter, with a few extending through its interior (see figure 5.10). Dedicated off-road trails for mountain biking venture deeper into the nature area.

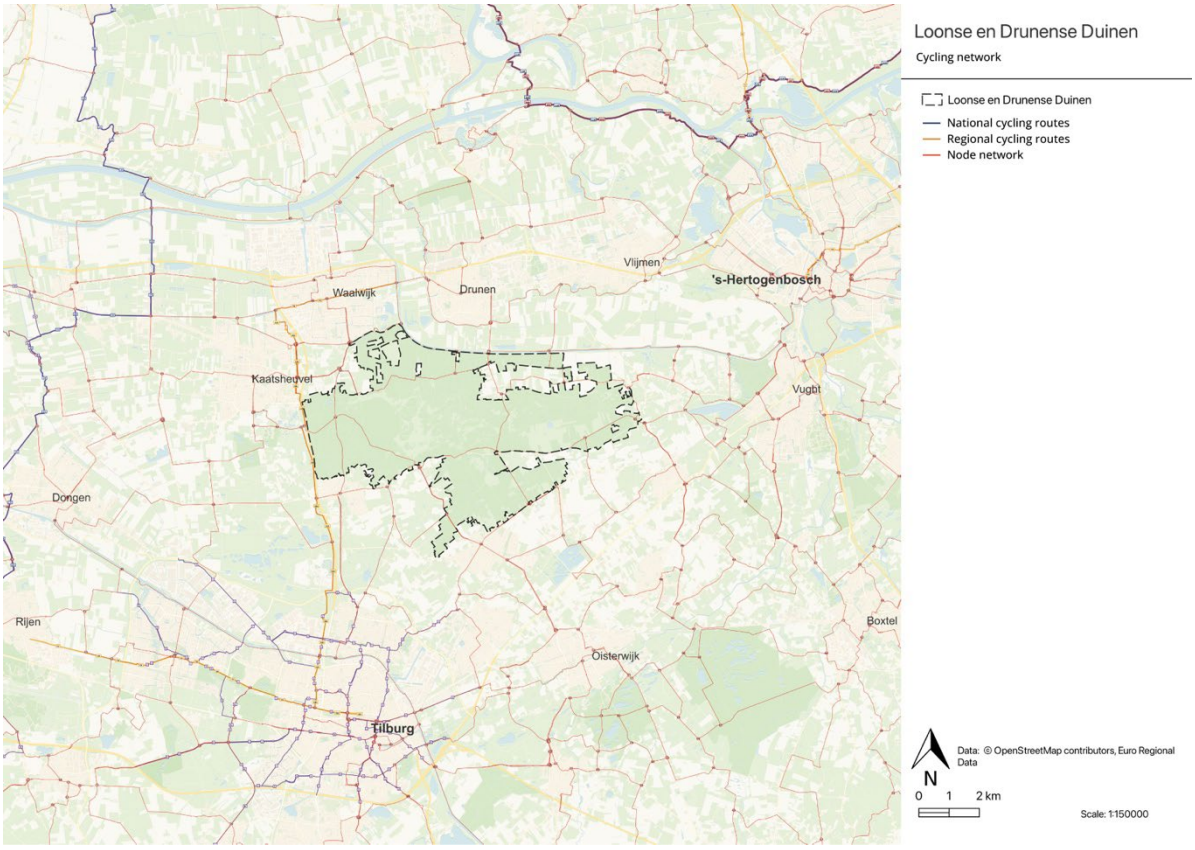

Figure 5.10 Cycling network Loonse en Drunense Duinen

Figure 5.11 shows the travel time map for the areas accessible by cycling in 15, 30 and 60 minutes. It reveals that nearby municipalities such as Waalwijk, Udenhout, Helvoirt and Sprang-Capelle are well within accessible bicycle time from the nearest entry points. The outskirts of larger cities of 's-Hertogenbosch and Tilburg can be reached in approximately 30 minutes. As observed earlier, 60% of the visitors originate from the direct environment of the park; there may be opportunities for a modal shift from car use towards cycling among visitors from these areas.

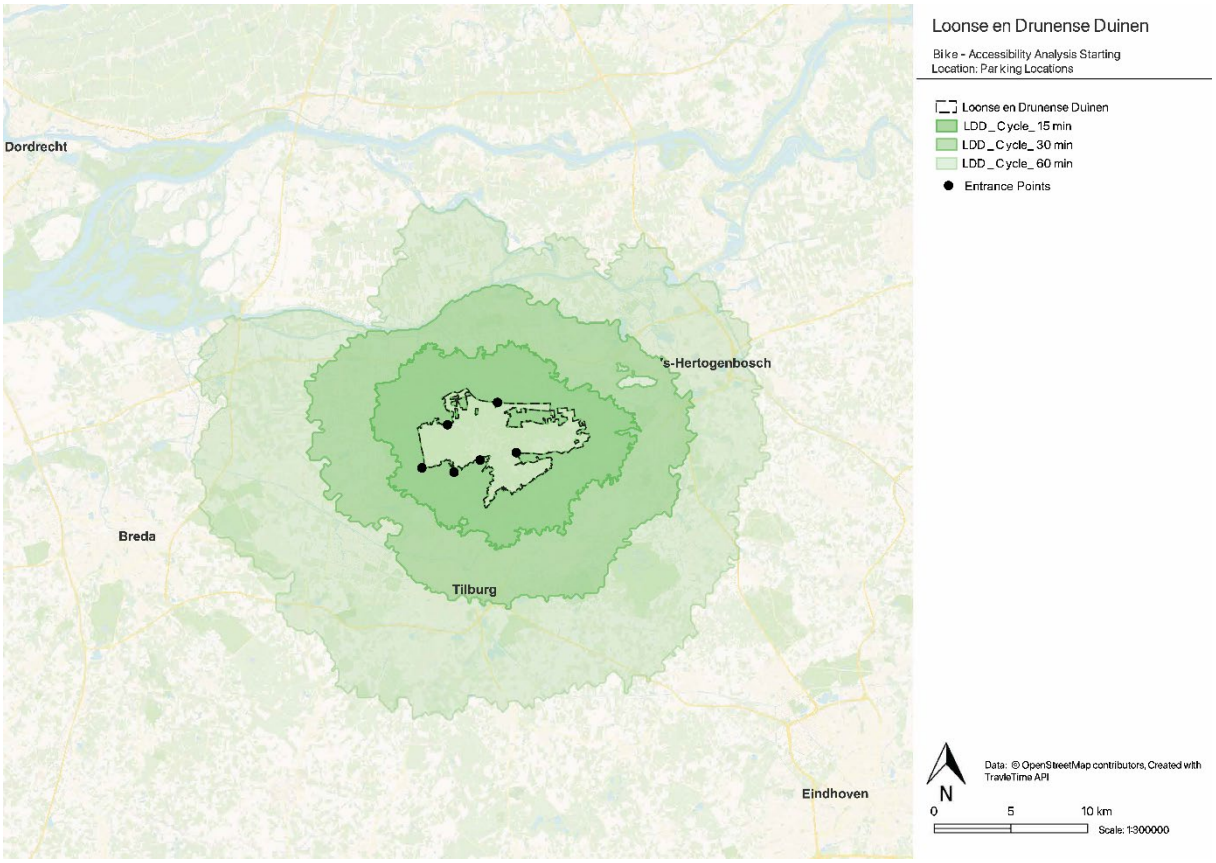

Figure 5.11 Bicycle accessibility Loonse en Drunense Duinen

Pedestrian accessibility

Walking facilities are mainly focused on the park interior, which provides one of the best ways to enjoy the interior of the LDD. There are several official walking routes which start from different park entrances and nearby towns, but these routes can also be combined to enjoy longer walking trips (see figure 5.12).

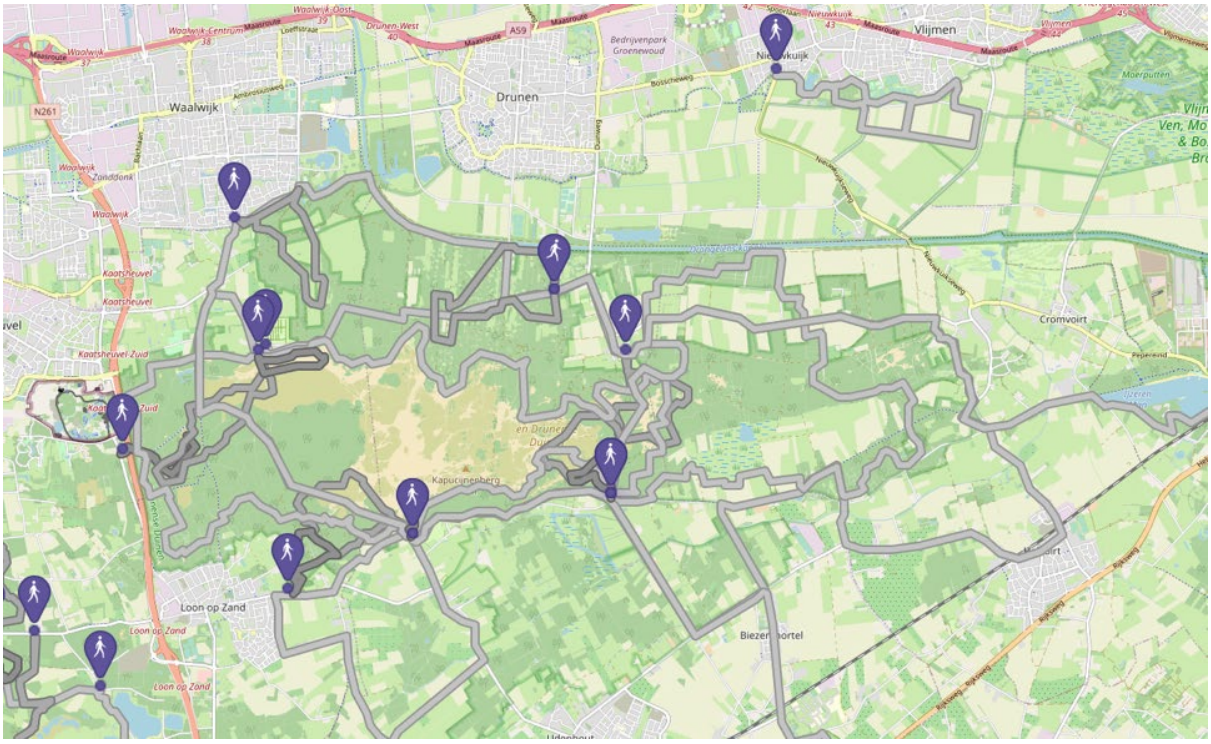

Figure 5.12 Walking routes Loonse en Drunense Duinen. Source: (Natuurmonumenten, 2024)

5.4 Challenges and (potential) opportunities

This section describes the challenges and potential opportunities for the LDD to encourage sustainable tourism and reduce the impact of visitor flows. First, knowledge from previous studies and activities is summarised. Subsequently, the results from the inventory session are shared.

Background knowledge

The LDD experience significant recreational pressure due to its proximity to the surrounding urban areas. This high level of visitation has been a concern since the 1990s, when the first issues related to recreational pressure were identified in the former municipality of Udenhout (Molin, Grobben, & Goedkoop, 2009). Especially on peak days, this results in overcrowding, user conflicts, and an overload of the nature area's carrying capacity. Related challenges are identified in the SAMR (2016) visitor satisfaction study, Masterplan Van Gogh National Park (2020) and an exploratory study regarding walking in Brabant (VisitBrabant, 2022):

- **Parking Issues**: Insufficient parking facilities and illegal parking around key access points which contribute to congestion and accessibility problems.
- **Limited Public Transportation**: in line with the accessibility analyses, public transport access is seen as restricted, with long travel times from some nearby areas, making car travel more attractive. Furthermore, the green bus stops do exist; however, they are largely underused and have somewhat faded from the

picture. A pilot will be launched in the Loonse and Drunense Duinen, utilising Tilburg's public transport stops as starting points for walks, providing alternatives to traditional parking areas

- **User conflicts**: Popular paths, especially those shared by cyclists and pedestrians, face safety concerns due to high usage and insufficient space during peak times.
- **Need for Infrastructure Improvements**: The park requires accessible starting points, synchronised signage, expanded parking, well-placed rest areas and improved gate management to distribute visitors more evenly and enhance the overall customer journey and experience. In particular, dog off-leash zones, sanitary facilities, and clearer separation of pathways for different activities are mentioned.
- **Nature Conservation**: Nature areas face rising pressure from increased foot traffic. Suggested strategies involve establishing pathways outside these areas and designing route combinations that connect urban and rural regions, along with a new form of recreation zoning. Furthermore, research is underway to explore the potential of using farms as starting points since they are located away from sensitive natural environments.
- **Organisation and Cooperation:** The development of a joint platform for information and route management is needed for better coordination in route maintenance, enforcement, and communication.

Inventory session

To develop a better understanding of the key challenges and opportunities, an inventory session was organised by Buas in collaboration with Visit Brabant in Udenhout in November 2023. A wide variety of stakeholders, including Van Gogh NP, Visit Brabant, Natuurmonumenten, IVN Brabant, and the municipalities of Tilburg, Loon op Zand and Heusden, were invited in order to develop a comprehensive picture of the current status quo.

Key challenges

During the session, stakeholders addressed and discussed key challenges. The most prominent ones are listed below.

Car accessibility and parking

The most significant challenges in the area are related to car accessibility, particularly parking issues. There are five busy main entrances: Bosch en Duin, Drie Linden, De Roestelberg, De Rustende Jager, and Natuurpoort van Loon (see also figure 5.13). These entrances have a long history and are deeply ingrained in visitors' habits. However,

several roads leading to these entrances are narrow, causing traffic difficulties on busy days.

One of the major concerns is the impact of parking overload during peak seasons, which can obstruct access for emergency services such as ambulances and fire brigades. For example, the parking area at the Bosch en Duin entrance has space for over 100 cars, which is insufficient on busy summer Sundays. Additionally, as discussed during the session, visitors often fail to exhibit appropriate parking behaviour and are hard to persuade to use alternative parking locations, exacerbating the problem.

Figure 5.13 Main parking area Bosch en Duin

Conflicts between users

Within the nature park, conflicts often arise between different types of users. One of the most prominent issues involves clashes between visitors engaging in various activities. For example, mountain bikers, hikers, and dog walkers frequently encounter friction at certain places within the park.

These findings are in line with results from the visitor survey (SAMR (2016) where many respondents noted that cycling paths are simultaneously used for walking and cycling, which contributes to conflicts. These issues are further exacerbated by the narrow width of certain cycling lanes in some areas.

Ecological impact and stress on vulnerable nature

As previously mentioned, the park holds significant ecological value due to its unique landscape. However, veering off designated paths, often influenced by apps and GPS navigation, has a severe negative ecological impact. In the open dunes, the absence of designated walking paths leads visitors to wander freely, often trampling through delicate heather, leading to habitat degradation. This is particularly damaging in

transition areas between vegetation types—home to 86% of the park's species—where the ecological pressure is unsustainably high.

Opportunities

During the session, participants were encouraged to explore potential opportunities to address the identified challenges.

Spreading Visitors

One of the potential solutions is to develop alternative routes around the Loonse en Drunense Duinen. Park Pauwels, located to the south of the park, could be one of the areas of interest. However, the general idea is to spread the load more evenly across the areas just outside the park's borders.

Role of Landschapspark Pauwels

Landschapspark Pauwels, situated on the southern side of the Loonse en Drunense Duinen, offers one of the important opportunities to alleviate recreational pressure on the dunes (see figure 5.13). By proving additional spaces for hiking, cycling, and nature exploration, it can help distribute visitor numbers more evenly. This approach not only safeguards the fragile ecosystems of the sand dunes but also ensures visitors can continue to enjoy diverse outdoor activities sustainably, staying within the area's ecological carrying capacity.

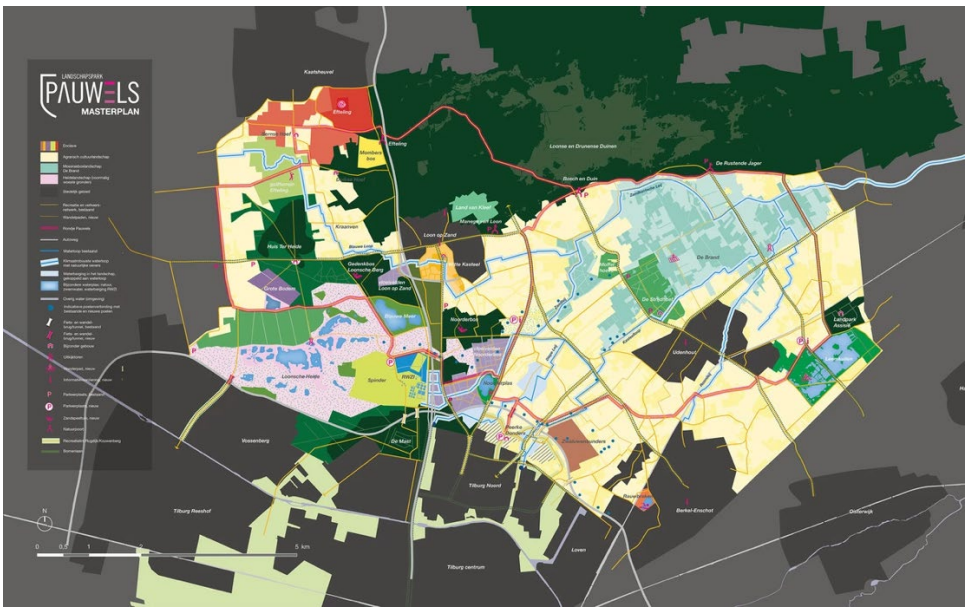

Figure 5.14 Masterplan Park Pauwels. Source: (Stootman Landschapsarchitecten, 2018)

Altered Use

One of the other opportunities highlighted was to expand the role of *Gastheren*—local entrepreneurs who could act as hosts in the nature areas. These hosts would provide valuable information about alternative routes and promote sustainable practices.

Additionally, the implementation of "green bus stops" was mentioned as a way to enhance accessibility to the park.

It was emphasised that alternative offerings should be fully developed before being introduced to visitors. This includes addressing key aspects such as access, routing, hosting, food and beverage options, children's activities, waste management, and more to contribute to an enjoyable experience.

5.5 Summary of findings

- **The Van Gogh National Park** is unique in its ambitions to integrate nature areas, cultural landscapes, urban areas and agriculture. The focus area of **LDD** is a Natura 2000 site with rich biodiversity and is known for its sand dunes, oak and pine forests and stream valleys.
- The LDD area attracts a **diverse** range of visitors, including nature enthusiasts, families, recreational users, adventure seekers, local residents, and tourists. **Walking** and **cycling** are key activities commonly used to explore and appreciate the park's unique natural landscapes. Many people also enjoy combining a short walk with a visit to one of the **hospitality** establishments at the park's perimeter.
- People mostly use **cars** to access the park while public transport is used less often. People living nearby also take the bicycle or walk to the LDD area to enjoy its unique landscape.
- The multimodal accessibility maps reveal that **car accessibility** is **high** while **public transport** accessibility is more **limited** and more selective, with better access in cities and along the public transport corridors. For cycling and walking, fine-grained networks are available in and around the LDD area. Currently, cycling seems to provide more opportunities for a sustainable modal shift from car use compared to public transport where considerable improvements in accessibility are needed in order to compete with the car.
- The main **challenges** are related to **overcrowding** near the main entrances and insufficient parking, especially during peak times (weekends and holidays). This leads to conflicts between users, especially on shared paths and to ecological strain due to overcrowding, off-path activities and trampling of sensitive habitats.
- **Opportunities** to address these challenges primarily focus on easing the pressure on LDD by creating **alternative routes** and directing visitors to **Landschapspark Pauwels**. Furthermore, the development of **green bus stops,** and the promotion of public transport accessibility could help to ease the pressure. To encourage **responsible** visitor behaviour, local **entrepreneurs** can also be engaged as ' Hosts of the Landscape' for **communication** and **education** initiatives. Finally, improving signage, parking and facilities for better **visitor management** could improve the current status quo.

6. Veluwezoom (The Netherlands)

6.1 Characteristics and attractions

General characteristics

The National Park Veluwezoom (NPV), situated in the eastern part of the Netherlands, ranks among the country's most well-known and historically significant national parks (Bureau voor Ruimte & Vrije Tijd, 2024). Established in 1931 as the first national park of the Netherlands, it encompasses an extensive area of approximately 5000 hectares. The park is integrated into the larger Veluwe region, popular for its undulating hills, vast forests, heathlands, and sandy drift areas, thereby exemplifying a rich and dynamic natural landscape (Ten Hoedt & Knol, 2011).

The park in Gelderland is surrounded by urban areas and villages. To the south lies Arnhem, a city, and east is Rheden, a smaller town, which offers park access through entry points such as Posbank. Nearby municipalities, including Ede and Arnhem, also provide access to trails and attractions (see figure 6.1).

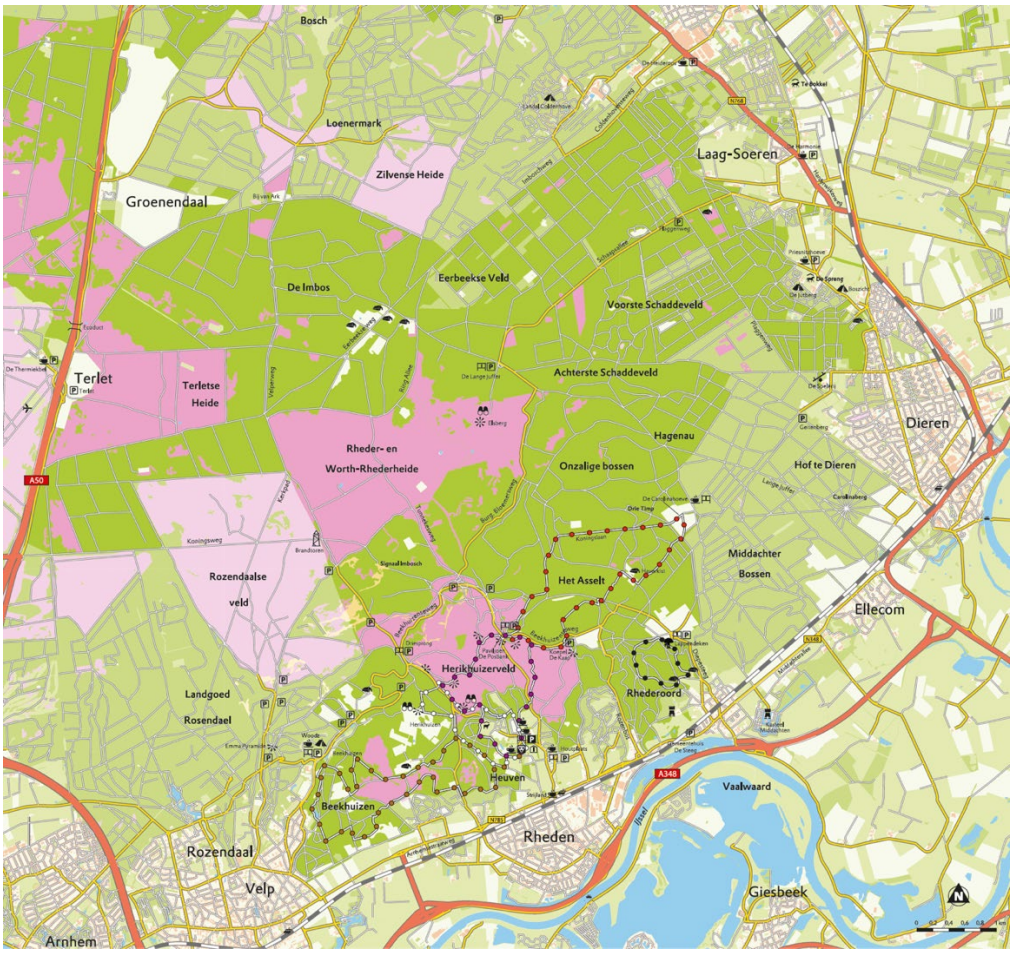

Figure 6.1 Overview map Veluwezoom. Source: (BuroNIV)

NPV is known for being a mixed-use park, blending recreational activities with nature conservation. Its extensive network of hiking and cycling trails connects the park to surrounding urban areas, creating a unique integration of urban, rural and natural landscapes. NPV's well-maintained pathways, historic estates, and unique heathlands contribute to its reputation as a vital cultural and ecological resource in the region (Gemeente Rheden, 2016).

Functions and attractions

Within NPV, various types of facilities and attractions can be found, ranging from numerous bike routes to walking, hiking, and horse riding trails. The cultural exploration, including visits to historical estates and sites, adds a unique dimension to the visitor experience. These activities showcase NPV's versatility as a destination that combines outdoor adventure with cultural and ecological enjoyment engagement.

While Veluwezoom is managed as a singular entity by Natuurmonumenten, it forms part of a network of parks within the Veluwe. This network includes De Hoge Veluwe National Park, private estates, and smaller municipal reserves, which are interconnected through green corridors designed to protect wildlife and enhance visitor mobility.

Agriculture significantly impacts the NPV by integrating with cultural landscapes. Traditional practices, like sheep grazing, preserve heathlands by preventing overgrowth and supporting biodiversity, especially near Posbank. These methods reflect the region's historical land use. Small-scale farming on the park's edges enhances its rural charm and supports local economies (Rinus Jaarsma, 2009).

6.2 Visitor profiles and activities

Visitor profiles

National Park Veluwezoom attracts many day visitors and tourists every year, some 1.5 million unique visitors a year (Provincie Gelderland, 2021) (NBTC-NIPO, 2015) who walk, cycle, ride horses or walk their dogs. Within the Veluwezoom, the number of visitors per year varies through the seasons, especially throughout mid-August and early September. During this time, the heather (Calluna vulgaris) transforms the landscape into a sea of purple hues, attracting numerous visitors. During this time, roughly 200,000-300,000 people visited the Posbank in Veluwezoom (Bureau de Groot Volker, 2017; BuroNIV, 2023; Natuurmonumenten, 2024).

Based on the different sources, several types of visitor profiles have been defined.

1. **Nature Enthusiasts**

Nature enthusiasts form the largest group, accounting for 40% of visitors. These are primarily older adults (aged 55+) who visit Veluwezoom for its serene environment, scenic trails, and unique heathland vistas, especially at the Posbank. This group values

quiet activities like walking, nature observation, and photography. Their preference for off-peak visits ensures they avoid the busier summer months.

2. **Families and Casual Visitors**

Families represent around 25% of visitors, drawn by the park's accessibility, kid-friendly walking trails, and water-based attractions. Most family groups visit during weekends or holidays, often for shorter recreational outings. Their activities focus on walking, picnicking, and exploring interactive trails.

3. **Adventure Seekers**

Adventure seekers, comprising 15% of visitors, are typically younger (aged 16–40) and more physically active. They favour mountain biking and hiking through challenging terrains, such as the trails at Schietbergseweg or the paths leading to the Posbank. This group often brings their own equipment and tends to visit in smaller groups.

4. **Cultural Explorers**

Cultural explorers account for 10% of visitors, drawn by the historical and cultural elements of Veluwezoom, such as its estates and military landmarks like the Posbank. This group often overlaps with older visitors and international tourists, particularly those interested in World War II history.

5. **Local Recreational Users**

10% of visitors are locals from nearby towns like Rheden, Arnhem, and Rozendaal. These individuals use the park regularly for exercise, dog walking, or short nature breaks. Their familiarity with the park ensures they gravitate toward less crowded areas, often during weekdays.

Type of activities

In a study in Veluwezoom Zuid, the top reasons for visiting were (Bureau de Groot Volker, 2017):

1. **Nature (35.7%)**
2. **Relaxation (26.8%)**
3. **Sportive activities (18.2%)**

Veluwezoom's visitor demographics highlight its broad appeal across age groups and interests. While nature enthusiasts and families dominate the numbers, the park's mix of cultural, recreational, and adventure-focused offerings ensures a diverse visitor base. Strategic management is essential to balance these groups' needs, preserve the park's ecosystems, and maintain its status as one of the Netherlands' most cherished natural reserves.

6.3 Multimodal accessibility

This paragraph examines the multimodal accessibility of Veluwezoom, focusing on specific entrance points for various transport modes, including cars, public transport (trains and buses), cycling, and walking. For each mode, the availability and density of the networks are analysed, and accessibility maps are provided to reveal the areas within reach of the park's main entrance points.

Car accessibility

The most popular way to visit Veluwezoom is by car. There are various parking locations, each with its own entrance and available walking routes totalling to around 786 spaces (Bureau de Groot Volker, 2017). The area is connected to the rest of the country via motorways and a primary and secondary road system that surrounds the park (figure 6.2). In recent years, residents of nearby municipalities, such as Rheden, have faced negative externalities, including parking challenges and noise pollution caused by visitors (Gemeente Rheden, 2020). As of July 1, 2024, eight parking locations in Veluwezoom are closed, and three parking areas, including the largest three parks, will be reduced in size (Natuurmonumenten, 2024). This change is part of a new plan aimed at promoting sustainability and encouraging visitors to use public transport or bicycles instead.

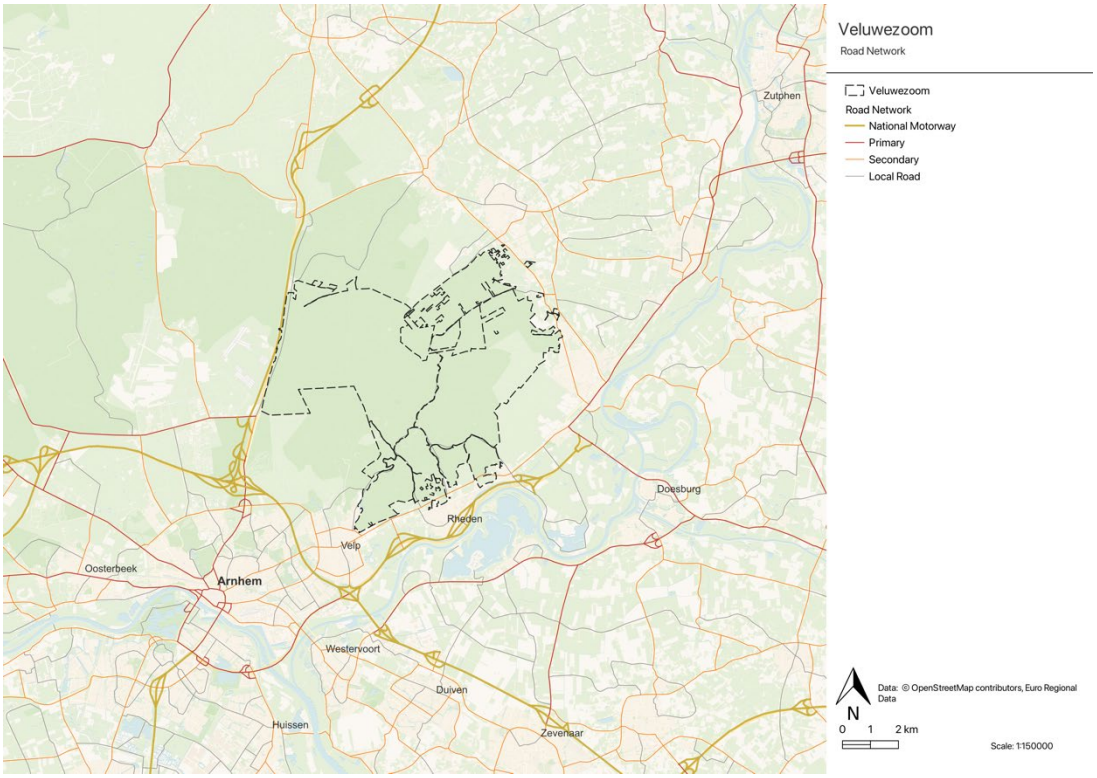

Figure 6.2 Car infrastructure Nationaal Park Veluwezoom

Figure 6.3 illustrates that Veluwezoom National Park is highly accessible by car, with many nearby cities such as Amersfoort, Arnhem, Nijmegen, Apeldoorn, and Deventer

reachable within or close to 30 minutes. Within 60 minutes, significant areas of the Randstad and the provinces of Noord-Brabant, Limburg, and Overijssel are also accessible. This convenient car access likely plays a key role in many visitors opting for this mode of transport when traveling to the national park.

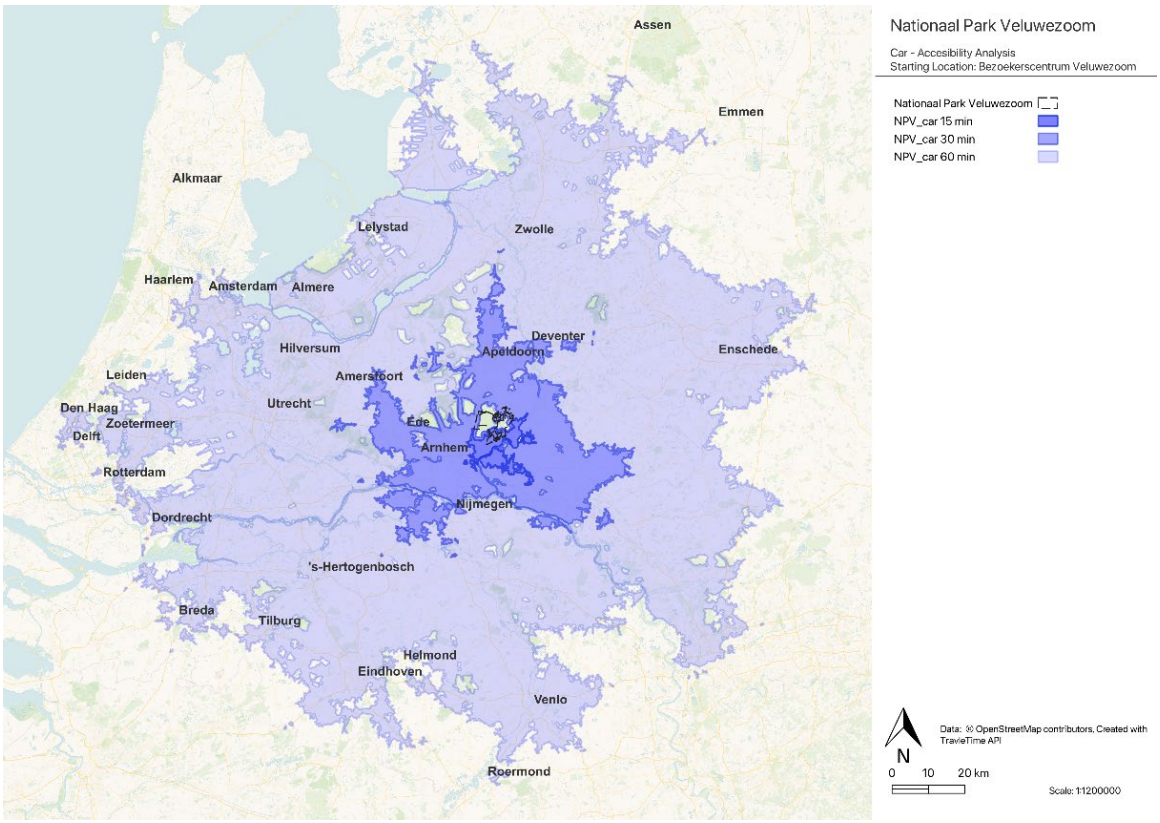

Figure 6.3 Car accessibility Nationaal Park Veluwezoom

Public transport accessibility

Veluwezoom is quite well connected by public transportation, making it accessible to visitors without private vehicles (figure 6.4). The nearest train stations, such as **Dieren** and **Rheden**, provide convenient entry points to the park. These stations are part of the Arnhem–Zutphen rail line, with frequent trains running every **30 minutes** during peak hours. From these stations, visitors can reach the park's attractions either by walking (approximately **2–3 kilometres**) or cycling, with rental bikes available at key stations. Regional bus services further complement train connectivity by linking nearby towns and villages to popular park entry points, ensuring seamless transport options for both local and international visitors. A convenient option is to take a bus to the Groenestraat bus stop in Rheden. On weekdays, buses run twice an hour, while on weekends, they run once per hour. A 10-minute walk (approximately 950 meters) will take you to the Visitor Centre.

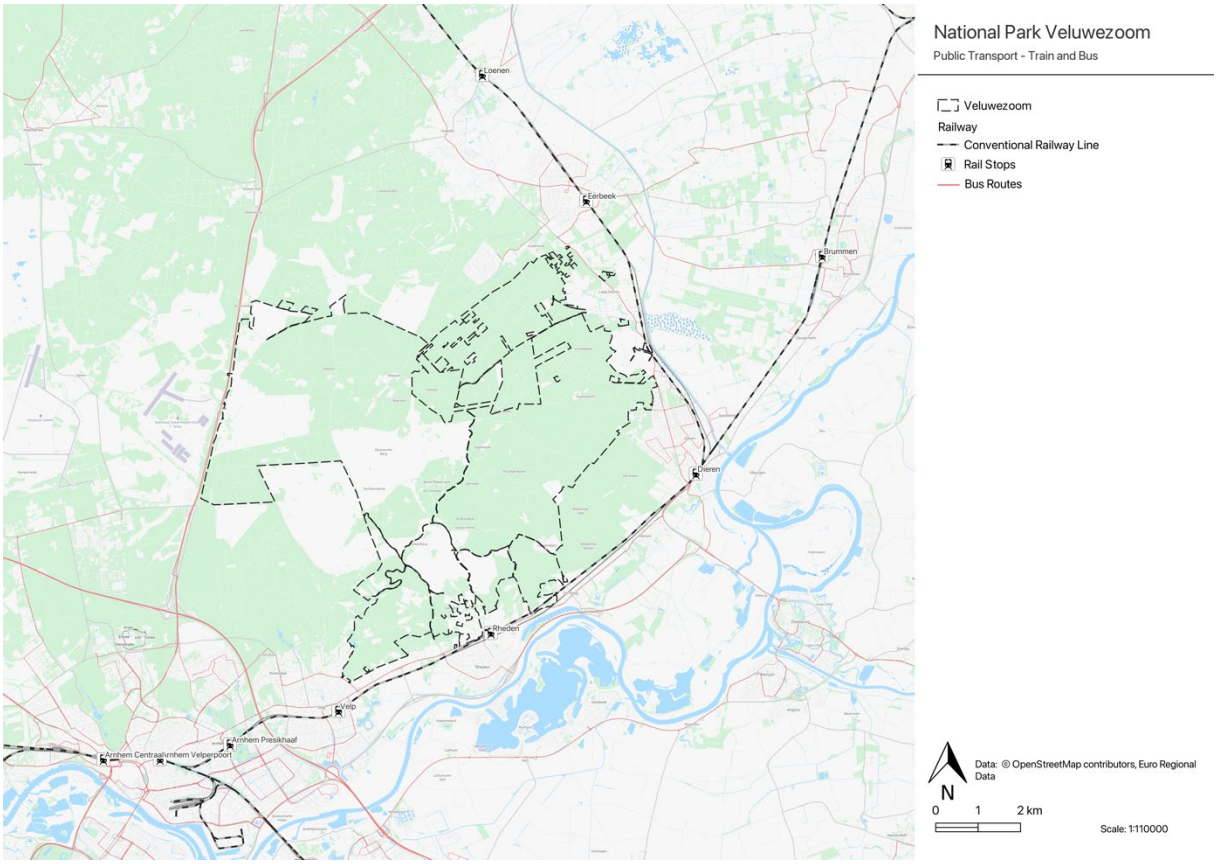

Figure 6.4 Public transportation infrastructure Nationaal Park Veluwezoom

Despite the relatively good connection by public transport, its accessibility clearly falls short compared to the car accessibility (figure 6.5). Taking station Rheden as a starting point, Arnhem and Zutphen can be reached within or close to 30 minutes by public transport. The map clearly shows that accessibility is provided along the axis of important public transport lines. Areas around railway stations at somewhat larger distances such as Deventer, Elst and Apeldoorn can still be reached by train within 60 minutes. Other parts of Nijmegen, Apeldoorn & Deventer and Zwolle take up to 90 minutes to reach.

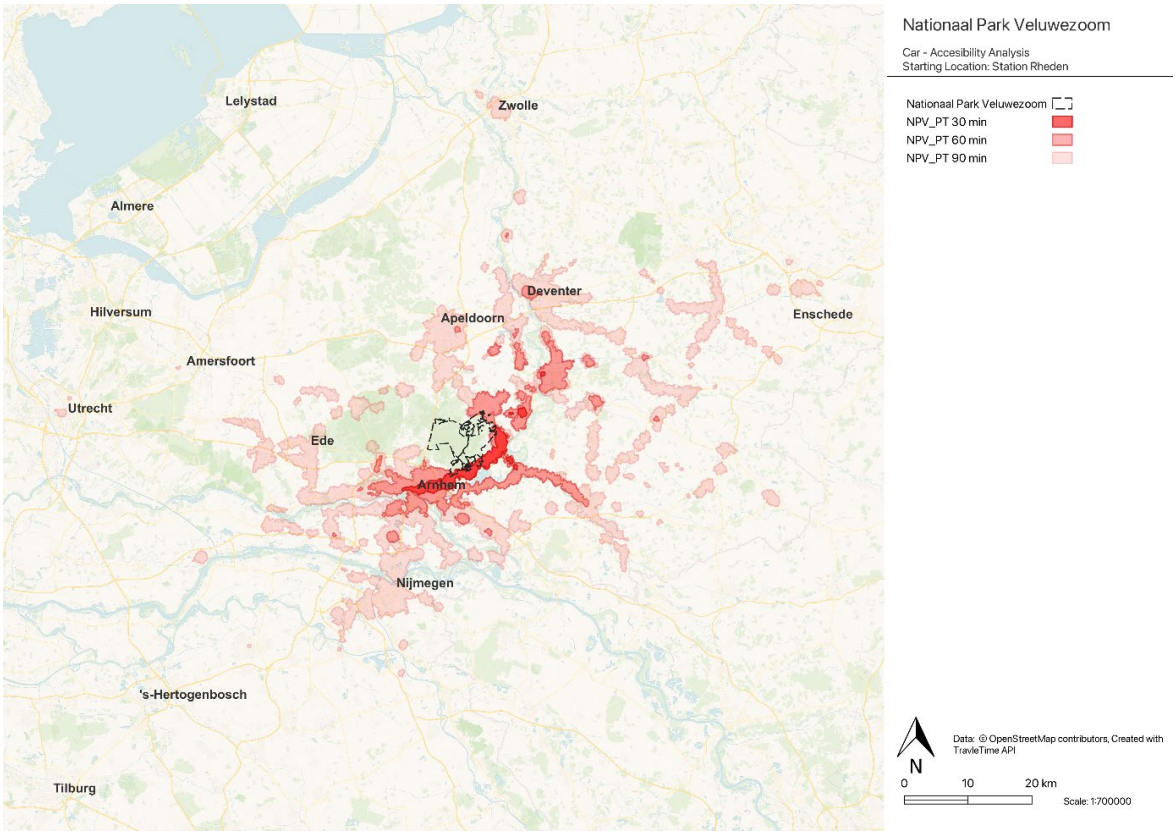

Figure 6.5 Public transport accessibility Nationaal Park Veluwezoom from the train Rheden train station

Cycling accessibility

Cycling in the Veluwezoom is encouraged, as well as throughout the entirety of the Veluwe. There are many places where you can store your bike to continue on foot and visit a restaurant. There are also many routes connecting the Veluwezoom to the rest of Arnhem and its surrounding towns and cities, as this is a popular and well-maintained cycling destination. The network of paths (shown in figure 6.6) offers options for both casual cyclists and those looking for a more challenging ride, ensuring that everyone can enjoy the scenic beauty of the region.

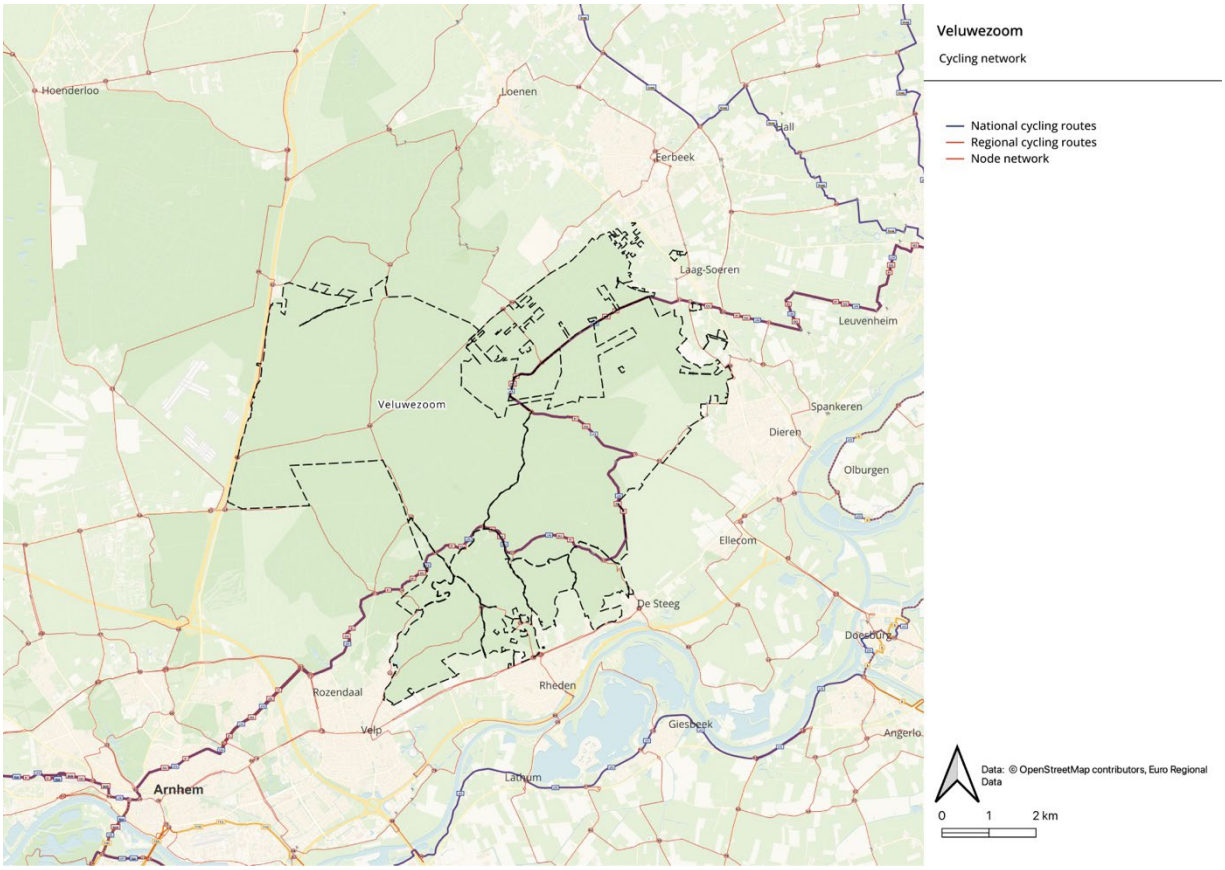

Figure 6.6 Bike network of Nationaal Park Veluwezoom

The accessibility map for cycling in figure 6.7 shows that the surrounding areas are well accessible by bicycle, especially areas on the Northern side. On the Southern side, the rivers and lakes clearly form a barrier. Rheden, Arnhem, Dieren, and Eerbeek can be reached within or close to 30 minutes. Larger cities such as Zutphen and Apeldoorn take up to 60 minutes to reach. The catchment area for the bicycle includes many areas that are not well served by public transport, showing that the combination of these modes is important to provide a good alternative for car use.

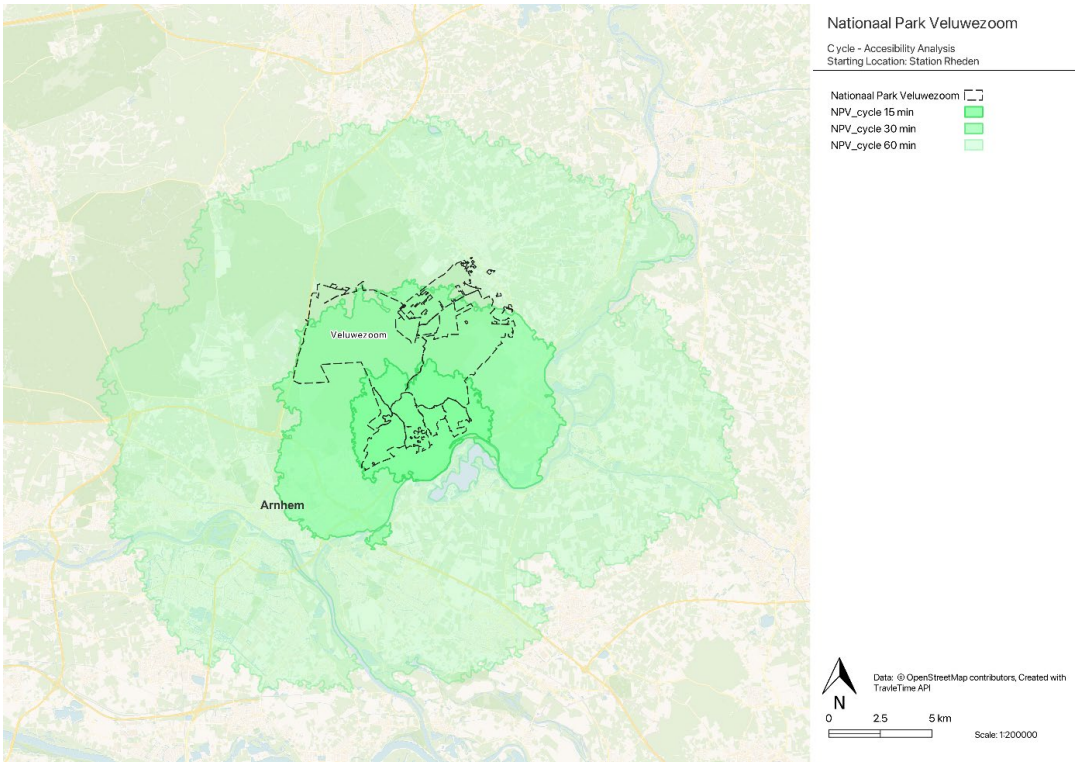

Figure 6.7 Bicycle accessibility Veluwezoom

Pedestrian accessibility

Accessing the Veluwezoom by foot is encouraged, and there are 25 routes you could take within this park that are advised within the Natuurmonumenten site, ranging from 2km to 18km. Walking facilities are mainly focused on the interior of the park, which provides great ways to enjoy the views and nature that this park has to offer. Most of these routes start at the visitor centre (Bezoekerscentrum).

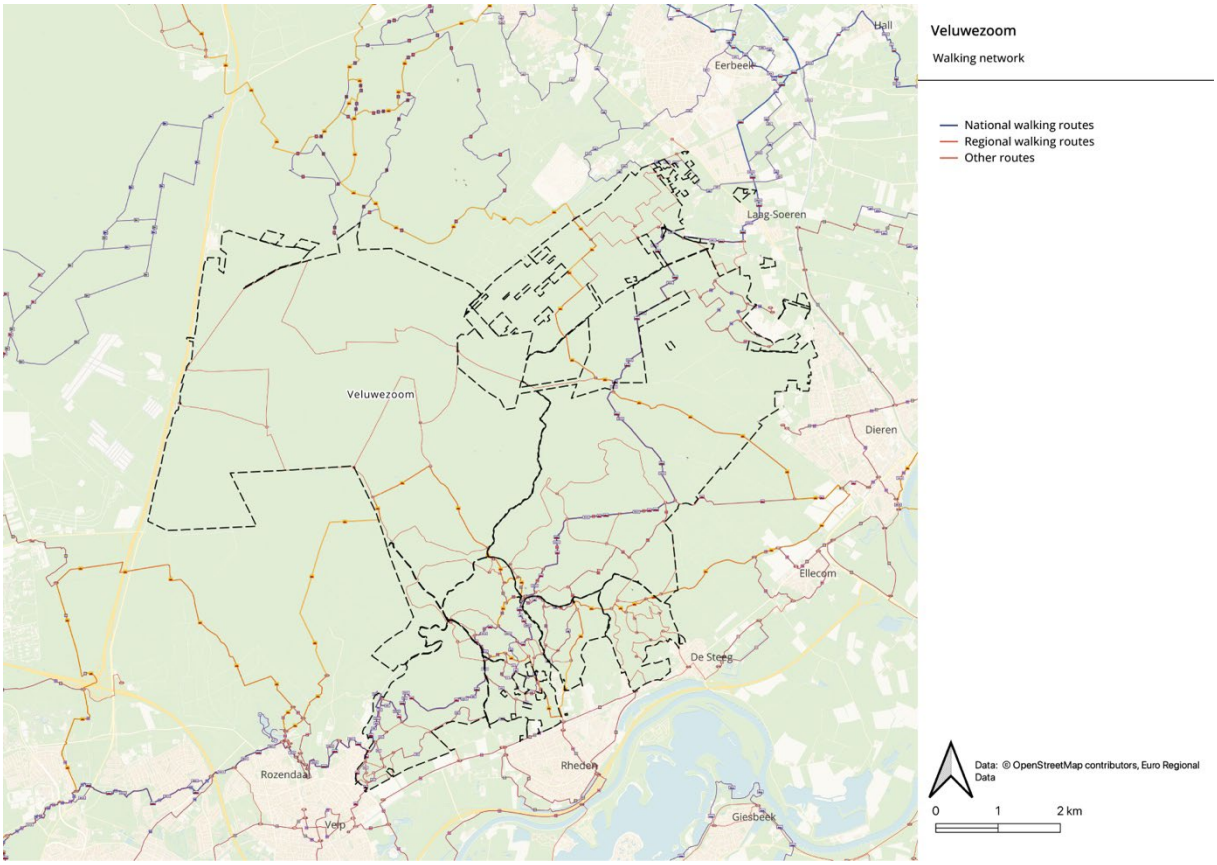

Figure 6.8 Pedestrian network of the Veluwezoom

6.4 Challenges and (potential) opportunities

This section describes the challenges and potential opportunities for the NPV to encourage sustainable tourism and reduce the impact of visitor flows. First, knowledge from previous studies and activities is summarised. Subsequently, the results from the inventory session are shared.

Background knowledge

Rheden and the Posbank represent a focal point for recent developments in Veluwezoom National Park. Within 2022, the municipalities Rheden, Rozendaal and Natuurmonumenten worked together and published a masterplan to preserve and strengthen nature in Veluwezoom National Park (2022). Driving efforts to balance nature conservation and visitor satisfaction, the area continues to evolve as a key destination for both recreation and environmental stewardship.

The strategic initiatives for enhancing the visitor experience and sustainability at Veluwezoom focus on four key areas.

1. **Visitor Management** aims to balance park usage by introducing a zoning system to designate areas for high, medium, and low visitor intensity while developing

alternative access points to evenly distribute traffic. Digital tools and apps will help inform visitors about less crowded areas and available amenities.

2. **Infrastructure Development** seeks to expand and improve cycling and walking trails, enhancing accessibility and visitor enjoyment, alongside upgrading visitor centres with modern facilities, multilingual information, and interactive exhibits.
3. **Sustainability Measures** emphasise promoting public transport and shared mobility options, such as electric shuttles and bicycles, while implementing waste reduction programs to preserve the park's natural beauty. Lastly,
4. **Community Engagement** involves local stakeholders in decision-making and supports local businesses by integrating them into tourism services, including guided tours and local product sales, fostering a stronger connection between the park and its surrounding communities.

The current aims of Rheden and the Posbank are to establish models of sustainable tourism and recreation, emphasising the following points:

- **Ecological Integrity**: Protecting the park's natural beauty while ensuring habitats remain undisturbed.
- **Improved Accessibility**: Strengthening connections to Rheden through upgraded public transport links and better cycling infrastructure.
- **Enhanced Visitor Experience**: Offering interactive digital tools, clear signage, and modernised facilities while reducing congestion in hotspot areas like the Posbank.

As for the discussion in masterplan four, developmental points were emphasised and can be characterised into the following:

1. **Infrastructure Improvements**: Trails connecting Rheden to the Posbank have been upgraded to handle increased foot and cycling traffic, with proposals for real-time parking systems to reduce overcrowding during peak seasons.
2. **Sustainable Mobility**: The masterplan emphasises public transport, cycling, and shuttle services to decrease vehicle reliance and parking pressure near the Posbank.
3. **Zoning and Visitor Flow**: High-intensity zones like the Posbank are managed through visitor zoning and alternative routes, reducing strain on popular areas while guiding traffic to less-visited parts of the park.
4. **Nature Conservation**: Conservation efforts prioritise the preservation of the Posbank's heathlands through grazing programs and restricted visitor access during sensitive periods.

The Masterplan Veluwezoom serves as a roadmap for sustainable development in the region, emphasising ecological preservation, improved visitor management, and community involvement. Its strategic initiatives aim to address current challenges while

preparing the Veluwezoom for long-term growth and resilience. The following key issues are identified in the masterplan:

- **Environmental Pressures**: Increased tourism has led to **erosion of natural landscapes**, disturbances to wildlife, and littering. In addition, overcrowding in sensitive areas risks ecological degradation.
- **Visitor Management Challenges**: Uneven distribution of visitors, with some areas experiencing overcrowding while others remain underutilised. This also exaggerates overcrowding issues, such as the lack of sufficient parking facilities and congestion, especially in peak seasons.
- **Community Concerns**: Conflicts between tourism and local residents, including traffic congestion, noise, and overuse of resources.

Inventory session

To develop a better understanding of the key challenges and opportunities, an inventory session was organised by BUAS in collaboration with Natuurmonumenten in Rheden in June 2024. Diverse stakeholders, including the municipalities of Rheden and Rozendaal, Veluwe op 1, Veluwe Actief and Natuurmonumenten, were invited to develop a comprehensive picture of the current status quo.

Key challenges

During the session, stakeholders addressed and discussed key challenges. The most prominent ones are listed below.

Overcrowding and distribution of visitors

One of the key challenges brought up during the session was overcrowding of the natural area and the negative impact of it on the area's nature. Especially during weekends and holidays, the region experiences a substantial influx of visitors, often leading to conflicts among various user groups. Specific locations, such as the Posbank, become excessively crowded, resulting in potentially conflicting activities, such as mountain biking and walking (see figure 6.9). Furthermore, the distribution of visitors is not optimal in terms of temporal and spatial considerations, worsening these issues.

Accessibility of the park by different modes

The Posbank area, particularly around Schietbergseweg, faces dangerous traffic situations due to overcrowding at peak times and **conflicts between different modes** of transport, including cyclists, road bikers, cars, motorbikes, and pedestrians. The narrow, winding, and hilly roads reduce visibility, exacerbating the risk. Additionally, accessibility is suboptimal, with limited and infrequent public transport. Most visitors arrive by car, primarily parking at the main entry point in Rheden. Other entry points offer plenty of parking spaces that are not always used to their potential. Furthermore, the accessibility and routing from stations to the park are identified as areas for

improvement, although wayfinding is provided by dedicated signposts and walking paths as well as bike rentals are provided.

Figure 6.9 Busy area at Posbank. Source: (Gemeente Rheden, 2020)

Communication and stakeholders

Another often-mentioned challenge was the lack of communication and overall stakeholder involvement, which impacted the surrounding areas, particularly concerning proposed changes and interventions related to the traffic situation, as well as information about facilities, routes, and activities. The nearby villages face negative traffic impacts, highlighting the need for support from local inhabitants.

Opportunities

During the session, participants were encouraged to explore potential opportunities to address the identified challenges.

Stimulation of sustainable modes of transportation

One of the most discussed opportunities is to enhance sustainable transportation. The participants from the session focused on the development of complementary transport options such as shuttle buses and a TOP Hub, adding new facilities for shared bicycles targeting families and electric bikes, and improving the route between the Rheden train station and the park's main entry point and visitor centre. The frequency and reliability of these options should be prioritised, as a coherent operating schedule is key. Shared bicycles can also play a big role in this, especially when combining trips with public transportation. However, it is important to consider how weather and costs impact this. The various entry points of the nature park, regarding the different user groups, can also influence this.

Spreading of visitors over the area

To address the challenge of overcrowding in the park during peak times, particularly on weekends and holidays, the park has already focused on creating a new traffic flow. However, the session provided valuable insights into developing new or improved entry points (e.g. Eerbeek on the **east side** of the park) aimed at alleviating parking pressure on the existing entrances and reducing (visitor) congestion. Additionally, exploring the relationship with nearby train stations, such as the Dieren train station, could be a viable option. This station is close to one of the park's entry points and experiences a higher frequency of train arrivals and departing.

Focus on collaboration and communication

Closely connected to one of the challenges was the aim of creating a stronger collaboration among the different stakeholders. The participants indicated that cooperation should also be sought, even though many of them exist. One of the opportunities focused on cooperation in a broad context, not just on the nature park but also on the region. Within this, it is essential to define clear collective goals and targets.

6.5 Summary of findings

- Established in 1931, Veluwezoom National Park is the **oldest national park** in the Netherlands and spans approximately 5000 hectares in the Veluwe region. It is a **mixed-use** park known for its **natural assets,** such as rolling hills, forests, heathlands, and sandy drift areas, but also for cultural **heritage** and **recreational** opportunities. Key attractions include the Posbank, historic estates, and extensive cycling, hiking, and horseback riding trails. The park integrates traditional **agricultural** practices, such as sheep grazing, to maintain its heathlands and biodiversity.
- The park attracts 1.5 million visitors annually, with peak seasons during the blooming of the heather in late summer. The park attracts a wide range of visitors, of which **nature enthusiasts** are the largest group. Furthermore, **families** with children enjoy short rails and recreational activities. Younger visitors seek **adventure** in mountain biking and hiking. Another group of tourists is interested in the historical and **cultural** aspects, including heritage. Finally, nearby residents use the park for recreational use, including exercise and nature breaks.
- The **car** clearly provides the best accessibility to the park and is the most popular mode among visitors. **Public transport** accessibility, provided via the train system and regional bus services, is limited to areas along the major transport corridors and is therefore much more selective and less competitive. The well-developed **cycling** network provides accessibility to surrounding towns and cities. The **combination** and integration of public transport and cycling provide opportunities to combine the strengths of both systems and provide a better alternative for car use.

- The main **challenges** identified are related to **overcrowding** and the uneven visitor **distribution,** which creates congestion, unsafety and ecological degradation at hotspots such as Posbank. This is related to **accessibility** issues. While some entry points are serviced by public transport, the car is the most convenient mode for most entry points and for the majority of visitors, leading to a lack of parking places at peak times. Finally, **stakeholder involvement** and **communication** with stakeholders and residents about proposed changes and interventions should be improved to address the challenges effectively.
- To address these challenges, the most frequently mentioned **opportunity** is to enhance **sustainable transportation**. This includes improving public transport connections, introducing shuttle bus services, and expanding shared bicycle options to facilitate seamless last-mile connections from train stations to park entry points. Furthermore, **visitor management**, including zoning, development of alternative entry points, and digital tools, could help to spread visitors spatially and temporally. Finally, **stakeholder collaboration** and strengthening partnerships among municipalities, conservation groups, and local businesses could help to get and keep the necessary support among stakeholders for sustainable tourism and conservation efforts.

7. Tourism Province of Antwerp (Belgium)

7.1 Characteristics and attractions

General characteristics

Tourism Province of Antwerp is the provincial government's tourism service, which promotes attractions and Antwerp regional products, supports local municipalities, and establishes cycling and walking routes. The province encompasses sixteen parks and domains, providing opportunities for relaxation, enjoyment, and exploration within a total area of 1,700 hectares of forests, parks, nature areas, heathlands, and castle grounds, all managed and made available by the provincial government (Toerisme Provincie Antwerp, 2022). Figure 7.1 illustrates the various types of 'hiking areas' in the province of Antwerp. These areas are historical and thematic names, often associated with geographical and/or historical features.

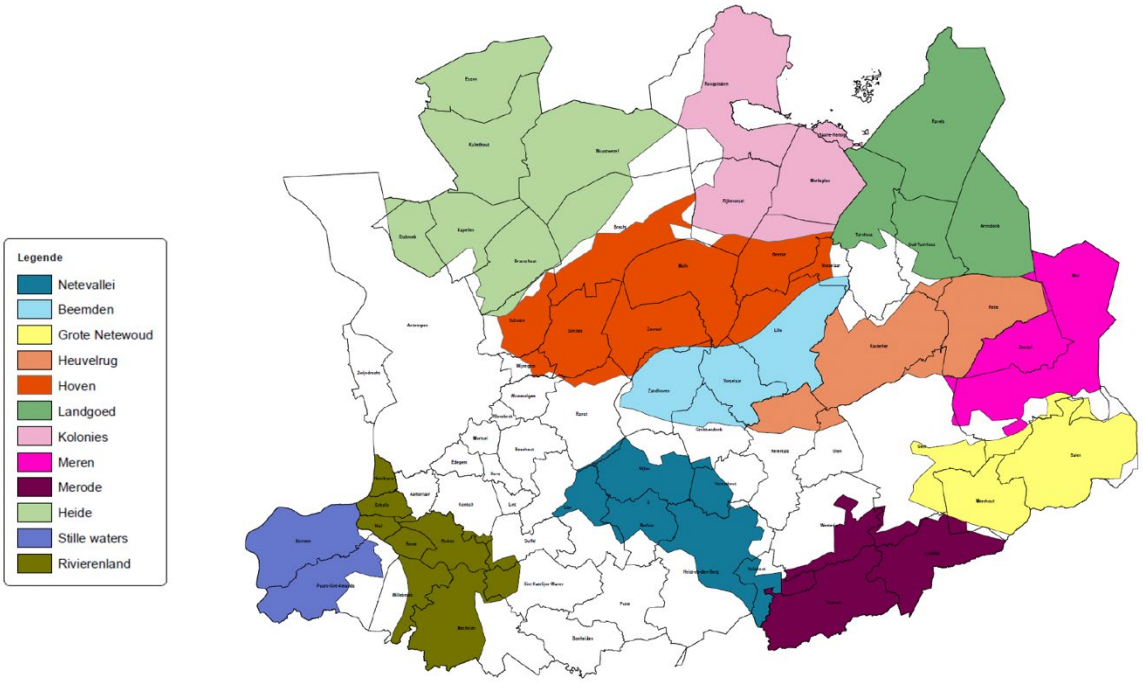

Figure 7.1 General map of Province of Antwerp and the different areas. Source: (Toerisme Provincie Antwerp, 2022)

Within MONA there are two main focus areas. These De Liereman and Wortel-Kolonie (see figure 7.2).

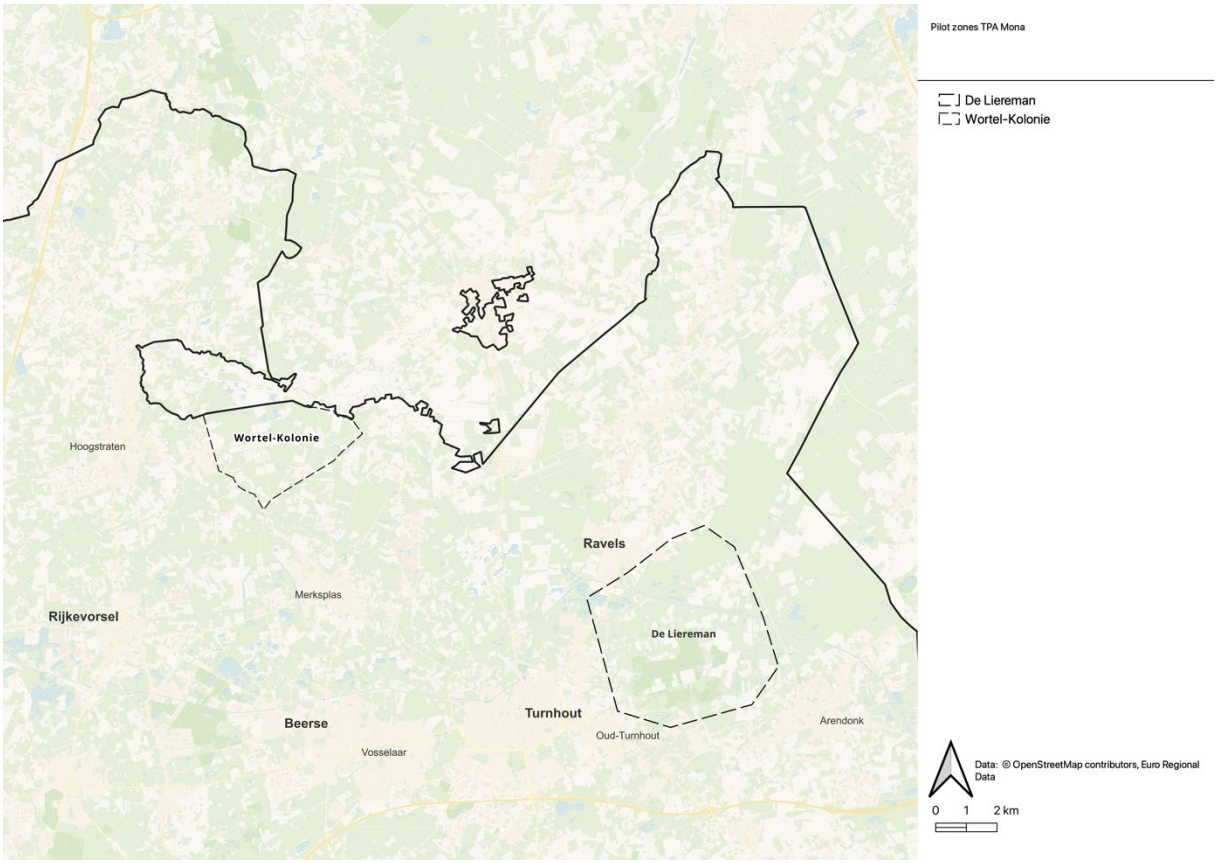

Figure 7.2 Pilot zones Tourism Province of Antwerp

Landschap De Liereman is a 530-hectare nature area situated in the Kempen region, nestled between Oud-Turnhout and Arendonk. Recognised as one of Flanders' "silence areas" (*stiltegebieden*), this reserve features a variety of habitats, including heathlands, dunes, and wetlands. The visitor centre acts as a central point for education and relaxation, offering activities suitable for all ages and attracting more than 82,000 visitors each year (Natuurpunt, 2024).

Wortel-Kolonie is situated in Belgium's Kempen region, close to the town of Wortel within the municipality of Hoogstraten. This historical site, originally established as a colony for vagrants, was founded in 1822 as part of the Colonies of Benevolence to assist the poor through agricultural labour and housing. Its landscape features expansive open areas and a distinctive grid layout that echoes its history as a welfare colony. The region is characterised by its woodlands, wetlands, and pastures, fostering a rich ecological diversity. Since 1999, Wortel-Kolonie has been recognized as a cultural-historical heritage site, and since 2021, it has also held the titles of UNESCO World Heritage Site and “silence area” (Agentschap voor Natuur en Bos, sd).

This region is part of the larger Merksplas and Wortel colonies, situated between the towns of Merksplas and Hoogstraten, contributing to the area’s protected natural heritage (see figure 7.3).

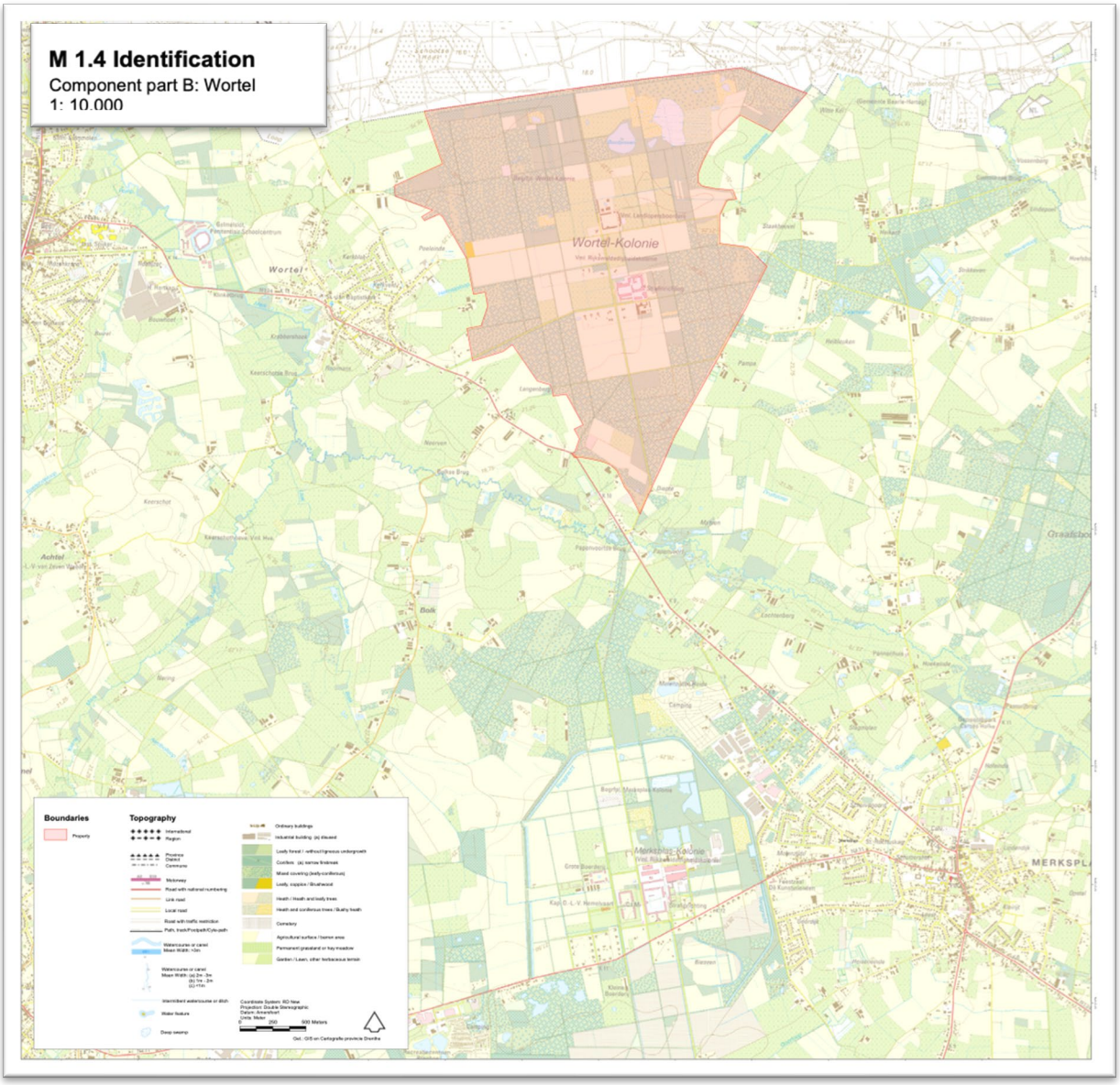

Figure 7.3 Position of Wortel-Kolonie within the surrounding area. Source: (GIS en Cartografie provincie Drenthe)

Functions and attractions

The province of Antwerp boasts a cycling network spanning 3024 km, which includes 1159 km of thematic routes, 370 km of iconic routes, and 4543 km of signposted walking paths, covering 58% of the province. Additionally, it features a 520 km virtual walking network, 50 km of wheel-friendly walking routes, 487 km of routes for cars and motorhomes, and a 520 km equestrian network (Toerisme Provincie Antwerpen, 2024).

Wortel Kolonie

Wortel-Kolonie features a vibrant network of over 10 marked trails and routes, ideal for walking enthusiasts hiking. These paths wind through diverse landscapes, including serene forest trails, expansive open fields, and charming heathlands, offering a tranquil escape into nature (Agentschap voor Natuur en Bos, sd). The route titled "Gevangen

tussen grens en groen" ('Caught between border and green"), measuring 11.3 kilometres, was recognised as the most popular walking trail in 2013. For cycling enthusiasts, there are numerous paths through the region's diverse environments, highlighting nature and culture. One of these routes is the Landlopersroute, a 57km cycling trail that forms a loop connecting the Kolonie with the villages of Merksplas, Hoogstraten, Turnhout, and Rijkevorsel (see figure 7.4); this route was the most popular cycling route in 2023 (Toerisme Provincie Antwerpen, 2024).

Figure 7.4 Cycling route: Landlopersroute. Source: (Toerisme Provincie Antwerpen, 2022)

Beyond walking, hiking, and cycling, Wortel-Kolonie offers a range of activities to connect with nature, such as Equestrian paths and bird watchers observation points, which are strategically placed to study over 75 species, including hawks and buzzards. Bivouac zones enable sustainable camping experiences. Moreover, educational tours are

available to enrich visits, shedding light on the site's transformation from a historical colony for vagrants into a vibrant, protected natural reserve. Additionally, seasonal events and activities, including nature walks and heritage exhibits, make Wortel-Kolonie a prime location for recreation and cultural exploration (Agentschap voor Natuur en Bos, sd).

Visitor centre Vallei van het Merkske – De Klapekster

The main centre point for activities is located in the old vagrants' farm in Wortel-Kolonie. Visitor centre Vallei van het Merkske – De Klapekster is the starting point for cycle tours and numerous walks in both Wortel-Kolonie and the adjoining nature areas Castelreesche Heide and Halsche Beemden, which together form the Valley of the Merkske (Natuurpunt Markvallei, sd). Natuurpunt employees and volunteers welcome visitors in the visitor centre and provide information about the area. They also organise lectures, courses, and exhibitions. This place also offers a drink and sells regional products in the shop (Stichting Kempens Landschap, 2021).

7.2 Visitor profiles and activities

Visitor profiles

Since its UNESCO recognition in 2021, the number of visitors to Wortel-Kolonie has increased significantly. Visitors come from Limburg and Brussels but also from other regions in Belgium and even from the Netherlands to experience its unique landscape and history (VRT, 2021). To the best of our knowledge, no research has been conducted among visitors to identify their profiles and their motivations for visiting the area. However, the expected type of visitors are described in the application for open heritage recognition of the Wortel and Merksplas Kolonie (Vzw Kempens Landschap, 2019):

- The Wortel- and Merksplas-Kolonie are open to a diverse audience, offering a variety of activities tailored to different types of visitors. **Cultural enthusiasts** with a specialised background will find the rich history and heritage of the colonies fascinating. They can explore the cultural-historical aspects through interactive exhibits and extensive archival materials at the Kolonie 5-7 Visitor Centre in Merksplas-Kolonie. This centre provides a deep dive into the origins, evolution, and current status of the colonies, making it an ideal spot for those interested in the cultural significance of the area.
- **Nature enthusiasts** will appreciate the natural beauty and biodiversity of the colonies. Vallei van het Merkske – De Klapekster in Wortel-Kolonie highlights the landscape, fauna, and flora, explaining how the colony landscape created unique biotopes. The extensive route infrastructure, connected to walking, cycling, and horse-riding networks, offers thematic routes that guide visitors through important viewpoints and monuments, making it a perfect destination for outdoor enthusiasts.

- **Local recreational visitors** and **families** can enjoy a leisurely visit to the colonies, with activities designed to cater to their interests. The Vossenstreken app, developed specifically for families, enhances their experience by providing engaging and interactive content. Group tourists, particularly those over 50, often visit through organized tours by sociocultural associations or groups of friends. These tours, promoted by the tourist services of Merksplas and Hoogstraten, typically last half a day and include recreational facilities.
- **International cultural tourists** and descendants of colonists are drawn to the historical connection with the Colonies of Benevolence in the northern Netherlands. The collaboration between these colonies encourages visitors to explore multiple colonies, with regional clustered offerings such as combinations of Wortel- and Merksplas-Kolonie or Frederiksoord and Veenhuizen in the Netherlands. Projects aimed at accessing individual vagrants' files appeal to those with genealogical interests who visit the colonies from a "roots tourism" perspective. The heritage accommodation in part of the Grote Hoeve further enhances the appeal to this international audience.

Distribution and crowding

Figure 7.5 shows the potential distribution of hikers in the area, based on data from users of the Wandelknooppunt app between April and December 2023 (Provincie Antwerpen, n.d.). This data shows the downloads of routes between nodes on the Nodemapp/walking node website and app. The data potentially indicate that the majority of hikers are concentrated around the visitor centre and the route along the fens (Torendreef). Visitors also seem interested in areas in the east around Heikant. In contrast, the southern areas are less frequently visited and the connection with the Merksplas Kolonie.

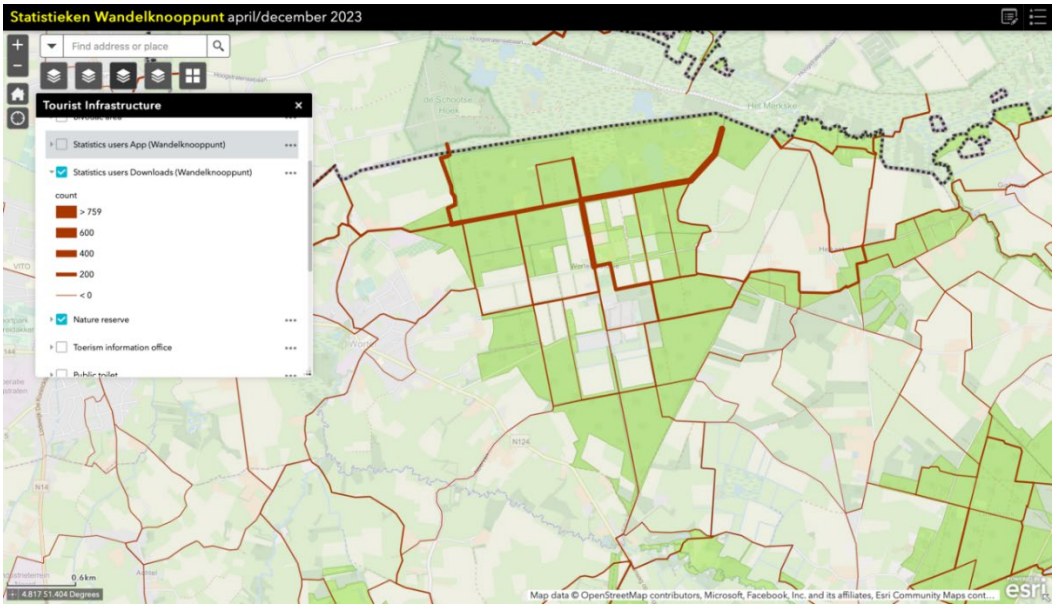

Figure 7.5: ArcGIS viewer route downloads. Source: (Provincie Antwerpen, n.d.)

7.3 Multimodal accessibility

This paragraph examines the multimodal accessibility of Wortel-Kolonie, focusing on specific entrance points for various transport modes, including cars, public transport (trains and buses), cycling, and walking. For each mode, the availability and density of the networks are analysed, and accessibility maps are provided to reveal the areas within reach of the park's main entrance points.

Car accessibility

Figure 7.6 shows that Wortel-Kolonie is situated in a relatively remote area with few primary roads. Due to its location on the Belgium-Dutch border, there are limited North-South connections, the nearest being the primary road in Hoogstraten. The closest motorway is the E-19, located further to the west, which connects Antwerp with Breda.

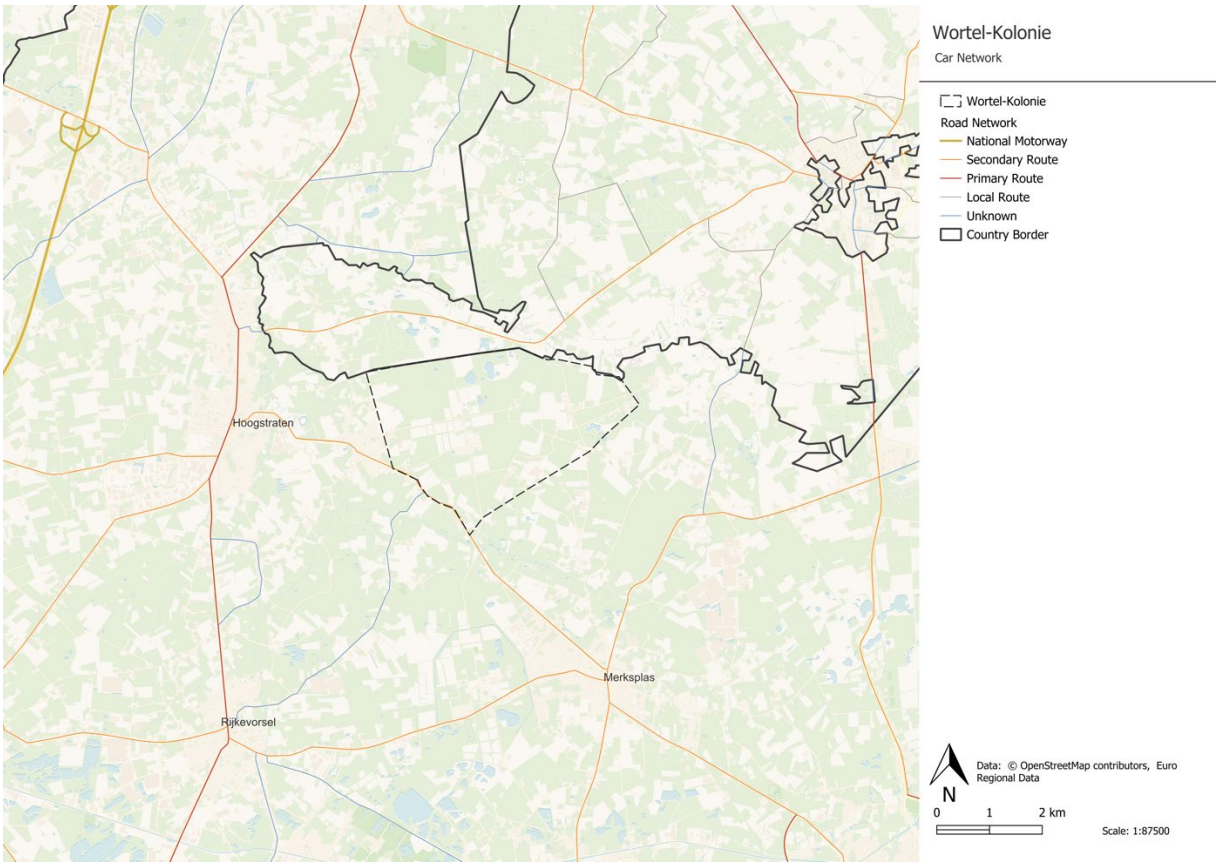

Figure 7.6: Car infrastructure Wortel-Kolonie

To access Wortel-Kolonie by car, visitors can use secondary and cobblestone roads leading to the starting point near the visitor centre at the heart of the park. A free parking area is available along the avenue near the farm, adjacent to both the visitor centre and the youth residence centre, De Bonte Beestenboel. For visitors with mobility impairments, designated parking spaces are conveniently located near the entrance to ensure easy access.

The accessibility map in figure 7.7 shows that the 15-minute contour is compressed in the north due to the limited North-South connections near the border. Within a 30-minute driving radius, mainly smaller surrounding communities can be accessed. The city of Turnhout is the closest major city, reachable in just under 30 minutes, followed by Antwerp, Breda, and Tilburg, each approximately 45 minutes away. Residents of cities such as Rotterdam, Eindhoven, and 's-Hertogenbosch must drive up to 60 minutes to reach the park.

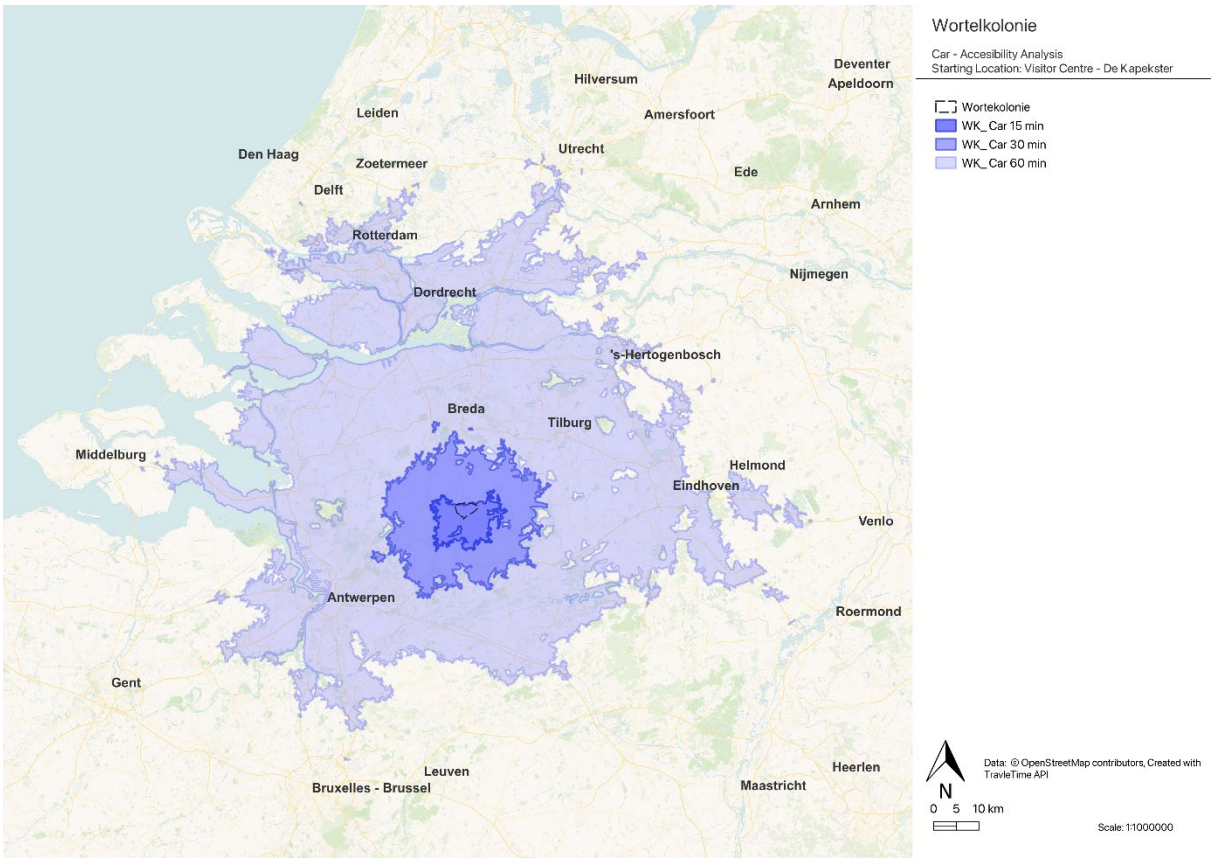

Figure 7.7: Car accessibility Wortel-Kolonie

Public transport accessibility

The Wortel Kolonieweg bus stop, situated near the historic Wortel-Kolonie in Hoogstraten, Belgium, is serviced by De Lijn bus routes, including line 430. This line connects the area to nearby towns and cities, facilitating access for visitors. However, the frequency of buses, especially those passing directly through Wortel-Kolonie, is limited (see figure 7.8).

Given this limited schedule, relying solely on public transport requires careful planning to align with the bus timings. Alternatively, visitors might consider combining public transport with other modes, such as cycling or walking, to enhance flexibility when exploring the area.

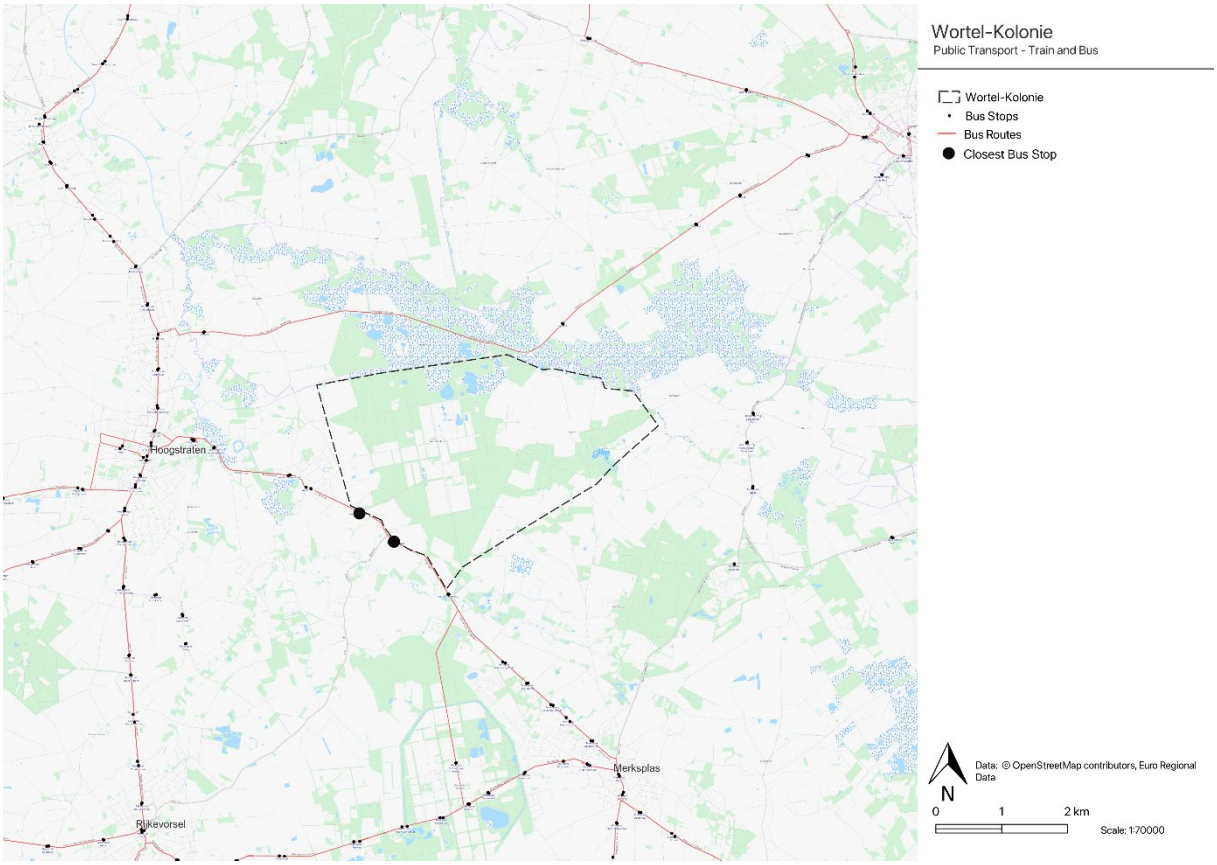

Figure 7.8: Public transport provision Wortel-Kolonie

The public transport accessibility map in figure 7.9 shows that Hoogstraten, Merksplas, and Turnhout can be reached within or just under 30 minutes. Surrounding municipalities, including those near Turnhout, Hoogstraten, and Rijkevorsel, are accessible within 60 minutes. The map also highlights that public transport options across the border are limited, with a significant number of Belgian municipalities accessible within 90 minutes, while few Dutch cities can be reached within this timeframe.

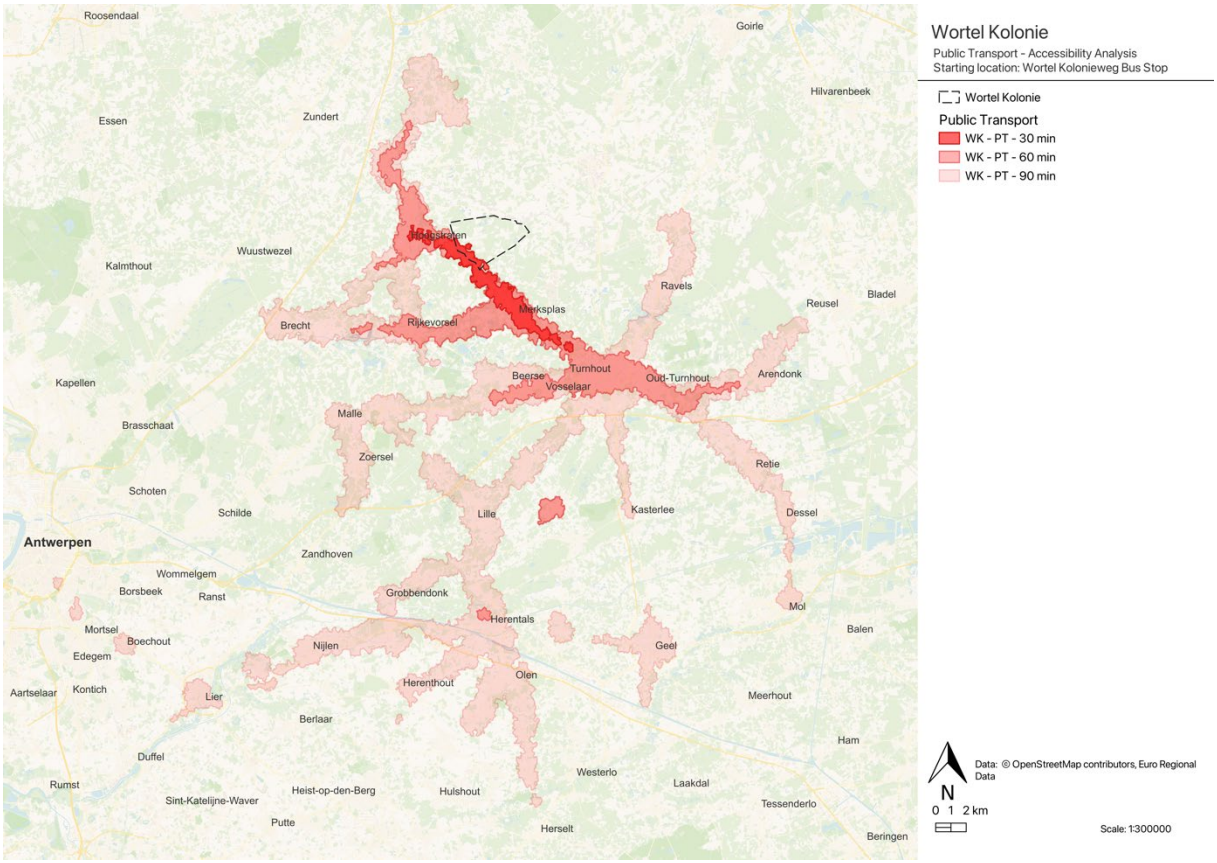

Figure 7.9: Public transport accessibility Wortel-Kolonie

Cycling accessibility

Wortel-Kolonie offers good cycling opportunities through its scenic rural landscape, thanks to the integration within the extensive Flemish cycling network (see figure 7.10). The area is part of the Flemish cycling node system, allowing riders to navigate using numbered junctions, with node 99 near the Wortel-Kolonie farm and node 30 close to the Colony 5-7 visitor centre in Merksplas. Cyclists can explore diverse routes, including the Vagrants' Route, a 57 km trail that winds through scenic spots across Colony 5-7, encompassing both Wortel and Merksplas. While the majority of roads are paved, some rural stretches may be unpaved. For mountain biking enthusiasts, the park offers two dedicated loops: the green route, spanning 21.6 km, starts at the Casino of Wortel-Kolonie, and the red route, covering 28.7 km, begins at the sports hall in Merksplas.

The bicycle accessibility map in figure 7.11 indicates that accessibility by bike is strongest on the western side of Wortel-Kolonie. Hoogstraten is within a 15-minute cycling distance, while Merksplas and Rijkevorsel can be reached within 30 minutes. However, the map does not accurately represent bicycle accessibility to regions in the Netherlands. This is due to the lack of integration between bicycle networks from different countries in this GIS application. Notably, the areas around Baarle-Nassau can be accessed within an hour of cycling, although they are not reflected on the map.

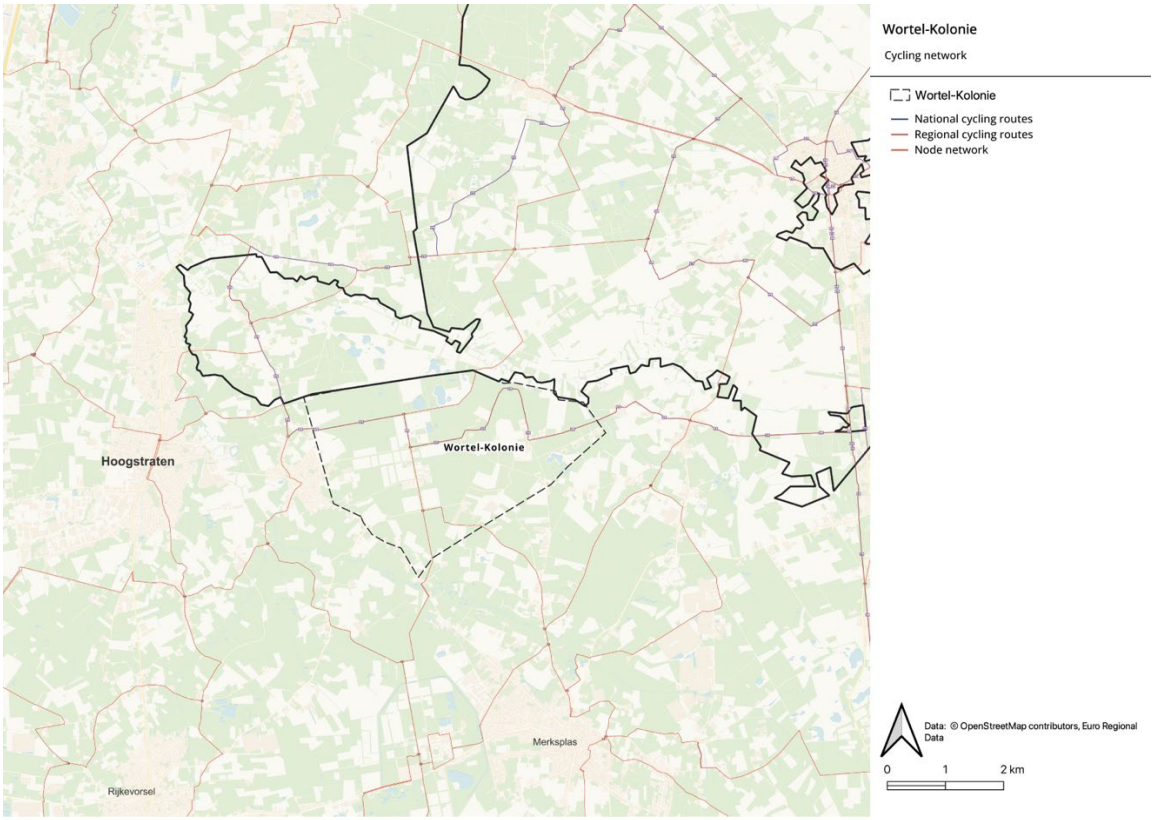

Figure 7.10 Bicycle Network Wortel-Kolonie

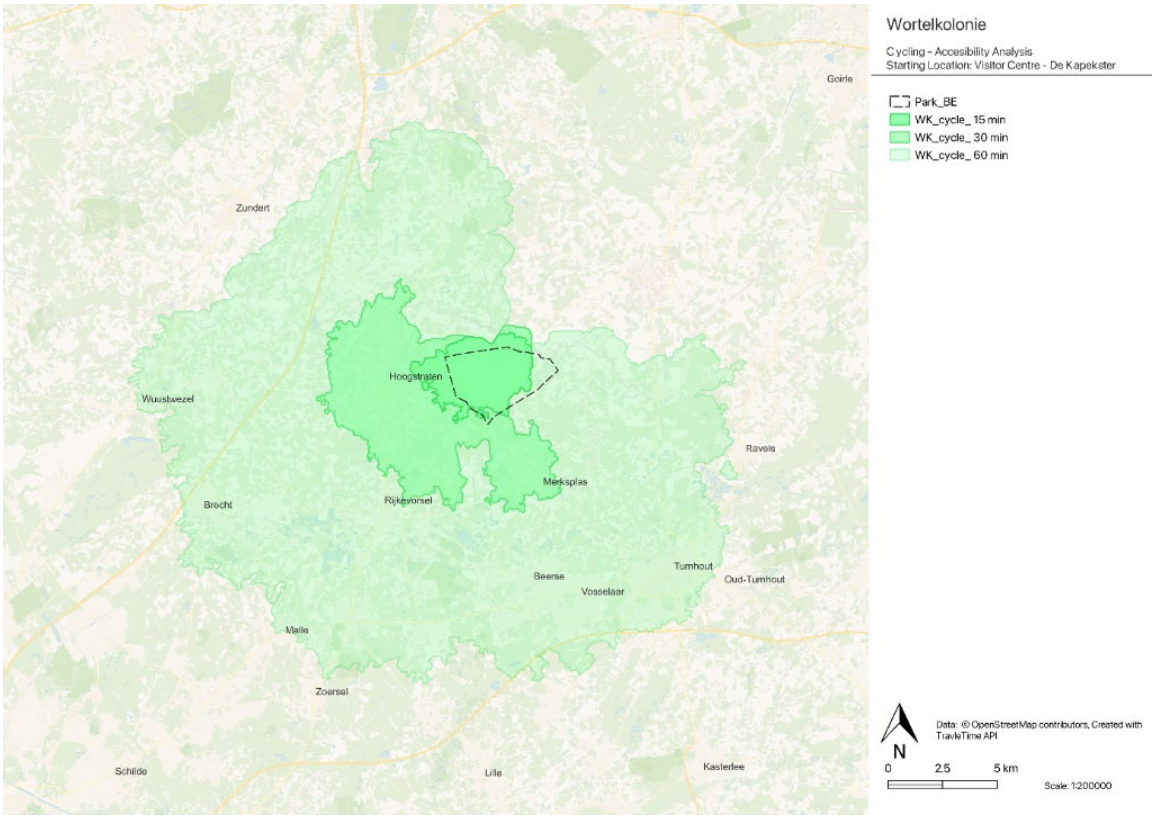

Figure 7.11: Bicycle accessibility Wortel-Kolonie

Pedestrian accessibility

The area offers a range of walking trails suitable for different preferences and connections to nodes, enabling visitors to create their own routes (figure 7.12). One notable route is the **Wortel-Kolonie Loop**, a moderately challenging loop trail approximately **7.4 miles (12 kilometres)** in length. This trail takes an average of **2 hours and 29 minutes** to complete and is popular for hiking and running. The trail is open year-round, offering scenic views of forests and lakes, and is dog-friendly, provided pets are kept on a leash. Some walking routes are combined with cycling routes.

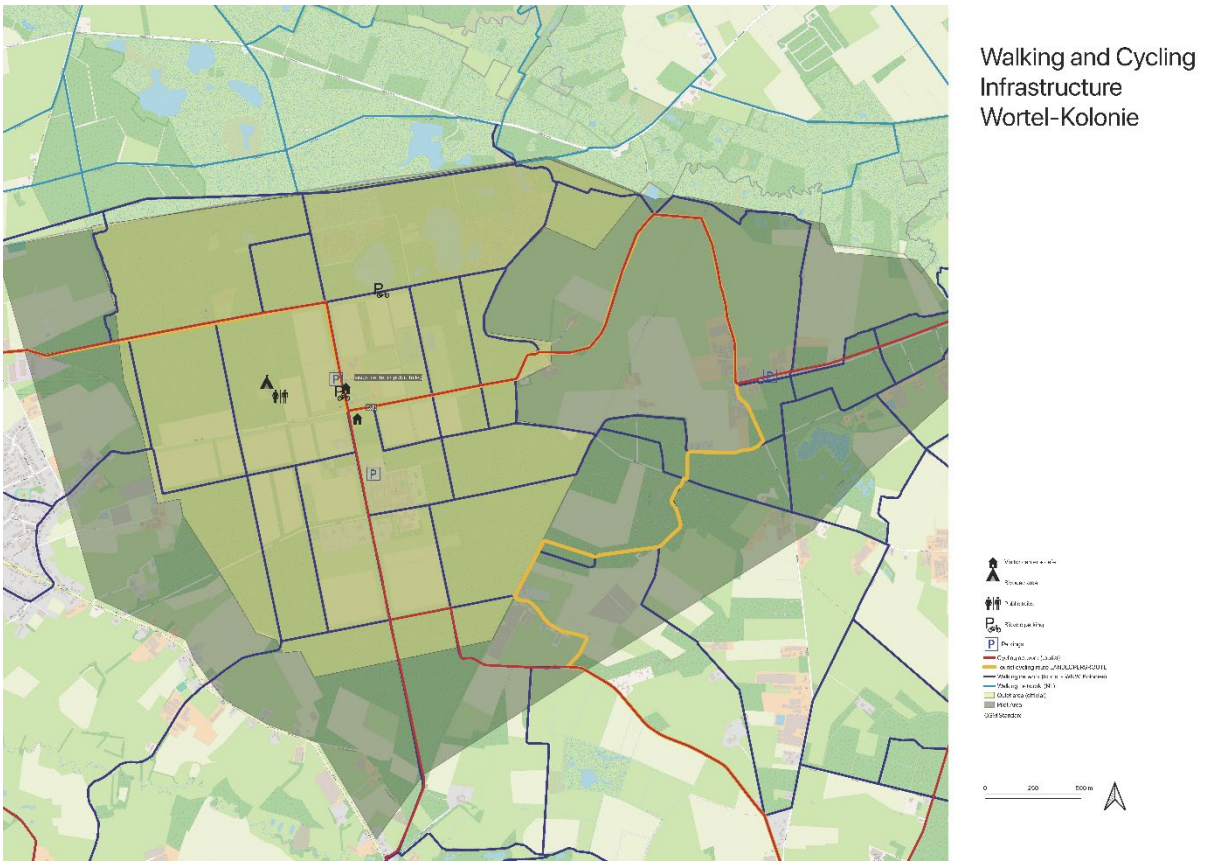

Figure 7.12: Pedestrian Infrastructure Wortel-Kolonie. Source: (Provincie Antwerpen, n.d.).

7.4 Challenges and (potential) opportunities

This section describes the challenges and potential opportunities for the Wortel-Kolonie to encourage sustainable tourism and reduce the impact of visitor flows. First, knowledge from previous studies and activities is summarised. Subsequently, the results from the inventory session are shared.

Background knowledge

Based on the documents received, several challenges have been identified. These are mainly aimed at the province of Antwerp in relation to walking and cycling.

Tourism Province of Antwerp is evaluating and restructuring the hiking node network in their province. The initiative WandelWijzer faces several key challenges in its efforts to enhance walking networks in Antwerp province. Currently, the network covers only 60% of the region, with 4,500 kilometres of walking routes. This limited coverage is insufficient to meet the growing demand from local governments, holiday planners, and recreational users, driven by the increasing popularity of walking as a leisure activity. The main aim is to spread visitors and to reduce pressure on the most popular and busy areas (Toerisme Provincie Antwerp, 2022).

A major challenge is the development of a futureproof walking network that is sustainable, inclusive, and adaptable. Accessibility for individuals with reduced mobility is an important aspect, requiring the design and implementation of inclusive routes. Furthermore, the initiative aims to enhance geographic distribution, ensuring walking networks are more accessible to users while reducing travel times. Key considerations include integrating transportation hubs, such as train and bus stations, and maintaining a balance between environmental and cultural variety (Toerisme Provincie Antwerp, 2022).

When taking a closer look at Wortel-Kolonie, several challenges can be identified (Tourism Province of Antwerp, 2023). Firstly, the combination of natural landscapes and UNESCO heritage status often results in overcrowding, particularly during the summer when the camping area becomes a popular destination. Additionally, accessibility is suboptimal, with a strong reliance on car travel, while parking spaces are limited. This crowding conflicts with Wortel-Kolonie's designation as a quiet area (*Stiltegebied*), a status it has held since 2017. To address these challenges, Tourism Province of Antwerp is exploring strategies to distribute visitor numbers better and improve multimodal accessibility. Additionally, its location near the border presents opportunities for cross-border collaboration with partners in the Netherlands to develop a cooperative approach for the area.

Inventory session

To develop a better understanding of the key challenges and opportunities, an inventory session was organized by BUAS in collaboration with Tourism Province of Antwerp Heide in April 2024 in the visitor centre Vallei van het Merkske in Hoogstraten. A wide variety of participants, such as the Agentschap Natuur en Bos Vlaanderen, Kempens-Landschap, Visit Turnhout, Visit Hoogstraten, Toerisme Merksplas, Baarle-Nassau, Natuurpunt and KU Leuven were present.

Key challenges

During the session stakeholders addressed and discussed key challenges. The most prominent ones are listed below.

- **Accessibility** is not optimal:

  - Most visitors arrive by **car,** and some are routes for cars cut through the area.
  - They use the main parking in the **centre** of the area, which is often full at peak moments;
  - Many visitors do not take the '**correct'** route, at least partially due to the lack of good wayfinding (signs).
- **Attractiveness** is not optimal:
  - Unattractive **broad** tree-lined avenues **(dreven)** are sometimes used by **cars.**
  - Lack of variety in walking routes and trajectories **through the forest.**
- **Location** of entry points:
  - Public transport stops are **too far** from entry points and visitor centres.
  - Better car parking facilities should be available at the **edge** of the area.
- **Overcrowding:**
  - Certain areas/spots occasionally experience **overcrowding** and potential conflicting uses (e.g., mountain biking and walking), although the latter does not seem to be a large issue in many places.
  - The current camping site is very popular and affects the tranquillity of the Kolonie.
- **Storytelling** around Wortel-Kolonie (mainly nature-based) and Merksplas-Kolonie (more culture-based) is not always clear for visitors who might arrive with wrong expectations.

Opportunities

During the session, participants were encouraged to explore potential opportunities to address the identified challenges. The opportunities are strongly linked to the challenges and include:

- Developing **new entry points** on the edges of the area, providing an alternative to the main parking in de centre.
- Improving **routing** and **wayfinding**, in combination with extra entry points, to improve the **spreading of visitors** around the area.
- **Separating** facilities for walking, cycling and cars:
  - on routes towards the entry points and in the wider area to increase safety and visitor experience.
  - Develop round-trip walking tours through the area.
- Better **information** provision. Link between Merksplas and Wortel-Kolonie can be made clearer by (digital) information points in both visitor centres.

During the session, there was also a strong focus on the opportunities to optimise the visitor **experience**.

7.5 Summary of findings

- Tourism Province of Antwerp spans **16 parks and 1,700 hectares**. The MONA project focuses on two key areas: De Liereman, and Wortel-Kolonie. This report centres on **Wortel-Kolonie**, a **UNESCO** World Heritage Site (designated in 2021) located in the Kempen region and recognised as a **'silence area'** (stiltegebied). The area features woodlands, wetlands, and meadows arranged in a historical grid from its origins as a 19th-century **vagrants' colony.**
- **Combining natural beauty** with rich **historical** and **cultural heritage**, Wortel-Kolonie offers marked walking and cycling trails, birdwatching points, bivouac zones, the visitor centre *Vallei van het Merkske – De Klapekster*, and seasonal educational activities.
- No formal visitor surveys have been conducted, but experts identify four main visitor types: **cultural enthusiasts** drawn to the colony's history and UNESCO heritage, **nature lovers** exploring its biodiversity and thematic trails, **local families** enjoying nature and camping and **international tourists** interested in heritage and genealogy. Since its UNESCO designation, visitor numbers have surged.
- Key **challenges** include **overcrowding** during peak times, leading to user conflicts (e.g., walkers vs. cyclists) and reduced tranquillity. This is exacerbated by the **car-dependent access** via secondary roads with limited parking and few attractive alternatives, which creates parking issues. **Wayfinding and storytelling issues** could lead to wrong visitor expectations and disappointment.
- **Opportunities for improvement** include developing **new entry points and parking** at the colony's edges to reduce congestion as well as the mapping of visitor numbers and visitor flows with counters. Also, **bus stops** can be added near main entry points to improve public transport access. To minimise user conflicts, facilities for walking cycling and car driving could be **separated**. Enhancing **signage and routing** could improve navigation and visitor satisfaction. Finally, **cross-border collaboration** could be encouraged for the development of joint sustainable tourism strategies.

8. Bliesgau Biosphere Reserve (Germany)

8.1 Characteristics and attractions

General characteristics

The Bliesgau Biosphere Reserve is located in southwestern Germany, east of the federal state capital Saarbrücken, bordering France and Rheinland-Pfalz (see Figure 8.1). It covers 14% of the area of Saarland and, with a size of 361 km², is one of the smallest Biosphere Reserves in Germany, as of 2013, 51% of the total area of the Biosphere Reserve is designated as a protected area .

Figure 8.1 General plan of the Bliesgau Biosphere Reserve. Source: (Saarpfalz-Touristik, 2022)

The northern area of Bliesgau is an urban catchment with a population density that exceeds the national average, making It more urbanised than other German biosphere reserves. This region features a mix of forests, wetlands, and orchards, which host numerous endangered species. A distinctive aspect of this area is its varied landscape, where different habitats coexist in a compact space and support many rare animal and plant species (Biosphärenzweckverband Bliesgau, 2020). In May 2009, UNESCO recognized this unique landscape and designated it a UNESCO Biosphere Reserve.

A Biosphere Reserve differs from a National Park in that its focus is on economically engaged people and nature. It serves as a model region for sustainable development and fulfils various functions: promoting sustainable economic systems, nature conservation, research and education for sustainable development, and international cooperation (Dittel & Weber, 2024).

Functions and attractions

Visitors can engage in several activities that reflect the area's natural and cultural heritage (Saarpfalz-Touristik, 2023). The biosphere is widely recognized by hikers. There are several hiking and walking trails available. Some of these trails traverse the region on foot along designated pathways, offering expansive views, shaded forests, and sandstone formations rocks. Cycling is also a popular activity for tourists visiting the area. The region features a 135 km cycle path that stretches from Sarreguemines, France, through the Bliesgau Biosphere to Rhineland-Palatinate, offering a mix of moderate ascents and flat sections The Baroque Road "SaarPfalz" in Germany runs through several towns known for their Baroque architecture, including Saarbrücken, Blieskastel, and Ottweiler (Tourismus Zentrale Saarland, sd). It connects historical sites like royal palaces, churches, and gardens, many designed by architect Friedrich Joachim Stengel (see figure 8.2). The route also has cultural significance due to its connections with figures such as Johann Wolfgang von Goethe.

Figure 8.2 The SaarPfalz Baroque Road. Source: (Saarpfalz-Touristik, 2023)

Focus area - Gersheim Orchid Area

Within the aim of MONA, the Gersheim Orchid Area (Orchideengebiet Gersheim) serves as a case area and is located in the south part of the biosphere close to the border with France. The Gersheim Orchid Area, specifically, is known for its diverse and rare orchid species. The nutrient-poor soil and special climate conditions of the Bliesgau region create an ideal habitat for these orchids (Gemeinde Gersheim, sd). Visitors can explore the **Orchideenpfad (Orchid Trail)**, a 1.8 and 2.7-kilometer loop trail those winds through the area. The trail features several information stations where visitors can learn about the different orchid species and their habitats. (see figure 8.3).

Figure 8.3 Map of the Orchid Garden and path with the different stations/stops. Source: (Biosphärenzweckverband Bliesgau)

8.2 Visitor profiles and activities

The **Biosphere Reserve Bliesgau** is a well-known destination that appeals to a wide variety of visitors, offering something for nature lovers, cultural enthusiasts, and eco-conscious travellers alike. Below is an expanded look at the types of visitors, the annual number of visitors, and the accessibility features of the park based on the research

conducted for the Biosphere Reserve Bliesgau framework (Biosphärenzweckverband Bliesgau, 2020).

Visitor profiles

The development of tourism over the past ten years has been characterised by fluctuating demand. The park attracts a wide range of visitor demographics, including:

1. **Day and Weekend Visitors:**

These are primarily local or regional tourists seeking a quick getaway. They enjoy short excursions to explore the park's scenic landscapes, hiking trails, and cultural landmarks. The popularity of activities such as picnics, birdwatching, and photography highlights the park's allure for spontaneous day trips. The number of visitors in Bliesgau Biosphere between 06/2016 – 05/2017 was, in total, 3,9 million, with 83.5% of the day visitors (Job, Majewski, Woltering, & Engels, 2024).

2. **Wellness Tourists:**

Wellness tourism has become a significant driver for the region. Visitors seeking relaxation and rejuvenation are drawn to the reserve's serene environment and offerings, such as spa facilities, wellness centres, and nature retreats. The emphasis on peaceful surroundings and holistic well-being complements the natural and tranquil atmosphere of the reserve.

3. **Business and Event Travelers:**

The region has established itself as a popular choice for corporate meetings, conferences, and team-building events. This segment is supported by the reserve's modern conference infrastructure, picturesque settings for outdoor events, and proximity to urban centres.

4. **Eco-tourists and Outdoor Enthusiasts:**

Visitors interested in sustainable travel and ecological preservation are a key audience. The reserve's focus on biodiversity, eco-friendly practices, and immersive educational programs appeals to this group. Activities like guided nature walks, cycling tours, and workshops on sustainable living are highly favoured. From August to December 2024, approximately 3,500 people visited the Orchid Garden, with a peak day seeing 1,300 visitors and an average of 31 visitors each day.

5. **Families and Educational Groups:**

Families and school groups are frequent visitors, taking advantage of educational opportunities within the reserve. Interactive programs, nature discovery trails, and hands-on workshops introduce younger audiences to the importance of biodiversity and conservation.

6. **Cultural Visitors:**

The park's rich cultural history, including medieval villages, historical landmarks, and festivals, attracts visitors interested in the region's heritage. Events such as the annual **Biosphere Festival**, medieval markets, and city festivals add a vibrant cultural layer to the reserve's offerings.

8.3 Multimodal accessibility

This paragraph examines the multimodal accessibility of the Bliesgau Biosphere, focusing on the Orchid Garden for various transport modes, including cars, public transport (trains and buses), cycling, and walking. For each mode, the availability and density of the networks are analysed, and accessibility maps are provided to reveal the areas within reach of the park's main entrance points.

Car accessibility

The Bliesgau Biosphere is well-connected by a network of main roads, providing good accessibility by car (see figure 8.4). The A6 and A620 highways connect the region to Saarbrücken, while the A4 links to France. From Saarbrücken, the B269 road provides access to the Bliesgau area, including towns like Gersheim, where the Orchideengebiet is located. Visitors coming from France can use the D137 or D43 to reach the biosphere. Local roads within the biosphere connect key sites, with parking facilities available at various points, allowing access for visitors arriving by car; these facilities often include designated spots for eco-friendly vehicles and carpooling options, aligning with the reserve's sustainability goals. For the Orchid Garden, the walk from the parking area is around 15 minutes (see also figure 8.3).

Figure 8.4 Car infrastructure Bliesgau Biosphere Reserve. Source: (Biosphärenzweckverband Bliesgau, sd)

Figure 8.5 shows the destinations accessible within 15, 30, and 60 minutes from the Orchid Garden. As shown, Blieskastel is approximately 15 minutes away by car, providing access to its historic old town and local amenities. The French border can also be reached in about the same time. Within the 30-minute radius, most of the Biosphere is accessible. Saarbrücken, the regional capital, is situated just outside the 30-minute radius.

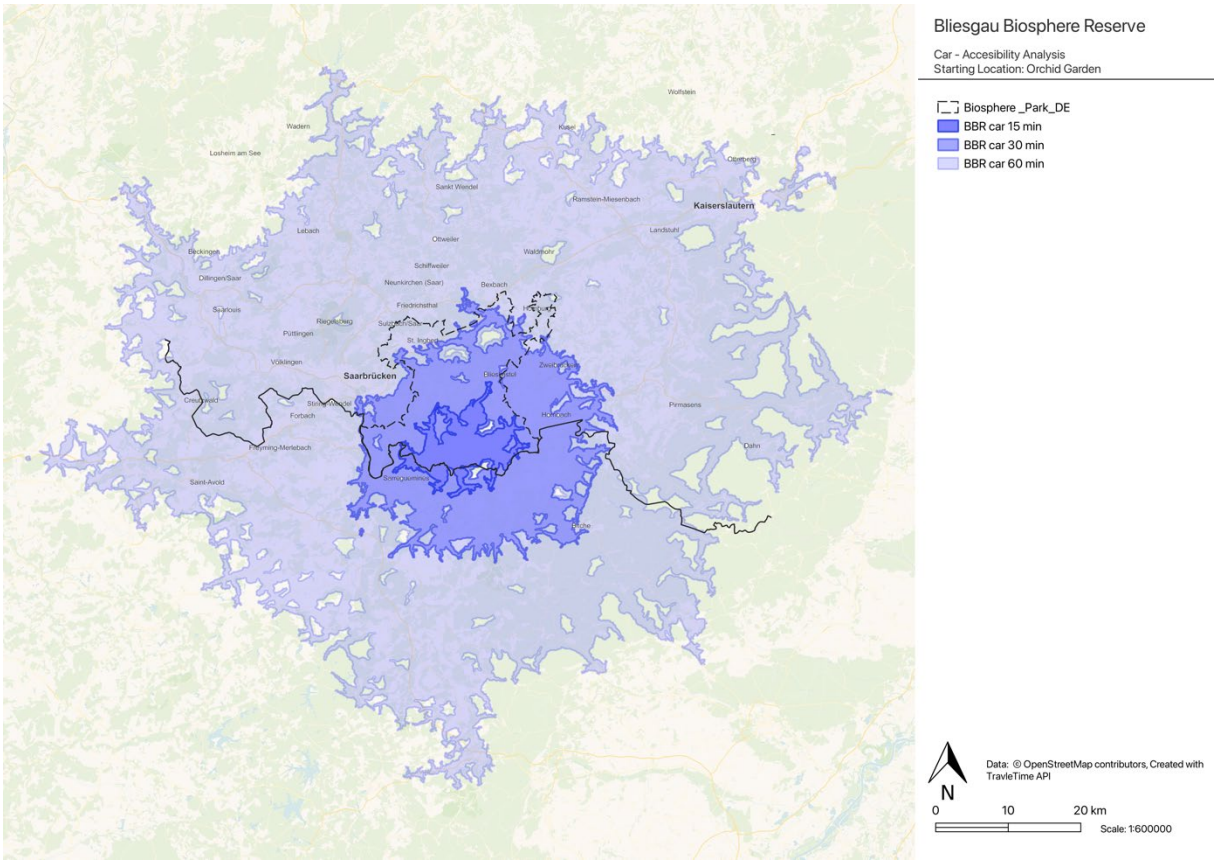

Figure 8.5 Car accessibility Bliesgau Biosphere Reserve

Public transport accessibility

The Bliesgau Biosphere Reserve is connected by public transport, including regional trains and buses that link nearby cities such as Saarbrücken and Homburg. Local bus lines, like the Saar-Mobil network, provide routes to key areas within the reserve (see figure 8.6). Two regional railway lines and a tramway connect the 13 stops in the biosphere reserve to neighbouring cities like Homburg, Saarbrücken, St. Ingbert, and Zweibrücken. The bus lines R7, R10, R14, the biosphere bus 501, and the 506 bus line offer daily services, facilitating extended walks in the nature reserve without any issues. Additionally, other bus routes create a dense network, especially on Saturdays (Biosphärenzweckverband Bliesgau, sd).

The closest train stations, such as **Blieskastel-Lautzkirchen** and **Zweibrücken**, serve as key access points for visitors. From these stations, regional bus services, including the **'Biosphere Bus' 501**, connect directly to the reserve's entrances, such as the Orchid Garden. The Biosphere Bus 501 serves as an example of promoting environmentally friendly tourism from Homburg, through Blieskastel and Reinheim, to Kleinblittersdorf and back. It provides services seven days a week, from early morning and continuing until late at night, connecting numerous leisure, shopping, and nature experiences. Additionally, certain transport services align their timetables with peak visiting hours to improve accessibility for both local and international tourists. The Biosphere Bus

connects to the railway at three designated stops, making it the backbone of local public transportation within the region.

The Saarland Card is available from accommodation providers participating in the scheme (for bookings of two nights or more). This card includes entry to over 100 attractions and grants free-of-charge use of the saarVV public transport (bus and train) for the entire duration of the stay.

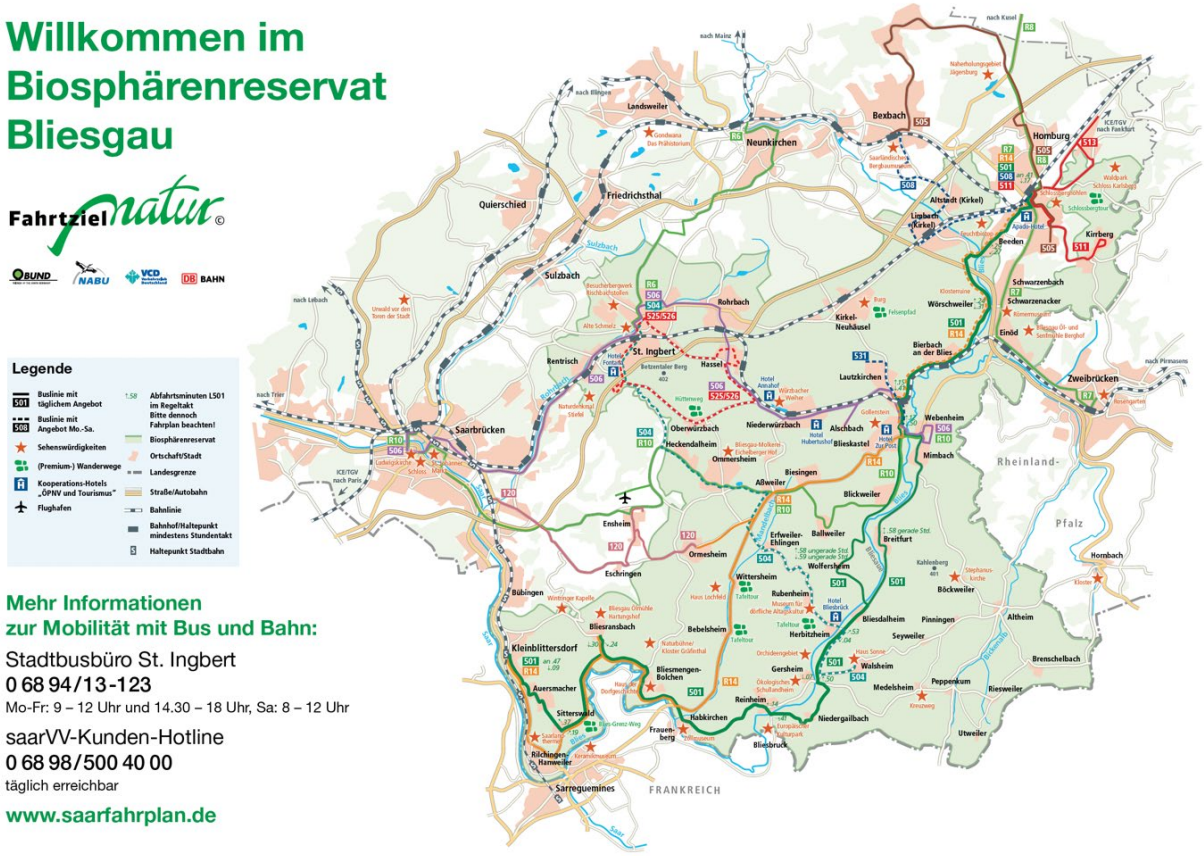

Figure 8.6 Public transport map of the Bliesgau Biosphere Reserve. Source: (Saarpfalz-Touristik, sd)

Public transport from the Orchid Garden in Gersheim provides access to nearby destinations within 30, 60, and 90 minutes, but planning is essential due to rural schedules. As shown in figure 8.7, visitors can reach nearby towns like Blieskastel via local buses within 30 minutes. Within 60 minutes, Saarbrücken, the regional capital, is accessible through a combination of buses and regional trains, offering extensive amenities and connections to the wider rail network. Cross-border travel to towns such as Sarreguemines in France is also feasible within this timeframe (not visible on the map). For trips up to 90 minutes, destinations like Homburg, a major transport hub, or larger French towns can be reached.

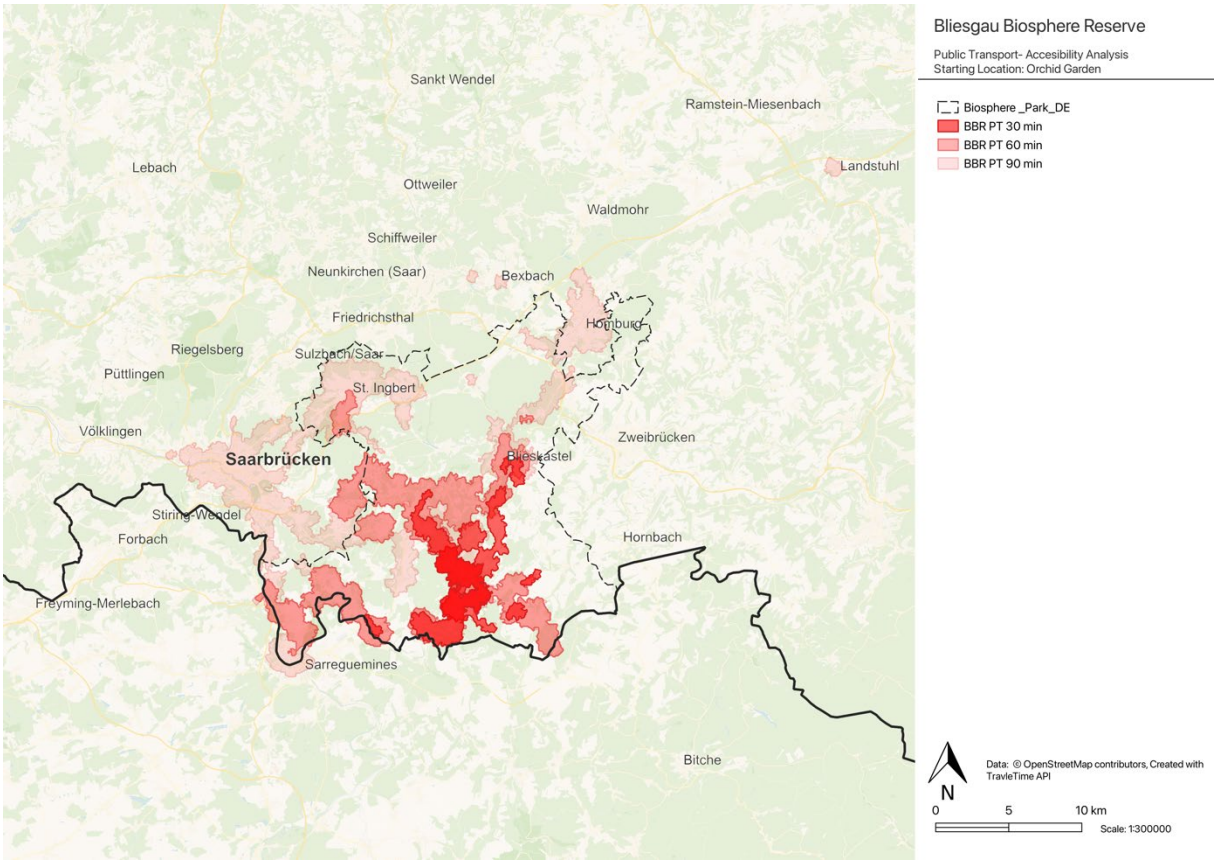

Figure 8.7 Public transport accessibility of Bliesgau Biosphere Reserve

Cycling accessibility

The Bliesgau Biosphere Reserve is part of an extensive cycling network, offering well-developed routes for cyclists of various levels. The region features a range of cycling paths, including dedicated bike trails and quiet country roads (see figure 8.7). The Saarland Cycle Route (Saarland-Radweg), which passes through the biosphere, connects the area to Saarbrücken and extends toward France. Local cycling routes, such as the Bliesgau Radweg, allow visitors to explore the biosphere's natural landscapes, including the Orchid Garden in Gersheim.

Figure 8.8 Cycling routes and infrastructure Bliesgau Biosphere Reserve. Source: (Saarpfalz-Touristik)

Cycling from the Orchid Garden in Gersheim provides access to various destinations within 15, 30, and 60 minutes, offering scenic routes through the Bliesgau Biosphere (see figure 8.9). Within 15 minutes, cyclists can reach nearby villages such as Reinheim. In 30 minutes, Blieskastel is accessible via the Bliesgau Cycle Path. During the same timeframe, cyclists can cross and explore the French border region. Within an hour, cyclists can nearly reach Saarbrücken, the regional capital, via the Saarland Cycle Route.

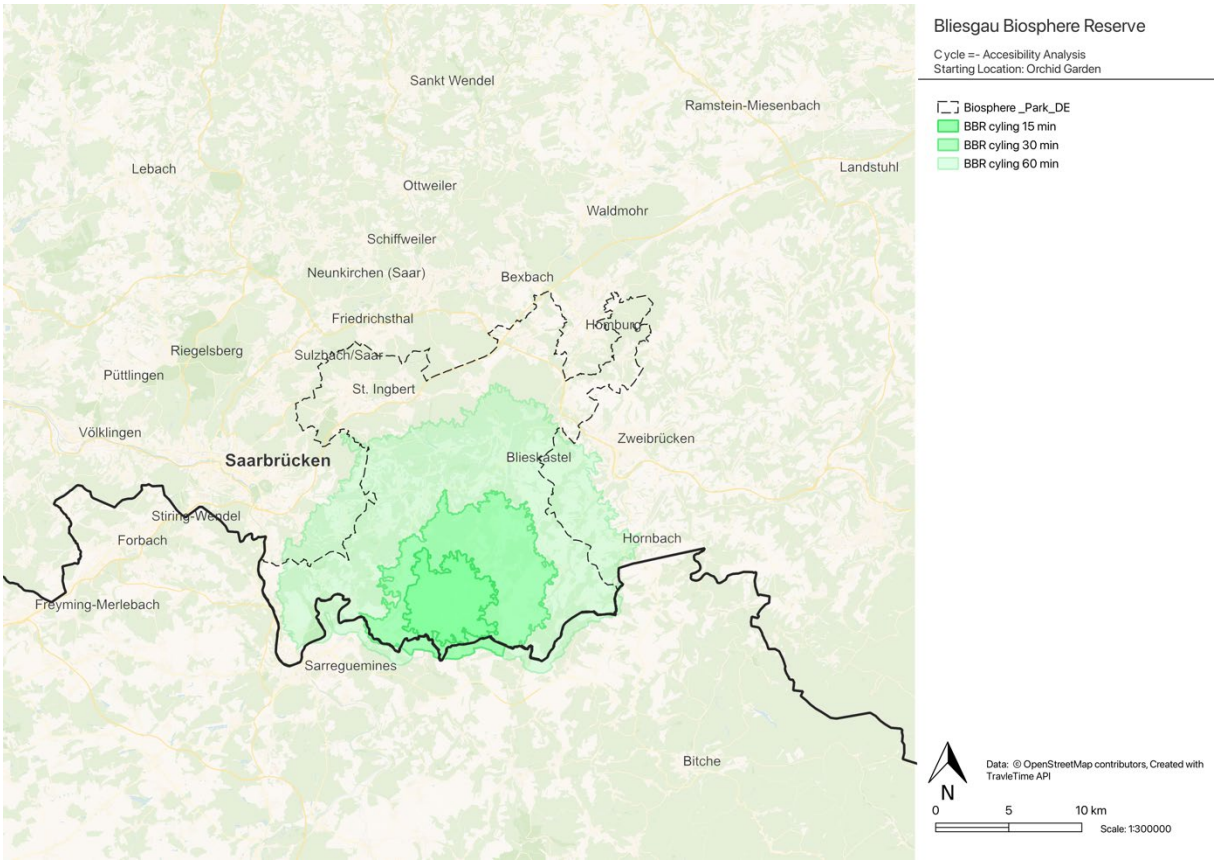

Figure 8.9 Bicycle accessibility Bliesgau Biosphere Reserve

Pedestrian accessibility

The Bliesgau Biosphere Reserve features an extensive and clearly marked walking network, enabling visitors to discover its varied landscapes, ranging from rolling meadows and beech forests to river valleys and cross-border walks (see Figure 8.10). The routes accommodate different fitness levels, providing options for both casual walks and more demanding hikes with panoramic views.

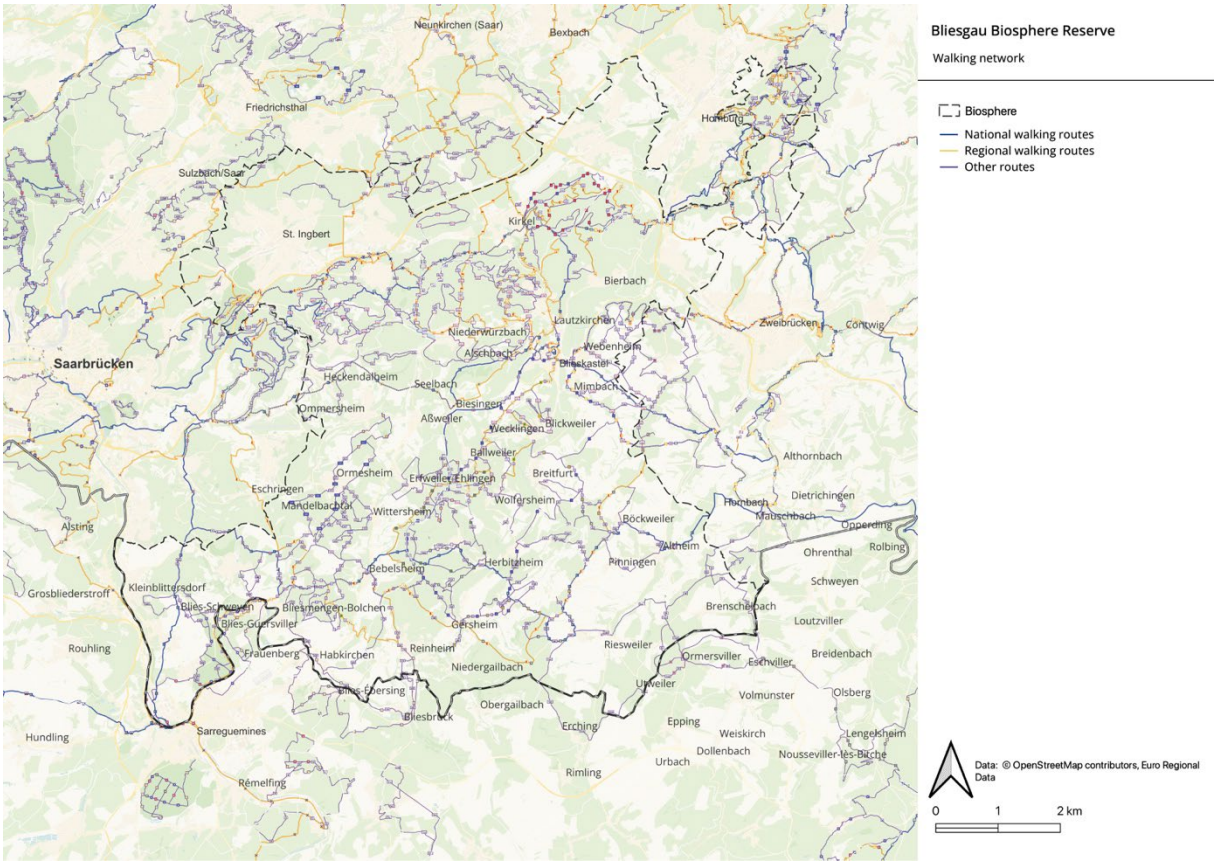

Figure 8.10 Walking routes Bliesgau Biosphere Reserve

8.4 Challenges and (potential) opportunities

This section describes the challenges and potential opportunities for the Orchid Garden in the Bliesgau Biosphere to encourage sustainable tourism and reduce the impact of visitor flows, based on the results from the inventory session.

Inventory session

To better understand the key challenges and opportunities, an inventory session with a wide variety of stakeholders was organised by BUAS in collaboration with Tourismus Zentrale Saarland in November 2023 in Gersheim. A wide variety of stakeholders, such as the Biosphere Association (Biosphärenzweckverband), Municipality of Gersheim including their Mayor (Gemeinde Gersheim), a ranger from the Naturwacht Saar, SaarForst Landesbetrieb and Saar-Pfalz Tourism department were invited to develop a comprehensive picture of the current status quo.

Key challenges

During the session, stakeholders addressed and discussed key challenges. The most prominent ones are listed below.

Visitor behaviour and environmental impact

Activity 1.2 General inventory of nature areas

The Orchid Garden faces several challenges related to visitor behaviour and environmental impact. Visitors often stray off designated paths, potentially harming the ecosystem and nature. As well, participants mentioned that there is a lack of awareness about nature sensitivity and desired behaviour within the area. Moreover, there is no clear picture of the number of visitors and how this impacts the area.

Funding and tourism offer

Another significant challenge is the shortage of staff and funds, particularly in the absence of tourism. This financial strain affects the garden's ability to maintain and improve its facilities. Gastronomy services and other local activities are currently not well connected to the area, and enhancements are needed to attract more visitors and generate income.

Lack of mobility options and parking

The insufficiency of mobility options in and to the orchid garden is intricately associated with the previous challenge. Currently, there is a heavy reliance on cars in the area; however, the infrastructure is not designed to handle increased vehicle volumes during peak times. This situation results in problematic parking behaviours that negatively impact the surroundings. Many visitors drive directly to the entrance of the Orchid Trail (which is prohibited) and since there is no parking available at the entrance, they often park wildly along the road or on grassy areas. Some even park on the farm across from the Orchid Trail, leading to significant issues with the farm owner. Parking remains the most pressing challenge in the area. Furthermore, this could be the lack of a direct or efficient connection to the existing public transport services. Many individuals opt to drive to Gersheim as the bus takes considerably longer and is perceived to be unreliable. Attendees mentioned that the bus stop is rather distant from the park entrance, and the frequency of the service is less than ideal.

Opportunities

During the session, participants were encouraged to explore potential opportunities to address the identified challenges.

Monitoring and increase in awareness

During the session, participants emphasised the necessity of enhancing awareness and sensitivity. Among the opportunities identified was the organisation of additional guided tours and educational stations, as well as the utilisation of social media and influencers to convey the importance of orchid preservation. Implementing more permanent control measures, along with monitoring visitor flows and biodiversity, could provide a more comprehensive understanding of the area and its impact on nature. For biodiversity assessment, a survey or mapping inventory could be performed. One option for tracking visitor behaviour includes the analysis of telephone data and applications. Furthermore, a pressing need exists for additional measures, such as nudging, to ensure

visitors adhere to rules such as staying on designated paths, keeping dogs on leashes, and not discarding litter.

Increase in tourism offer

Furthermore, enhancing the garden's connectivity with other local activities has the potential to foster a more comprehensive visitor experience. During the session, various suggestions were proposed in order to address the shortage of staff and funding. By improving and extending gastronomy services, the garden can generate additional revenue. Integrating the Orchid Garden visit with other local activities may elevate the overall visitor experience and attract a greater number of tourists. This approach could facilitate a more equitable distribution of visitor numbers and mitigate the financial pressures on the garden

Mobility alternatives

One potential opportunity regarding the mobility issue is enhancing public transport connections and encouraging bicycle use, which may help reduce traffic congestion. Proposals include the introduction of a temporary shuttle bus during the orchid season, adding a seasonal bus stop closer to the garden, and utilising alternative access routes. Monitoring visitor behaviour, including cyclists, and adding amenities like picnic spots can enhance visitor satisfaction. Conducting regular visitor surveys and using counting devices and phone data will provide valuable insights for better management and planning.

8.5 Summary of findings

- **Bliesgau Biosphere Reserve** in southwestern Germany near Saarbrücken covers 361 km² and 14% of Saarland's area and has been recognized as a UNESCO Biosphere Reserve since 2009. It offers a mix of forests, wetlands, orchards, and rare species in a compact area and functions as a model for sustainable development, combining nature conservation, education, and economic engagement.
- **Key attractions** include the **Gersheim Orchid Area** with unique orchid species, the Baroque Road ("SaarPfalz") linking Baroque architecture and historical sites and a network of scenic hiking and cycling routes. This report focuses on the Gersheim Orchid Area.
- **Visitors** include **regional day and weekend** visitors seeking nature **wellness tourists** focused on relaxation, **business travellers** attending corporate events, **eco-tourists** interested in biodiversity**, families and educational groups** engaging in interactive programs, and **cultural visitors** drawn to festivals, history, and architecture.
- Most visitors arrive by **car,** but detailed modal choice data is unavailable. The area is **accessible by car** via highways (A6, A4) and local roads, though limited parking causes issues during peak times. Public transport connections the area via trains and

busses; however, the frequency and proximity to entrances are **not optimal**. **Cycling** routes are **well-developed** within the broader Saarland cycling network, and walking trails are widely available, including the Orchid Trail near Gersheim.

- The most prominent **challenges** include the **environmental impact** caused by visitors straying off paths and damaging ecosystems; **mobility issues** such as car dependency, limited parking, and inadequate public transport connections; and **insufficient funding and tourism offerings,** characterised by a shortage of staff, insufficient local activities, and a lack of connected services.
- **Opportunities** to address these include campaigns for **awareness and education** through guided tours, educational stations, and social media efforts; enhancing **tourism offerings** by improving gastronomy, integrating local attractions, and developing new activities for better visitor distribution; providing **improved mobility alternatives** to reduce car dependency, such as seasonal bus stops, horse coach services, and promoting cycling; and utilising **monitoring and data collection** through visitor surveys, phone data, and biodiversity assessments to support informed planning and management.

9. Scarpe-Escaut Regional Nature Park (France)

9.1 Characteristics and attractions

General characteristics

Parc Naturel Régional Scarpe-Escaut (PNRSE) is a national park located on the French Belgian border and is part of the Plaines Scarpe-Escaut European Natural Park. Situated between the Province of Hainaut and the Hauts-de-France region, this area encompasses meadows, mixed farmland, forests, and wetlands that have preserved their rural character despite nearby urban pressures (see figure 9.1).

The park covers 55 municipalities and has a population of 194,000 in the Valenciennes and Douai districts. Shaped by the Scarpe and Escaut rivers, PNRSE is rich in biodiversity, with nearly one-third classified under the European Natura 2000 network. It also features a unique blend of industrial heritage, mining and natural landscapes, located near major urban centres like Lille, Valenciennes, Douai, and Tournai (Parc naturel régional Scarpe-Escaut, 2011).

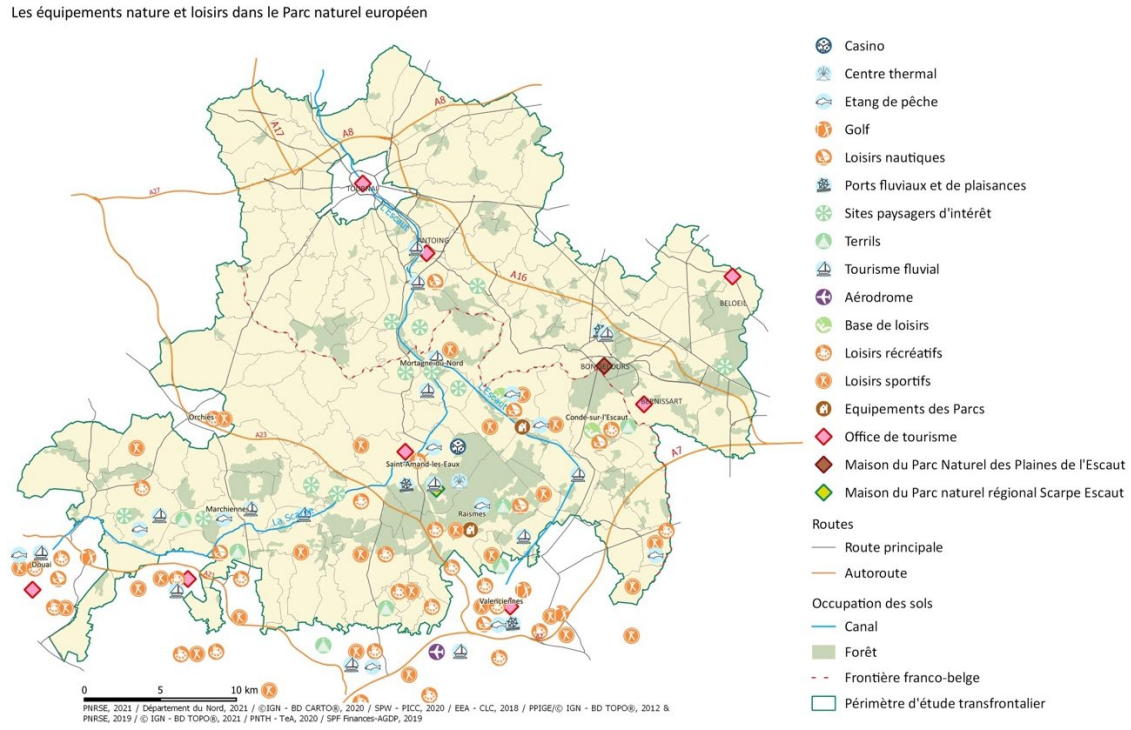

Figure 9.1 Nature and leisure facilities in the European Natural Park. Source: (Parc Naturel Régional Scarpe-Escaut , 2021)

Functions and attractions

PNRSE offers various activities that are available to its users; the main activities include hiking, walking, and nature sports. The park has over 600 km of marked hiking trails, some recognised under the PDIPR (Plan Départemental des Itinéraires de Promenade et Randonnée). These trails allow visitors to explore the region's rich biodiversity and

scenic landscapes. The region encourages cycling, especially along its river valleys and through its unique wetlands and forested areas. Cycling is promoted as part of the park's sustainability initiatives. Nature sports like mountain biking are also common in this region, and NPRSE is working on ways to promote these activities as they are now part of the park's tourism strategy.

Saint-Amand-les-Eaux, located in the heart of the Regional Natural Park, is the only spa town north of Paris. It attracts many spa guests from March to October (10,000 on average), whose stay is generally three weeks. The town brings together three-quarters of the gîte accommodations in the Regional Natural Park (Parc Naturel Régional Scarpe Escaut, 2021).

At the start of 2025, the park will have 18 so-called “Café-Rando” including restaurants, ten cafés, one educational farm, and two craft breweries. Located in rural areas, close to hiking, horse-riding, mountain biking or cycling trails, the ‘cafés rando’ welcome hikers in a friendly atmosphere and offer a service linked to their activities. These establishments encourage visitors to enjoy picnics or offer meals crafted from local ingredients. The owners provide tourist information to help tourists explore nearby attractions. Moreover, local tourist offices pledge to organise at least one public event yearly, such as musical performances or gourmet walks. At the same time, the Regional Natural Park supports and promotes awareness of local heritage and tourism opportunities (Parc naturel régional Scarpe-Escaut, 2023).

Terrils of Raismes

In relation to the inventory session, there has been a focus on the three Terrils of Raismes—Sabatier Nord, Sabatier Sud, and Lavoir Rousseau— which are integral components of the park’s post-industrial landscape, reflecting the area’s mining past while offering significant ecological and recreational value. Located within the Raismes-Saint-Amand-Wallers Forest, these terrils have been repurposed into spaces for biodiversity conservation and outdoor leisure (Arnal & Champin, 2021).

Each terril offers unique landscapes and ecosystems that have emerged over decades of natural regeneration. The terrils are now havens for biodiversity, featuring rare plant species, birds, and other wildlife. Their slopes provide diverse habitats, from grasslands to forested areas, making them valuable ecological corridors within the park.

In addition to their environmental importance, the terrils have become popular destinations for outdoor activities. They offer opportunities for hiking, mountain biking, and even panoramic views of the surrounding forest and countryside. The transformation of the terrils into recreational and ecological spaces highlights the park’s commitment to sustainable development and the preservation of its mining legacy (Parc Naturel Régional Scarpe Escaut, sd).

9.2 Visitor profiles and activities

The National Park Regional Scarpe-Escaut attracts a wide range of visitors, drawn by its natural beauty, cultural heritage, and recreational opportunities. Not many specific numbers of visitors are known. But based on the received documents, several types of visitors can be distinguished (Parc Naturel Régional de Scarpe-Escaut, 2023):

1. **Nature Enthusiasts**

Nature enthusiasts are among the most prominent visitors, taking advantage of the park's extensive network of over 300km of hiking trails and several mountain biking routes, and numerous water-based leisure activities like fishing and kayaking. Popular locations such as the Argales recreational area, Chabaud-Latour, and Amaury offer ideal settings for outdoor adventures and scenic exploration.

2. **Cultural Tourists:**

Cultural tourists are also significant, drawn by the park's rich historical and architectural landmarks. Sites like the fortified city of Condé-sur-l'Escaut and the iconic abbey tower in Saint-Amand-les-Eaux reflect the region's unique history. Additionally, the UNESCO-listed mining heritage and other historical structures, such as chapels and abbeys, provide an engaging cultural experience that highlights the interaction between human activity and the natural environment.

3. **Family Groups:**

Families frequently visit the park, enjoying its accessible paths and a variety of educational and leisure activities suitable for all ages.

4. **Eco-tourists and Wildlife Observers:**

Eco-tourists and wildlife observers are attracted to the region's biodiversity, which includes Ramsar-listed wetlands, lush forests, and a wide array of rare and protected species

5. **Sports and Event Participants:**

The park also hosts regional, national, and international sporting events, bringing sports enthusiasts and event participants to the area. Within the aim of the case study area, the heap race in the forest of Raismes is of most interest. Since 1984, the "Heap race"(*Course des terrils*) takes place every year in the national forest of Raismes–Saint-Amand-Wallers located in the heart of the Regional Park Scarpe-Escaut and in the perimeter of the mining basin of Nord Pas-de-Calais. This event, initially local, has grown very quickly to become the second most important race in the Nord-Pas-de-Calais region (Arnal & Champin, 2021). Over the years, the event has gained momentum: each year, this event brings together an average of **7,000** athletes on the last weekend of September. Within recent years, the organizers of the Race, already concerned about the preservation of the site, wanted to go further and give even more environmental value to their sporting event. Thus, a commitment charter bringing together 8 partners was signed in

September 2015. The various signatories are committed to a progress approach for the next editions and are a force for proposals and support in the implementation of actions (Parc Naturel Régional Scarpe Escaut, sd).

6. **Local Visitors:**

The park is valued by local residents for its green surroundings ("cadre de vie verdoyant"), that enhances their quality of life and provides a convenient space for daily leisure and relaxation close to urban areas.

7. **River-based tourism**

Approximately 70% of the river-based tourism clientele in the Scarpe area is composed of European visitors, predominantly from Belgium, Germany, the Netherlands, and the United Kingdom. The diverse activities, including cycling, hiking, and water sports, appeal to local and international visitors, strongly emphasising slow tourism and eco-friendly recreational options. The Thermal Baths of Saint-Amand-les-Eaux attract around 9,856 visitors annually, making them a focal point of health and wellness tourism in the area (Parc Naturel Régional Scarpe Escaut, 2021).

9.3 Multimodal accessibility

This paragraph examines the multimodal accessibility of NPRSE, focusing on specific entrance points for various transport modes, including cars, public transport (trains and buses), cycling, and walking. For each mode, the availability and density of the networks are analysed, and accessibility maps are provided to reveal the areas within reach of the park's main entrance points.

Car accessibility

NPRSE is well accessible by car, located about 40 minutes from Lille and 20-30 minutes from Valenciennes or Tournai in Belgium via major highways like the A23 and A2. The park offers several parking facilities near key attractions such as the Forest of Raismes-Saint-Amand-Wallers and the Thermal Baths of Saint-Amand-les-Eaux, as well as trailheads and event venues like the Course des Terrils. Within the park, a network of roads connects various sites and towns (see figure 9.2).

The accessibility map in figure 9.3 shows that many bigger and smaller municipalities can be reached within a 15-minute drive, such as Valenciennes. Within a 30-minute driving radius, most of the park attractions, as well as the smaller surrounding communities in the park, can be accessed. Within a 40-minute drive, the city of Lille can be accessed and function as a gate for the park.

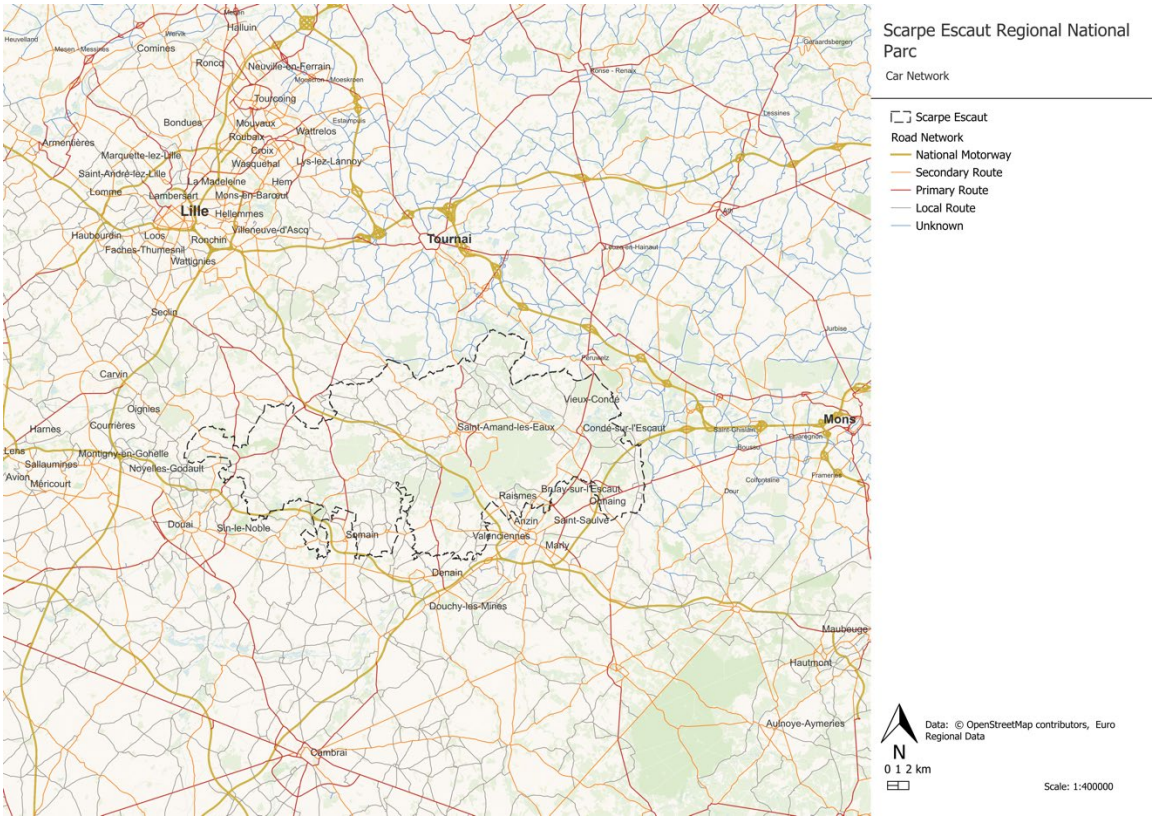

Figure 9.2 Car infrastructure PRNSE

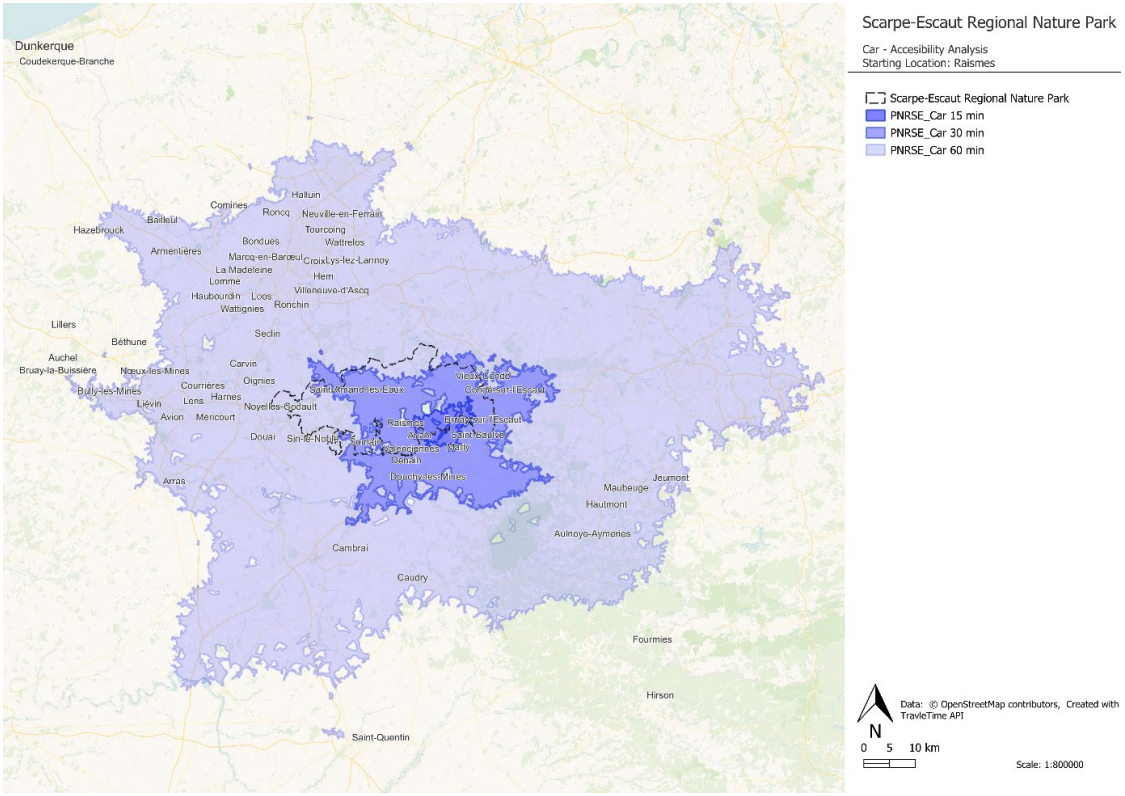

Figure 9.3 Car accessibility NPRSE

Public transport accessibility

NPRSE is accessible via public transportation, with nearby hubs such as Saint-Amand-les-Eaux, Orchies and Valenciennes (see figure 9.4). The Saint-Amand-les-Eaux train station, located on the Lille-Valenciennes railway line, provides direct connections to major cities. Regional bus services, link train stations to park entry points and attractions like the Forest of Raismes. Several train stations also offer facilities for bringing or renting bicycles, allowing visitors to combine train travel with cycling to explore the park.

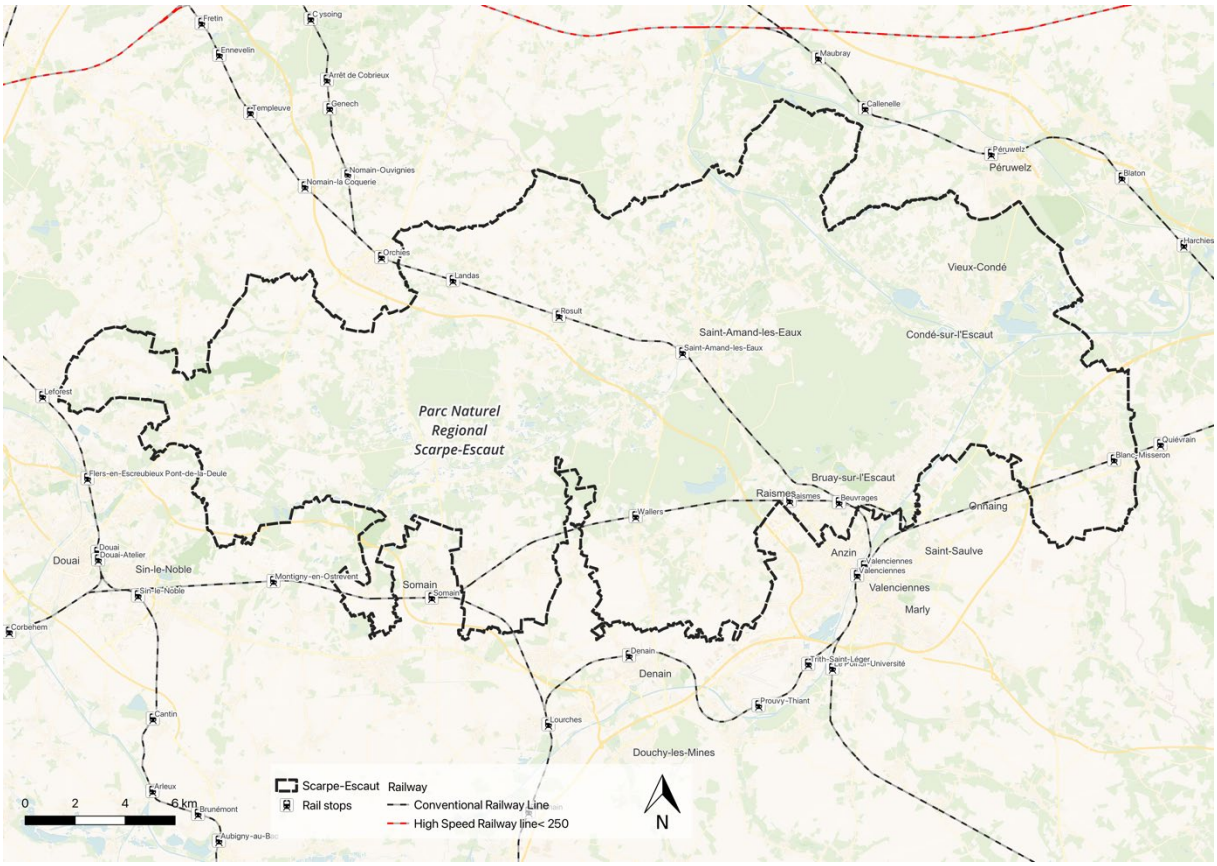

Figure 9.4 Public transportation map PRNSE

The public transport accessibility map in figure 9.5 shows that the city of Valenciennes can be reached in 30 minutes or less from Raismes Train Station. Saint-Amand-les-Eaux and the surrounding municipalities within the park are accessible within 60 minutes. Within a 90-minute radius, Lille and the catchment area of the city can be reached.

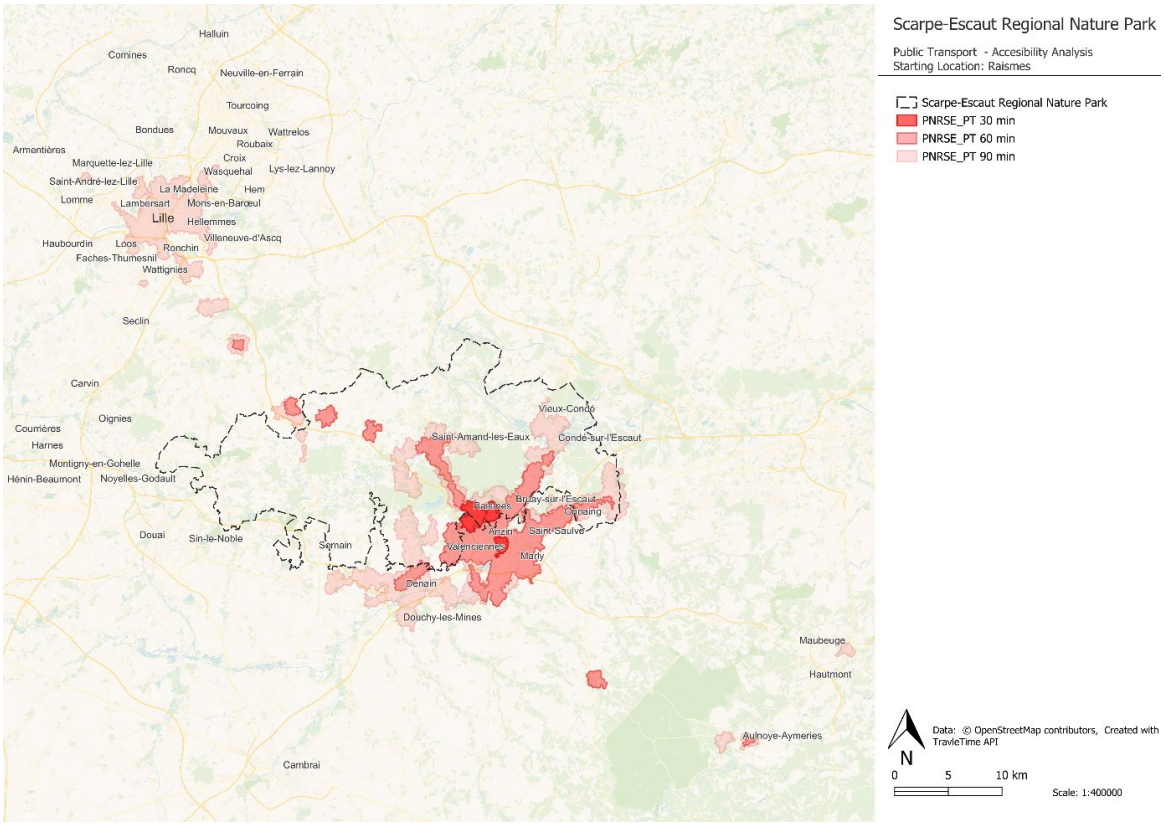

Figure 9.5 Public transport accessibility PRNSE

Cycling and pedestrian accessibility

Figure 9.6 illustrates the bicycle and hiking networks. The region encourages cycling, particularly along its river valleys and through its distinctive wetlands and forested areas; the well-marked trails also connect it to nearby towns and natural sites. Cycling is promoted as part of the park's sustainability initiatives. Amenities such as bike rental services, repair stations, and designated parking areas enhance the convenience of exploring the park by bike. There are two main cycling connections for standard bicycles: one in the southern part of the park, providing east-west links, and another in the northern region, which extends across the border into Belgium. Mountain biking routes are confined to designated zones but are interconnected by a separate linking route for user convenience. The park has over 600 km of marked hiking trails, some recognised under the PDIPR (Plan Départemental des Itinéraires de Promenade et Randonnée) and many starting points which provide access to the must-sees of the park and its unique landscapes.

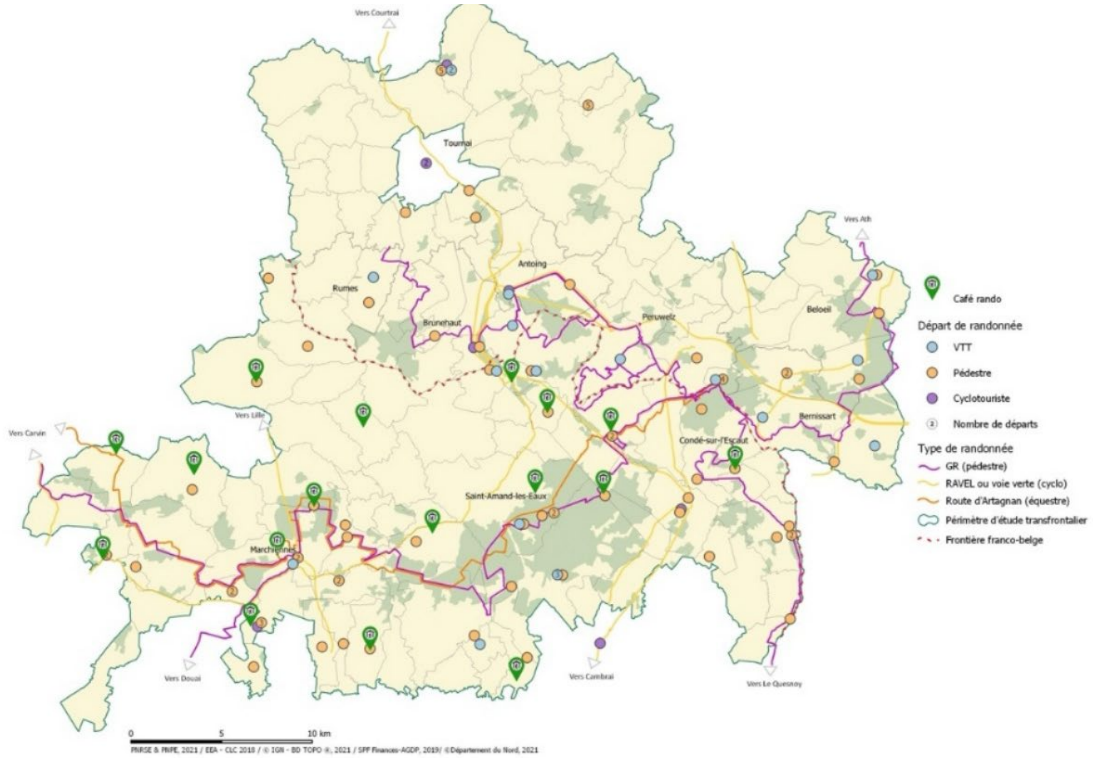

Figure 9.6 Cycling and walking routes in PRNSE. Source: (Parc Naturel Régional Scarpe-Escaut, 2021)

The cycling accessibility map highlights the sheer size of the Nature Park. Starting from Raismes, cyclists can reach a significant part of the southern areas in the park. A larger city like Valenciennes is accessible within or close to 15 minutes by bicycle. Within 60 minutes, most of the eastern part of the park can be covered by bicycle because of the cycle path network (see figure 9.7).

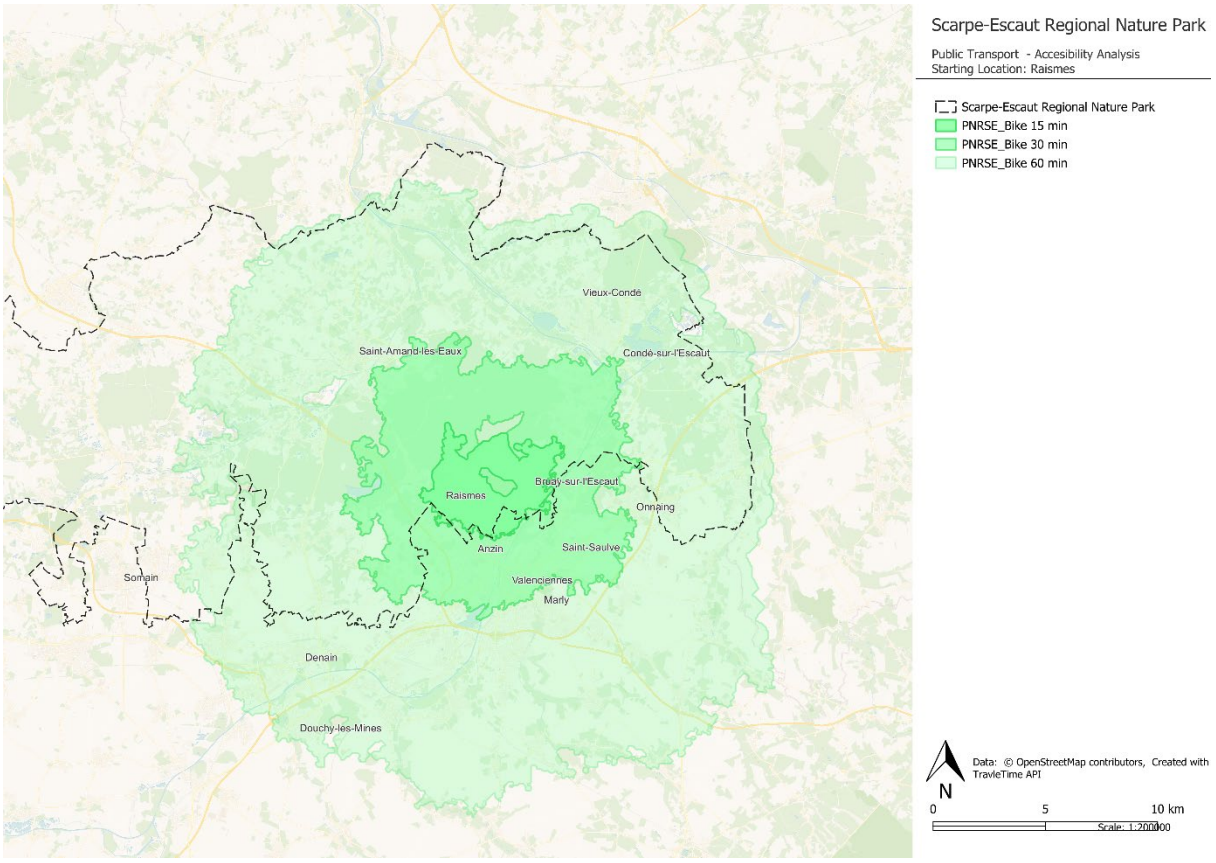

Figure 9.7 Bicycle accessibility PRNSE

9.4 Challenges and (potential) opportunities

This section describes the challenges and potential opportunities for the Parc Naturel Régional Scarpe-Escaut with the main focus on three slag heaps in Raismes: Sabatier Nord, Sabatier Sud et le lavoir Rousseau to encourage sustainable tourism and reduce the impact of visitor flows. First, knowledge from previous studies and activities is summarised. Subsequently, the results from the inventory session are shared.

Background knowledge

As noted in the various documents shared, overcrowding has been observed at certain natural sites since 2020, particularly during the summer, by visitors seeking a fresh experience: the Argales site, the Chabaud Latour pond, and the four forest massifs: Marchiennes, Raimes-Saint-Amand-Wallers, and Flines-lès-Mortagne Bonsecours, being one of the main challenges for the park.

Inventory session

To better understand the key challenges and opportunities, an inventory session was organised by BUAS in collaboration with PNR Scarpe-Escaut in December 2023 in Saint-Amand-les-Eaux. A wide variety of stakeholders, such as the SNCF, SNCF voyageurs – Direction régionale HDF, Association Droit Au Vélo, Fédération Française de Randonnée Pédestre Nord, Département du nord and Office National des Forêts were present and

participated in the session to develop a comprehensive picture of the current status quo.

Key challenges

During the session, stakeholders addressed and discussed key challenges. The most prominent ones are listed below.

Overcrowding and demand

A significant challenge highlighted during the session was the impact of overcrowding and increasing demand for nature tourism on site preservation. As more individuals seek to connect with natural landscapes, popular destinations often experience an influx of visitors, resulting in congestion and stress on local amenities. This issue is particularly problematic in locations like the Etoile de la Princesse crossroads, where overcrowding can result in environmental degradation, littering, and damage to sensitive ecosystems. The increased interest, partially fuelled by climate change, adds further strain on these sites, making it difficult to balance tourism with conservation efforts.

Political Will and Public Transport

Public transport in rural areas poses a significant challenge for nature tourism and site preservation. In regions with limited or non-existent trains and buses, the lack of political will to improve transportation infrastructure can severely impact access to natural sites. The Communauté d'Agglomération de la Porte du Hainaut (CAPH) recently created a mobility scheme, but communication about these new initiatives has been lacking. This makes it difficult for residents and visitors to navigate the area effectively, particularly in Saint-Amand, where getting around by train and bike remains complicated. Additionally, security concerns at the bicycle parking area at Saint-Amand-les-Eaux station deter people from using trains and bicycles.

Undesired use and behaviour

Undesired use and behaviour present significant challenges in managing nature tourism and preserving sites. In areas like the Etoile de la Princesse crossroads and the slag heap, activities such as downhill mountain biking can cause erosion and damage to the landscape. Additionally, the presence of quad bikes creates conflicts with pedestrians, discouraging them from visiting due to safety concerns. The inadequate maintenance of the wooden shelters against rain over the years has also led to a decline in their usability and security, although recent improvements have been implemented.

Opportunities

During the session, participants were encouraged to explore potential opportunities to address the identified challenges. The opportunities for improving the area mentioned in the session were diverse but mainly focussed on three main aspects: communication, sustainable mobility, and balancing visitor impact on nature and experience.

Improving communication

Firstly, the opportunity discovered was to enhance communication, which should involve identifying and reworking strategic entry points using maps and improving communication about existing facilities and routes. Potentially leading that visitors are well-informed and can navigate the area more effectively. Identifying entry points and developing multimodal facilities with clear information on parking and access to the forest are also crucial.

Improved sustainable mobility system and network of activities

Opportunities aligned with challenges include developing a comprehensive mobility plan connecting trains and bikes to establish a sustainable transportation identity. This plan would enhance existing routes and improve cyclist safety. Additional opportunities involve linking the forest to the Scheldt and utilising mining sites and the Scarpe. Also, creating shuttles for thermal baths and developing a network connecting key attractions can better distribute visitor flows. This network could connect the Scarpe, coalfield, Escaut, and Amaury sites, using rivers as the main routes of interest.

Balancing visitor impact on nature and experience

Balancing the potential negative effects of visitors on nature while allowing exploration of the park is essential. This involves allowing access to and discovery of natural landscapes without causing damage, enabling people to enjoy a tranquil environment. Reevaluating the distribution of uses based on environmental concerns and directing tourist flows according to the fragility of the environment are necessary measures to protect the natural surroundings. Encouraging visitors to explore lesser-known paths can help reduce traffic at popular sites. Identifying areas that require work is crucial. Reducing the presence of motor vehicles and cyclists around the slag heaps and resolving conflicts of use, such as quads discouraging pedestrians, are necessary steps to enhance the area's accessibility and appeal.

9.5 Summary of findings

- **Parc Naturel Régional Scarpe-Escaut (PNRSE),** located on the French Belgian border, is part of the Plaines Scarpe-Escaut European Natural Park. It encompasses meadows, farmland, forests, wetlands, and post-industrial landscapes. One-third of the area is part of the **Natura 2000** network. Cultural and industrial heritage includes **UNESCO**-listed mining sites, abbey towers, and the unique terrils of Raismes, repurposed for biodiversity and recreation. **Key attractions** include over 600 km of hiking trails, cycling paths, paddleboarding opportunities, and Saint-Amand-les-Eaux spa town.
- **Visitor Profiles** include **nature enthusiasts** aiming for hiking, mountain biking, and water-based activities; **cultural tourists** interested in historical landmarks, mining heritage, and architectural sites; **families** enjoying the accessible trails and

educational activities; **eco-tourists** attracted to the Ramsar-listed wetlands and rare biodiversity; **sports participants** joining seasonal events like the annual "Heap Race" in Raismes; **local visitors** the come for regular leisure and relaxation; and finally **river-based tourism**: international visitors engaging in slow and eco-friendly tourism.

- Visitors mainly arrive by **car**, with the area well connected by major highways and parking available near key attractions. **Public transport** offers basic connections to the main entry points. Bicycle rentals are available at only two stations, Saint-Amand harbour and Argales of Rieulay, for the last-mile; however, the frequency and proximity to park attractions are insufficient. **Cycling** routes are established along the park's edges, and mountain biking trails can be found in specific zones. There is also an extensive network of **walking** trails, though some are at risk of overcrowding at certain times."
- The main **challenges** relate to **overcrowding** and damage to the ecosystem at popular sites like Argales and Etoile de la Princesse crossroads; the **car dependency** and **limited public transport** options combined with a lack of **political** support for improvements and **potential conflicts** between **different** types of **users** (e.g., quads and downhill biking) impacting the visitor's **safety**.
- **Opportunities** to address these challenges include **improved communication** through better maps, signage, and strategic entry points; the development of **sustainable mobility plans**, including trains, bicycles, and shuttles, to better connect attractions and distribute visitors and **balancing nature conservation with tourism** by directing visitors to less sensitive areas, reducing motorised traffic, and resolving user conflicts.

10. Parc National Regional Montagne de Reims (France)

10.1 Characteristics and attractions

General characteristics

Parc Naturel Regional Montagne de Reims (PNRMR) is located in the Grand Est region, and in the Marne department, its surface area is currently 533km². It is made up of over 60 municipalities with a population of 35000 inhabitants. The Parc de la Montagne de Reims is located in the far west of the Grand Est Region, close to the area of influence of Paris and opposite the regional capital, Strasbourg (Parc naturel régional de la Montagne de Reims, 2024).

PNRMR hosts several UNESCO World Heritage sites and protected vineyards known for their production of champagne. Furthermore, the park functions as the “green lung' within the urban centres of Reims, Épernay, and Châlons-en-Champagne. The park also has three areas that are labelled as State Forests “Exceptional Forest” (Faux de Verzy, Chêne à la Virginie, Hautvillers). PNRMR is now acknowledged for its unique value and fragility: diverse natural environments, an array of natural heritage, significant cultural and architectural heritage, as well as unique landscapes and expertise recognised on an international scale (Parc naturel régional de la Montagne de Reims, 2023).

These sites form a ring around the natural centre of the park, which is comprised of forests and natural sites. Natural tourist attractions include the Faux de Verzy and Marne River. Figure 10.1 shows the plan of the park.

Figure 10.1 Overview of activities and attraction points in Parc naturel régional de la Montagne de Reims. Source: (Parc naturel régional de la Montagne de Reims, 2024)

PNRMR is rich in activities and attractions that cater to a wide variety of visitors. Its unique landscape of forests, vineyards, and farmlands provides the backdrop for outdoor recreation such as hiking, with over 400 km of marked trails, and cycling, supported by dedicated routes like the Véloroute de la Vallée de la Marne. The region is also a hub for oenotourism, offering vineyard tours, tastings, and events celebrating the UNESCO-listed Champagne landscapes. Cultural activities and local festivals, such as the "Lire Perché dans L'arbre" in Germaine or "Les Secrets du Petit Bonhomme" in Rilly-la-Montagne, add to the diversity of experiences.

Ligne des Bulles

Key hubs along the "Ligne des Bulles" rail network connect visitors to these offerings. Four train stations (in Rilly-la-Montagne, Germaine, Avenay-Val-d'Or, and Aÿ-Champagne) serve as entry points, linking tourists to scenic trails, cultural landmarks, and villages. These stations, complemented by natural attractions such as the Forêt Domaniale des Faux de Verzy, which sees 250,000 visitors annually, are central to the park's strategy for promoting sustainable and accessible tourism. Seasonal sporting events and growing interest from cyclo-tourists further bolster the park's appeal as a versatile destination (Parc Naturel Régional de la Montagne de Reims, 2024).

10.2 Visitor profiles and activities

Visitor profiles

The park welcomes a diverse array of visitors, each drawn to its a combination of natural beauty, cultural heritage, and recreational opportunities. **International tourists** are often attracted by the Champagne region's UNESCO-listed vineyards and cellars, combining visits to these iconic sites with scenic exploration of the park's landscapes. **National visitors**, including families and nature enthusiasts, frequent the area for its hiking trails, cycling routes, and opportunities to connect with nature.

A significant number of **cyclo-tourists** take advantage of routes like the Véloroute de la Vallée de la Marne, which links the park's villages and attractions, making it an ideal destination for multi-day cycling excursions. **Local residents** also play a significant role, using the park for day trips, community events, and outdoor activities. **Seasonal visitors,** including participants in wine festivals, sporting events, and cultural gatherings, add to the diversity, while the proximity of urban hubs like Reims and Épernay ensures a steady flow of short-term visitors seeking relaxation or adventure (Parc Naturel Régional de la Montagne de Reims, 2024).

Distribution and crowding

Visitation to the forests in the Parc de la Montagne de Reims is estimated by the use of eco counters positioned by the **Forêt Domaniale des Faux de Verzy**. In 2019, there were 266,700 visitors to the Verzy forest. For comparison, in the same year, the only other eco counter present in a forest environment in the park (on the Mailly Champagne geological trail) counted 2,000.

Apart from the eco-counters located in the Forêt de Verzy and on the geological trail in Mailly-Champagne, there is no other precise data concerning forest attendance in the Parc de la Montagne de Reims (quantitatively and qualitatively). PNRMR is currently repositioning their strategy on the monitoring of visitor flows within the forest massif, thanks to thanks to a subsidy from the national tourism agency Atout France obtained in 2024.

Approximately 80 authorised **sporting events** occur annually in the Montagne de Reims Forest massif. Most of the time, these are hikes or "trail" type races. Often held in the same areas, these events attract more than 20,000 participants each year and are primarily concentrated from April to October (Parc naturel régional de la Montagne de Reims, 2023).

10.3 Multimodal accessibility

This paragraph examines the multimodal accessibility of NPRRM, focusing on specific entrance points for various transport modes, including cars, public transport (trains and buses), cycling, and walking. For each mode, the availability and density of the networks

are analysed, and accessibility maps are provided to reveal the areas within reach of the park's main entrance points.

Car accessibility

Several roads and one national highway provide car accessibility. The main regional road axis of the park is D951, which runs north to south from Epernay to Reims (see figure 10.2). It is used by nearly 16.000 vehicles per day, including more than 800 heavy goods vehicles. Other major roads are D980 and D9 within the park, as well as A4, which bypasses PNRMR and connects Reims to Paris.

According to the Diagnostic Charte 2039, 15 carpooling areas in the region were installed near significant roads or locations. Five of them are located near regional railway stations to encourage multimodal travel. However, there are no studies on the usage of these facilities.

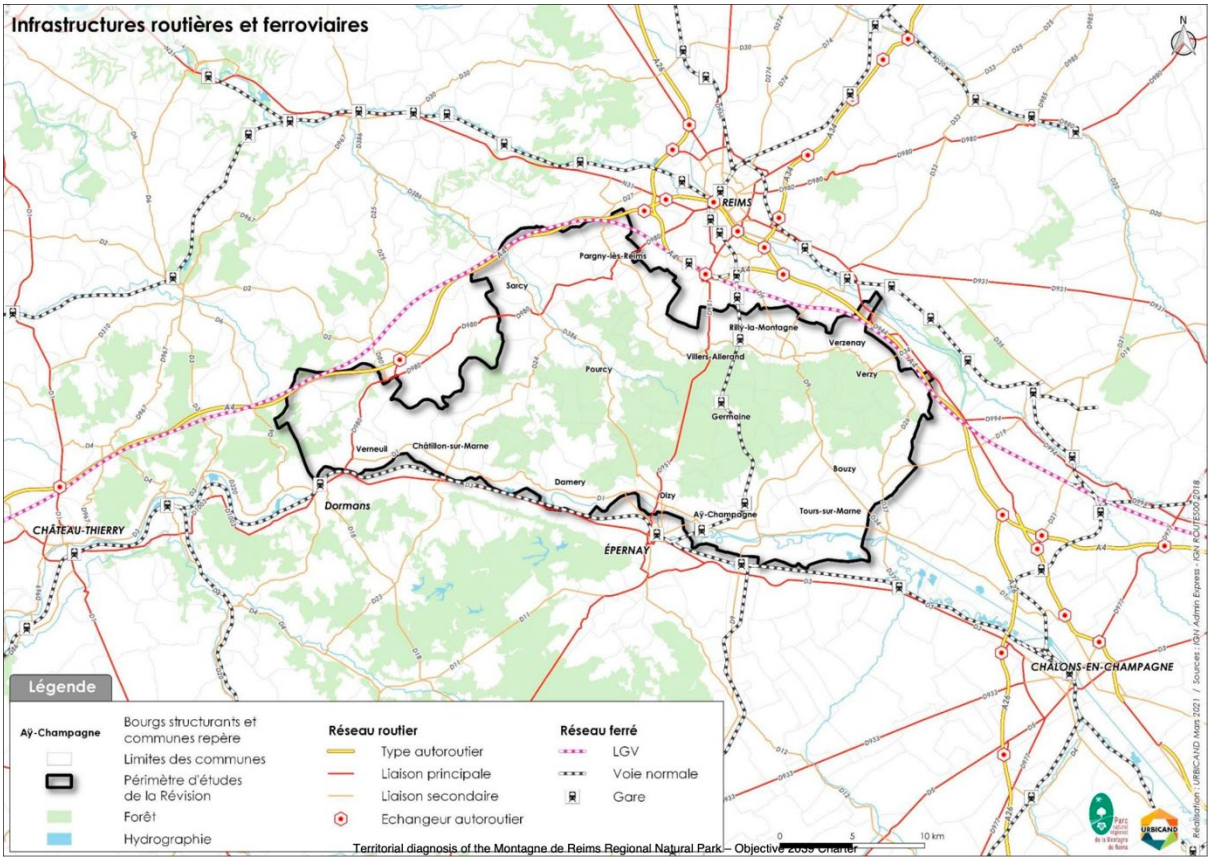

Figure 10.2 Public transportation and car infrastructure map Parc naturel régional de la Montagne de Reims

The accessibility map in figure 10.3 shows that many bigger and smaller municipalities can be reached within a 15-minute drive, such as Bouzy. Within a 30-minute driving radius, most of the park attractions, as well as the cities Reims and Épernay, can be accessed. Within a 60-minute drive, the whole park can be accessed.

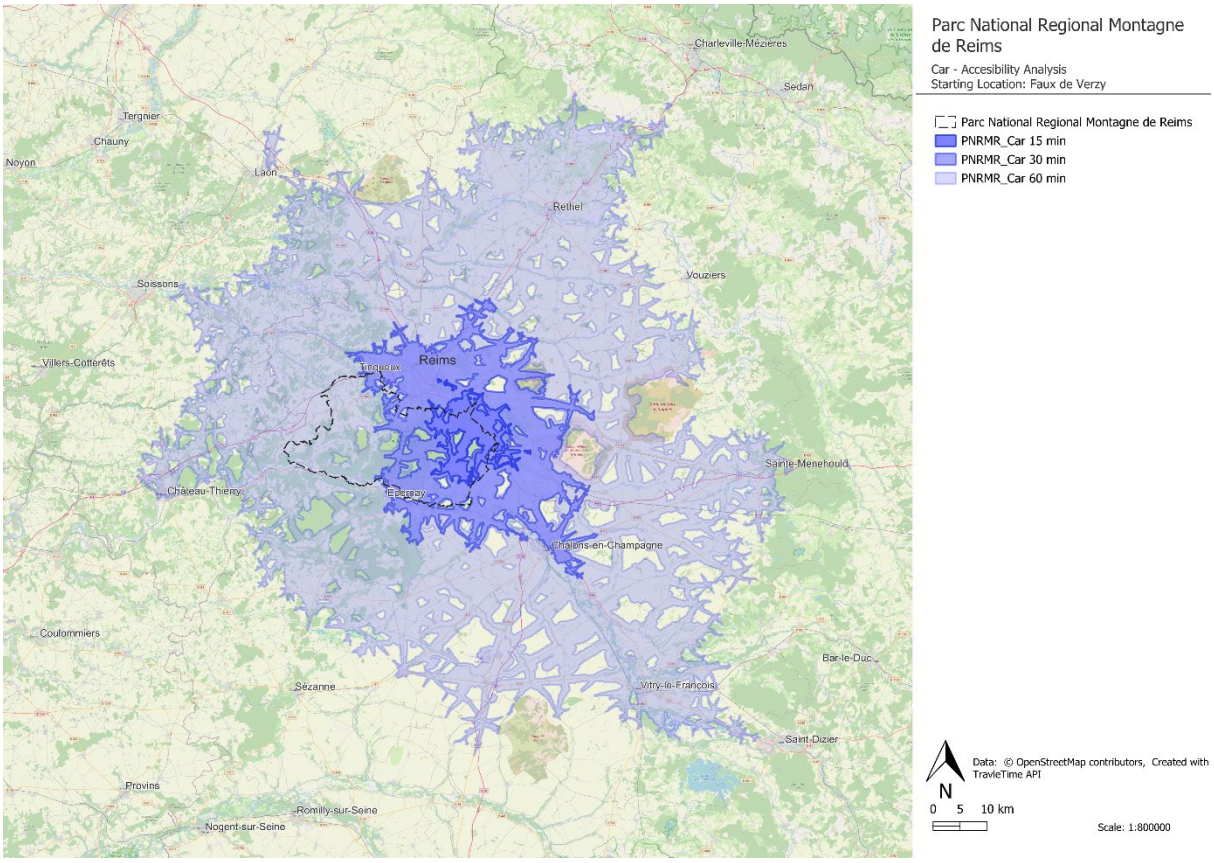

Figure 10.3 Car accessibility Parc naturel régional de la Montagne de Reims

Public transport accessibility

There are four train stations within PNRMR: Ay-Champagne, Avenay-Val-d'Or, Germaine, and Rilly-la-Montagne (see figure 10.2). They see TER trains every 1-2 hours to Épernay and Reims. Avenay and Germaine stations have around 18.000 passengers per year, and Ay-Champagne and Rilly-la-Montagne around 55.000 passengers yearly (Parc naturel régional de la Montagne de Reims, 2023). Train stations in the park face a challenge in their connectivity to the existing hiking and cycling paths. Although trails are nearby, they are not sufficiently highlighted. One of the primary challenges that PNRMR plans to tackle is increasing the attractiveness of alternative modes of transportation to the area by transforming train stations into "green entrances" through improvements to facilities, information, signage, and urban planning around the station areas.

To the north of the park lies Champagne-Ardenne TGV station, which serves high-speed trains to Paris (a 40-minute ride). Reims and Epernay stations serve direct trains to Paris and nearby major cities.

Only a few bus routes serve the area, connecting the largest towns south of the park. Since spring 2024, "Grand Reims Mobilités," which operates public transport for the greater Reims area, has established a seasonal daily bus service linking the Champagne-Ardenne TGV station to Verzy.

The public transport accessibility map in figure 10.4 shows that the city of Reims can be reached within or just under 30 minutes from Germaine train station. The city of Epernay and surrounding municipalities and train stations are accessible within 60 minutes, depending on the schedule.

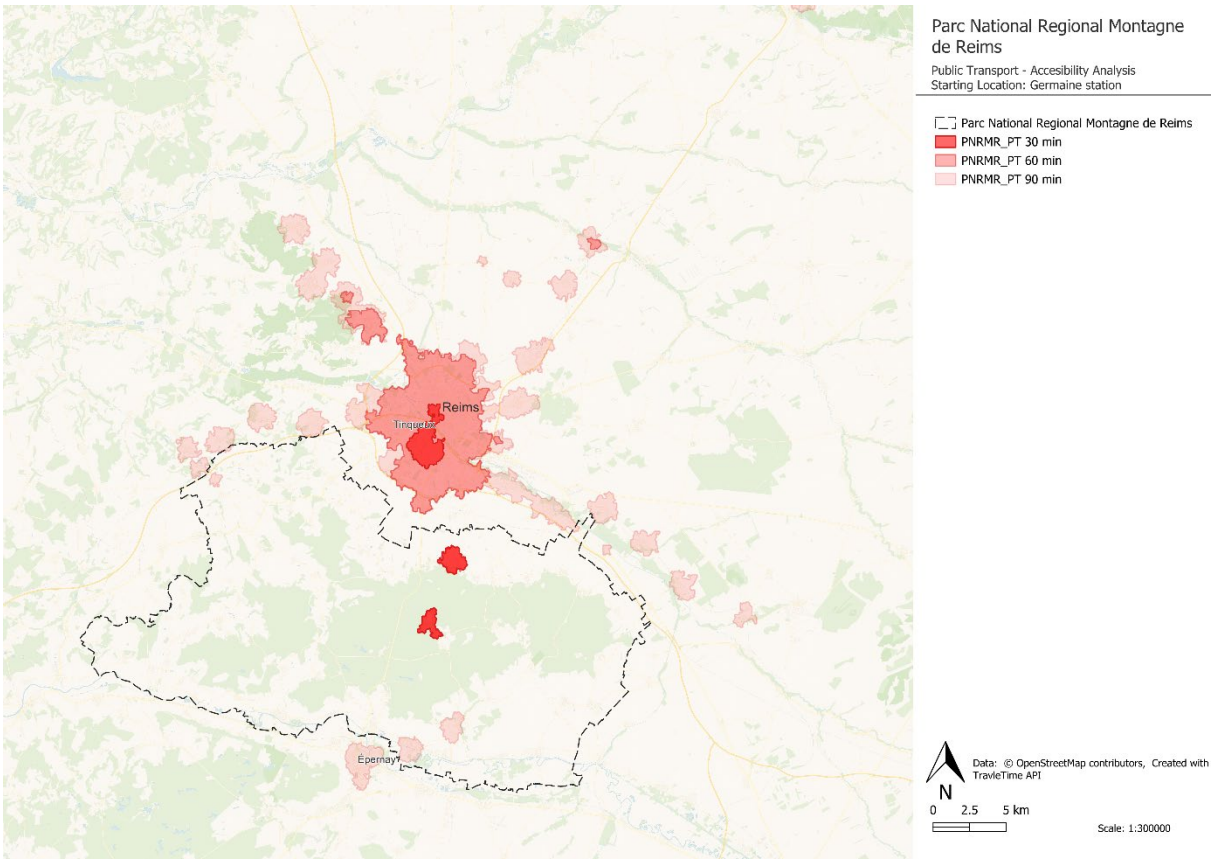

Figure 10.4 Public transport accessibility Parc naturel régional de la Montagne de Reims

Cycling and walking accessibility

The park offers a network of several cycling routes, connecting the key cities of Reims and Épernay with the park's scenic landscapes (see figure 10.5). These routes provide a range of options for cyclists, from vineyard trails to forested paths for mountain biking. Figure 10.6 shows the accessibility provided by the bicycle network taking Faux de Verzy on the eastern side of the park as a starting point. It reveals the substantial size of the nature park. The Faux de Verzy can be accessed by bicycle within 15 to 30 minutes from surrounding areas and smaller municipalities on the eastern side of the park, even though cycling and mountain biking are not officially permitted in the Verzy forest. Larger cities such as Reims and Épernay can be accessed within or close to 60 minutes, enabling opportunities for day trips by bicycle.

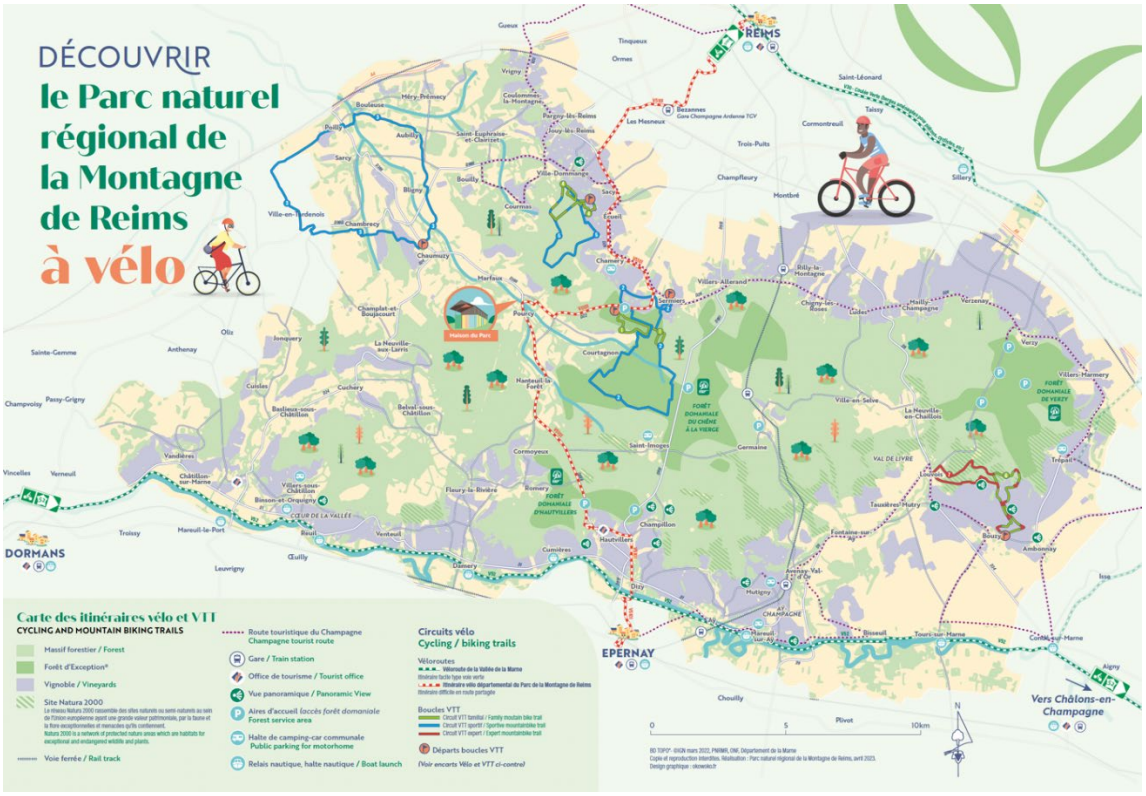

Figure 10.5 Cycling routes within PNRMR. Source: (Parc naturel régional de la Montagne de Reims, 2023)

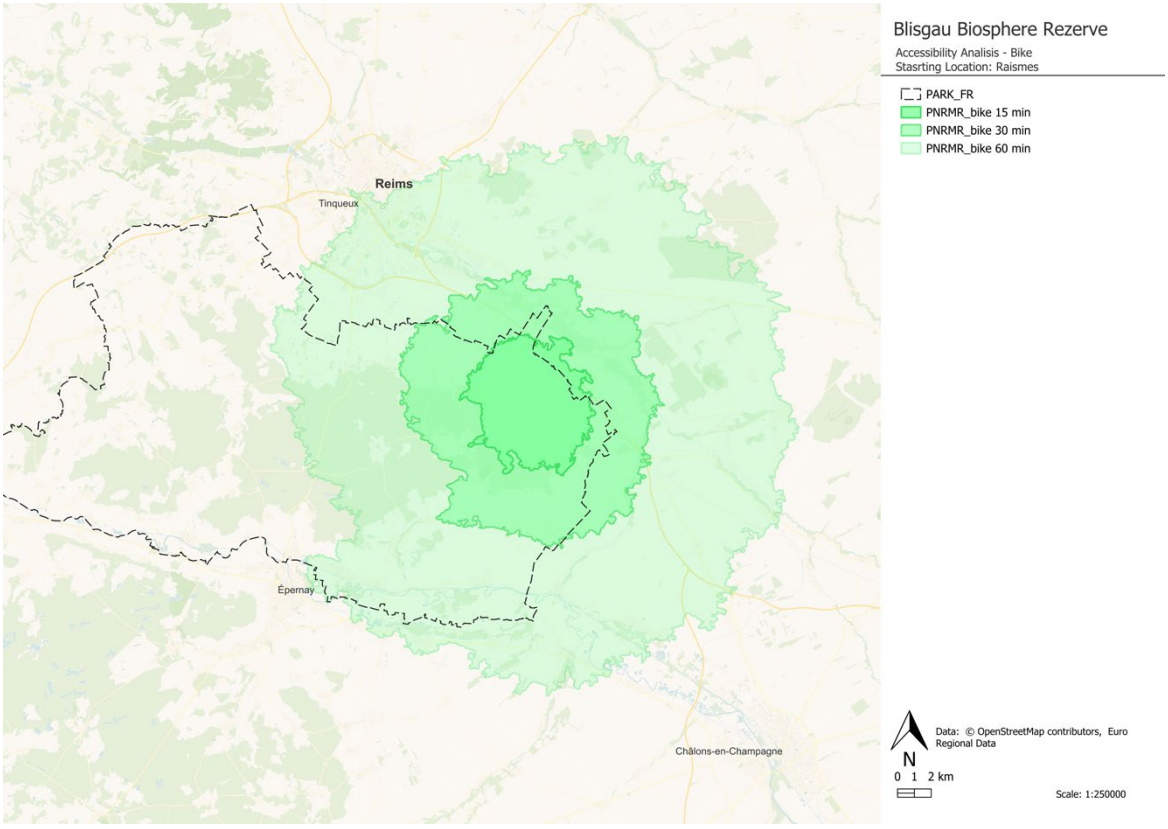

Figure 10.6 Bicycle accessibility Parc naturel régional de la Montagne de Reims

Figure 10.7 depicts the walking and hiking routes in the nature park. More than 400 km of marked trails are available with varying levels of difficulty and length, which enables the exploration of forests, vineyards, and farmlands. Amongst others, the "Sentier des Faux de Verzy" leading to rare, twisted beech trees and longer hikes like the " GRP (Tour) de la Montagne de Reims" are popular routes. Information panels along these routes provide insight in the unique nature and culture of the region.

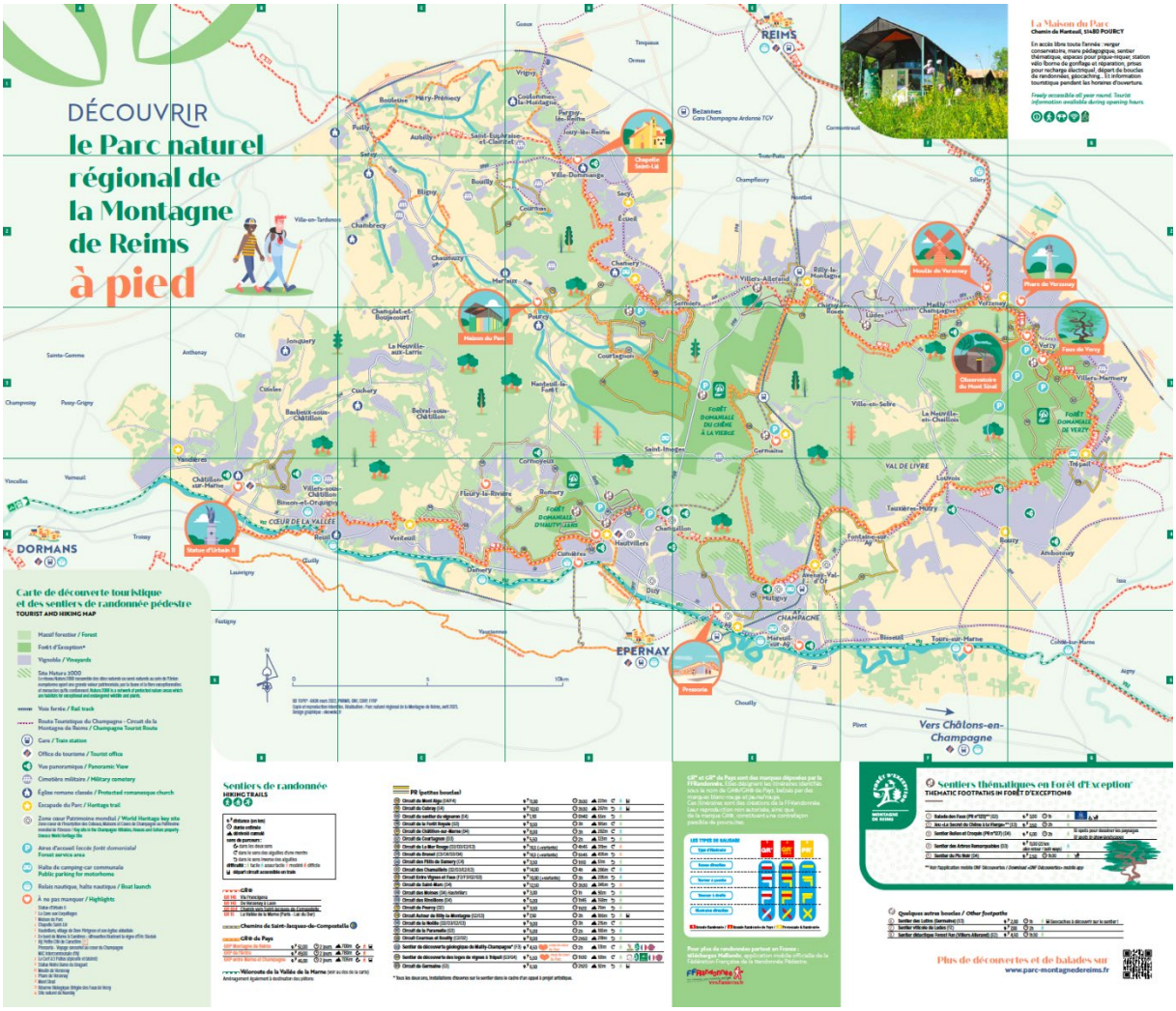

Figure 10.7 Walking routes within PNRMR. Source (Parc naturel régional de la Montagne de Reims, 2023)

10.4 Challenges and (potential) opportunities

This section describes the challenges and potential opportunities for the Parc Naturel Régional de la Montagne de Reims with the main focus on the “Ligne des bulles”, the TER line connecting the cities of Reims and Epernay and Forêt des Faux de Verzy to encourage sustainable tourism and reduce the impact of visitor flows. First, knowledge from previous studies and activities is summarised. Subsequently, the results from the inventory session are shared.

Background knowledge

While the park has significant attractions, several challenges hinder its ability to provide a seamless visitor experience. The **"last-mile" connectivity** from train stations to trails, villages, and landmarks remains a critical issue. Visitors often struggle with **limited signage**, inadequate transport options, and a lack of clear information. This gap reduces the accessibility of key sites, such as Pressoria, an interactive Champagne centre located a short walk from Aÿ-Champagne station (Parc Naturel Régional de la Montagne de Reims, 2024).

Infrastructure at the **park's rail hubs** also needs reimagining to serve visitors better. Current amenities like bike racks and public spaces are insufficient to meet the needs of both locals and tourists. Developing services such as electric bike rentals, enhanced picnic areas, and digital tools for navigation could address this shortfall. **Seasonal fluctuations** in visitor numbers, driven by popular events and festivals, also **strain** existing **facilities** and highlight the need for scalable solutions.

Sustainability presents a critical challenge. Increased tourism poses risks to the park's **sensitive ecosystems** and biodiversity. Balancing **conservation** with the development of **tourism** infrastructure requires careful planning. The park seeks to position itself as a model for eco-friendly rural tourism, aligning with a strategy that encourages responsible and sustainable tourism, leisure, and sports activities in nature while offering an alternative to the prevailing focus on urban and wine tourism. Although the Marne department lacks a strong tourist reputation, the allure of champagne is a significant asset for the destination (Parc naturel régional de la Montagne de Reims, 2023).

Collaborative efforts are underway to address these issues, focusing on requalifying train stations as intermodal gateways, enhancing transport options, and promoting sustainable practices among visitors. These ambitions are summarised in the charter renewal document (see figure 10.8).

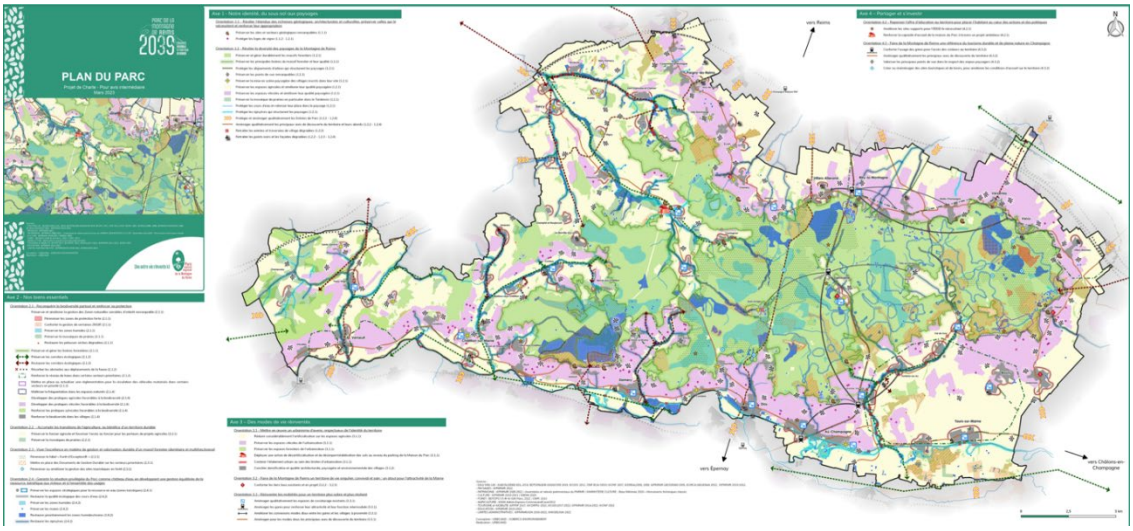

Figure 10.8 Overall development plan of Parc naturel régional de la Montagne de Reims. Source: (Parc naturel régional de la Montagne de Reims, 2023)

Inventory session

To better understand the key challenges and opportunities, an inventory session was organised by BUAS in collaboration with PNR Montagne de Reims in December 2023 in Aÿ-Champagne. A wide variety of stakeholders, such as the SNCF, ONF (National Forestry Office), Mission Coteaux Maisons et Caves de Champagne – Patrimoine Mondial, Région Grand Est, Office de tourisme du Grand Reims, Maire d'Aÿ-Champagne, Agence Régionale du Tourisme Grand-Est, Agence de développement touristique de la Marne, Office de tourisme intercommunal d'Hautvillers, Loisium en Champagne, Rilly-la-Montagne, ACR Rilly-la-Montagne, Grand Reims and Commune de Germaine were present and participated in the session to develop a comprehensive picture of the current status quo. Within the session there was a focus on mainly modal shift (pilot A). However, several of the elements listed below also refer to different nudging strategies (pilot C) to encourage practitioners and visitors to adopt an eco-friendlier behaviour and encourage the commitment of participants in order to promote a more responsible way of practising.

Key challenges

During the session, stakeholders addressed and discussed key challenges. The most prominent ones are listed below.

Accessibility of Nature Areas and Connections Between Tourist Sites

One of the most significant challenges mentioned by the participants is ensuring accessibility to natural areas and improving connections between various tourist sites. Many key tourist attractions, such as Hautvillers and Verzy, are not served by public transport, which limits accessibility and encourages car use. The stations are situated outside the main tourist areas, further promoting car dependency. Additionally, there is

a lack of safe cycling infrastructure and connections along the cycle routes, which discourages visitors from using more sustainable modes of transport.

Management of Visitor Numbers at Certain Sites and Times

Managing visitor numbers at specific sites and times is another prevalent challenge. Popular sites like the Verzy National Forest face issues related to parking and the fragility of the site due to high visitor numbers. The facilities at these sites are often unsuitable for the number of visitors they receive, leading to overcrowding and potential damage to the natural environment. Additionally, tourism in the region is highly seasonal, with a significant influx of visitors from April to September. This seasonal surge exacerbates the challenges of managing visitor numbers and maintaining the quality of the visitor experience. Furthermore, Hautvillers is undergoing a major tourism project that is expected to increase the number of visitors significantly. This project, while promising, adds to the challenge of managing visitor flow and ensuring that the town's limited parking capacity can handle the increased demand.

Status of Public Transport

The current status of public transport in the region poses several challenges. The Ligne des Bulles, which connects Reims and Epernay, is not well-known to the general tourist public, making it difficult to encourage visitors to use the train. Moreover, the existing timetables are designed more for local residents who use the line daily for commuting rather than for tourists.

Different Types of Tourism

One challenge that was also mentioned was linked to the different types of tourism. The region attracts various types of tourists, each with unique needs and preferences. The wine tourism sector, for example, tends to draw visitors who prefer luxury services and travel by car. In contrast, tourists from the UK, Benelux, and other areas may be more inclined towards sustainable transport options and outdoor activities like cycling and hiking. However, there is currently a lack of services to accompany foreign tourists, such as guides and multilingual support. Navigating the varied preferences of tourists and promoting more sustainable tourism practices presents a complex challenge for the region.

Opportunities

During the session, participants were encouraged to explore potential opportunities to address the identified challenges.

Enhancing Accessibility and Connections

Participants identified ways to improve access to nature and tourist sites. They proposed a comprehensive public transport network connecting key attractions like Hautvillers and Verzy. Additionally, participants suggested improving the public transport system,

particularly the Ligne des Bulles, by raising awareness through targeted communication aimed at visitors. They recommended adjusting timetables to better align with tourist schedules for added convenience. Other suggestions included shuttle services or on-demand transport to connect stations with tourist sites. They also stressed investing in safe cycling infrastructure and well-connected routes to promote sustainable transport, such as the Marne Valley cycle route. There is also a possibility to focus on integrating train and bike options. Effective communication campaigns are emphasised as a strategy to promote these service options.

Managing Visitor Numbers and Seasonal Tourism

Participants discussed various strategies for managing visitor numbers at popular locations and tackling the issues of seasonal tourism in the area. One suggested approach was to enhance facilities at busy sites like Verzy National Forest to accommodate visitors and locals better while protecting the environment; here lies an opportunity to use nudging. Furthermore, participants advised promoting lesser-known attractions and spreading tourist traffic more evenly throughout the region, such as on the western side of the park, to alleviate pressure on popular locations. Another proposed strategy was to organise seasonal events and activities to draw visitors during off-peak periods, thereby extending the tourism season and reducing overcrowding.

Promotion of "nature" tourism

Promotion of "nature" tourism and targeting national and international tourists, particularly from the UK and Benelux, presents significant opportunities for the region. While wine tourism has been developing for several years, there is a growing need to improve communication around the "nature" destination to attract tourists and locals who are more sensitive to soft and sustainable mobility, for example, walkers and sports enthusiasts (e.g. mountain bikers, track and field runners, hikers). This includes promoting multimodal transport options and providing comprehensive information on cycling routes, bike rentals, and eco-friendly accommodations. However, there is currently a lack of services to accompany foreign tourists, such as guides and multilingual support, which needs to be addressed. Offering bilingual communication and tailored services can enhance the experience for international visitors.

10.5 Summary of findings

- **Parc Naturel Regional Montagne de Reims** is located in the Grand Est region, Marne department, spanning 533 km² with 60+ municipalities and 35,000 inhabitants. It is known for its UNESCO-listed Champagne vineyards and iconic landmarks and hosts several cultural and natural UNESCO heritage sites.
- **Natural and cultural highlights** include three exceptional forests, the Marne River, extensive trails for hiking and cycling, vineyards and related oenotourism and cultural events and festivals such as "Lire Perché dans L'arbre."

- The park attracts a **wide array of visitors,** including i**nternational visitors**, attracted by Champagne vineyards and landscapes, **national visitors,** including families and people who use trails for hiking and cycling to enjoy nature, **local residents**, who utilise the park for day trips and community events, and **seasonal participants** in events like wine festivals and sports competitions.
- The park attracts a **substantial number of visitors**; however, no comprehensive estimate of total visitation is available. A key site, Verzy Forest, recorded 266,700 visitors in 2019. Additionally, approximately 80 **sporting events** are held annually, drawing a combined total of 20,000 participants. These events contribute to **seasonal surges** in visitor numbers, leading to **crowding** and placing significant **strain** on the park's facilities.
- Most visitors rely on car use to access the park.
    - The park is well-connected by regional highways (e.g. D951), providing **car accessibility** to a wide region around the park.
    - **Public transport** accessibility is provided via the regional rail network "Ligne des Bulles", with four stations linking key sites and villages, promoting sustainable tourism. However, the connections (including last-mile) and scheduling are not optimal aligned with visitors' needs.
    - There are also **15 carpooling sites** near regional railway stations, providing opportunities to combine car use and public transport.
    - There are **extensive cycling routes** that connect cultural and natural heritage sites, but dedicated cycling infrastructure is limited on many parts of these routes.
    - Extensive **walking routes** enable visitors to explore different sites of the park's interior.
- **The main challenges** are **poor 'last-mile'** connectivity from train stations to attractions, **seasonal overcrowding**, leading to environmental strain at popular sites, **limited sustainable transport** infrastructure (e.g., safe cycling routes), and conflicting tourist needs (luxury wine tourists vs. eco-tourists).
- **Opportunities** to handle these challenges include **improvements in accessibility** by enhancing public transport connectivity (shuttle services, improved timetables) and promoting cycling and multimodal integration; **visitor flow management**, focusing on a better distribution of visitors from hotspots to lesser-known areas and extending the tourism season and upgrading facilities at the hotspots; and **nature tourism promotion**, targeting eco-conscious travellers with sustainable mobility options and improving communication for international visitors.

11. Conclusions and recommendations

This report presented the results of the general inventory of the eight nature areas that are part of the MONA project. The aim was to provide a shared understanding of the current challenges regarding sustainable visitor flows in nature areas and opportunities to improve the current status quo. This provides the groundwork for the development of effective strategies to achieve more sustainable tourism flows in and around these areas, which benefits not only nature but also the local environment, visitors and residents.

For each nature park, the report describes the main characteristics and attractions, the visitor profiles and modal choices, the level of multimodal accessibility and the challenges and opportunities regarding visitor flows and the carrying capacity. This information was collected via a combination of methods, including literature research, GIS-based accessibility analysis and inventory sessions and workshops with relevant stakeholders. The main findings for each park are summarised in the dedicated chapters. In this final chapter, we take a closer look at the similarities and differences in the challenges and solutions of the nature parks and define the implications for the next phases of the MONA project.

11.1 Overall conclusions for the MONA nature parks

More than just nature parks

The MONA project includes a wide variety of nature parks in different forms and sizes, including unique forests, ecology and nature landscapes. Many parks combine these natural assets with other distinctive features ranging from UNESCO Heritage sites to cultural landmarks and recreational facilities and catering. Some parks also include vast areas with urban and agricultural functions. In other words, they are much more than 'just' a nature park and also hold responsibility for unique ecological and cultural assets and recreation facilities. Balancing the interests of stakeholders and the different types of visitors, with sometimes conflicting needs, provides a challenge for many of the parks involved.

Visitor profiles

Due to the mix of functions, the parks attract a wide array of visitors, including, amongst others, eco-tourists, families, cultural enthusiasts and local recreational users. Depending on the types of attractions in the specific parks, the composition of the visitors differs. Walking is the most conducted activity in all parks. Often this is combined with enjoying nature and a visit to catering to eat and have a drink. In many parks, most visitors originate from municipalities and cities that are in close proximity. Nevertheless, a common challenge in all parks is the excessive car use among visitors. This creates congestion and parking issues and negatively influences the quality of natural and

cultural resources in the park due to pollution, environmental degradation and unsafety. This creates an interesting paradox: nature lovers often rely on cars to access nature parks, ironically harming the ecosystems they cherish and want to protect.

Multimodal accessibility

The extensive car use can at least partially be attributed to car dependency: for many visitors, distances are simply too long for walking and cycling, and public transport provision does not provide a reasonable alternative. Compared to accessibility provided by the car system, accessibility provided by public transport is much more selective and limited to the areas around strong public transport axis. Key issues relate to insufficient frequencies and inconvenient scheduling, especially during weekends and inadequate integration of public transport and cycling facilities, leading to suboptimal last-mile connectivity. But even if the public transport system would be dramatically improved, it would still only provide an alternative to a selective part of the visitors. As many visitors originate from areas in relatively close proximity to the nature parks, promoting cycling (in combination with public transport) seems just as promising.

Remarkable similarities regarding opportunities and challenges

Despite their differences in size and character, the challenges and opportunities identified for the nature parks are strikingly similar.

With regard to the **challenges**:

- Most parks face **overcrowding** during peak hours and at particular hotspots, leading to parking problems, congestion, ecological deterioration, conflicts between users and a strain on facilities.
- These challenges are exaggerated due to **car dependency** and a lack of viable sustainable transport options.
- **Visitor behaviour** frequently exacerbates the impact on sensitive ecosystems through actions like littering and straying off designated paths, which results in the trampling of delicate habitats.
- Many parks face challenges in aligning diverse **stakeholder interests**, especially when balancing the complex combination of recreational, cultural, ecological or tourism objectives.
- In addition, parks close to the border, such as Kalmthoutse Heide and Scarpe-Escaut, face specific challenges regarding **cross-border management** in managing accessibility and continuity of routes on both sides of the border.

For the **opportunities**:

- **More targeted visitor management** is considered to improve the distribution of visitors to ease the pressure on hotspots. This can be achieved by zoning, digital tools and developing and improving alternative areas and entry points. For the

latter, an attractive alternative, offering a well-designed route through an attractive environment, could suffice to redirect visitors. Dedicated monitoring and **data collection** could be used to support informed decision-making.

- Improving and promoting **sustainable mobility initiatives** is important to reduce car dependency. Many parks put emphasis on the improvement of public transport provision by shuttle services and green bus stops, sometimes in combination with improving cycling facilities.
- Developing **educational and awareness campaigns** to raise awareness of the vulnerability of ecosystems and the importance of sustainable behaviour.
- Enhancing tourism offerings by **upgrading visitor facilities**, improving signage and improving communication by providing accurate information about accessibility, routes and services. To avoid conflicts between different users, facilities could be separated.
- Effective **stakeholder engagement** to develop a common understanding among municipalities, conservation groups and local businesses and shared visions for the sustainable tourism in the nature area.

11.2 Recommendations for the MONA project

Many parks combine natural assets with ecological, cultural assets and recreational facilities. **Balancing** the needs of different **stakeholders** can be a challenge due to conflicting interests. This is exacerbated by siloed working methods where individual organisations focus on their own mandates, driven by time, capacity, and budget. Without a collective goal, this limits integrated collaboration and makes it difficult to manage interests effectively. To address this challenge, stakeholders can organise **structural collaborations** through cross-organizational **programs**. Establishing a **platform** or organisation to facilitate this collaboration can contribute to a broader and more effective approach

The clear **similarities** regarding challenges and opportunities across MONA nature parks underscore the importance of **collaboration** in research and development initiatives like the MONA project. **Mutual learning** allows nature parks to build on one another's successes and learn from past mistakes. While the overarching goals of the parks are aligned, each park has a unique starting point and distinct approaches to achieving these goals. This diversity creates valuable opportunities to explore what works, what doesn't, and why.

Currently, mutual learning in MONA is concentrated within three pilot groups, focusing on modal shift (Pilot A), routing (Pilot B), and nudging (Pilot C). However, this inventory highlights that most parks are engaged with all these topics to varying degrees. The current allocation to pilot groups reflects each park's primary emphasis rather than exclusivity. This underscores the added value for a **broader framework** of mutual

learning beyond the pilot groups—something the MONA project could facilitate effectively.

By facilitating the **exchange** of lessons learned, innovations, and best practices across parks, individual parks can avoid reinventing the wheel and develop interventions informed by the experiences of others. For instance, many nature parks aim to improve **public transport provision**, which, while important, may only improve the accessibility to a limited portion of visitors due to the inaccessibility of many areas by public transport. Considering that many park visitors come from nearby areas, **promoting cycling** could be equally promising.

Efforts could focus on developing safe, comfortable **cycling infrastructure** and encouraging visitors to explore the parks by bike or use bicycles to reach entry points for hiking routes. This would require secure and convenient bicycle parking at entry points. Moreover, improving cycling facilities could address **first- and last-mile connections** to public transport, significantly extending the accessibility of transit stops. Dutch nature parks, with their extensive experience in developing bicycle infrastructure, could serve as a model for others. Conversely, other parks may provide valuable insights into enhancing public transport connections or conducting effective educational and awareness campaigns. **Mutual learning** across these areas will accelerate the transition toward more sustainable tourism in natural areas.

To ensure effective learning, it is essential to assess the success of interventions. This highlights the importance of **robust data collection and monitoring**. By standardising data collection practices and testing various monitoring methods to measure visitor numbers and flows, parks can evaluate the effectiveness of interventions, compare outcomes, and identify scalable solutions. This approach strengthens evidence-based decision-making and promotes continuous improvement. The upcoming activities for the monitoring framework (1.4) and visitor flow analyses (act. 1.8) will facilitate this process within the MONA project.

Finally, a significant difference among parks lies in their focus on **inclusivity**. Experiencing nature is vital for well-being and can be especially meaningful for individuals with disabilities. Beyond general measures and ambitions, parks must prioritise accessibility to ensure that all visitors, regardless of physical ability, can enjoy these natural spaces.

This report serves as a **stepping stone** for mutual learning, offering a comprehensive and accessible overview of the current challenges and ambitions of individual parks. In the upcoming years, the MONA framework will facilitate this process. To achieve lasting impact, it is important that ongoing initiatives and processes will continue as part of a collective and sustainable strategy. By joining forces, we can break the **paradox** of nature conservation and tourism, creating a future where people can enjoy nature sustainably while preserving the ecosystems we all treasure.

Activity 1.2 General inventory of nature areas

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