

Appendix A - Interviews

This appendix contains the informed consent form and summaries of the three interviews conducted as part of this research. These interviews provided valuable insights from key stakeholders involved in the planning and execution of major events, with a specific focus on traffic management, accessibility, and security measures. The perspectives shared by the interviewees helped to deepen the understanding of the complexities involved in organizing events of the scale of the NATO Summit 2025. The summaries presented here capture the main points discussed and highlight the practical implications of their expertise.

A1 - Informed consent

Name student	Koen van den Berg, Lotte Westrik Broeksma, Maryvonne Marang
Student ID	4968530, 5109477, 5172470
Research title	Impact explorer accessibility NATO summit
A description of the data that will be collected:	
We have 3 different interviews: 1. For actor analysis 2. For data availability 3. The perspective of a citizen living in the area We have approached them for interview 1 and 2 through our contact person from the Municipality of The Hague. The 3 rd interview was through a personal contact from Maryvonne. All interviews will be conducted online, through a Microsoft Teams meeting.	
This is the opening of my interview that we will use	

You have been invited to participate in a study entitled Engineering and Policy Analysis (EPA). This research is carried out by Koen van den Berg, Lotte Westrik Broeksma and Maryvonne Marang in the context of the course Societal Challenge Project as part of our master's program at TU Delft.

This interview's purpose is [to get a general overview of the actors concerning the case / to get a general overview of the data available and the data collection methods / to get a general citizen's perspective on the traffic around the NATO Summit]. It will take you approximately 60 minutes to complete.

Your participation in this study is completely voluntary and you may withdraw at any moment.

We believe that there are no known risks associated with this research study; however, as with any online-related activity, the risk of a breach is always possible. Your answers in this survey will remain confidential as much as possible and will only be processed anonymously.

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We confirm that the risk of the study is minimal, i.e. the answers to all questions in Table 1 are "no" (see [History of Human Research Ethics: a short introduction - YouTube](#)):

Date:
16-12-2024

Signature:

Koen van den Berg
Lotte Westrik Broeksma
Maryvonne Marang

Table 1. Potential risks

Potential Risk	Yes	No
1. Does the study involve participants who are particularly vulnerable or unable to give informed consent? (e.g., children, people with learning difficulties, patients, people receiving counselling, people living in care or nursing homes, people recruited through self-help groups).		X
2. Are the participants, outside the context of the research, in a dependent or subordinate position to the investigator (such as their children or own students)?[1]		X
3. Will it be necessary for participants to take part in the study without their knowledge and consent at the time? (e.g., covert observation of people in non-public places).		X
4. Will the study involve actively deceiving the participants? (For example, will participants be deliberately falsely informed, will information be withheld from them or will they be misled in such a way that they are likely to object or show unease when debriefed about the study).		X
5. Will the study involve discussion or collection of personal sensitive data (e.g., financial data, location data, data relating to children or other vulnerable groups)? Definitions of sensitive personal data and special cases are provided on the TUD Privacy Team website .		X
6. Will drugs, placebos, or other substances (e.g., drinks, foods, food or drink constituents, dietary supplements) be administered to the study participants? <i>If yes see here to determine whether medical ethical approval is required</i>		X
7. Will blood or tissue samples be obtained from participants? <i>If yes see here to determine whether medical ethical approval is required</i>		X
8. Is pain or more than mild discomfort likely to result from the study?		X
9. Does the study risk causing psychological stress or anxiety or other harm or negative consequences beyond that normally encountered by the participants in their lives outside research?		X
10. Will you be offering any financial, or other, inducement (such as reasonable expenses and compensation for time) to participants?		X

[1] **Important note concerning questions 1 and 2.** Some intended studies involve research subjects who are particularly vulnerable or unable to give informed consent. This includes research involving participants who are in a dependent or unequal relationship with the researcher or research supervisor (e.g., the researcher's or research supervisor's students or staff). If your study involves such participants, it is essential that you safeguard against possible adverse consequences of this situation (e.g., allowing a student's failure to complete their participation to your satisfaction to affect your evaluation of their coursework). This can be achieved by ensuring that participants remain anonymous to the individuals concerned (e.g., you do not seek names of students taking part in your study). Please ensure that you include such risks – and how you will mitigate against them in your risk section.

A2 - Interview summary

Rinaldo de Lange and Bart de Haan - NATO summit planners

The first interview that was held was with Rinaldo de Lange and Bart de Haan, key figures in the planning process of the NATO summit of 2025. They provided insights into the extensive preparation required to host such a high-profile event. Central to the planning is the understanding that the summit itself is relatively straightforward in terms of logistics. Extensive analyses and prior experience have already provided clear insights into how traffic and security will operate during the event. However, what truly intrigues the planners is the period leading up to and following the summit. These months are seen as critical for exploring how The Hague can maintain accessibility while managing the complex preparations and aftermath of such a large-scale event. This extended timeline offers a unique opportunity to refine strategies for road closures, diversions, and public engagement, ensuring the city remains functional and livable throughout.

The groundwork for traffic management is already underway, involving experienced consultancy firms and market players who bring a wealth of expertise. Drawing on lessons from previous large-scale events in the region, the planners are crafting strategies that minimize disruption while maintaining efficiency. Months before the summit begins, major road closures and diversions will be implemented. Johan de Wittlaan, a key thoroughfare, will close early to facilitate the construction of temporary structures near the World Forum, the summit's central venue. Modifications to other streets, such as making the roads one way, aim to improve traffic flow and enhance safety. Navigation systems will also play a role, with certain streets blocked to deter unauthorized use, while electronic boards provide real-time updates on travel times and alternative routes.

Security is central to the summit's planning. During the event, a secure perimeter will restrict access to authorized personnel and residents, with ID checks enforced at entry points. Public transport will generally operate as usual during the preparation and teardown phases, but adjustments, such as rerouting tram line 1, will be made during the summit itself. VIP convoys will require temporary road closures coordinated by traffic marshals.

A broad coalition of stakeholders ensures the seamless integration of traffic and security measures. The Ministry of Foreign Affairs, the National Coordinator for Counterterrorism and Security (NCTV), and the Royal Netherlands Marechaussee oversee the event's security. Simultaneously, Rijkswaterstaat and The Hague Municipality collaborate on mobility and accessibility, balancing national priorities with local interests. While community engagement has been limited due to the technical nature of the planning, input from residents and neighborhood representatives is considered where possible. However, decisions primarily rely on specialized expertise to address the summit's unique demands. Protests and potential disruptions are being addressed proactively. Designated zones for demonstrations will be established in collaboration with local police and security services to ensure safety and maintain order.

To minimize the summit's impact on daily life in The Hague, detailed measures are being taken to reduce noise, emissions, and congestion. Diversion routes have been carefully designed to avoid residential areas, maintaining livability in the city. These strategies account for the extended nature of the summit, which requires a more sustainable approach than shorter events like Prinsjesdag or President Obama's visit, where disruptions were brief and manageable.

Ultimately, the success of the NATO Summit 2025 hinges on precise coordination and adaptability. The extended focus on the months surrounding the event, paired with collaborative efforts and strategic planning, underscores The Hague's readiness to host one of the most significant international events in its history.

Wouter schijns - Mobility data analyst and operational traffic engineer

Wouter Schijns works in the Accessibility and Traffic Management division under DSB. His responsibilities include managing the city's traffic control center, overseeing processes related to traffic signals, traffic cameras, and dynamic route information panels for redirection, as well as managing the data processes associated with traffic management. While Wouter is not directly responsible for traffic models, he works closely with teams that develop and use these models and utilizes their insights for more efficient traffic operations.

During the interview, Wouter explained that the traffic models used within The Hague are managed by the team mobility data, a part of DSO. These models are static and focus on linking demand and supply by using matrices or origins and destinations to calculate route choices. They primarily focus on optimizing traffic signals, assessing the impact on public transport, and analyzing effects such as queue formation and harmonica effects (traffic compression and expansion). While these models can be valuable, they often lack the granularity to accurately capture resistances in network-wide traffic flows, which means that factors like shortcut traffic caused by navigation systems are sometimes underestimated. Collaboration with external parties for traffic research is common, with DSB sending requests to team mobility under DSO, which operates project-based. DSB provides program guidelines for such projects and verifies the outputs delivered by external contractors. Although DSB could theoretically perform some of these tasks independently, it would require significant time and resources.

One of the models Wouter discussed is the metropolitan model managed by DSO, which covers The Hague, Rotterdam and surrounding areas. This model has been continuously developed over the past 20 years and continues to expand. While comprehensive, its large scale introduces limitations, as cities like The Hague and Rotterdam have different traffic management needs. Additionally, the model currently lacks a full integration of car traffic and public transport data, although there is interest in improving this in the future.

Wouter highlighted efforts to collaborate with navigation systems to improve traffic management, such as redirecting traffic and enforcing detours. Upcoming European regulations, expected within two years, will require navigation service providers to integrate municipal data such as environmental zones, school zones, and neighborhood-specific restrictions. Tools like geofencing could be used to preemptively inform drivers of closures or restrictions, enabling them to adapt their routes earlier. For example, drivers could receive in-car notifications from municipal systems, independent of platforms like Google Maps. However, implementing such systems is expensive and requires careful planning. Driver behaviour is another important factor in traffic management. Wouter noted that drivers are habitual and tend to stick to familiar routes, even in the face of closures, until their behaviour is forced to change. The first week of a road closure is particularly critical for influencing behaviour and redirecting traffic effectively.

Wouter also addressed the challenges posed by the upcoming NATO Summit, in which he is involved. He explained that security considerations take priority, followed by ensuring public transport and emergency routes remain operational. Any remaining road capacity is allocated to residents and detour routes. Many decisions regarding the summit, such as which roads will be closed and for how long, remain uncertain, increasing the risk of complications. This high-profile event, which will draw international attention, coincides with the summer period, a time of high traffic in areas like Scheveningen, and overlaps with planned maintenance, including the closure of the Hubertus Tunnel. Strategies to mitigate traffic disruptions during the summit include evenly distributing accessibility across the city, communicating detours early to divert traffic before it enters the city, and minimizing the impact on surrounding neighborhoods. Despite these efforts, Wouter acknowledged that traffic jams during such events are inevitable.

Finally, Wouter discussed tools like Cecel programs (used for intersection management) and CCOL-VISSIM models (used for traffic simulations) as opportunities for further optimization. Discussions about incorporating data for bicycles and alternative mobility modes have also begun, although these efforts are still in their early stages.

Harco de Jager - Digital Twin expert

Harco de Jager is an expert on the digital twin (Digitale Spiegelstad) of The Hague and actively contributes to its development. The digital twin integrates diverse urban data, enabling simulations and supporting decision-making across various city domains, including traffic management, urban planning, and environmental initiatives. During the interview, Harco provided detailed feedback on the presented product, highlighting areas for improvement and alignment with the goals of the digital twin.

Harco encouraged incorporating dynamic 3D visualizations to display routes in real time, including vehicles departing and arriving at specific points, as well as making individual vehicle routes clickable for closer tracking. The inclusion of a dashboard that combines these features would enhance the accessibility and usability of the product, allowing a broader range of stakeholders to derive actionable insights.

In discussing the reliance on external contractors, Harco observed that municipalities often depend heavily on third parties for technical tasks. While this approach is convenient, it creates ongoing reliance, as contractors retain proprietary control over the models, necessitating repeated external engagement for updates. Harco advocated for greater in-house expertise to reduce costs, retain critical knowledge, and maintain control over technical processes. He acknowledged that while outsourcing is currently the standard, investing in internal capabilities could lead to significant long-term efficiency gains.

The digital twin itself serves as a powerful tool for urban management, transforming raw data into actionable insights through advanced modeling and visualization. Harco explained that it is designed to make urban data accessible to a wide range of stakeholders, supporting applications such as traffic and mobility management, environmental planning, and resource optimization. For example, the platform can simulate the impact of minimal adjustments to underground infrastructure, such as pipelines and cables, on urban greening efforts like cooling heat islands with greenery. It also facilitates comprehensive urban planning by tracking long-term developments, from the design phase through decades of implementation and maintenance. By efficiently reusing data, the digital twin ensures continuity between initial designs and completed projects, preserving critical information about design intent, implementation timelines, and infrastructure replacements for future use.

Harco is currently working on dashboards that provide insights into neighborhood livability by combining physical, social, and safety indicators. These dashboards integrate objective data from official sources with subjective input from resident surveys to create a holistic view of neighborhood conditions. The goal is to make this information accessible to stakeholders and residents alike, promoting transparency and informed decision-making. Harco highlighted the importance of engaging with the public and incorporating their feedback into urban development projects. Neighborhood councils and working groups collaborate with the municipality on themes such as mobility, crime, and environmental concerns, ensuring that decisions are data-driven and aligned with public needs. While Harco has not directly participated in these engagements, he recognizes their value in fostering collaboration and maintaining transparency, even when opinions within the community differ.

The digital twin is already being applied to several projects, such as the Piet Heinplein, transitioning from design to management phases while integrating multiple urban systems. Harco noted the importance of showcasing these applications to other city departments to demonstrate the platform's capabilities and encourage its broader adoption. While the digital twin is functional and actively used, it remains a work in progress, with significant potential for future development. Harco envisions incorporating advanced interactive features such as augmented reality (AR) and virtual reality (VR) for urban planning. Although current tools like artist impressions of new buildings meet existing needs, AR and VR could provide added value in the long term. The twin's ability to centralize data,

enable simulations, and visualize results makes it a transformative tool for The Hague's urban planning and operations, with the potential to shape the city's future in a transparent, data-driven, and participatory manner.