

USING CITIZEN PARTICIPATION METHODS TO IDENTIFY STRATEGIES FOR INCREASED ACTIVE MOBILITY - CASE ELGESETER STREET OF TRONDHEIM

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ABSTRACT

Public participation adds more information to the decision-making process, such as scientific or technical knowledge, knowledge of the context in which decisions are implemented, history, and personalities. Citizen participation is an important criterion for sustainable urban transportation planning. Citizens should be able to express their concerns and opinions while also contributing creative and innovative transportation solutions. As a result, the study's goal was to determine what types of mobility solutions are required to make the case area more adaptable to green micro mobility by using citizen participation methods. The primary methodology for this study is a digital survey that was created in the Nettskjema platform in both Norwegian and English. It started with a brief description of the case study and the study's objectives. The investigation is being carried out in response to the following research question: *"What types of participation methods/strategies are required to ensure that "all" needs are met in the transformation of the urban development area?"* Quantitative and qualitative results are the two perspectives from which the results are presented. Based on the findings, stakeholder engagement activities that were expertly moderated cultivated goodwill and trust. This made it possible for interested parties to offer their invaluable expertise to help the city's traffic and mobility policy. The study advances our knowledge of the variables affecting commuters' desire to participate in mobility-related projects.

KEYWORDS _ *Citizen participation, Active mobility, Mobility-related projects*

Introduction

In most democratic societies, public participation is a well-accepted requirement of transportation planning, and it is generally required at all levels: local, regional, state, and national (McAndrews & Marcus, 2015). Public participation in transportation planning is an attempt to give citizens a direct voice in public decision-making. Participation in shared goals enriches the planning, implementation, operation, and management processes (Khisty, 2000). Genuine public involvement entails bringing people into the planning process—at the very least, reviewing existing conditions, analysing challenges, and reviewing draft concepts (Hügel & Davies, 2020).

Elgeseter street is a city street in Trondheim that connects Professor Brochs gate in the south to Klostergata in the north. The road is a continuation of the major route that runs south from the city centre. In this study, the term Elgeseter district refers to the area surrounding Elgeseter gate. The case study area is depicted in Figure 1, which includes the Elgeseter gate, the surrounding region, and the - connecting roadways.

The study's goal was to determine what types of mobility solutions are required to make the case area more adaptable to green micro mobility by using citizen participation methods. The research project is being done in response to the following question: What types of participation methods/strategies are required to ensure that "all" needs are met in the transformation of the urban development area?



Figure 1: The focus area of the case study

THEORETICAL BACKGROUND

Cities must deal with issues such as traffic congestion, air pollution, car accidents, and urban sprawl as the world's population grows rapidly. Walking and cycling are non-motorized modes of transportation that require minimal infrastructure and do not rely on fossil fuel energy. They are easily adaptable and inexpensive to maintain in comparison to motorized modes, which benefit both users and governments (Afshari et al., 2023). In order to create effective and equitable transportation networks and to make the transition to more sustainable communities, active mobility, also known as non-motorized mobility, is crucial for most cities (Victoria Transport Policy Institute, 2016). In

many cities today, development and increasing the population and job areas in an area that was constructed more than 50 years ago are growing challenges. More people mean more pressure on the existing roads and more conflicts between cars, buses, lorries, pedestrians, and people who walk in urban development areas.

One of the most significant streets in Trondheim, Elgeseter district, faces issues like increased traffic, toxic pollutants, and noise pollution. The majority of these issues can be resolved with more active mobility in the area (Afshari et al., 2023). Cycling and walking are two forms of active transportation that can help you get your recommended daily allowance of exercise. Since almost every city in the world is eager to address these issues, it is a challenge to encourage people to engage in more active mobility because doing so will require comprehensive planning strategies that cover everything from land use to municipal infrastructure design (Afshari, 2022).

Increased population in cities implies increased infrastructure, basic services, transportation, employment, housing, and other resources that allow them to improve their quality of life, necessitating a change in conventional urban planning models that are insufficient to meet the new demands. The 21st century planning cities processes tend to take an inclusive approach, with citizen participation taking a special interest; thus, it contributes to the goal of obtaining receptive cities that are focused on the citizen. In terms of mobility, the traditional mobility planning approach has shifted toward sustainable smart mobility in order to ensure the participation of all social groups while reducing the effects of transportation such as energy consumption, CO2 emissions, air quality, wasted street space, and public health impact (Liseth et al., 2021). Even though the importance of citizen involvement in enhancing transportation systems has gained more recognition in recent years, it still largely revolves around rituals (Sagaris, 2014).

Citizens can change mobility patterns in their cities, promoting active mobility and demanding changes, as evidenced by various global experiences. As a result, citizen empowerment enables them to actively participate in long-term and equitable projects, facilitating political changes in their favor to improve their quality of life (Moscoso et al., 2020). As a consequence, a citizenry transition from being an observer of their reality to an active and committed citizenry that participates in their city's change processes is required (Salazar, 2019).

RESEARCH DESIGN

When the goal is to find patterns, hypotheses, or ideas that can be tested and will serve as the foundation for future research, an exploratory research design is usually recommended. Case studies, surveys, observation, and reviews of previous related studies and data are typical research techniques. The data on which this paper is based was collected between February and May of 2022. Other aspects of the case study research have been presented in papers: "Identifying methods and tools toward more active mobility - Case Elgeseter gate", "Identifying Methods and Tools Toward More People-Friendly Environment - A Scoping Review" and "Developing approaches and strategies to promote increased active mobility in urban city neighbourhood".

METHODOLOGY

Digital surveys are currently one of the most widely used methods for gathering data. This can be explained in part by its low cost and ability to quickly and efficiently collect massive amounts of data. Digital surveys can be completed and processed quickly, and they can be distributed to a large number of people in a variety of locations and locations geographically (Digital Survey Research, Retrieved 2022).

Survey procedure

The digital survey for this study was created in Nettskjema, as well as in Norwegian and English, and it began with a brief overview of the case study and the goal of the research. There were 14 total questions, three of which were optional. Seven of them were radio button questions, three were checkbox questions, two were matrix questions with radio buttons, and two were open questions.

On April 1st, the authors opened the survey form and shared the link with those who live or commute through Elgeseter street. On the same day, the link was also shared in Trondheim student and resident Facebook groups, as well as on the LinkedIn platform. By the end of the fourth of April, 89 responses had been received. On April 5th, the link was shared on several other social media platforms, and 18 new answers were added.

Following that, one of the authors prepared a paper with a brief description of the study goal and the QR code, which she distributed to some students in Gløshaugen, some pedestrians in Elgeseter street, one hair salon in Elgeseter street, and she also placed it in the post boxes of some of the houses in Elgeseter street. By the end of April 18th, 116 more responses had been received. The papers were then placed on several bikes parked in Gløshaugen, and she distributed them once more to students and Elgeseter street pedestrians. As a result, by the end of April, a total of 283 responses had been received. The author closed the survey form on May 13th.

Survey analysing

The analysis of the survey began with exporting all of the data to an excel file. After that, the data cleansing procedure was started. Each question (both the Norwegian and English versions) was exported into a single excel sheet, and all Norwegian terms in the responses were converted into English so that all responses were in English. The questions were then organized into groups, and graphs were created based on their content and relationship to the other questions. To best display the results, the charts were created in the 2-D column, 3-D pie, and Doughnut formats.

Because many of the respondents wrote several comments in open questions about the motivators for increasing walkability and bikeability in the area, the barriers in the Elgeseter district, and their experiences with the topic, the digital survey for this study was not only quantitative, but also qualitative. As a result, the data was added to and analyzed alongside the survey results.

Objectivity, Reliability, and Validity

The presence of bias could explain the objectivity of the digital survey used in this study. This survey was considered objective because it was anonymized and had a lower risk of bias. It is considered reliable because 283 people responded to the survey, which is a large number for this study. It is also considered valid because all of the rules and procedures were strictly followed during the development of questions, distribution to the appropriate people, and analysis of the questions.

One possibility that can always happen during data collection in a survey is the difficulty in understanding whether the responses read the questions and answered them with a high concentration or not. However, this possibility has a low likelihood of happening in this particular survey based on the substantial amount of comments that the respondents made.

RESULTS

This section presents the results of the online survey. A total of 283 responses were received, as seen in table 1, with 102 people responding in English and 181 in Norwegian.

Table 1: Total number of responses

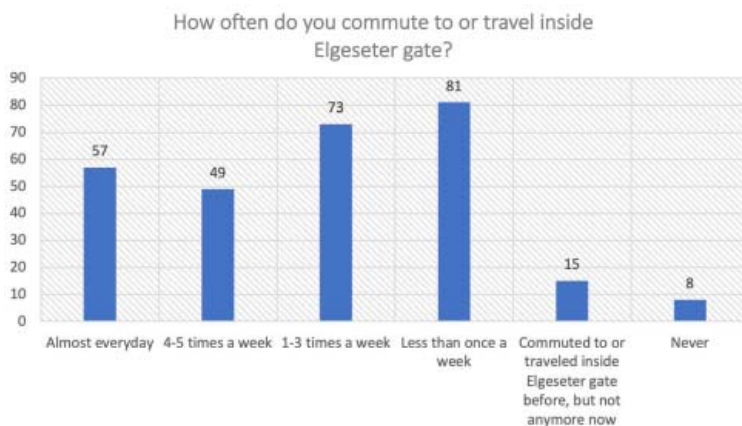
Reply	Number	Percent
English	102	36%
Norsk (Norwegian)	181	64%

Quantitative results

One of the most important aspects was determining where the respondents lived and how close they were to the target region of the case study. According to Figure 2, 222 of the 283 respondents live within a four-kilometer radius of the Elgeseter street.

**Figure 2:** Living area

To find out how many of the participants are familiar with the area and how their experience there was, as well as the mode of transportation they use and why they use it, it was also asked of the participants how frequently they commute to or pass through Elgeseter street. Only 8 of the 283 respondents had never been there, as shown in Figure 3, while 179 commuted in the area at least once to three times per week.

**Figure 3:** Elgeseter Street commuters' frequency of travel

The percentage of respondents who choose walking as their primary mode of transportation is shown in Figure 4, while their behaviour at Elgeseter street is shown in Figure 5. This section's interesting finding is that 51% of participants frequently walk to their destinations, but when asked about Elgeseter street, that number drops to just 29%, and 10% never prefer to walk there, suggesting that even people who can be considered active pedestrians are unwilling to walk in Elgeseter gate due to the barriers there.



Figure 4: Walking as the primary mode of transportation; **Figure 5:** Walking through the Elgeseter street

The biking situation in the Elgeseter district is examined in the same way that the preceding paragraph examined walking. Figure 6 displays the proportion of survey participants who selected bicycles as their main mode of transportation, while Figure 7 illustrates how respondents' actions change when they choose to bicycle at the Elgeseter street. The main finding of this section is that nearly half of respondents (48%) never prefer to bike in the area, indicating that the area is not pleasant enough for bikers. However, when participants were asked about Elgeseter street, this number dropped to just 13 percent and approximately 48 percent never frequently bike to their destinations.

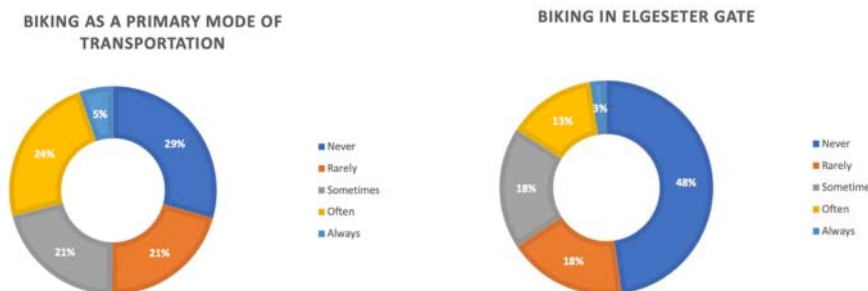


Figure 6: Biking as the primary mode of transportation; **Figure 7:** Biking through the Elgeseter street

Combining quantitative and qualitative findings

It was intriguing to learn the motivations behind local residents' commutes. It was interesting to observe that most respondents, or about 19%, just use Elgeseter gate as a shortcut to the other side of town. Additionally, 18% of the population travels by road to attend college, and 17% go shopping nearby. 16 percent of the respondents were regional residents who used the road to get to their homes. In the Elgeseter region, about 4% of respondents mention various travel-related reasons, with visits to St. Olav Hospital, attendance at Studentsamfundet events, visiting family members, going to restaurants and cafés, and using the road to get to the bus stop being the most common. Further details on the causes are shown in Figure 8.

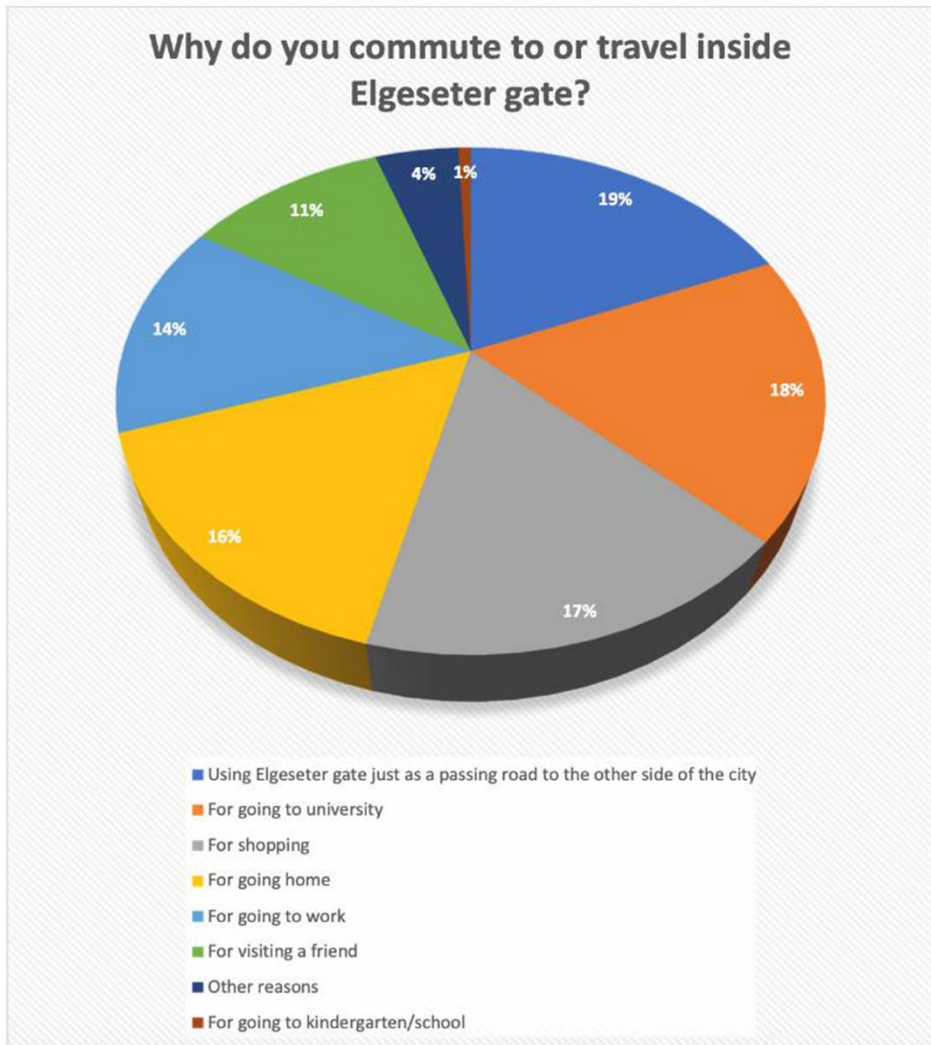


Figure 8: The reason for commuting to or traveling through Elgeseter street

Since the main objective of this paper is to identify methods that might persuade people to walk and cycle more in the neighbourhood, one of the most important questions answered in this survey was about active mobility motivators. Figure 9 demonstrates that, according to 15% of commuters, having more trees and green spaces like parks was the most alluring feature. The provision of adequate bicycle facilities and enhancing the quality of the sidewalks were the next two significant drivers, accounting for 12 percent and 11 percent of the total. Another significant factor was the development of specific pocket parks alongside the roadway and the existence of routes with dedicated bike lanes, both of which received 10% responses.

The factors are detailed in Figure 10, and as you can see, 3% of the participants mentioned some additional motivators, including the implementation of bicycle tunnels with heaters, wider sidewalks free of snow in the winter, better facilitation at traffic lights and pedestrian crossings, the reduction of waiting times at intersections, cycle paths with pedestrian crossings, improved bus connections to various parts of the city, the presence of more restaurants and shops, and the use of parallel streets.

Other suggestions made by commuters include building a car tunnel beneath Elgeseter street, adding more bike parking spaces, painting buildings, maintaining the area's cleanliness, making sidewalks quieter by placing trees or other obstructions between them and the road or by extending the sidewalk away from it, adding nice cafés and other places to relax, and lowering traffic, noise, dust, and the number of vehicles on the road.

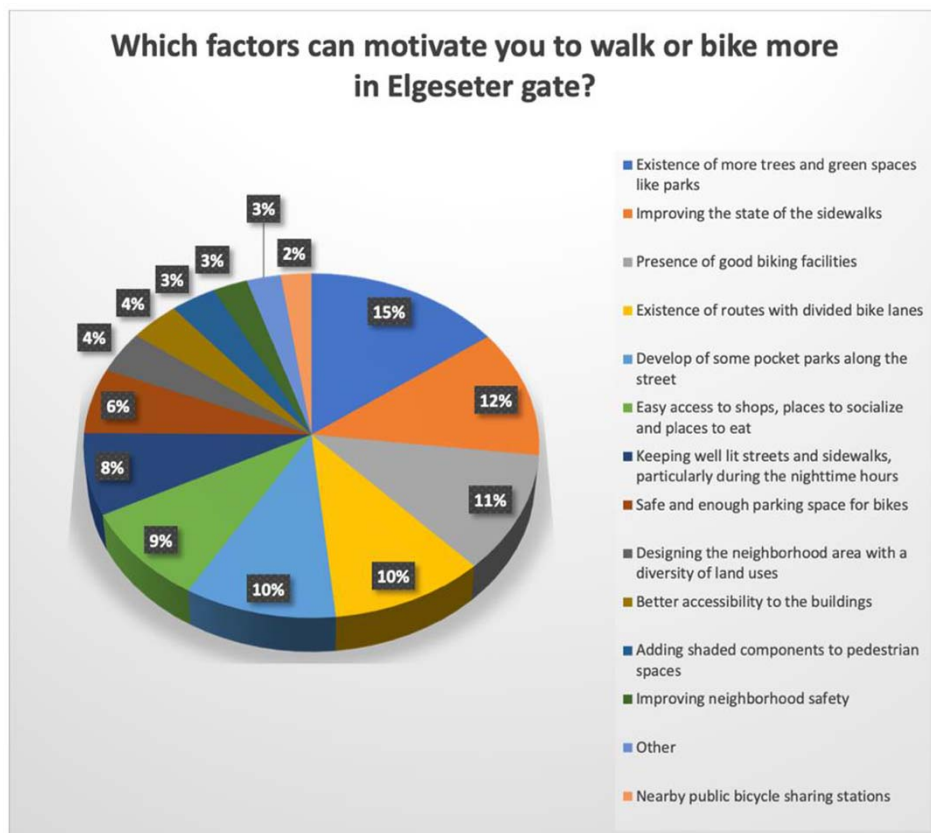


Figure 9: Motivators for active mobility

Finding the traits that lower commuters' motivation to walk and cycle in the Elgeseter district was another important goal of this paper. The most significant active mobility restrictions for commuters were weather (14%), sidewalk quality (12%), and noise or air pollution (15%), as shown in Figure 10. The lack of a separated cycle path and pedestrian route, long waits at pedestrian crossings, uninteresting spots for walking or bicycling due to existing buildings, and winter pedestrian maintenance are all seen as major obstacles in the Elgeseter district.

Figure 11 shows active mobility obstacles in greater detail. The lack of biking safety, the unpleasant environment brought on by all the traffic, including noise and dust, the absence of trees that could serve as visual barriers, inadequate lighting for bikes during the winter, and dirty and slick sidewalks during colder months are other factors that are mentioned by about 1% of respondents as lowering their motivation to walk and bike.

Furthermore, Elgeseter street is a busy thoroughfare on rainy days, and pedestrians may quickly get drenched because some of the walkways are too narrow. In general, the main issues are traffic, pollution (both noise and air pollution), a lack of cafes and enjoyable places to visit.

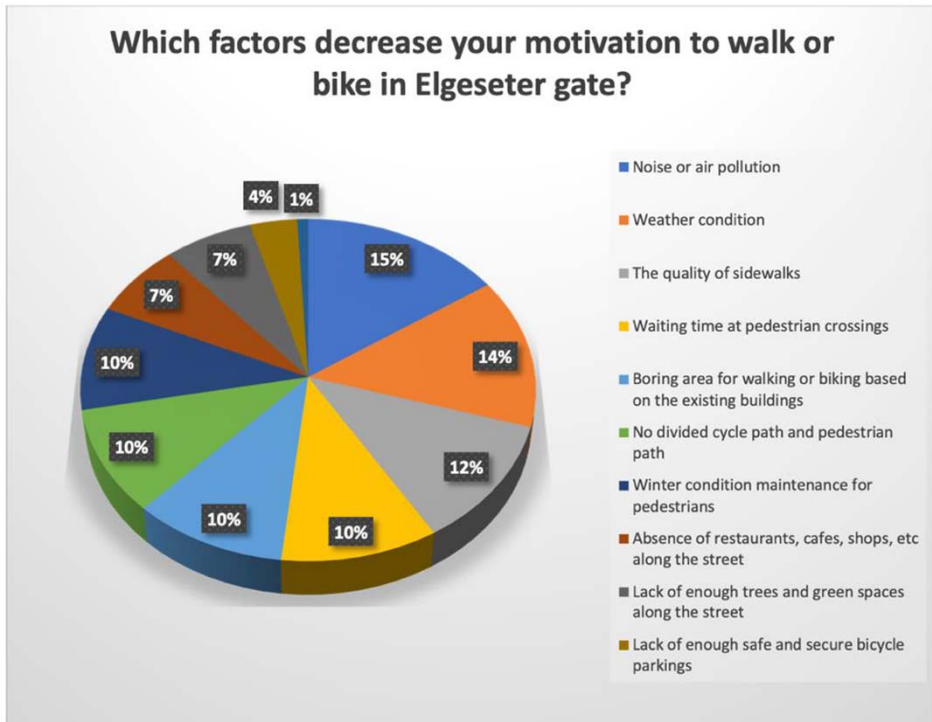


Figure 10: Barriers for active mobility

QUALITATIVE RESULTS

The participants were also asked two open-ended questions in addition to the previous sections. In response to the first question, which asked if there was anything in particular that they believed would make them more likely to bike or walk in the Elgeseter district if it changed, many responses were written, including:

- The need for numerous eateries, cafes, shops, greenery, parks, playgrounds, and benches;
- Making it simple to cross the street;
- Installing tree-shaded pathways;
- Creating a more accessible and well-maintained green space;
- Enabling more accessible and cost-free bicycle sharing;
- Putting safe bicycle parking along the road;
- Moving car traffic below ground level;
- Reducing the number of cars on the road;
- Ensuring that sidewalks and bicycle lanes are wide and pleasant enough to prevent conflicts between walkers and cyclists and being splashed by water when cars or buses pass through water at full speed on rainy days;
- Reduced wait times at crosswalks for pedestrians;
- More restaurants and shops, as well as green spaces, reading rooms, and study spaces;
- An automobile-only tunnel, free of pedestrians and bicycles;
- Prioritize bicycles and pedestrians at traffic lights over cars;
- Placing artwork or paintings on buildings;
- Designing the city to provide adequate lighting and noise reduction;

- Fewer cars mean more safety for bikers;
- A vibrant cityscape with a focus on smooth traffic boundaries and appropriate circumstances for work, cultural, and leisure activities;
- Less busy, more tranquil locations with trees and vegetation;
- Areas where you can walk without worrying that a car or a bike will hit you;
- Visible markings and a bike route that can be easily followed as far as is practical;
- Winter maintenance is essential.
- Better facilities for cyclists and pedestrians in comparison to cars. Or, to put it another way, the most practical option should be walking or cycling;
- Simpler building-to-building connections, such as skywalks;
- Slower traffic speeds;
- A distinct cycling infrastructure;
- Nice walkways that are well-maintained in the winter;
- Utilizing historic buildings in a novel way;
- Bike on a path or road that is reasonably clear of snow, ice, or gravel so that you won't slide and don't have to worry about falling into a hole in the ground.

The second open question asked respondents to describe what aspects of the places they visited inspired them to bike or walk, and they provided a variety of responses, including:

- Good bicycle lanes in Lade, Trondheim, with a lovely view and a green area;
- The High Line, an elevated park in New York City;
- Making certain underground passageways, which is a great choice for countries with harsh winters, like Finland, Canada, and the Netherlands;
- Bike lanes in Kristiansund, Norway with a nice view of the lake and forest next to the road;
- Clean streets, secure bike lanes, and a lot of greenery in Helsinki, Finland.

DISCUSSION AND CONCLUSION

Since the former railway line became a street in 1882, Elgeseter street has been an important entry point to the city centre. Elgeseter street is a historic and urban residential street that runs through one of Norway's most productive and inventive campus areas. Today, the road is old, noisy, and dusty, and because of the volume of traffic, it is regarded as a barrier for the area's soft road users. Increased active mobility in the region can help resolve some of these barriers (Afshari, 2022). Citizens can alter the mobility patterns in their cities, encouraging active mobility and demanding changes. Through public participation, more knowledge is added to the decision-making process, such as scientific or technical expertise, understanding of the context in which decisions are implemented, history, and personality traits. Citizen involvement is a critical criterion for sustainable urban transportation planning. Citizens should be able to voice their concerns and opinions, as well as contribute creative and innovative transportation solutions. As a result, The purpose of the study was to identify the types of mobility solutions needed to make the case area more adaptable to green micro mobility by using citizen participation techniques. The research project is being done in response to the following question: What types of participation methods/strategies are required to ensure that "all" needs are met in the transformation of the urban development area?

Involvement in decision-making with the intention of influencing the decision or decisions is a common definition of public participation. It is necessary to reconsider and redesign urban development plans with the help of citizen participation techniques in order to improve traffic flow by promoting and incorporating non-motorized, less-polluting modes of transportation like cycling and walking. Using citizen participation techniques reduces the likelihood of producing inferior designs. The likelihood that the project will succeed can therefore be increased by being aware of the community's needs and wants before beginning to plan the changes. It will be possible to design the transportation system

more effectively if a platform is created for those who typically do not have a voice, despite the fact that they are the main users of transport system.

According to Afshari, (2022) it's crucial to understand the area's function and, more importantly, the preferences of the local population for a better transportation system. In a corporate district, a residential neighbourhood, and a university campus, people have different mobility needs and expectations. Thus, this paper attempted to examine the issue from the perspective of citizens, with a particular emphasis on listening to Elgeseter district daily commuters to understand their needs, concerns, and desires for a better neighbourhood for active mobility.

According to Afshari et al., (2023) to provide an acceptable mobility solution and transportation network service and encourage people to use it, infrastructure and regulations must match the expectations of both current and future users. As a result, using participation methods and attempting to involve citizens in decision-making processes, as well as providing a forum for them to express and share their thoughts, concerns, and suggestions, can assist planners in developing a solution that meets the needs of as many people as possible.

Participation by citizens promotes innovative thinking and a lively exchange of ideas. This suggests that individuals with a wide range of backgrounds, particularly those who can serve as representatives of other cultures and nations, can offer a wide range of creative solutions. With the aid of daily commuters who can inform the planners about challenges and the strengths of the current transportation system, it will be possible to use the ideas from these findings to implement more effective policies in the Elgeseter region that will encourage and develop active modes of transportation. In other words, the authorities can gain valuable information from local communities, which will open up a wider range of potential solutions. Overall, by organizing workshops, discussions, hackathons, creative activities, digital surveys and direct dialogue, it can be urged that citizens participate in decision-making more in the future. The co-creation of public spaces should also prioritize empowering citizens and assisting them in becoming co-managers and co-designers.

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