The Role Of Sustainable Transportation In Shaping Metropolitan Mobility: A Survey Analysis In Esenyurt, Istanbul

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ABSTRACT

Sustainable transportation plays a key role in addressing environmental issues and influencing urban mobility. The study's focus is on Esenyurt, a rapidly growing neighborhood in Istanbul where sustainable transportation is needed. Through a survey of traveler behavior and public opinion, the research determines the main problems, which include; inadequate public transportation, a heavy reliance on private vehicles, inadequate infrastructure for cyclists and pedestrians, and a lack of places to charge electric cars. The paper suggests Esenyurt to adopt approaches used in cities like Copenhagen, Zurich, and Amsterdam based on international best strategies towards sustainability. For instance, Copenhagen's bicycle lanes, Zurich's extensive public transportation and car parking regulations, and Amsterdam's car-free zones and reducing parking-lots have all helped to reduce traffic and air pollution. Esenyurt needs bike lanes, congestion fees, better public transportation like rail ways, and car-free zone in order to accomplish the same approach. For cities to become clean, livable, and more sustainable transportation system, all may be achieved through policy adjustments, infrastructural investment, and behavioral change.

Keywords: Car Dependency, Sustainable Transportation, peoples' perceptions, Air Quality, Urbanization.

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1. INTRODUCTION

Since the 1950s, Istanbul has had a tremendous increase in urbanization, and as of 2015, it has the highest traffic density in the world (58%) (Polat et al., 2017). A sustainable transportation strategy that considers Istanbul's unique circumstances and is closely tied to land use is required to lessen the city's excessive traffic congestion. The main cause of traffic congestion is the increase in the use of private vehicles for urban mobility due to the inefficiencies of public transit systems and the comfort and convenience that private vehicles provide. It is crucial to determine and forecast how urbanization and residential land use may affect traffic density in the future. (Polat et al., 2017).

As shown in (**Figure 1-1**) and (**Figure 1-2**) Esenyurt is a developing neighborhood in western Istanbul that is now dealing with a number of urgent urbanization-related issues, most notably transportation and air quality. As one of Istanbul's most densely populated neighborhoods, Esenyurt experienced

severe air pollution and traffic jams as a result of the city's growing reliance on private vehicles (Istanbul Real Estate, 2024). Using sustainable mobility options has become more difficult as a result of the local transportation system being overloaded by this growth and sprawl Esenyurt's industrial activity, vehicle emissions, and close proximity to major traffic thoroughfares have all contributed to the city's steadily declining air quality (Istanbul Real Estate, 2024). Despite limited study on Istanbul's air pollution, it is reasonable to anticipate that high atmospheric NO2 and PM2.5 concentrations could cause major health issues for the city's residents. Websites like IQAir provide information on the city's overall air quality, indicating that PM2.5 levels are typically higher than WHO guidelines. This suggests that growing urban expansion in places like Esenyurt has been linked to deteriorating air quality.

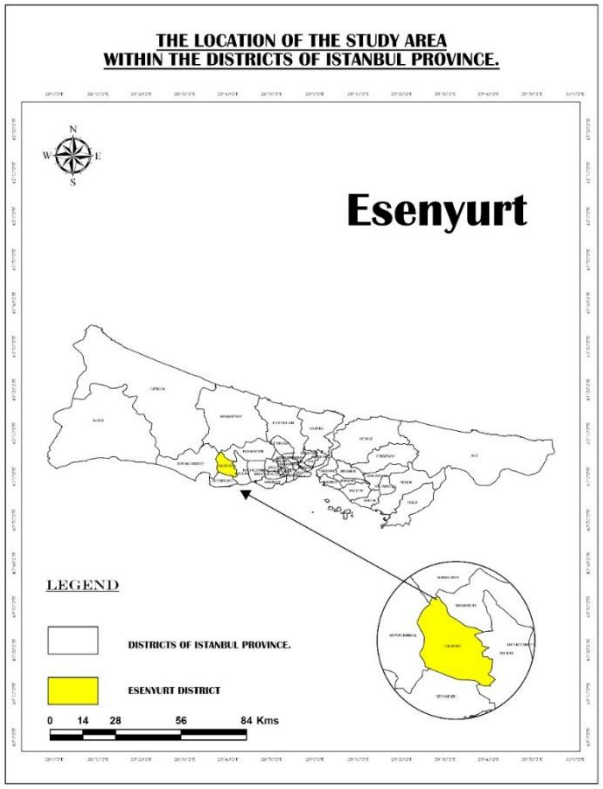

Figure 1-1: Location of Esenyurt District in Istanbul. (By Author)

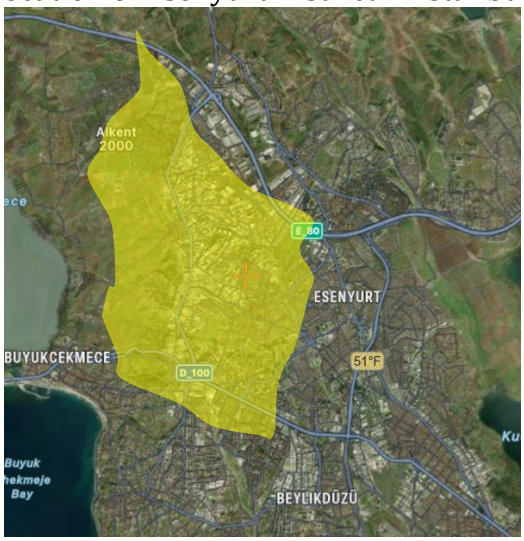

Figure 1-2: Satellite Map of Esenyurt, Istanbul. (From Google Maps)

This article discusses the urgent problems of air pollution, traffic congestion, and vehicle dependence in Esenyurt, one of Istanbul's fastest-urbanizing neighborhoods. Using a survey-based methodology, it is attempted to examine the connection between the sustainable transportation system and the pattern of urban mobility. This study's examination of behavioral factors, infrastructural requirements, and public perceptions can be used to identify opportunities and obstacles to the adoption of sustainable mobility solutions. In order to lessen the environmental impact of urban air quality and encourage the transition to environmentally friendly transportation in metropolitan areas that are constantly expanding, the following research will offer suggestions for practical measures that politicians and urban planners might implement.

1.1 Research Objectives

This research examines at the current status of transportation in Esenyurt, and how well it fulfills the district's mobility needs. It also evaluates how people feel about public transportation's affordability, accessibility, and convenience as well as how these perceptions affect the use of private vehicles, which contribute to pollution and congestion. Additionally, it examines how people assess the amount of environmental and air pollution caused by transportation activity.

1.2 Research Question

What aspects of Esenyurt's mobility patterns are impacted by the adoption of sustainable transport systems, and what elements determine how well they work to lessen reliance on cars? Considering factors like affordability, usability, and accessibility as well as the unique socioeconomic and urban features of the region, what are the special obstacles and opportunities to encourage Esenyurt people to embrace sustainable mobility solutions? The assessment of public knowledge regarding the effects on health and the environment, efficient sustainable transit regulations, and obstacles to the adoption of sustainable solutions in sprawl areas are also included in this study.

2. LITERATURE REVIEW

2.1 Transportation Issues and Urbanization in Esenyurt

The fastest-growing neighborhood in Istanbul, Esenyurt, is a prime example of how ineffective transit-driven growth can be. Esenyurt is seeing remarkable growth, with over a million inhabitants, as a result of its accessibility and affordability for low-income individuals and middle-income classes. During the time of rapid urban growth, traffic problems arose, ranging from overcrowded public transit to deteriorating highways. The main modes of public transportation in Esenyurt are buses, minibuses, which can be crowded during rush hour. The lack of a metro line makes situations worse by forcing individuals to rely on road-based transportation, which causes traffic and increases travel times. Research indicates that Esenyurt's average daily commute is one of the longest in Istanbul, which has a negative impact on both productivity and quality of life (Soy & Tavacioglu, 2023). Furthermore, the structure of Esenyurt in an urban environment creates problems for sustainable mobility. Insufficient resources are available for essential city green spaces, bike lanes, and pedestrian routes that promote other modes of transportation. As a result, private vehicles continue to be used extensively, significantly increasing traffic on the available road space. There are urgent demands for environmentally friendly transportation options throughout Esenyurt, which call for calculated actions in line with the highest quality global practices for forward-thinking, sustainable communities. According to a study by (Demir and Akgün, 2020), inefficient transport networks have grown despite the fact that population growth has not been matched by a similar development of infrastructure. Additionally, (Yigitcanlar & Teriman, 2014) emphasize through study the necessity of aligning land use planning and transportation policy to mitigate mobility challenges in expansive metropolises such as Istanbul.

2.2 Sustainable Transportation

A balance between environmental, social, and economic factors is necessary for sustainable growth, especially in the transportation sector. It's unclear, nevertheless, which attributes ought to be balanced and ensured. To evaluate the sustainability of transportation networks, a number of indicators have

been created; nevertheless, a crucial collection of indicators has not yet been determined (Steg & Gifford, 2004). Examining the sustainability of the transportation system as a whole, with an emphasis on the externalities and positive and negative values of traffic and transportation, might help us think about sustainable transportation. The pace of commuting, traffic delays, the range and caliber of available transportation options, the accessibility of events, and household transportation expenses are all indicators. Since changes in the transportation sector may have an impact on other sectors, which in turn may affect sustainable development, a wider variety of sustainability indicators may be taken into consideration (Steg & Gifford, 2004). Though they require improvement, a number of techniques and models have been created to evaluate the economic, social, and environmental impacts of transportation initiatives. Due to a lack of expertise and reliable techniques for evaluating the social impact of transportation developments, social indicators are rarely incorporated (Steg & Gifford, 2004). Cities like Amsterdam, Zurich, and Copenhagen have all established rules in place to encourage sustainable transportation, which decreases the use of private vehicles and increases the use of effective public transportation. Lessons that can guide policy recommendations in Istanbul's metropolitan areas can be found by comparing the city to Esenyurt as explained bellow.

2.2.1 Overview of Copenhagen and Its Strategies

In Copenhagen, 49% of all commutes to work or school are made by bicycle, up from 35% ten years earlier, making it the best cycling capital city in the world. The sustained municipal investment in bicycle infrastructure is responsible for this increase. Three-quarters of Copenhageners still ride their bikes throughout the severe winter months, and 97% of them are happy with the city's cycling conditions. Copenhageners don't cycle because they care about the environment or their health. Cycling is becoming a competitive form of transportation for individuals of all ages and abilities thanks to the city's infrastructure (Thoem, n.d.)17. The Danish Cyclist Organisation suggested a city-wide bike network, prompting Copenhagen to add extra bike lanes. To increase cycling safety, the city created a bikeway plan and 240 km of bike lanes in the 1980s. Bicycle travel rose by 40% and associated injuries decreased by 30% between 1990 and 2000. Cycling was first put on the political agenda in 2005 when the mayor of Copenhagen encouraged it. Residents were encouraged to bike this year in an effort to improve their quality of life by lowering pollution and traffic (Kassirer, 2023).

2.2.1.1 Widespread Cycling Infrastructure: The municipality has created bike superhighways and more than 400 km of separate bike routes to promote cycling as a primary source of transportation (Marco & Marco, 2024).

2.2.1.2 Car-Free Zones: To improve cycling and pedestrian conditions and lower emissions, places like Strøget, one of the world's longest pedestrian retail avenues, limit automobile traffic (Thomas, 2012).

2.2.1.3 Parking Restrictions and Congestion Fees: In order to reduce traffic and pollution, Copenhagen imposes expensive parking fees and limits the use of private cars within the city's center (Thomas, 2012).

2.2.1.4 Investing in Public Transportation: The metro, bus, and train systems of Copenhagen are all well-connected, and by 2025, all buses are expected to be zero-emission vehicles (WWF Scotland Briefing, 2016).

2.2.1.5 Low-Emission Zones: To promote more sustainable modes of transportation, Copenhagen has strict rules limiting the number of high-emitting vehicles that are allowed inside the city (WWF Scotland Briefing, 2016).

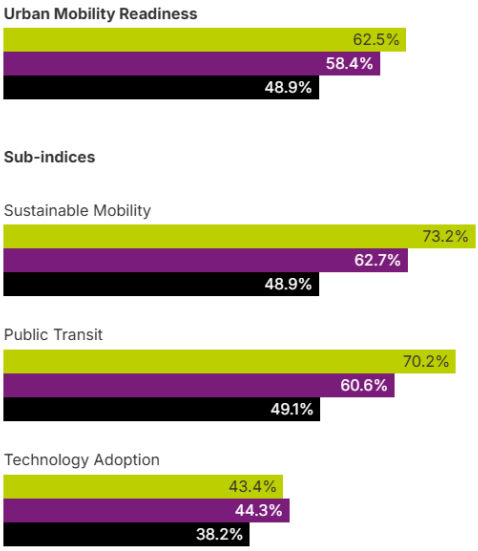

Figure 2-1: City scores in percentage compared with global and regional averages (WWF Scotland Briefing, 2016).

2.2.2 Overview of Zurich and Its Strategies

When it comes to city public transportation, Zurich is now ranked second in the world. In contrast, it comes in fifth place globally in the Urban Mobility Readiness Index 2022, behind Singapore, San Francisco, Stockholm, and Helsinki. Pedestrians benefit from the city's excellent and safe roads, which also have little traffic Zurich has a well-planned zoning strategy that promotes accessibility to public transportation and discourages private citizens from driving in city center regions (Mersetzky, 2023). Mobility in Esenyurt would be greatly increased by adopting a metro development strategy, increasing the effectiveness of bus rapid transit (BRT), and integrating other forms of transportation. By encouraging people to use public transportation instead of private vehicles, an integrated payment system, like that in Zurich, can ease traffic and the environment.

2.2.2.1 Effective Public Transportation System: With 14 tram lines totaling 172 km, 14 bus lines, and 6 trolleybus lines totaling 54 km, Zurich has an extensive and effective public transportation system. People are persuaded to utilize public transportation over private transportation due to its density and effectiveness. (Desprez, 2024).

2.2.2.2 Integrated Land Use and Transportation Planning: With less reliance on cars and more use of public transportation, the city is combining land use and transportation planning. With 5 tons of greenhouse gas emissions per person, Zurich is currently among of the lowest emissions in Europe (WWF Scotland Briefing, 2016).

2.2.2.3 Car-Free Areas and Parking Space Reduction: Zurich limits the use of private vehicles and promotes the use of alternative forms of transportation by establishing car-free zones and reducing parking spaces (Kodransky & Hermann, 2011).

2.2.3 Overview of Amsterdam and Its Strategies

The world's cycling capital, Amsterdam, comes in third place in the Sustainable Mobility sub-index and fifth in the Urban Mobility Readiness Index. By 2030, the city wants to increase bike lanes and parking such that 35% of all trips are made by bicycle. Two underwater storage units with 7,000 bicycles were revealed in January 2023. Amsterdam promotes multimodality by providing free bicycle parking near the station for up to 24 hours. There are plans to build an additional garage that can hold 9,000 bikes. Additionally, the city is funding bike safety projects, such as the use of virtual reality glasses to teach traffic laws (Thibault et al., 2024).

2.2.3.1 Facilities for Cycling: Amsterdam is well known for its wide range of bike lanes and amenities, which have significantly decreased both the number of automobiles and pollution (Thibault et al., 2024).

2.2.3.2 Reducing Parking-lots: Amsterdam is reducing parking permissions to free up 1,100 spaces each year, with 10,000 by 2025, to allow for bikes, walkers, green spaces, and entertainment. This move is consistent with similar efforts in cities such as Zurich and Copenhagen, which have reduced parking (Martret, 2024).

2.2.3.3 Car-Free Zone: There are two emission zones in Amsterdam: zero emission zones for vans, trucks, motorcycles, and scooters, and low emission zones for diesel vehicles. While the zero emission zone mandates emission-free vehicles without signs or registration, the low emission zone allows vehicles manufactured in 2011 or later (Jacobs, 2024).

3.2 Survey-Based Studies on Urban Mobility

In order to investigate topics pertaining to urban mobility, transportation options, and sustainable transportation in metropolitan environments, some research has used survey approaches. It has been successful in highlighting a few elements, such as commuter preferences, modal choice, and the environmental effects of transportation systems. For example, before a mobility center was established in Kalamaria, Greece, a survey was carried out to learn more about the locals' travel habits. Important aspects of mode selection and factors influencing transportation preferences, including affordability, accessibility, and ease of use, were highlighted in this survey. Additionally, it provided more specialized inputs for the creation of ETR mobility services (Tyrinopoulos & Antoniou, 2012).

Other studies included a survey and statistical analysis on how urban mobility, like LMA, could help make an urban environment more livable. Because several cities continue to rely on their automobile demands, the survey's data revealed evidence of intraregional disparities in unsustainable urban transportation. Based on these geographical disparities, it suggested a thorough approach to specific urban development principles (Louro, Da Costa, & Da Costa, 2021). In order to investigate the possible carbon dioxide savings associated with the adoption of shared mobility services, a European research institute conducted a web-based survey on the use of SAVs within shared mobility services. The survey asked employees to categorize their preference for sustainable modes of transportation into three groups (Garus et al., 2024).

3.3 Research Gap

Although research on Istanbul's congestion and ineffective public transit is well-documented, little is known about specific sustainable mobility solutions in Esenyurt. Studies that are now available concentrate only on Istanbul's central districts, leaving out neighborhoods like Esenyurt that suffer from a strong reliance on cars, insufficient public transportation, and deteriorating air quality. There hasn't been much survey-based study done on the attitudes and behavioral characteristics of Esenyurt people that influence their choices for sustainable transportation. Addressing this gap is important for developing localized approaches to improve environmental sustainability and urban mobility (Soy & Tavacioglu, 2023).

3. RESEARCH METHODOLOGY

2.1 Research Design

The quantitative research design of the survey will be applied in this investigation to identify how people in Esenyurt, Istanbul feels about the issues of sustainable mobility and air quality. The proposed research methodology envisages collecting and assessing the data from 210 respondents with an objective to make inferences for their perceptions concerning sustainable transit systems, their awareness of air quality problems, and their travel behavior.

2.2 Samples

Targeting this survey will include all individuals who stay in Esenyurt or have visited the district individuals above 18 years of age have participated to make the target group representative in variables like age, sex, status, and level of attainment. Stratified random sampling ensures demographic

variabilities of the district are captured; however, the sampling itself is done online by sharing the survey's link through the utilization of social media and advertising in various public areas.

2.3 Data Collection

The data collection instrument is a structured survey of thirty questions. The questionnaires consist of three parts:

2.3.1 Demographics and Transportation Behavior: asks the age, sex, income, education, mode of transportation used daily, and time spent commuting.

2.3.2 Perceptions of Sustainability and Air Quality: Items assessing the participants' familiarity with the concept of sustainable transport, perceived air quality in Esenyurt, and how well they can understand the link between transportation behaviors and environmental impact.

2.3.3 Attitudes to Policies and Solutions: Items assessing the support of policies that encourage sustainable transport, the willingness to use other modes of transport-such as bicycling or public transport-and perceived barriers to sustainable behavior.

The survey will be carried out both in person using paper questionnaires and online using Google Forms in order to increase the response rate and reach more people.

4.2 Data Analysis

Survey responses are statistically calculated using mean, median, and percentage in order to quantify the responses numerically and determine the predominant patterns in public perceptions and transportation use. The measurements include the study's respondent demographic and provide current travel patterns, public transportation satisfaction. Without the use of more sophisticated statistical methods like regression and factor analysis, the study's main goals are frequency distribution and pattern analyzing.

4. FINDINGS AND RESULT OF SURVEY

Additionally, it turns out that the Esenyurt survey provides a comprehensive overview of the region's mobility characteristics and road condition problems. According to (**Figure 4-1**), the majority of participants (52.9%) would typically commute to and from their location via buses and the metro. The use of private vehicles is likewise fairly common among another enormous portion of them (34.8%). Bicycles (6.2%), walking (4.3%), ride-sharing services like Uber and Lyft (1.4%), and electric scooters (0.5%) represent relatively low percentages of the remaining modes of transportation. Public transportation usage frequency: 22.4% of respondents use public transportation three to five times per week, while 36.7% of respondents use buses, metros, or other forms of public transportation every day. Notably, 14.8% never use public transportation, and 18.1% use it infrequently. Only 8.1% of people took public transportation once or twice a week. According to these figures, public transportation is the most popular modal method of transportation, however practically everyone uses it little or never. In Esenyurt, cycling has not yet gained popularity as a substitute form of transportation. According to the results, only 21.4% of people use bicycles for transportation, while 53.8% of people do not ride their bikes to work and 24.8% support riding their bikes to work but have not yet done so. Numerous factors contributed to this, including inadequate bike facilities, security concerns, and urban design that prioritized bike routes.

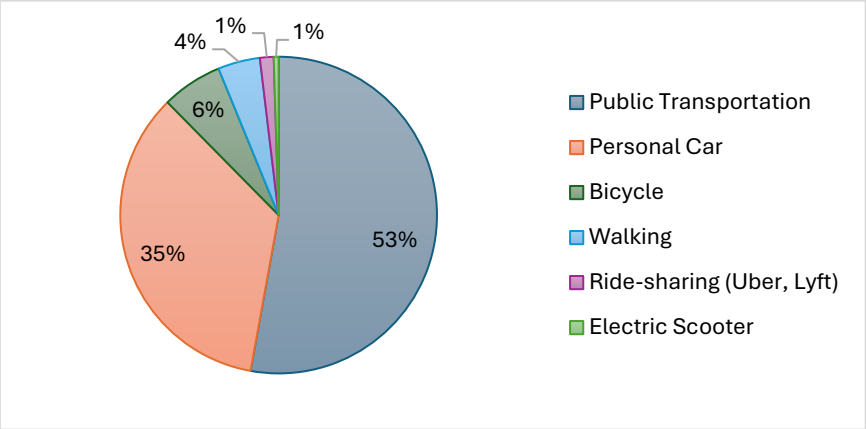

Figure 4-1: Respondents using different transportation modes. (By Author)

Esenyurt's convenience levels of satisfaction with public transportation reflect differing opinions. Twenty percent of the survey sample expressed satisfaction with the current level of public transportation, compared to almost 51.9% who expressed dissatisfaction and 27.1% who were neutral. Both "very satisfied" and "very dissatisfied" accounted for 0.5%. According to the percentages, there is still a great deal of room for improvement in terms of accessibility, dependability, and efficiency, even when public transportation use is at its peak. Another widespread problem in Esenyurt is attitudes toward the safety of bicyclists and pedestrians. The lack of infrastructure, bike and pedestrian amenities, or traffic density made nearly half of the research participants (46.2%) feel insecure when walking or cycling. An additional 27.1% are unsure about their safety, which may be a sign of a lack of confidence in the quality of the facilities for bicycling and walking. The site is safe, according to 26.2% of respondents, and 0.5% said it was "very safe." According to the data, there is a need for more bike and pedestrian spaces in an effort to improve non-motorized transportation and safety.

The accessibility of electric vehicle (EV) charging stations is another element that influences how people travel in Esenyurt. Of those who responded to the study, 37.1% don't care and 42.9% think the charging stations are too inaccessible. EV charging facilities are only rated as very accessible by 19% of respondents, with very accessible and very inaccessible accounting for 0.5% of the total. Residents who want to use eco-friendly cars as a clean transportation option are put off by the lack of charging stations. According to 37.8% of respondents, congestion is now one of the biggest obstacles to locals using more environmentally friendly modes of transportation. The lack of convenient public transportation options comes next, as 34% of respondents cited this as a hindrance. The second factor was time constraints; 11.5% of respondents stated that they did not have enough time for other, cleaner modes of transportation. Safety was cited by 8.6% of respondents as the area where they feel most comfortable utilizing walking or cycling as alternatives. Another aspect that influenced use was the cost of transportation; 6.2% of the people stated that this cost prevented them from utilizing eco-friendly forms of transportation.

If conditions improve, citizens strongly want to switch to more environmentally friendly forms of transportation. The majority, 63.8%, said that if facilities were improved, they would ride their bikes or take public transportation more often. Even though 14.8% of respondents said they would never change regardless of the time horizon for infrastructure upgrades, and 21.4% said they were unsure, these responses indicate that more people would use more ecologically friendly forms of transportation if more money was spent on the public transportation corridor, bike lanes, and pedestrianized infrastructure. According to the survey's conclusions, Esenyurt needs to invest in its transportation infrastructure and plan for the city's long-term future. The vast majority of people would benefit from increased service efficiency, coverage, and dependability, as seen by the ubiquity of public transportation use despite high levels of discontent. Increased safety for walkers and bicycles may persuade more people to use greener forms of transportation. Cleaner energy transitions may be encouraged by easier access to charging stations for electric vehicles. Last but not least, a greener

municipal transportation system can be promoted by reducing traffic jams and improving access to public transportation.

To sum up, the survey results show where Esenyurt's transportation system needs to be improved. Accessibility, infrastructure quality, and cost are just a few of the areas that would require improvement when the transportation system shifts to more sustainable modes of transportation, given that the majority of its residents rely mostly on public transportation for mobility. Esenyurt may work toward a more environmentally friendly and better transportation system that serves all of its citizens by investing in better transportation planning, upgrading the infrastructure, and implementing regulatory changes.

5. DISCUSSION

As shown in (**Table 5-1**), comparative analysis of sustainable transport strategies in cities like Amsterdam, Zurich, and Copenhagen helps determine what steps Esenyurt should take to improve its transportation infrastructure. According to the survey, Esenyurt has significant issues with traffic, air pollution, and reliance on private cars. Implementing the sustainable city model successfully suggests that building transportation infrastructure and implementing policy changes and these are efficient ways to address the same urban transportation issues.

Table 5-1: Comparative analysis of sustainable transport strategies in cities. (By Author)

Sustainable Strategies	Cycling Infrastructure	Parking Restrictions	Congestion Fees	Investing in Public Transportation	Low-Emission Zones	Parking-lots Reduction	Land Use Planning
Copenhagen	✓	✓	✓	✓	✓	✓	-
Zurich	✓	✓	✓	✓ ✓	✓		✓
Amsterdam	✓	✓	✓	✓ ✓	✓		-
Esenyurt	-	-	-	-	-	-	-

5.1 Esenyurt's Public Transportation Issues

According to survey data, 34.8% of Esenyurt individuals drive their own automobiles on day journeys, while 52.9% utilize buses and the metro. Nonetheless, 51.9% of respondents expressed dissatisfaction with the effectiveness and availability of public transportation, indicating a common area in need of improvement. The following are priority areas for improvement:

5.1.1 Increasing service frequency to help decrease wait times.

5.1.2 Cutting down on travel time to increase efficiency.

2.1.3 Improving multimodal accessibility to make mass transit more convenient.

Following Zurich's well integrated bus and tram network, Esenyurt can offer more practical and effective public transportation.

5.2 Challenges of cycling and walking

The survey found that few people used bikes (6.2%) and walks (4.3%) as a form of transportation. The following explains some of the factors behind this pattern:

5.2.1 High traffic congestion and a lack of designated lanes cause safety issues.

5.2.2 Inadequate infrastructure for pedestrians and cyclists.

5.2.3 Ineffective non-motorized transportation promotion.

According to the data, 46.2% of people are unwilling to walk or cycle in areas with poor infrastructure and high traffic. By creating safer bike lanes and enhancing pedestrian amenities, Esenyurt could imitate Copenhagen's extensive bicycle network and encourage non-motorized transportation.

5.3 The availability of charging stations for electric vehicles

The lack of electric vehicle (EV) charging stations in Esenyurt is one of the biggest obstacles to sustainable transportation. According to the survey, 42.9% of respondents believe that EV charging stations are inaccessible, which discourages them from utilizing electric cars. In order to fill this gap, Esenyurt can provide encouragement for the usage of electric vehicles and extend EV charging networks throughout the district. Take inspiration from Amsterdam's strategy of installing extensive EV infrastructure to lower emissions and enhance air quality.

5.4 Policy Approaches for Traffic Congestion

According to 37.8% of the respondents, traffic congestion is the largest obstacle to sustainable transportation. Policy measures like:

5.3.1 Congestion pricing to limit the number of cars in areas with heavy traffic.

5.3.2 Car-free zones to encourage pedestrian-friendly cities.

5.3.3 Investing in alternative modes of transportation to decrease the usage of private vehicles.

The implementation of parking and congestion fees by the cities of Zurich and Amsterdam has been beneficial in reducing traffic congestion.

5.5 Behavioral Changes Toward Sustainable Transportation

One of the most important steps in transforming Esenyurt into sustainable transportation is behavioral adaptation. According to the questionnaire, 63.8% of people would be open to using environmentally friendly transportation if facilities were improved. The following are the most important steps to implement the change:

5.5.1 Infrastructure improvements for bike lanes, walkways, and public transportation.

5.5.2 Efforts to raise awareness and provide information on adopting sustainable transportation.

5.5.3 Financial incentives such as providing low-cost public transportation fares and bike subsidies.

6. CONCLUSION

A sustainable transport solution is required, according to a survey study examining Esenyurt's mobility problem. Based on the results of surveys and comparisons with the successful mobility solutions of Copenhagen, Zurich, and Amsterdam, Esenyurt must give developing alternative forms of transportation, regulating them, and constructing infrastructure the greatest priority. The results of the survey highlight areas that require urgent attention, such as improving the effectiveness of public transportation, expanding infrastructure for cyclists and pedestrians, and resolving issues with EV charging ease. 51.9% discontent with public transportation is a clear indication that the service's quality needs to be raised immediately. Given the low level of cycling and walking, Esenyurt needs to make these activities easy and safe, much like Copenhagen and Amsterdam have done with their bike-friendly laws.

Other than that, parking restrictions, car-free zones, and improved transport mode integration can all help to reduce traffic congestion and encourage the use of clean transportation. The fact that 63.8% of respondents said they would be willing to utilize cleaner alternatives under the right circumstances is evidence that targeted policy intervention is effective. The main forces behind habit change will be public education, financial incentives, and transportation integration with few transfers. Even though Esenyurt faces many obstacles, there are also many chances for sustainable growth. To make a city accessible and livable, town planners and government policymakers should have a toolset of coordinated measures that include green policy, infrastructure investment, and public participation. De-carbonization doesn't have to be an impossible goal, as sustainable cities have shown. In Esenyurt, a green city mobility commitment will improve people's lives by providing a basis for a more efficient and greener city, in addition to diverting traffic from the roads and clearing the air.

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