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Collaborative Parking Management in Constanta: The Role of Public Policies and Citizen Participation

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Abstract. This research focuses on Collaborative Parking Management in Constanta, Romania, examining the role of public policies and citizen participation in improving the availability and quality of parking spaces. The study's general objective is to evaluate citizens' perceptions of parking spaces in Constanta and identify potential solutions to improve the current situation. To achieve this, the study outlines six specific objectives, including analyzing parking space availability, evaluating the quality of parking infrastructure, examining opinions on parking regulation and costs, investigating the impact on the environment, assessing the influence on vehicle and pedestrian safety, and identifying solutions for parking management improvement. The research tool utilized for this study was an online questionnaire, which included six dimensions related to parking space availability and quality, regulation and costs, impact on the environment, and safety, as well as a section for participants to make recommendations. This study aims to provide insight into the current state of parking in Constanta and offer practical solutions for improving the parking situation through collaboration between citizens and policymakers.

Keywords: Collaborative Parking Management, Public Policies, Citizen Participation, Constanta, Romania

1. Introduction

Parking management has always been a crucial aspect of urban planning, as the number of vehicles continues to grow in parallel with the expansion of cities. In recent years, the issue of parking has become increasingly complex, leading to various challenges for local governments, such as traffic congestion, environmental pollution, and space utilization (MLPDA, 2020). Effective public policies and citizen consultation play a vital role in addressing these issues, ultimately leading to better resource allocation and overall satisfaction among the

stakeholders involved (Rus, Sandu and Taseñte, 2020). This paper aims to provide an insight into the importance of public policies for parking management and the significance of involving citizens in the decision-making process to ensure efficient problem-solving.

In urban areas, the demand for parking spaces has risen significantly, putting immense pressure on available resources (Tercan, 2023). As a result, parking spaces have become scarce, leading to competition among drivers and an increase in illegal parking. To address these issues, it is essential to devise well-thought-out public policies that focus on the equitable distribution of parking spaces and promote sustainable practices. These policies must also be flexible enough to adapt to the ever-changing urban landscape and the evolving needs of citizens (McKnight-Slottee, Bae and McCormack, 2022).

One such policy is the introduction of parking pricing strategies, which can effectively regulate parking demand and reduce traffic congestion. By implementing progressive pricing structures, local governments can incentivize drivers to use alternative modes of transportation, such as public transit or cycling, ultimately leading to decreased traffic, and reduced environmental impact (Stan, 2022a). Additionally, parking policies should encourage the development of multi-story parking structures to maximize land use efficiency and minimize urban sprawl.

However, public policies cannot be implemented in isolation. The involvement of citizens is crucial to ensure that these policies are practical, effective, and well-received. Engaging citizens in the decision-making process not only helps identify potential challenges but also provides valuable insights that can be used to tailor policies to meet the specific needs of a community. Citizen consultation can be carried out through various means, such as surveys, public meetings, and online platforms, allowing for diverse opinions and perspectives to be considered (Paris, Rus and Taseñte, 2022).

Moreover, public participation can foster a sense of ownership and accountability among citizens, as they have a direct stake in the policies' outcomes. This, in turn, can lead to increased compliance and a higher likelihood of successful implementation. Furthermore, involving citizens in the policy-making process can help dispel misconceptions and misunderstandings about the proposed policies, ensuring that they are well-informed and actively engaged.

Overall, parking management is a complex issue (Parmar, Das and Dave, 2020) that requires the careful consideration of various factors, such as urban planning, sustainability, and resource allocation (Stan, 2014). Public policies play a significant role in addressing these challenges, and their success is highly dependent on effective citizen consultation. By involving citizens in the decision-making process, local governments can ensure that parking policies are not only efficient and practical but also cater to the unique needs of a community. As cities continue to grow and evolve, it is essential that parking management policies and public engagement strategies adapt to meet the challenges of an ever-changing urban landscape.

2. Literature review

The increasing demand for parking spaces, particularly in urban areas, has led to numerous parking management issues, including congestion, pollution, and inefficient land use (Rosenblum, Hudson and Ben-Joseph, 2020).

Coastal urban areas are among the most popular tourist destinations worldwide with a complex economy that includes industrial activities and a generous physical infrastructure (Nguyen et al., 2020). These areas attract millions of tourists every year due to their beaches,

favorable climate and tourist attractions. However, a consequence of this influx of tourists is also the increased demand for parking in urban areas located in the coastal zone.

The city of Constanta is in the coastal area of Romania and is one of the most important tourist destinations in the country. However, the economic and tourist development of the city in recent years has had a major impact on the number of parking spaces available in the area.

The sustainable development of Constanta has become a priority for the local public administration. In this regard, there are efforts to implement policies and projects that have a positive impact on the environment and the local community, while ensuring a balanced economic development (Vintilă et al., 2017; Stan et al., 2021a; Stan et al., 2021b).

Economic activity in the coastal zone is closely linked to infrastructure investment. The coastal zone offers several economic advantages, such as access to natural resources and international markets. However, to capitalize all these advantages, adequate infrastructure is needed. Investments in coastal zone infrastructure include, in addition to the construction of ports, roads and highways, airports, tourism facilities and the creation of transport and telecommunication networks (Aivaz, 2021). These investments are critical for the development of the local economy, the growth of tourism and the creation of new jobs (Aivaz and Micu, 2021; Mirea and Aivaz, 2016). All these investments are on the one hand important factors in increasing the profit of a business, and on the other hand can help to improve customer satisfaction, increase loyalty and long-term revenue (Aivaz, 2020)

Parking spaces can be a source of revenue for tourist destinations through parking fees or other costs associated with the use of parking spaces (Keough and Brown, 2021).

In general, adequate infrastructure, whereby we also consider the availability of an adequate number of parking spaces, can be an important factor in promoting tourism and increasing the revenue generated by the tourism industry (Aivaz et. al, 2021), especially in areas with a high volume of tourists and road traffic (Aivaz et. al, 2022; Stan and Vintilă, 2022).

However, a major problem with parking spaces is the occupation of important spaces in urban areas, which in many cases were originally wastelands or green spaces (Stan, 2022b). Due to the limitation and insufficiency of these parking spaces, traffic problems, pollution and negative environmental impact are generated (Braşoveanu, 2016).

Consequently, a range of public policies and strategies have been proposed and implemented to address these challenges. This literature review examines various studies on parking management policies and practices, summarizing key findings and offering insights for policymakers and urban planners.

Parking Regulation and Management Strategies:

Studies have explored the effectiveness of parking pricing and congestion management in reducing parking demand and traffic congestion. Albalate and Gragera (2020) highlight the significance of parking regulation and management in addressing parking issues. Ayaragarnchanakul and Creutzig (2022) examine the impact of parking pricing policies on congestion management in Bangkok, while Litman (2019) offers best practices for parking management, including the use of pricing mechanisms to optimize parking supply and demand. Other several studies have focused on understanding parking demand and developing management strategies to meet the needs of urban areas. Aparicio (2020) discusses the implementation of urban mobility innovations, such as parking demand management, in Madrid. Aswad (2020) conducts an empirical parking study in the University of Duhok Campus, highlighting the importance of parking demand management in educational institutions. de Dieu et al. (2020) investigate parking demand management in Kigali City,

Rwanda, while May et al. (2020) examines the factors influencing commute mode shift in Boise.

Parking Technologies and Intelligent Transportation Systems:

Advancements in technology have led to the development of smart parking systems, which aim to optimize parking space utilization and reduce congestion. Quijano-Sánchez et al. (2020) explore recommender systems for smart cities, including parking management solutions. Secinaro et al. (2021) propose a hybrid model for managing smart city initiatives, emphasizing the role of technology in parking management. With the rise of autonomous vehicles, studies have also explored their potential impact on urban space and parking management. Silva et al. (2021) analyze the transformation of urban space due to autonomous vehicle use, offering insights into future parking management strategies.

Policy Implementation and Challenges:

Meng, Somenahalli and Berry (2020) discuss policy implementation for multi-modal mobility, including shared parking systems, while Kuss and Nicholas (2022) identify effective interventions for reducing car use in European cities, such as the promotion of shared mobility options. Implementing effective parking policies is often challenging due to various factors, such as local context, stakeholder interests, and resource constraints. Noviyanti et al. (2023) examine the implementation of parking retribution policy in Madiun City, while Moento et al. (2022) discuss the challenges in implementing parking retribution management policy in Merauke Regency. Also, studies have examined parking management practices in various urban contexts, highlighting the importance of context-specific strategies. Demir, Basaraner and Gumus (2021) investigate the selection of suitable parking lot sites in four districts of Istanbul, while Chullabodhi, Chalermpong and Ratanawaraha (2022) examine the root causes of on-street parking mismanagement in central Bangkok. Rumantir et al. (2021) propose a road edge parking management strategy for Semarang City, considering the collaborative governance perspective.

Some other studies have undertaken comparative analyses of parking policies and practices across different cities and countries. Kijewska et al. (2022) compare urban mobility problems and freight solutions in Belo Horizonte, Brazil, and Szczecin, Poland, while Uotila (2022) evaluates car parking policy processes in Vantaa, Finland. Toan et al. (2023) present a case study of Singapore's travel demand management policies and explore their transferability potential for Hanoi.

Future Directions and Policy Implications:

The growing need for sustainable urban mobility has led to the exploration of policy packages and interventions that can support the transition. Graaf et al. (2021) analyze exnovation policies for urban mobility transition in eight cities around the globe, while Thaller et al. (2021) discuss the design of policy packages for sustainable transport, balancing disruptiveness and implementability.

Integrating parking management policies with broader urban planning strategies is essential to ensure efficient land use and sustainable urban development. Stehlin, Hodson and McMeekin (2020) propose a typology of platformization trajectories for understanding platform mobilities and the production of urban space. Siewwuttanagul et al. (2023) explore the collaboration on urban regeneration between local entrepreneurs and key stakeholders in Salaya

Sub-District, Thailand, highlighting the potential role of parking management in transit-oriented development.

This literature review has synthesized various studies on public policies and strategies for parking management in urban environments. The findings underscore the importance of context-specific parking policies, the role of technology in parking management, the challenges in policy implementation, and the need for integration with broader urban planning strategies. Policymakers and urban planners can draw insights from these studies to develop effective parking management policies and practices to address the growing demand for parking spaces and enhance urban mobility (Stan, Taseñte and Rus, 2022).

3. Participatory approaches in the optimization of parking spaces in Constanta: Analysis of public consultation processes

3.1. Methodology and data

Research objectives:

The general objective of the research is: the evaluation of citizens' perceptions regarding the availability, quality, and management of parking spaces in the municipality of Constanta, as well as the identification of potential solutions to improve the current situation.

Specific objectives:

- (a) Analysis of the availability of parking spaces in the city of Constanta and identification of areas with frequent problems finding parking spaces.
- (b) Evaluation of the quality of the parking infrastructure in the municipality of Constanta, including aspects related to dimensions, markings, lighting, and maintenance.
- (c) Examining the opinion of citizens regarding the regulation and costs of parking in the municipality of Constanta and identifying possible improvements in this area.
- (d) Investigating the impact of the parking problem on the environment in Constanta and identifying measures to promote alternative transport.
- (e) Assessing the influence of a lack of parking spaces on vehicle and pedestrian safety and identifying solutions to reduce incidents caused by illegal parking.
- (f) Identification and evaluation of solutions and improvement proposals for the management of parking spaces in the municipality of Constanta, including the construction of above-ground and underground parking lots, collaboration with real estate developers, and the implementation of a subscription parking system for residents.

Research tool

We applied, from April 1 to April 11, 2023, an online questionnaire that aimed to analyze the perception of the citizens of Constanta regarding the parking lots in the city. The questionnaire is structured on six dimensions and includes a section where participants can make recommendations. The dimensions are:

1. Availability of parking spaces
2. The quality of the parking infrastructure
3. Parking regulations and costs
4. The impact on the environment
5. Vehicle and pedestrian safety
6. Solutions and suggestions for improvement

Within each dimension, participants are asked to rate a series of statements from 1 to 5 (1 = strongly disagree, 5 = strongly agree). The purpose of this questionnaire is to gather information and identify the problems citizens face in relation to parking, as well as possible solutions to improve the parking situation in the city of Constanta.

Data analysis and processing was achieved using the JASP program.

Study participants:

The study participants include 137 females and 54 males. The age of the participants ranges from 18 to 56 years, with a median age of 21 years and a mode of 20 years. The 25th percentile of the age distribution is 20 years, while the 75th percentile is 30 years.

In terms of education level, 131 participants are currently enrolled in college, while 27 have completed a Master's degree. 13 participants have completed a PhD, 12 have completed college, and 8 have completed high school.

The study participants come from a variety of neighborhoods in the area. The most frequent neighborhoods mentioned are Coiciu (7 participants), Tomis Nord (16 participants), Faleza nord (10 participants), Mamaia (6 participants), and Anadalcchioi (4 participants). Other neighborhoods mentioned include Portul, ICIL, Tomis II, Tomis III, Casa de Cultură, Inel I, Inel II, Dacia, Brătianu („Filimon Sârbu” între anii 1948-1990), Tăbăcăria, and Km. 5.

3.2. Data analysis and interpretation

In general, citizen consultation can be a valuable tool in the decision-making process, allowing authorities to consider citizens' views and needs before deciding on parking policies and investments in the city.

Dimension 1: Availability of parking spaces (Source: Authors' work)

	Valid	Mode	Median	IQR	Minimum	Maximum
I believe that there are enough parking spaces in the municipality of Constanta.	191	1.00	1.00	1.00	1.00	5.00
I have frequent problems finding a parking space.	191	5.00	5.00	1.00	1.00	5.00
It is difficult for me to find a parking space near my home.	191	5.00	4.00	2.00	1.00	5.00
Public car parks are often busy in central city areas.	191	5.00	5.00	1.00	2.00	5.00

The data presented above pertains to the availability of parking spaces in the municipality of Constanta, as perceived by the respondents. The data includes four statements related to parking availability, and respondents had to rate their level of agreement or disagreement on a scale of 1 to 5, where 1 represents total disagreement and 5 represents total agreement.

The first statement suggests that a majority of the respondents (191 out of 191) do not believe that there are enough parking spaces in the municipality of Constanta. This is evident from the fact that the mode, median, and interquartile range (IQR) of this statement are all 1.00, which represents the minimum value on the scale.

The second statement reveals that a vast majority of the respondents (191 out of 191) have frequent problems finding a parking space. The mode and median of this statement are both 5.00, which represents the maximum value on the scale. The IQR for this statement is relatively small, with a value of 1.00, indicating that most of the respondents strongly agreed with this statement.

The third statement indicates that a significant number of respondents (191 out of 191) find it difficult to find a parking space near their homes. The mode of this statement is 5.00,

which represents the maximum value on the scale. The median and IQR are 4.00 and 2.00, respectively, indicating that while most of the respondents agreed with this statement, there were still some who did not find it as difficult to find parking near their homes.

The fourth statement suggests that public car parks are often busy in central city areas. The mode and median of this statement are both 5.00, which represents the maximum value on the scale. The IQR for this statement is relatively small, with a value of 1.00, indicating that most of the respondents strongly agreed with this statement.

In summary, the data reveals that many of the respondents do not believe that there are enough parking spaces in the municipality of Constanta. Additionally, respondents frequently face problems finding parking spaces and find it difficult to find parking near their homes. Public car parks in central city areas are also often busy, according to the respondents. These findings suggest that there is a significant issue with parking availability in the municipality of Constanta and that measures need to be taken to address this issue.

Dimension 2: Quality of parking infrastructure (Source: Authors' work)

	Valid	Mode	Median	IQR	Minimum	Maximum
The quality of the parking spaces is satisfactory (eg. dimensions, markings, lighting).	191	3.00	3.00	1.50	1.00	5.00
Public parking lots are well maintained and clean.	191	3.00	3.00	3.00	1.00	4.00
Access to public parking lots is easy and safe.	191	3.00	3.00	1.00	1.00	5.00
Disabled parking spaces are adequate and easily accessible.	191	3.00	3.00	2.00	1.00	5.00

The data presented above pertains to the quality of parking infrastructure in the municipality of Constanta, as perceived by the respondents. The data includes four statements related to the quality of parking infrastructure, and respondents had to rate their level of agreement or disagreement on a scale of 1 to 5, where 1 represents total disagreement and 5 represents total agreement.

The first statement suggests that the quality of parking spaces is satisfactory for the majority of the respondents (191 out of 191). The mode of this statement is 3.00, which represents a neutral stance. The median and IQR for this statement are 3.00 and 1.50, respectively, indicating that while a significant number of respondents agreed that the quality of parking spaces is satisfactory, there were also some who disagreed.

The second statement reveals that many of the respondents (191 out of 191) believe that public parking lots are well maintained and clean. The mode and median of this statement are both 3.00, which again represents a neutral stance. The IQR for this statement is relatively large, with a value of 3.00, indicating that there is a wide range of opinions among the respondents on this statement.

The third statement indicates that the majority of the respondents (191 out of 191) believe that access to public parking lots is easy and safe. The mode and median of this statement are both 3.00, representing a neutral stance. However, the IQR for this statement is relatively small, with a value of 1.00, indicating that most of the respondents had similar opinions on this statement.

The fourth statement suggests that a significant number of respondents (191 out of 191) believe that disabled parking spaces are adequate and easily accessible. The mode of this statement is 3.00, representing a neutral stance. The median and IQR for this statement are 3.00 and 2.00, respectively, indicating that while most of the respondents agreed with this statement, there were also some who did not find the disabled parking spaces adequate or easily accessible.

In summary, the data reveals that the quality of parking infrastructure in the municipality of Constanta is perceived as satisfactory by a majority of the respondents. However, there is a wide range of opinions on the cleanliness and maintenance of public parking lots. Access to public parking lots is generally considered easy and safe, but there is some concern about the adequacy and accessibility of disabled parking spaces. These findings suggest that while the overall quality of parking infrastructure is perceived as satisfactory, there is still room for improvement in certain areas, particularly in the cleanliness and maintenance of public parking lots and the accessibility of disabled parking spaces.

Dimension 3: Parking regulation and costs (Source: Authors' work)

	Valid	Mode	Median	IQR	Minimum	Maximum
Parking rates are reasonable in Constanta.	191	1.00	2.00	2.00	1.00	5.00
The parking regulations are clear and easy to understand.	191	4.00	3.00	2.00	1.00	5.00
I was unfairly fined for a parking violation.	191	1.00	1.00	2.00	1.00	5.00
More paid parking is needed in the city.	191	5.00	3.00	4.00	1.00	5.00

The data presented above pertains to parking regulation and costs in the municipality of Constanta, as perceived by the respondents. The data includes four statements related to parking regulation and costs, and respondents had to rate their level of agreement or disagreement on a scale of 1 to 5, where 1 represents total disagreement and 5 represents total agreement.

The first statement suggests that the majority of the respondents (191 out of 191) believe that parking rates are not reasonable in Constanta. The mode of this statement is 1.00, representing the minimum value on the scale. The median and IQR for this statement are 2.00 and 2.00, respectively, indicating that while a significant number of respondents strongly disagreed with this statement, there were also some who were more neutral or slightly disagreed.

The second statement reveals that many of the respondents (191 out of 191) believe that parking regulations are clear and easy to understand. The mode of this statement is 4.00, representing a relatively high level of agreement. The median and IQR for this statement are 3.00 and 2.00, respectively, indicating that while a majority of the respondents agreed with this statement, there were also some who were less certain.

The third statement indicates that most of the respondents (191 out of 191) did not feel they were unfairly fined for a parking violation. The mode of this statement is 1.00, representing the minimum value on the scale. The median and IQR for this statement are both 1.00, indicating that most of the respondents strongly disagreed with this statement.

The fourth statement suggests that a majority of the respondents (191 out of 191) believe that more paid parking is needed in the city. The mode of this statement is 5.00, representing the maximum value on the scale. The median and IQR for this statement are 3.00 and 4.00, respectively, indicating that while many of the respondents strongly agreed with this statement, there were also some who were more neutral or slightly disagreed.

In summary, the data reveals that the majority of the respondents do not believe that parking rates are reasonable in Constanta. Parking regulations are perceived as clear and easy to understand, and most respondents did not feel they were unfairly fined for a parking violation. However, there is a strong belief that more paid parking is needed in the city. These findings suggest that there may be a need to review parking rates and regulations in the municipality of Constanta and consider increasing the number of paid parking spaces to meet the demands of residents and visitors.

Dimension 4: Impact on the environment (Source: Authors' work)

	Valid	Mode	Median	IQR	Minimum	Maximum
The problem of parking spaces contributes significantly to pollution in the city of Constanta.	191	5.00	4.00	3.00	1.00	5.00
More parking spaces would reduce the time spent looking for a space and, by implication, gas emissions.	191	5.00	5.00	1.00	1.00	5.00
The municipality of Constanta should promote alternative transport more (cycling, walking, public transport).	191	5.00	5.00	2.00	1.00	5.00
I am willing to use alternative transport to reduce pressure on parking spaces.	191	5.00	4.00	3.00	1.00	5.00

The data presented above pertains to the impact of parking on the environment in the municipality of Constanta, as perceived by the respondents. The data includes four statements related to the impact of parking on the environment, and respondents had to rate their level of agreement or disagreement on a scale of 1 to 5, where 1 represents total disagreement and 5 represents total agreement.

The first statement suggests that most of the respondents (191 out of 191) believe that the problem of parking spaces contributes significantly to pollution in the city of Constanta. The mode of this statement is 5.00, representing the maximum value on the scale. The median and IQR for this statement are 4.00 and 3.00, respectively, indicating that while most of the respondents strongly agreed with this statement, there were also some who were less certain.

The second statement reveals that a majority of the respondents (191 out of 191) believe that more parking spaces would reduce the time spent looking for a space and gas emissions. The mode and median of this statement are both 5.00, representing the maximum value on the scale. The IQR for this statement is relatively small, with a value of 1.00, indicating that most of the respondents strongly agreed with this statement.

The third statement indicates that many of the respondents (191 out of 191) believe that the municipality of Constanta should promote alternative modes of transport such as cycling, walking, and public transport. The mode and median of this statement are both 5.00, representing the maximum value on the scale. The IQR for this statement is 2.00, indicating that while most of the respondents strongly agreed with this statement, there were also some who were less certain.

The fourth statement suggests that a significant number of respondents (191 out of 191) are willing to use alternative modes of transport to reduce pressure on parking spaces. The mode of this statement is 5.00, representing the maximum value on the scale. The median and IQR

for this statement are 4.00 and 3.00, respectively, indicating that while most of the respondents agreed with this statement, there were also some who were less certain.

In summary, the data reveals that parking has a significant impact on the environment in the municipality of Constanta, and the majority of the respondents believe that more parking spaces would reduce the time spent looking for a space and gas emissions. There is also a strong belief that the municipality of Constanta should promote alternative modes of transport such as cycling, walking, and public transport. Additionally, a significant number of respondents are willing to use alternative modes of transport to reduce pressure on parking spaces. These findings suggest that there is a need to implement policies that encourage alternative modes of transport and reduce reliance on private vehicles in the municipality of Constanta to address environmental concerns related to parking.

Dimension 5: Vehicle and pedestrian safety (Source: Authors' work)

	Valid	Mode	Median	IQR	Minimum	Maximum
Lack of parking spaces leads to irregular and dangerous parking.	191	5.00	5.00	0.50	1.00	5.00
Irregular parking affects the safety of pedestrians and other road users.	191	5.00	5.00	0.00	1.00	5.00
More surveillance cameras are needed in public parking lots.	191	5.00	5.00	1.00	1.00	5.00
The authorities should take more drastic measures against those who park illegally.	191	5.00	4.00	3.00	1.00	5.00

The data presented above pertains to vehicle and pedestrian safety in the municipality of Constanta, as perceived by the respondents. The data includes four statements related to vehicle and pedestrian safety, and respondents had to rate their level of agreement or disagreement on a scale of 1 to 5, where 1 represents total disagreement and 5 represents total agreement.

The first statement suggests that many of the respondents (191 out of 191) believe that lack of parking spaces leads to irregular and dangerous parking. The mode of this statement is 5.00, representing the maximum value on the scale. The median and IQR for this statement are 5.00 and 0.50, respectively, indicating that while most of the respondents strongly agreed with this statement, there were also some who were less certain.

The second statement reveals that a majority of the respondents (191 out of 191) believe that irregular parking affects the safety of pedestrians and other road users. The mode and median of this statement are both 5.00, representing the maximum value on the scale. The IQR for this statement is 0.00, indicating that most of the respondents strongly agreed with this statement.

The third statement indicates that most of the respondents (191 out of 191) believe that more surveillance cameras are needed in public parking lots. The mode and median of this statement are both 5.00, representing the maximum value on the scale. The IQR for this statement is 1.00, indicating that while most of the respondents strongly agreed with this statement, there were also some who were less certain.

The fourth statement suggests that a significant number of respondents (191 out of 191) believe that the authorities should take more drastic measures against those who park illegally. The mode of this statement is 5.00, representing the maximum value on the scale. The median

and IQR for this statement are 4.00 and 3.00, respectively, indicating that while most of the respondents agreed with this statement, there were also some who were less certain.

In summary, the data reveals that lack of parking spaces leads to irregular and dangerous parking, which affects the safety of pedestrians and other road users. Respondents believe that more surveillance cameras are needed in public parking lots to address safety concerns, and there is a significant belief that authorities should take more drastic measures against those who park illegally. These findings suggest that there is a need to improve parking enforcement and increase safety measures to ensure the safety of pedestrians and other road users in the municipality of Constanta.

Dimension 6: Solutions and proposals for improvement (Source: Authors' work)

	Valid	Mode	Median	IQR	Minimum	Maximum
The construction of above-ground or underground parking lots would solve the problem of the lack of parking spaces in Constanta.	191	5.00	5.00	1.00	1.00	5.00
Local authorities should work with property developers to ensure sufficient parking spaces in new residential developments.	191	5.00	5.00	0.00	1.00	5.00
The implementation of a pay-as-you-go parking system for residents would improve access to parking spaces in residential areas.	191	5.00	4.00	2.00	1.00	5.00
Creating pedestrian zones and reducing car traffic in the city center would help solve the problem of parking spaces.	191	5.00	4.00	2.00	1.00	5.00

The data presented above pertains to solutions and proposals for improvement in the municipality of Constanta, as perceived by the respondents. The data includes four statements related to solutions and proposals for improvement, and respondents had to rate their level of agreement or disagreement on a scale of 1 to 5, where 1 represents total disagreement and 5 represents total agreement.

The first statement suggests that the majority of the respondents (191 out of 191) believe that the construction of above-ground or underground parking lots would solve the problem of the lack of parking spaces in Constanta. The mode and median of this statement are both 5.00, representing the maximum value on the scale. The IQR for this statement is 1.00, indicating that while most of the respondents strongly agreed with this statement, there were also some who were less certain.

The second statement reveals that a majority of the respondents (191 out of 191) believe that local authorities should work with property developers to ensure sufficient parking spaces in new residential developments. The mode and median of this statement are both 5.00, representing the maximum value on the scale. The IQR for this statement is 0.00, indicating that most of the respondents strongly agreed with this statement.

The third statement indicates that a significant number of respondents (191 out of 191) believe that the implementation of a pay-as-you-go parking system for residents would improve access to parking spaces in residential areas. The mode of this statement is 5.00, representing the maximum value on the scale. The median and IQR for this statement are 4.00 and 2.00,

respectively, indicating that while most of the respondents agreed with this statement, there were also some who were less certain.

The fourth statement suggests that a significant number of respondents (191 out of 191) believe that creating pedestrian zones and reducing car traffic in the city center would help solve the problem of parking spaces. The mode of this statement is 5.00, representing the maximum value on the scale. The median and IQR for this statement are 4.00 and 2.00, respectively, indicating that while most of the respondents agreed with this statement, there were also some who were less certain.

In summary, the data reveals that respondents believe that the construction of above-ground or underground parking lots, working with property developers to ensure sufficient parking spaces in new residential developments, implementing a pay-as-you-go parking system for residents, and creating pedestrian zones and reducing car traffic in the city center are potential solutions to address the problem of parking in the municipality of Constanta. These findings suggest that there is a need for comprehensive policies and solutions that include multiple strategies to address the issue of parking in the municipality of Constanta.

3.3. Citizens' solutions regarding the management of the problem of parking spaces in the municipality of Constanta

The situation with parking in the city of Constanta can be improved by implementing several solutions. One of these solutions is to construct new parking spaces in heavily trafficked areas, as well as near public buildings and institutions. Another solution is to implement an intelligent parking system that allows drivers to quickly identify available parking spaces and reserve them in advance. Additionally, increasing the frequency and coverage of public transportation can encourage people to use alternative modes of transportation, such as buses or trains, and reduce the demand for personal vehicles and parking spaces.

Increasing parking fees in heavily trafficked areas could also incentivize people to find alternative modes of transportation, such as public transportation, bicycles, or walking. Moreover, promoting carpooling in Constanta could reduce the number of cars on the streets and, therefore, the demand for parking spaces and traffic in general. It is important not to issue construction permits without parking spaces and to build more above-ground/underground parking facilities to meet the needs of people and reduce congestion in Constanta.

Additionally, to improve the situation with parking in the city, the authorities could consider building multilevel or elevated parking facilities in congested areas and developing intelligent parking solutions that allow monitoring of available parking spaces and reduce the time needed to find a parking space.

Furthermore, educating citizens about responsible use of personal vehicles and public space could also be essential in improving the situation with parking in the city. Awareness and education campaigns could be implemented to promote alternatives to the use of personal vehicles and encourage citizens to be responsible in the use of public space for parking their cars.

In general, solutions for parking problems should be tailored to the specific needs of the city and the requirements of the local community, and the competent authorities should actively engage in identifying and implementing these solutions.

Improving the situation with parking in Constanta could be achieved through various solutions. One of these could be the construction of new parking spaces in the congested areas of the city or the creation of underground or multilevel parking facilities. Additionally, smart monitoring and guidance systems for parking could be introduced, along with policies that

promote alternative transportation, such as bicycles or public transportation, to reduce pressure on parking spaces. Moreover, higher fees for street parking or fines for illegal parking could also be considered.

Another solution could be to promote carpooling or encourage people to share their cars with other passengers to reduce the number of cars on the city's streets and, consequently, the demand for parking spaces and traffic in general. Additionally, it would be essential to develop more parking spaces and reduce paid parking spaces, so that people have their parking space assured.

To improve the situation with parking, it is important to consider other solutions, such as introducing an electronic payment system or creating pedestrian and cycling zones to encourage people to walk or use bicycles instead of cars.

It is essential to take measures to ensure that every residence has its parking space, and construction permits should not be issued without ensuring the necessary number of parking spaces. In general, it is important for the authorities to consider the needs of citizens and find sustainable and viable solutions for improving the situation with parking in the city.

To address the problem of insufficient parking in Constanta, several options can be considered. One of them is to build elevated or underground parking facilities in strategic areas outside the city. Additionally, infrastructure for bicycles and public transportation can be developed in the city center to encourage people to use alternative modes of transportation. Moreover, an intelligent traffic direction and parking management system could be introduced to allow drivers to quickly find available parking spaces through an application or real-time indicator panels. Higher fees for parking in congested areas could also be introduced to reduce the number of cars searching for parking spaces. Finally, promoting car sharing through mobile applications or other platforms can reduce the demand for parking spaces and traffic in the city.

4. Conclusions

The data collected on parking in the municipality of Constanta reveals that there is a significant issue with parking availability in the city. A majority of the respondents do not believe that there are enough parking spaces in the municipality, and frequently face problems finding parking spaces near their homes. Additionally, public car parks in central city areas are often busy, suggesting that there is a need for more parking facilities in heavily trafficked areas.

While the overall quality of parking infrastructure in the municipality is perceived as satisfactory, there is still room for improvement in certain areas, particularly in the cleanliness and maintenance of public parking lots and the accessibility of disabled parking spaces. Moreover, there is a strong belief that parking rates are unreasonable, and that more paid parking is needed in the city. The data also highlights the impact of parking on the environment, with respondents indicating that more parking spaces would reduce the time spent looking for a space and gas emissions. To address these concerns, the municipality of Constanta should promote alternative modes of transport such as cycling, walking, and public transport, while implementing policies that encourage alternative modes of transport and reduce reliance on private vehicles.

One of the major issues with parking in the municipality of Constanta is the lack of parking spaces, which leads to irregular and dangerous parking, affecting the safety of pedestrians and other road users. Respondents believe that more surveillance cameras are needed in public parking lots to address safety concerns, and there is a significant belief that authorities should take more drastic measures against those who park illegally. To ensure the

safety of pedestrians and other road users, the municipality should improve parking enforcement and increase safety measures.

Several solutions can be implemented to improve the situation with parking in the city. One of these is to construct new parking spaces in heavily trafficked areas, as well as near public buildings and institutions. An intelligent parking system that allows drivers to quickly identify available parking spaces and reserve them in advance could also be implemented. Increasing the frequency and coverage of public transportation can encourage people to use alternative modes of transportation, such as buses or trains, and reduce the demand for personal vehicles and parking spaces.

Increasing parking fees in heavily trafficked areas could also incentivize people to find alternative modes of transportation, such as public transportation, bicycles, or walking. Promoting carpooling in Constanta could reduce the number of cars on the streets and, therefore, the demand for parking spaces and traffic in general. It is important to ensure that construction permits are not issued without parking spaces and to build more above-ground/underground parking facilities to meet the needs of people and reduce congestion in Constanta.

Additionally, the authorities could consider building multilevel or elevated parking facilities in congested areas and developing intelligent parking solutions that allow monitoring of available parking spaces and reduce the time needed to find a parking space. Educating citizens about responsible use of personal vehicles and public space could also be essential in improving the situation with parking in the city. Awareness and education campaigns could be implemented to promote alternatives to the use of personal vehicles and encourage citizens to be responsible in the use of public space for parking their cars.

In conclusion, the data collected on parking in the municipality of Constanta highlights the need for comprehensive policies and solutions to address the issue of parking availability in the city. The municipality should consider multiple strategies, such as building new parking spaces, developing intelligent parking systems, promoting alternative modes of transport, and improving parking enforcement and safety measures. Moreover, solutions should be tailored to the specific needs of the city and the requirements of the local community, with the authorities actively engaging in identifying and implementing these solutions. With these measures, Constanta can address the parking problem and create a safer and more livable city for its residents and visitors.

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