



DOI: 10.7251/JTTTP2402107S

UDC: 656.1.015:004.78(497.5)

PROFESSIONAL PAPER

Analyses of the Parking System in Velika Gorica

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Received: May 31, 2024

Accepted: October 21, 2024

Abstract: Because there are fewer available urban spaces and more cars on the road, parking is becoming an increasingly important component of urban design. The sustainability of urban transportation and traffic flows can be greatly impacted by parking management. By using zonal parking as a parking policy measure, the city of Velika Gorica has arranged parking in its region. The parking system was examined in detail. Citizens were surveyed to find out what they thought of the parking system. Public unhappiness with the current parking system was shown by the analysis, which indicated that pricing adjustments and the provision of preferred parking permits were necessary. In areas with high demand, parking capacity must be increased. Using a collaborative approach to address parking issues can enhance traffic regulations and lead to more space for sustainable modes of transportation and pedestrian zones.

Keywords: Urban Mobility, Parking System, Parking Policy, Demand Management, Velika Gorica.

INTRODUCTION

Due to the increase in car ownership and use over the past 20 years, as well as the growing shortage of urban space, parking has become a growing priority in urban planning. For a very long period, reports and non-academic papers written by parking experts constituted the “grey” literature that dominated parking literature. Prior to the late 1990s, there weren’t many scientific articles on parking (Mingardo et al., 2015). Compared to other areas of transportation, parking is still a subject of little research in traffic studies, despite its critical role in controlling the total amount of travel demand in cities.

Following World War II, when new areas were developed to make driving simpler, motor vehicle ownership and usage in and around European cities started to rise. In Europe, there has been a steady transition from loosely regulated or unregulated parking to stricter rules that began in the 1960s, particularly in urban areas. The exception was Eastern Europe, where the emergence of a market economy in the 1990s was the catalyst for a notable increase in car ownership. Outside of metropolitan centers, new urban projects frequently emulated—and

frequently still do—the architectural trends that were popular at the time in the USA, Canada, and Australia. In densely populated urban areas, people began to park close to their residences, frequently obstructing traffic lanes and walkways (Kodransky and Hermann, 2011).

In major cities, cars looking for parking usually account for one-third of traffic. Parking-related disputes are among the most frequent issues that developers, operators, planners, and other parking experts deal with, and parking facilities represent a substantial financial burden on society. These issues are frequently characterized in terms of parking supply or management. Since management solutions support several strategic planning objectives, they are usually more effective than supply expansion. Policies and initiatives that lead to a more effective use of parking resources are referred to as parking management. When all factors are considered, better management is frequently the best way to address parking issues (Litman, 2021).

Parking regulations in European cities have always been a component of a larger urban transport policy that corresponds to the main concepts of the past few decades in transport policy (van Wee et al., 2011). Driv-

ing decisions can be significantly influenced by parking (Shiftan and Burd-Eden, 2001). In locations where the parking system is combined with local public transportation, economic objectives, and environmental protection aims, parking management solutions alter supply and/or demand. According to Brčić et al. (2016), parking fees can be employed as a strategy to control the impact on mode choice.

Therefore, it is essential to perform a parking policy analysis prior to making policy decisions about parking policies in a certain area. This gives a better idea of how parking regulations should be changed to increase the sustainability and functionality of local transportation as a whole.

Part of Zagreb County, Velika Gorica is a city in northwest Croatia that is the largest in terms of both population and area. Situated in the lowland region of Turopolje and on the edge of the hilly Vukomeričke Gorice, it is 16 kilometers southeast of Zagreb. The area of the city is 328.7 km²; when combined with the three recently created municipalities of Kravarsko, Pokupsko, and Orle, it makes up 552 km². Velika Gorica is the sixth-largest city in the Republic of Croatia, with 58 settlements. Settlement Velika Gorica has 30,086 inhabitants, while the city has 61,198 people, making it the sixth most populous metropolitan area as of the 2021 census.

PARKING SYSTEM

In a “Decision on the Organization, Payment, and Control of Parking in Velika Gorica,” the city of Velika Gorica

specifies the public spaces where parking payments will be made as well as the manner in which they will be made. Parking zones, parking zone locations, parking permit categories, parking permit usage, parking permit rates, and the rights to purchase privileged tickets and parking area supervisors were all outlined in the decision.

The business VG Komunalac d.o.o. is in charge of managing the parking operations in Velika Gorica. Authorized employees of the parking operator – controllers are in charge of managing parking. The “General Terms of Delivery of Communal Parking Services and Parking Lot Usage Agreement,” published by VG Komunalac d.o.o., outlines the terms and conditions for parking service provision, as well as the rights and obligations that users and service providers share. It also details how to measure, calculate, and pay for the service.

In the city center, 1,901 public parking spaces are used for parking regulation and payment. Time-limited parking and zone parking are two of the implemented parking rules. Three zones contain 278 spaces in Zone I, 1,598 spaces in Zone II, and 25 spaces in Zone I-1h. Zone I has a 180-minute time limit; Zone II has no time limit; and Zone I-1h has a 60-minute time limit. Weekday parking hours are from 7 AM to 8 PM, and on Saturdays, they are from 7 AM to 2 PM. Holidays and Sundays have free parking. In Zone I and Zone I-1h, the hourly parking price is €0,53, while in Zone II, it is €0,40.

The following are the costs for subscription and privileged parking permits:

- Residents living in the payment zone pay €3,98 a month.



Figure 1. Display of public parking areas

- Businesses within the payment zone: €21,24 per month
- Business entity employees: €9,29 per month
- Senior citizens: €2,65 per month
- Persons with disabilities: €1,33 per month
- Owners of electric vehicles: €3,98 per month
- All public parking lot users: €39,82 per month
- Legal entities parking in all lots: €66,36 per month
- Over 40 blood donations: €1,33 per month
- Velika Gorica College students pay €9,29 a month
- Parking ticket for the day (DPK): €10,62 per 24 hours.

Parking permits are available for purchase at the VG Komunalac d.o.o. premises, via parking machines, SMS, mobile applications, and the web store. The following represents the hourly parking permit sales share by sales channel:

- Purchase of SMS: 73,15%
- Purchase of parking machines: 22,8%
- DPK purchase: 1,92%
- Purchase of kiosks: 1,26%
- Purchase of the application: 0,87%.

Ensuring that vehicles have valid parking permits is the responsibility of nine controllers who work in two shifts.

A daily parking permit (DPK) is provided in the event that a parking permit is invalid. 13.875 DPKs were issued in 2021; 38% of those were in Zone I, 3% in Zone I-1h, and 59% in Zone II.

SURVEY RESULTS

To understand public attitudes towards the parking system, a survey was conducted among citizens to gather their satisfaction ratings with the current parking offerings, including the types of parking areas used and their opinions on parking prices. This approach provides essential insights into user experiences and perceptions, which are crucial for adequately planning and improving the parking system in line with the population's needs and expectations.

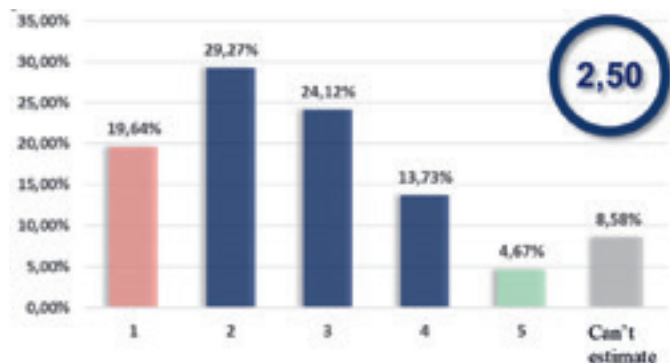


Figure 2. Satisfaction rating with the parking offer

In a survey on parking satisfaction among 1,049 respondents, the average rating was 2.50, indicating generally low satisfaction. A significant portion of respondents gave low ratings, with 19.64% rating the parking offer as 1 and 29.27% as 2, totaling nearly half of the respondents expressing dissatisfaction. Moderate satisfaction, with a rating of 3, was expressed by 24.12% of respondents, while higher ratings were less common, with 13.73% giving a rating of 4 and only 4.67% very satisfied with a rating of 5.

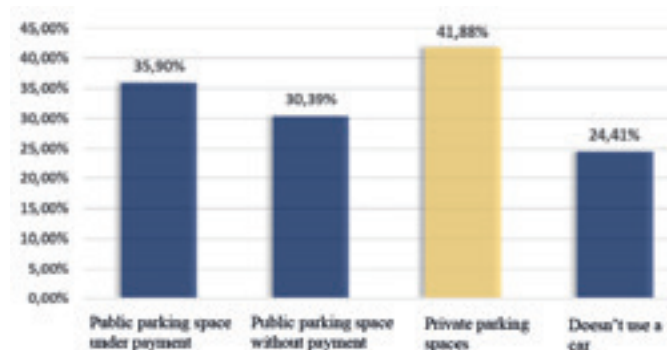


Figure 3. Types of parking spaces

In a survey on the type of parking areas used among 1,053 respondents, who could choose multiple answers, the largest share, 41.88%, used private parking spaces. This was followed by paid public parking spaces at 35.90%, and free public parking spaces were less common with 30.39% of users. These data suggest that private parking spaces are preferred among drivers, but there is also substantial use of public parking spaces, with a notable number of citizens opting for alternative transportation or not owning a personal vehicle.

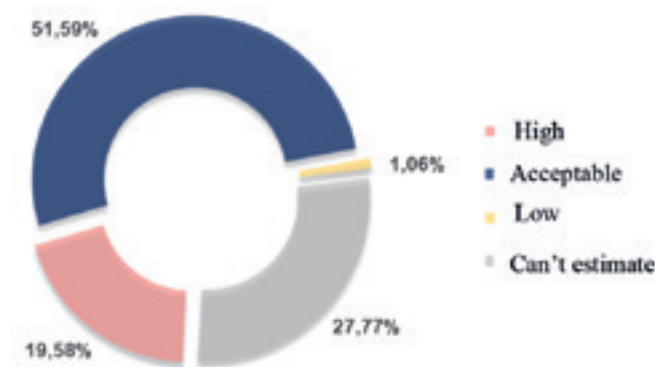


Figure 4. The respondents' opinion towards the price of the parking service- all of respondents

Among 1,037 respondents, 51.59% found the parking price acceptable. Conversely, 19.58% saw the price as high, and only 1.06% considered it low. Additionally, a significant number of respondents (27.77%) were unable to assess the parking price, possibly due to lack of use or unclear pricing.

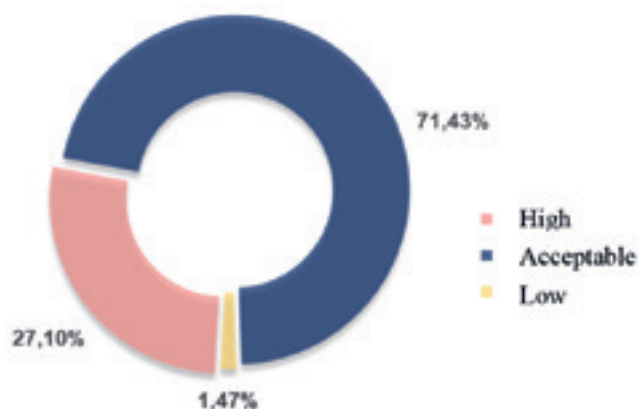


Figure 5. The respondents' attitude towards the price of the parking service- users of parking spaces

Among parking users, a smaller sample of 749 respondents, the perception of parking price differed. A larger share, 71.43%, found the price acceptable, while a higher proportion (27.10%) considered the price high compared to the general population. Only 1.47% of parking users found the price low. This contrast indicates that parking users are more likely to view the parking price as acceptable, possibly due to their regular need for parking and hence greater willingness to accept the associated costs.

CONCLUSION

A vital component of any urban area is traffic policy. When properly implemented, it could reduce traffic jams, maximize urban land use, promote environmental protection, and raise urban residents' quality of life. An essential component of traffic policy is parking policy.

The survey results reveal a general dissatisfaction with the current parking system among the citizens of Velika Gorica. With an average satisfaction rating of 2.50 out of 5, nearly half of the respondents rated the parking offer poorly. The data also indicates a preference for private parking spaces, although paid and free public parking spaces are also widely used. While a slight majority of respondents find the parking price acceptable, a notable proportion consider it high, with this perception being more pronounced among regular parking users. These findings suggest a need for revising the parking system, particularly regarding pricing and the availability of parking options, to better meet the needs and expectations of the city's residents.

Consequently, a review of the current parking system is required. This would entail improving accessibility to privileged parking licenses and changing the cost of parking. Creating more parking spaces in areas with high demand is essential. This would satisfy parking demands and enhance the region's overall traffic regulations. Additionally, road traffic safety would increase, but a more thorough examination of the total volume of

traffic in the area.

Parking management should be viewed as part of the overall traffic policy. A synergistic approach to solving parking problems will also address other traffic issues in the observed urban area. This will enhance the application of traffic policy in the observed area and create surplus urban space. Such areas could then be used to expand pedestrian zones and increase the use of sustainable modes of urban transportation.

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