Car drivers' evaluation of parking garages

van der Waerden, P.J.H.J.

Published in:
SerVicE_Magazine

Published: 01/01/2011

Document Version
Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:
• A submitted manuscript is the author's version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
• The final author version and the galley proof are versions of the publication after peer review.
• The final published version features the final layout of the paper including the volume, issue and page numbers.

Link to publication

Citation for published version (APA):

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

• Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
• You may not further distribute the material or use it for any profit-making activity or commercial gain
• You may freely distribute the URL identifying the publication in the public portal ?

Take down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Download date: 05. Dec. 2018
Drs. ing. P.J.H.J. van der Waerden

Peter van der Waerden is a researcher in both Traffic Engineering and Human Geography and he joined the Urban Planning Group of the Eindhoven University of Technology in 1996. He is specialized in parking, road engineering and public transport-related research with a focus on the relation between transportation, physical environment. Furthermore, he is coordinator of the Dutch National Parking Panel (www.parkingpanel.nl).

Because of growing competition between parking facilities in inner city areas, managers of parking garages are looking more carefully to the requirements of (segments of) their customers (e.g., Visser, 2000). According to Visser, the increase of operation costs requires an optimal operation of parking facilities. Parking operators have to act more professionally and focus more on the requirements and evaluation of their costumers, which concern various characteristics of parking garages.

In addition to the previous studies, this article provides additional insight into car drivers’ evaluation of location and price related characteristics of parking garages. The article addresses the following research questions: ‘How are different aspects of parking garages evaluated?’ and ‘Are there significant differences between parking garages?’ The remainder of the article is organized as follows: First, the adopted research approach and the data collection will be described. This section also includes a brief description of personal characteristics of the respondents included in the sample. In section 3, the analyses and the results of the analyses are discussed. The article ends with a discussion about managerial implications and suggestions for future research.

Research approach and data

To find the answers to the two included research questions the following approach was adopted. Car drivers were asked to evaluate characteristics of the parking garage they parked their car when visiting the city of Eindhoven. In total, six different characteristics of parking garages were investigated: the number of parking spaces, the price level, the traffic safety for both cars and pedestrians, the social safety, the accessibility of the parking garage in relation to home, and the accessibility of final destinations in relation to the parking garage. For the evaluation a five-point scale was used ranging from Bad (score 1) to Good (score 5).

To get the necessary insights into the requirements of car drivers with respect to parking garage characteristics, a questionnaire was developed. The questionnaire covers three parts: (i) the car drivers’ current use of parking garages, (ii) car drivers’ evaluation of parking garage characteristics, and (iii) car drivers’ response on hypothetical parking measures. Figure 1 shows part of the questionnaire on which the analysis of this paper are based. In addition, some questions were included concerning the personal characteristics of the respondents (gender, age, home location, group size, car type, and trip purpose).

In October 2005, questionnaires were administered by students in 8 different parking garages in the city centre of Eindhoven, the Netherlands (Figure 2). Kennedy Business Center (code 2), Bijenkorf (B), Mathildelaan (10), De Witte Dame (14), Heuvellage (19), ’t Hooghuis (20), Stadskantoor (30), and Stadhuisplein (31). The parking garages differ in size and are exploited by different organizations: Q-park, P1, and the municipality.

In the questionnaire respondents have evaluated different characteristics of the included eight parking garages. The numbers of respondents who have evaluated the parking garages are presented in Figure 3. The numbers of respondents across personal characteristics is what one might expect in inner-city areas. A few more females than males participated in the study. Most respondents belong to the age group 25 to 45 years, live outside the city of Eindhoven, visit the parking garages alone, use a standard car, and visit the city center for shopping.

The questionnaires were distributed across the parking garages in accordance with the size of the parking garage. When returning to their car, car drivers were asked to answer the questions of the questionnaire. More than 680 car drivers completed the questionnaire. The distribution of the respondents across personal characteristics is what one might expect in inner-city areas. A few more females than in the previous studies, this article provides additional insight into car drivers’ evaluation of location and price related characteristics of parking garages.
number ranges between 40 (garage Stadskantoor) and 120 (garage Bijenkorf), which makes it acceptable to include all the parking garages in the analyses.

In the first step of the analysis, for each characteristic the average evaluation scores were calculated. The result is shown in Figure 4. It appears that on average car drivers give the highest evaluation scores to traffic safety, social safety, and home location, closely followed by the score for location vis-à-vis home. The price level receives the lowest average score.

In the next step of the analysis, the differences in evaluation scores between the included parking garages are investigated in more detail. The differences are investigated using Analysis of Variance (ANOVA) with the multiple comparison test Bonferroni. ANOVA tests if there are differences in means over all parking garages and does not provide pair wise information. The ANOVA test uses the F-statistic to decide if the difference in means is statistically significant (at conventional level: F-statistic ≥ 1.96). Bonferroni test also uses the F-statistic and analyzes the differences in means for each pair of parking garages.

“Insights into car drivers’ evaluation of parking garage characteristics are important for managing parking garages.”

The results of the tests for each characteristic are presented in Table 3. The F-statistics show that the mean evaluations of the parking garages differ significantly for almost all parking garage characteristics except social safety.

Conclusions
Parking facilities in general and parking garages in particular have become interesting objects in the urban real estate market (CROW 2006b). Together with good accessibility, the availability of good parking facilities play an important role in the quality of a location which has a great influence on the value of buildings such as houses, shops, and offices. For example, parking facilities contribute for 24 percent in the rental value of offices. Parking facilities not only influence the value of property but also represent a certain value by itself by generating money and through the life cycle they go through. The described position of parking facilities requires a continuous monitoring of the quality of the parking facility in relation to the users of the facilities.

This article describes a study concerning car drivers’ evaluation of parking garages. Special attention is paid to location and price related parking garage characteristics. Both groups of characteristics include important management tools for operators of parking garages when looking to the customers and the value of their garages. Previous studies (e.g., Van der Waerden et al. 2006, CROW 2006a) show that parking tariffs and parking locations have a strong influence on car drivers’ parking choice behavior. Car drivers visiting different parking garages in the city of Eindhoven are asked to evaluate 6 different characteristics. The study shows that car drivers give the highest evaluation score to the distance between parking garage and final destination, and the lowest evaluation score to the price level of the parking garages. It also appears that all investigated characteristics differences in mean evaluation scores exists between individual parking garages. Operators of parking garages can use this information to start initiatives to improve the evaluation scores of their parking garage(s) and, in addition, improve the competitive position of the garages and its environment.

In addition, the test results show many significant differences between the different parking garages. For example, regarding capacity it appears that the mean evaluation scores between parking garage 2 and 10 differ significantly. The difference in mean score is equal to -0.570, indicating that parking garage 2 is higher evaluated than garage 10. Overall, the figures show that parking garages differ mostly in mean evaluation in the case of capacity, and less in the case of distance between parking garage and final destination. In more detail, it appears that parking 10 scores very well in relation to other parking garages in the case of capacity, and parking garage 8 scores poor in the case of price level.

References


Conference Proceedings of Recent Advances in Retailing and Services Conference 2005, EIRASS, Orlando, Florida, USA.


FIGURE 4
Car drivers’ evaluation of parking garages characteristics