

The Effect of P&R Introduction on Bus Users and the Comprehensive Evaluation of Shared Use P&R

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論 文 名 : THE EFFECT OF P&R INTRODUCTION ON BUS USERS AND THE
COMPREHENSIVELY EVALUATION OF SHARED USE P&R (P&R
によるバス利用者への影響及び潜在的な Shared Use P&R 施設の総合評価)

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論 文 内 容 の 要 旨

Park and ride (P&R), as a method of TDM, have been introduced to many counties in recent decades. P&R facilities are car parks with connections to public transport that allow commuters and other people headed to city centers to leave their vehicles and transfer to bus, rail system or carpool for the remainder of the journey. The vehicle is stored in the car park during the day and retrieved when the owner returns. P&R facilities are generally located in the suburbs of metropolitan areas or on the outer edges of large cities.

In this paper, we discuss how the P&R facility affects bus users and try to find proper plans for the pricing and siting of P&R facility, and how we should evaluate the new type of P&R that is called “Shared Use P&R”. We investigated the implementation of existing Shared Use P&R in Fukuoka City and provided approaches to comprehensively evaluate potential Shared Use P&R. Six chapters are included in this dissertation.

Chapter 1 introduces the concept and background of P&R facilities and the research object.

Chapter 2 is literature review. We explained the previous researches on P&R and divided them into five groups. They are on the pricing and siting plan of P&R, on the benefits of introducing P&R facilities, on the traveler response to traffic modes, on the implementation of P&R in various parts around the world and on new type of P&R. Several problems which occur by the introduction of P&R facilities are discussed, and from these problems we drew two research objects. One is the effect of P&R introduction on bus users and the other is the approach to comprehensively evaluating potential Shared Use P&R.

Chapter 3 discussed the problem of traditional P&R. That is the effect of P&R introduction on bus users. From the estimation and data analysis, we concluded that the introduction of P&R facilities impacts the operation of bus. Since the existing P&R parking fee is at a very low level, when P&R is introduced, people will choose the cheapest travel mode by the price-oriented method. As the result car users are significantly reduced, however, when the introduction of P&R facilities affects the operation of bus, it is possible for the bus company to abolish the route which is unprofitable. At the position of the residents who cannot drive a car, the only way of travel they can choose is walking. For the residents who live far away from the railway station, it is very inconvenient to walk to the railway station. To avoid the situation, we increased the parking fee of P&R to find a balance situation which the bus user can remain at

the normal level before the introduction of P&R facilities. Finally, we found that we could keep bus users exactly at the normal level when the P&R parking fee was about 1,500 yen/day in 10km or in 20km area from the city center. To keep the total general cost in the lowest level, the price of P&R parking fee have to be at the existing level. Since P&R parking fee will lead the bus operation to a negative situation, other measures are needed to keep the bus operation. Then two effective measures are proposed in this chapter. One is the local government subsidy, and this helps the bus company to keep the route running. Another plan is the cooperation between the railway company and the bus company, because the introduction of P&R can increase the number of railway users. On the other hand, the implementation of traditional P&R is not easy to obtain the support of related stakeholders. Many cities have a tendency to transfer to the new type of P&R in this background.

From chapter 4, we have entered the discussion on Shared Use P&R, which is considered as one of new types of P&R. In chapter 4, in order to clarify the implementation of Shared Use P&R, we conducted some interviews and literature reviews and learned that there were many consultations before the implementation of Shared Use P&R, realizing that the implementation of Shared Use P&R requires multi-party cooperation and some problems in the agreement process.

Chapter 5 is an approach to comprehensively evaluating potential Shared Use P&R. After setting our goal on comprehensive evaluation, we proposed a comprehensive evaluation standard and verified its feasibility through a case study. In order to allow the government to negotiate with the shopping center smoothly before implementing the Shared Use P&R policy, a comprehensive evaluation procedure was proposed including the selection of the target shopping center, public transport service level, parking lot situation and the estimation of the number of users. With Fukuoka City as a case city, according to the evaluation method for site selection, we selected Sunlive Koga as the target store. Questionnaire survey was conducted on residents around the store, and disaggregate model analysis was carried out to the survey data to construct a binomial logit model of P&R and other transportation methods. Using estimation results of the model, we estimated the number of P&R users in this store.

The last chapter summarizes the research, and points out several issues needing to be solved in future research.