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ABSTRACT

This research is a preliminary study to answer the question of "How the curb side of C.B.D. can be used ?". So, here we describe essential characteristics of certain existing truck, passenger cars and taxi service areas and operational aspects of loading & parking activities in Osaka C.B.D. based on field study.

The sample area consists of many blocks in main 3 streets in the City. Liscence plate survey have being done in two ways; one, is continous survey to determine accurately the characteristics of loading and parking operations, the other is periodic survey to compare if this type is sufficient to be used as input data to calculate the space requirements where the first one take long time and needs more man-hours. Having analized the characteristics, some of these data was used as input data to simulation model to determine the space requirements for different types of vehicles.

DATA COLLECTION

A pilot survey was done in about 78 blocks to determine the sample where the survey is going to be done. Fig.1 shows the result of this survey as a relation between the site of the block and parking density. Sakaisuji Str. showed slightly difference along the street, but Midosuji and Matsuyamachi showed enversely results where the first shows that parking density is haigher at the north side than south and vice versa in Matsuyama street. From Aug. to Sept. 1983, liscence plate survey was done at different blocks assigning one person for each block from 9:00 - 6:00 o'clock to determine arrival time, departure time, vehicle type, ...etc.

CHARACTERISTICS OF SURVEY DATA

A) VEHICLES ACCUMULATION

Fig.2 shows the accumulation of arrivals resulted from the continous survey considering all types of arrivals. The peak arrival was found to be occurred from 10:00-11:00.

B) TYPE OF ARRIVALS

If we considered the curb arrivals as a whole, the percentage of goods' vehicles (T1,T2,T3,W) was found to be ranging from 33%-75%, parked vehicles(C) ranging from 20%-35%, the rest from 6%-32% is a taxi(X). These results are shown in figure 3.

C) Loading TIME DISTRIBUTIOPN

The range of average loading time in minutes for different types of arrivals showed to be 9.1-19.3 (total arrivals), 4.6-6.1 (big trucks), 3.3-19.8 (medium trucks), 11.3-34.4 (light vans), 10.3-21.9 (passenger cars). These loading times were calculated when considering the total arrivals, but when neglecting vehicles waited more than 30 mins., these values showed to be 4.9-6.7, 4.6-6.1, 3.3-8.5, 2.9-8.9, respectively (case of passenger cars not calculated).

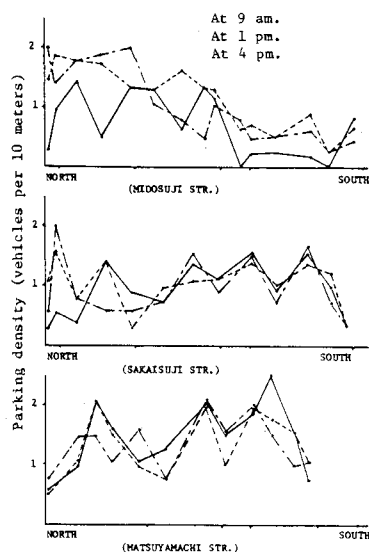


Fig. 1 Frequency of parking density

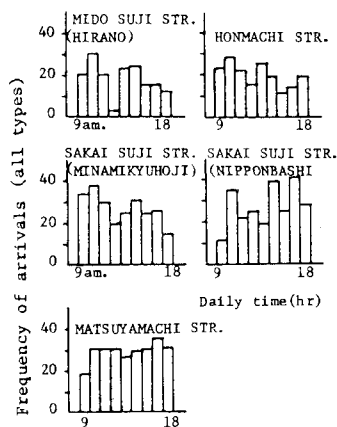


Fig. 2 Vehicles accumulation

The reason why less than 30 mins. loading was considered is that percentage was found to be ranging from 81.3%-95%. Loading time distribution for Nipponbashi str. is shown in figure 4. It is also noticed that not all arrivals did loading even in case of goods' vehicles, the percentage of vehicles did loading for every type is shown in table 1.

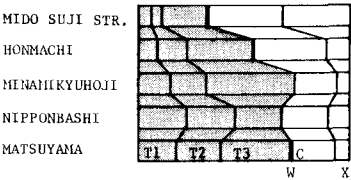


Fig. 3 Arrival by tipe

D) OTHER CHARACTERISTIC

Fig. 5 shows the accumulation of pedestrian . Comparing this figure with figure No.2, it is clear that these two relations are enversily proportional in all different 5 roads.

LOADING SPACE REQUIREMENTS

The purpose now is to calculate theoretically the space requirements for different type of arrivals to meet the growing demand for curb space in Osaka C.B.D. A simulation technique was used for the procedural analysis and performance assessment. The model was designed to examine the efficiency of the loading system in terms of the effect of every type of arrivals and service time.

For every case, considering a system consisting of N service stations (spaces) operating in parallel, where N is increased from 1 to 12 to calculate the required number of spaces. The average hourly arrival was calculated by deviding the daily arrivals by 8 hours.

RESULTS AND ANALYSIS

In this study, 3 case studies were considered:1st, all type of arrivals, ie.(truck loading vehicles, passenger cars, taxi). 2nd, vehicles did only loading considering the real average loading time. 3rd, vehicles did only loading with neglecting vehicles did loading more than 30 minutes. Considering the average loading time corresponding to every case, a relations between loading spaces and percentage of vehicles could not do loading (because space was occupied) were carried out.To simplify this relations, the results were obtained as shown in table 2. These results represent space requirements for a block its length ranging from 60-65 meters for corresponding street.

GENERAL CONCLUSION

- This research suggests a guide line in formulating zoning ordinances which deals with the problem of space requirements to be allocated at curb.
- The need to encourage planning and construct of off-road service area is recommended, but for short term solution of loading and parking problems, allocation of curb loading space is necessary (3-6 spaces) for block or (2-4 spaces) but loading time must not exceed 30 mins.
- Also, promoting the co-ordination and co-operation between drivers, shippers, and receiver is strongly recommended.

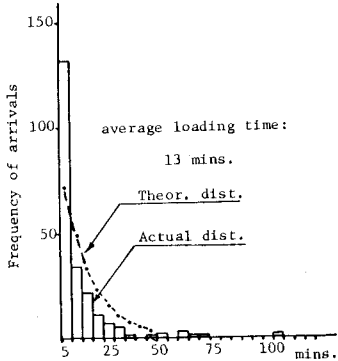


Fig. 4 Loading time distr.for all types (Nipponbashi)

	ALL TYPES	T1	T2	T3	C
MIDO SUJI STR.	18.9	70.0	87.5	47.1	1.7
HONMACHI STR.	23.2	50.0	60.5	28.6	4.8
MINAMIKYUHOJI STR.	56.0	88.9	61.0	62.9	23.5
NIPPONBASHI STR.	43.9	83.1	62.1	35.7	7.4
MATSUYAMA STR.	45.6	95.7	60.0	38.9	20.0

Table 1. Percentage of vehicles did loading only

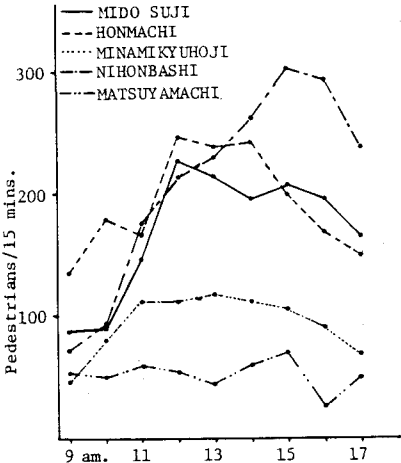


Fig. 5 Pedestrian accumulation

	CASE 1	CASE 2	CASE 3
HIRANO STR.	6	3	2
HONMACHI STR.	8	3	2
MINAMIKYUHOJI STR.	-	9	4
NIPPONBASHI STR.	9	6	4
MATSUYAMA STR.	10	-	-

Table 1. Loading space requirements for different str. when 5% of arrivals could not do loading.