

The Improvement of Traffic Conditions at the Wholesale District

by

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ABSTRACT

Traffic condition at Nihonbashi wholesales district in Tokyo was crowded by vehicles for loading or shopping and there were lots of illegal parking as the same as other wholesale district. In order to improve this condition, there has been implemented a dual usage parking meter which distinguishes parking time either for delivery trucks or passenger cars for shopping. This study consists of analyzing the impact of this measure by comparing the before and after survey.

1. THE PURPOSE OF INVESTIGATION STUDIES

This study arrange the effect of traffic condition improvement at the wholesale district. The traffic condition of wholesale district appears to have a heavy congestion by moving and purchasing materials. The wholesale district at Nihonbashi in Tokyo, for example, has a similar situation, especially disorder parking stand out. Improvement of traffic conditions in this place is an experimental case study of Truck Time Plan that carries the dual usage of existing parking meters on the road side by distinguishing the parking time for pick up/delivery and purchase. This paper is based on the effect of Truck Time Plan by a comparative analysis of survey before and after the fact.

2. TRUCK TIME PLAN IN PREVIOUS PARKING POLICYS

Truck Time Plan in previous parking policies is shown in Figure 1. Looking back on parking policy in Japan, parking lot law was established in 1957, which planned promotion of parking lot facilities to correspond to the increase of owned cars. In this law, parking lot equipped districts, on-street parking lots, off-street parking lots were defined. And 'The duty of attributing a parking lot' to more than 3000 m² buildings can be enforced by the municipality. In 1962, a garage law was established. In this law, people are assigned a duty to secure a garage less than 500m from their house when they own a car.

In this way, basic parking policies were built up by the 1960's when the number of owned cars was less than one for every ten households. But most of parking policies depend on the buildings, therefore it wasn't enough to require as on-street parking lots or district parking lots. After that some problems arise, so they were changed by partial law amendments. But the parking problem constituted a social problem and all nations paid increasing attention to it.

So these parking policies were reviewed, and each municipality was assigned a duty to have a parking facility plan relating to the condition of parking on streets or in the district. This is called 'Master plan of parking lot facility'. In Tokyo, Adachi-ward established this plan for the first time in 1992. Main object of this plan focused on over 30 minutes parking ; and it was put in practice at many districts as a policy for on and off-street parking lots, available use of the existing parking lot system, guiding and leading of parking lot system.

In this way, parking policies until now didn't correspond to less than 30 minutes on-road parking. Truck Time Plan is a countermeasure for less than 30 minutes short parking such as

3. CONCEPT OF TRUCK TIME PLAN

3.1 Summary of the wholesale district at Nihonbashi

The fiber wholesale district at Nihonbashi has a 60,000 m² area with 2,550m road that locates in 1.5km far from Tokyo Station, surrounded by Yasukuni St., Kiyosugi St., Kiyosubashi St., and Edo St. 350 fiber wholesale dealer and else 143 shops crowd in this district. Though population is 552 residence, day time population is 3,000(including 800 employee), there is crowd of more than 8,000~10,000 on a bargain sale day. Quantity of goods for outside on one day is about 5,000. There are 401 possessed car and the total number of inflow traffic from 8:00 to 17:00 is a 5371 in this district.

Table 1 shows the general traffic condition of Oh St. and Naka St. based on the traffic survey that the Metropolitan Police Department carried out on Friday, November 11, 1994.

Table 1 The general traffic condition of Oh St. and Naka St.

Street name	Oh St.	Naka St.
Population	65	52
Number of owned vehicle	Trucks: 0 Cars :16	Trucks: 0 Cars :4
Road length	310m	214m
Road width	6m (excluding pavement)	6.2m (including verge)
Pavement	3m on both side	No pavement
TRAFFIC REGULATION		
	No parking with time limits (9:00-16:00 except Sunday and holiday) (Parking permitted at off-operating time)	No parking with time limits (9:00-19:00 except Sunday and holiday) (Parking permitted at off-operating time)
One way regulation	Yokoyama-cho junction to Asakusabashi junction	Edo st. to Kiyosugi st.
Traffic prohibition	Over 3t freight vehicle (11:00-16:00, 8:00-20:00)	Large-scale truck (8:00-11:00, 16:00-20:00)
Traffic volume	(8:00-17:00) Inflow traffic volume: 1,302 -Trucks: 302 -Cars: 1,000 -Average: 145/h	(8:00-17:00) Inflow traffic volume: 842 -Trucks: 146 -Cars: 696 -Average: 94/h
Loading condition	Crowded at 8:00-11:00 Crowded after 4:00	Crowded at 8:00-11:00 Crowded after 4:00
Parkig condition	Crowded at 9:00-11:00 Crowded at 2:00-5:00	Crowded at 9:00-11:00 Crowded at 2:00-5:00
Significant day of on-street parking	Observed lots of on-street parkig on Monday, Tuesday, and Wednesday	
PARKING FACILITIES		
Off-road timely parking	One facility, 13 spaces (2 spaces for trucks)	No facility
Parking meter	19 spaces, parking turnover rate=4	14 spaces, parking turnover rate=3
Travel time	15 min at peak time	8 min at peak time

3.2 Detail of Truck Time Plan

Figure 2 shows the location of the wholesale district at Nihonbashi, the model section of Truck Time Plan, the appointed section for loading/unloading during passenger car time, and

and parking meter for delivery trucks. Until this time, the operating time of parking meter was from 9:00 to 19:00. In this plan, the parking meter is stopped from 7:00 to 10:00 and 16:00 to 19:00 on exclusive Truck Time operation and the space is opened free for trucks. It is appointed for passenger cars exclusively 10:00 to 16:00. When truck is obliged to do loading/unloading except Truck Time, drivers are guided to use parking meter on Kiyosugi St. and Kiyosubashi St. On their street 4 parking meters for trucks are secured by changing from ordinary parking meter or installing new meters so that trucks can use these space all day.

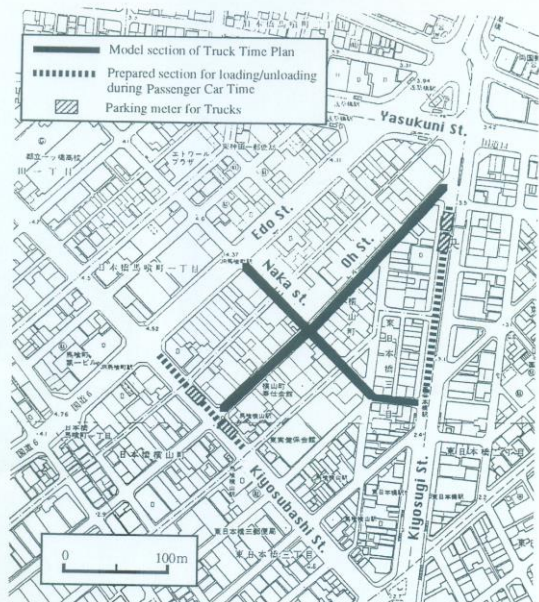


Figure 2 Model section of Truck Time Plan, appointed section for loading/unloading during Passenger Car Time

3.3 In the Enforcement Process Subject Measure

It was difficult to improve traffic conditions in the wholesale district at Nihonbashi because it was hard to move truck activities to an alternate off-road parking facility. So Truck Time

Plan which would use road space efficiently was enforced with following three subjects.

a. Measures of demand reduction

- 1) Forwarding appointed time and section about pick up/delivery
- 2) Reducing number of truck in freight agents by themselves.
- 3) Banishing of on-street parking
- 4) Self-controlling of employee's commute by private car
- 5) Establishing of material receive system on wholesale dealer shop at loading/unloading time.
- 6) Establishing of material receive system on wholesale dealer shop at opening and closing time.

b. Measures of parking capacity magnification

- 1) Installing 3 new parking meters
- 2) Canceling of no parking rules for trucks
- 3) Changing the existing 4 parking meters for trucks
- 4) Promoting parking use by organizing 'Nihonbashi-yokoyamacho parking committee'
- 5) Enforcing to increase off-street parking facilities
- 6) Forwarding appropriate utilization of parking meter

c. Measures of parking morals improvement

- 1) Providing information for individual by advertisement
- 2) Warning double parking which is disturbing traffic flow
- 3) Guiding for appropriate parking at Truck Time or Passenger Car Time

4. THE EFFECT OF TRUCK TIME PLAN

4.1 Summary of survey

In order to assess the effect of Truck Time Plan, we had a parking survey on the model and non model section before/after that plan was implemented by measuring traffic condition with loading space. Summary of each survey is shown as following.

(1) The date of survey

Before survey : 7:00~19:00, Tuesday. 23. May. 1995.

After survey : 7:00~19:00, Tuesday. 20. June. 1995.

(2) The area of survey

Figure 3 shows the investigated section of survey.

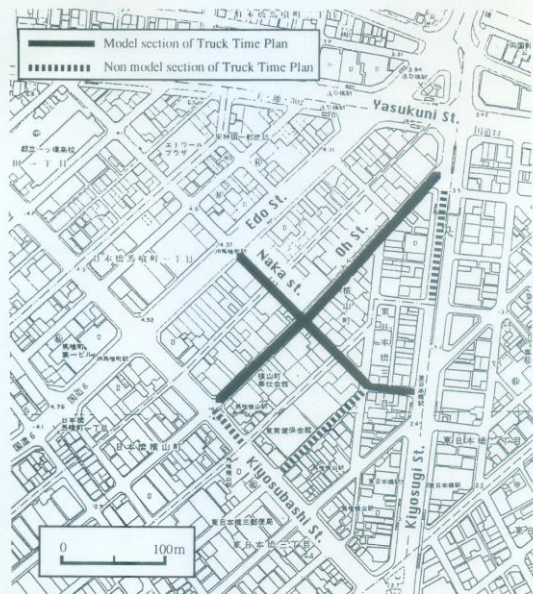


Figure3 The investigated section

(3)The method of survey

The staffs of survey stand on the object section and investigate parking place, parking duration, convey transport distance, and the condition of the engine either on or off. In the after survey, they interview the drivers simply at the same time.

(4)The results of survey

Table 2 shows the numbers of sample for each survey.

Table 2 The results of the parking realities survey

	Model section	Non model section	all section
Before	1 1 1 2	5 6 5	1 6 7 7
After	1 2 4 9	5 8 7	1 8 3 6
Total	2 3 6 1	1 1 5 2	3 5 1 3

4.2 The Assess of Traffic Condition

(1) Share of vehicle classification

Figure 4 shows the share of vehicle classification on model/non model section. Each share of cars which carry passenger mainly, vans & wagons that carry both passenger and cargo, and trucks which carry a cargo mainly occupy one-third among the volume of parking in this district. It appears that various types of vehicle exist in this district. There is no large change on before/after at each section. It can be said that the vehicles entering into this district have a clear purpose such as picking up/delivering or purchasing.

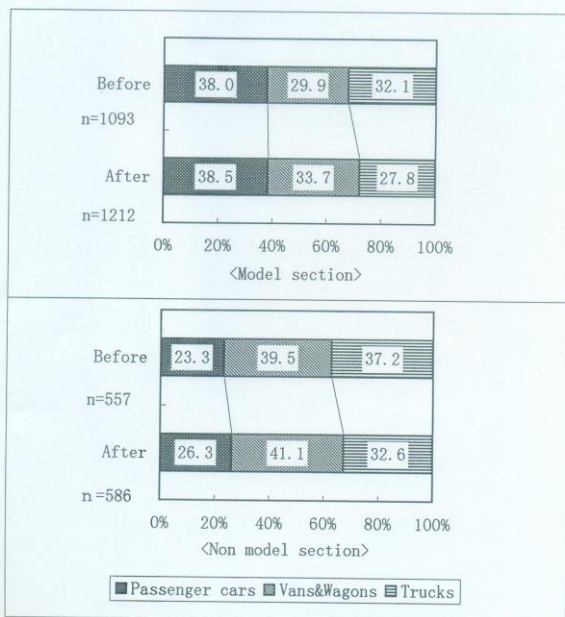


Figure 4 Share of vehicle classification

(2) Arriving time distribution

Figure 5 and Figure 6 shows arriving time distribution by vehicle types on model and non model section. There is no big change about passenger cars on before/after at the model section, but trucks concentrate in the period time for trucks(Truck Time) distinctly in the after survey, so trucks obey the rule very well. Most of trucks belong to a transport company. So they are informed and guided carefully by the company. Accordingly parking of trucks and passenger cars were distinguished generally. However, there is no big change from on before/after at non model section by controlling hours.

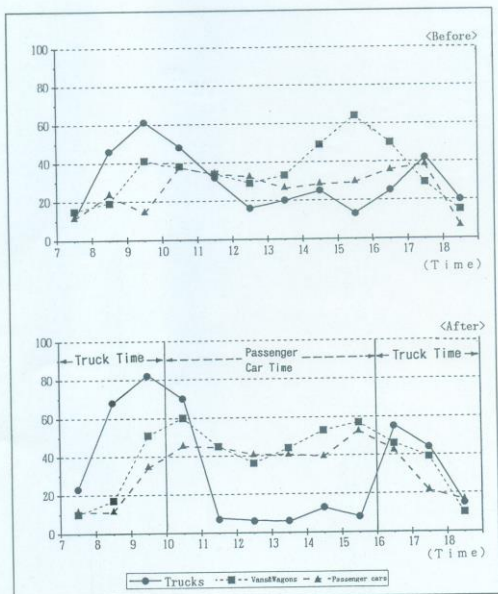


Figure 5 Arriving time distribution on model section

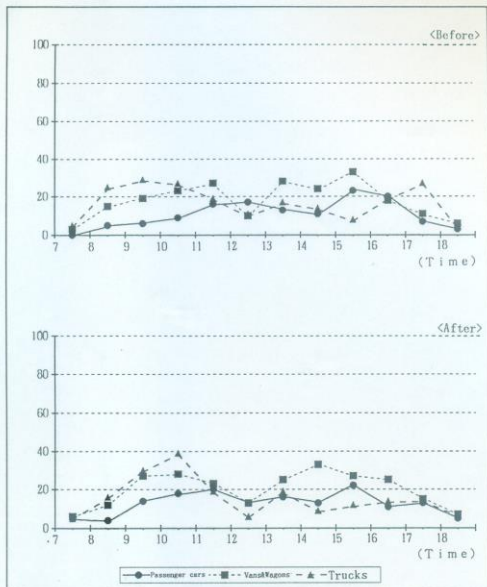


Figure 6 Arriving time distribution on non model section

(3) Parking time

Table 3 shows average time of parking by vehicle types on model and non model section. It was shortened regardless of vehicle types and sections, especially change of passenger cars is large. Because the maximum parking time of each vehicle type was shortened. This means that the long time parking was removed from the road side. In the after survey the parking time was shortened than before and the number of parking cars was increased, so the turnover rate of roadside parking was improved.

Table3 Parking time tabulation on roads

		Before	After
Model section	Passenger cars	47.5 min	32.4 min
	Vans&Wagons	26.4 min	20.8 min
	Trucks	13.0 min	9.5 min
Non model section	Passenger cars	35.7 min	28.1 min
	Vans&Wagons	23.4 min	20.6 min
	Trucks	16.9 min	16.4 min

(4)Convey transport distance

Figure 7 shows distribution of convey transport distance from parking place to destination on model and non model section. Parking in front of shop decreased on model section,

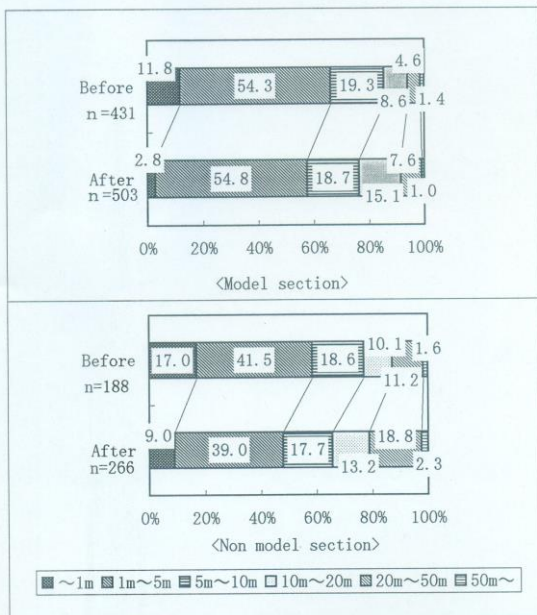


Figure 7 Distribution of convey transport distance

consequently it was extended after than before relatively. This means that truck drivers' behavior was changed by removed long time parking. The truck drivers could park in front of the shop even if they had to make double parking before Truck Time Plan was implemented. After Truck Time plan, drivers could find the certain parking spaces on the road side. These situation caused this result. On non model section, the convey transport distance of 20~50m increased after than before. It is supposed that the opportunity to park on model section during Passenger Car Time increased .

(5) Parking condition

Figure 8 and Figure 9 show the parking condition by vehicle types on model and non model section. According to the survey , the share of idling decreased sharply, 73.0% at before, and 29.2% at after on model section. It is 74.7% at before, 41.3% at after on non model section.

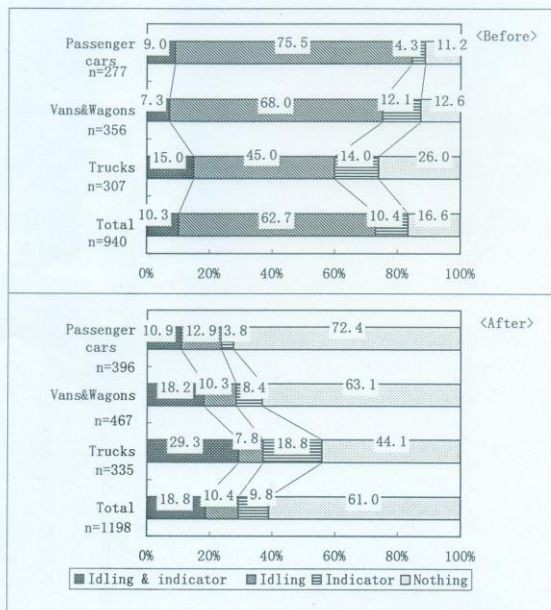


Figure 8 Parking condition by vehicle types on model section

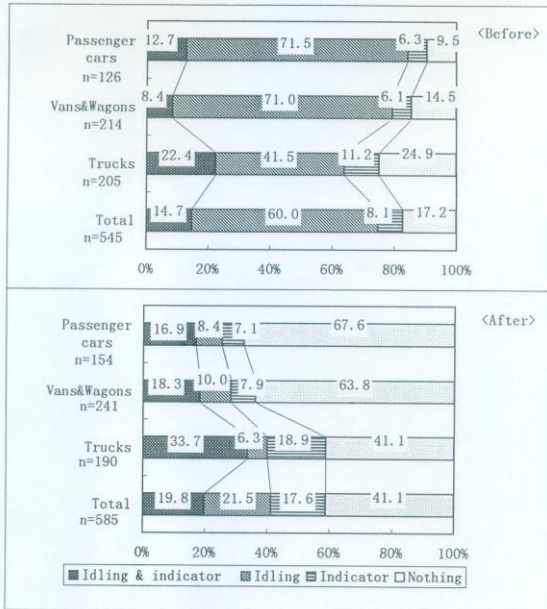


Figure 9 Parking condition by vehicle types on non model section

Observing by vehicle types, though idling on both section and decreasing rate of trucks is smaller than other vehicles. Consequently it is seemed that trucks stop the engine spontaneously by nature. Moreover the reason why it decreased on non model section is supposed that drivers mistook non model section for model section, because they aren't conscious of model section.

5.CONCLUSION

The findings of this paper on the effect of enforcing Truck Time Plan at Nihonbashi wholesale districts following.

- 1) Judging the analysis of passenger car, shops in this wholesale area could secure the same number of customers or more in comparison with the condition before introducing the Truck Time Plan.
- 2) According to distribution of arriving time, significant number of trucks arrived at Truck Time (7:00-10:00) and most trucks followed the rules. This is relied on comprehensive of related companies. Moreover, shops adjusted pick up schedule for truck time and it appeared the characteristics of Japanese small shops.
- 3) Turnover rate of roadside parking was improved by removing long time parking.
- 4)Convey transport distance was extended after than before relatively. This means that truck drivers' behavior was changed by removed long time parking. After Truck Time plan, drivers could find the certain parking spaces on the road side.
- 5)The most biggest effect of Truck Time Plan is decrease of exhaust gas. Truck drivers are not needed to keep the engine-on in order to avoid the parking violation.

As mentioned above, truck drivers can park with no guilty by providing parking spaces for trucks legally. In this way, this plan effects not only resolving traffic problems such as dissolution of traffic jam but also solution of environment problem.

However, some problems are remained yet, for example 1)convey transport distance extension, 2)limited service time of shops. To solve these problems, it is important to request cooperation from each field by showing the general effect.