

# Clarification of Operation System and Driver's Satisfaction of Paratransit in Sri Lanka

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Sri Lankan paratransit, called 3-wheeler (3W) is important transport mode in Sri Lanka because of insufficient public transport system. Interview survey with stakeholders of 3W industry were conducted in order to clarify the actual condition of 3W industry. The result of interview survey revealed that national and local government cannot control the numbers or management of 3W drivers and vehicles. In order to reveal 3W driver's satisfaction of working condition or government, driver's life satisfaction analysis was conducted by questionnaire survey in target four cities. From these two surveys, 3W industry and role of 3W driver group were clarified. In addition, the difference among cities such as were revealed.

**Key Words:** Paratransit, operation system, stakeholder, driver's satisfaction, Sri Lanka

## 1. INTRODUCTION

Paratransit is important transport mode mainly in Asian developing countries, where public transport is relatively poor. Paratransit is defined as middle transport mode between public transport and private transport and their personalized and flexible service have important role for people's life<sup>1)</sup>. Despite of its importance, many of them are being informal sector and not regulated by the government in many cases.

Sri Lanka is one of the countries where many paratransit called "3-wheeler (3W)" exist. 3W is necessary transport mode for Sri Lankan people due to poor public transport network. However, at the

same time, 3W can be a cause of several problems, such as traffic congestion, air pollution, and high accident rate. Several analyses about 3W have been undertaken. For Example, Kumarage *et al.* (2010) analyzed 3W drivers and passenger's basic information in Moratuwa City such as education level of drivers, trip purpose and passenger's perspective for 3W. Somasundaraswaran *et al.* (2008) analyzed 3W driver's information such as age, smoking and numbers of family. Kirkorowincz (2012) mentioned that 3W driver's health problems in Galle city. However, operation and administrative system of Sri Lankan 3W have not been well revealed. Thus, objective of this paper is set as (i) to reveal operational

system of 3W and (ii) to clarify the relationship between stakeholders of 3W industry in Sri Lanka. Additional objective is (iii) to analyze driver’s satisfaction level towards operation and administrative system (policies) of 3W industry.

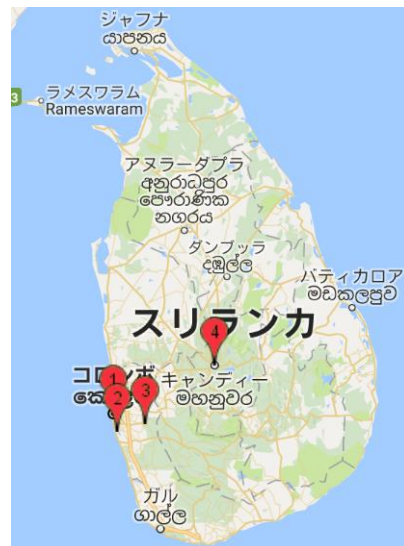
## 2. STUDY AREA AND SURVEY METHOD

### (1) Study area

Four cities were selected as target cities (Colombo (city area), Moratuwa (urban area), Padukka (rural area) in western province and Kandy (urban area) in central province). Colombo is the largest city in Sri Lanka in terms of economy and population. Moratuwa is residential and commercial area which is close to Colombo. Padukka is rural area in western province and most of roads are single-lane. While these three cities are located in western province, Kandy is a city belonging to Central province and provincial capital. In terms of economy and population, Kandy is the second largest city of Sri Lanka. Padukka is included as target city of the survey in order to clarify the difference between urban (i.e. other three cities) and rural area in terms of operation system and driver’s satisfaction level towards operation and administrative system. Kandy is included as target city since the difference between the cities of western and central province are expected.

**Table 1** Characteristics of four target cities

City (Province)	Population <sup>2)</sup>	characteristics
Colombo (Western)	648,034 (2016)	- Largest for economy and population. - City area. - City bus operation
Moratuwa (Western)	185,031 (2016)	- Residential/commercial city. - City bus operation
Padukka (Western)	65,267 (2012)	- Rural area - Most of roads are single-lane
Kandy (Central)	158,564 (2012)	-Second biggest city. -Former capital. - City bus operation



**Fig.1** Location of four target cities (1: Colombo 2: Moratuwa 3: Padukka 4: Kandy)

### (2) Survey method

#### a) Interview survey

Interview surveys were conducted to reveal operational system of 3W and to clarify the relationship between stakeholders of 3W industry in Sri Lanka, which corresponds to Objective (i) and (ii). **Table 2** shows overview of interview survey.

**Table 2** Overview of Interview survey

Items	Contents
Survey period	2-7 October, 2016 and 5-9 December 2016
Interviewee	<p><u>Colombo/Moratuwa</u></p> <ul style="list-style-type: none"> <li>- Ministry of Transport</li> <li>- National Transport Commission</li> <li>- Department of Motor Traffic</li> <li>- All island 3W Drivers and Owner Association</li> <li>- Western Province Passenger Transport Authority</li> </ul> <p><u>Colombo</u></p> <ul style="list-style-type: none"> <li>- Municipal Council</li> </ul> <p><u>Moratuwa</u></p> <ul style="list-style-type: none"> <li>- Municipal Council</li> <li>- 4 societies (3W driver group)</li> </ul> <p><u>Padukka</u></p> <ul style="list-style-type: none"> <li>- Local Council</li> <li>- Padukka police</li> </ul> <p><u>Kandy</u></p> <ul style="list-style-type: none"> <li>- Municipal Council</li> <li>- Kandy 3W driver Association</li> <li>- 3 societies</li> <li>- Peradeniya police (Peradeniya: one of the cities in Kandy)</li> </ul>

Interview surveys are conducted in the period between 2<sup>nd</sup> and 7<sup>th</sup> October, 2016. Interviewees are most of the stakeholders of 3W industry in Sri Lanka, which includes national governmental administration such as Ministry of Transport, National Transport Commission, Department of Motor Traffic, etc. Interview surveys are also conducted with local government of each city and driver's association, and driver's group called "society", which explains in section 3.

#### **b) Questionnaire survey**

Questionnaire surveys were conducted to collect the driver's satisfaction level towards operation and administrative system (policies) of 3W industry, which is corresponding to objective (iii). Questionnaire surveys were conducted in the period between 5<sup>th</sup> and 9<sup>th</sup> December 2016 in each four city.

### **3. OPERATION AND MANAGEMENT SYSTEM OF 3W**

#### **(1) Role of each stakeholder**

National institution, provincial institution, Municipal council/Local Council, and 3W association relate to 3W industry in urban area. Ministry of Transport (MOT), National Transport Authority (NTC), and Department of Motor Traffic (DMT) are national level stakeholders, and they consider about national policy regarding 3W. For example, Under the instruction of MOT, NTC are considering to replace 3W of electric environmental friendly vehicle in the future in order to solve air pollution problems caused by 3W. DMT are planning to make new 3W driver license, to raise the minimum age to obtain light vehicle license and start stricter 3W driver training system from 2017 in order to reduce accident rate related to 3W. Provincial Passenger Authority is provincial level stakeholder. Where Municipal Council exist, they make 3W parking space and record the place of society. Where Municipal Council do not exist (rural area), Local Council or

Police have responsibility of 3W management and they register society or make 3W parking space instead. In addition, there are largest 3W authority, called "All Island 3W Drivers and Owner Association" and provincial 3W trade unions in some area. All Island 3W Drivers and Owner Association is consist of each province's 3W director and they are able to talk with political people and present their opinion about nation and provincial policies. Trade union has no right to get contact with government institution.

#### **(2) Society**

Interview surveys with municipalities of each city and 3W drivers reveal that there are two types drivers in Sri Lanka. First type belongs to 3W driver's group called "Society" and the another type does not belong to Society. Here, this paper calls the former drivers as "society driver" and the latter is "free driver". Society driver is, as unofficial agreement, allowed to catch passengers at their parking space only. On the other hand, free driver is able to catch passengers everywhere except 3W parking space (i.e. territory of society). Note that these rules are not regulated by official Sri Lankan traffic law. Therefore, society drivers sometimes catch passengers in the way coming back to their parking space after send passenger to a destination. Free drivers often attempt to wait for and catch passengers where a lot of people gather, such as bus or train station, marketplace, university, etc.

Society consist of approximately 20-30 drivers and almost drivers live in the proximity of their parking space. Normally society only accept local people as drivers and hence, society drivers and passengers are familiar with each other. When driver retired, his relatives succeed to retired driver and outsiders are hardly to belong to society as a driver. Society has normally one parking space given by municipal council with rental fees. Some societies are given two or three parking spaces. In this case, society consists of approximately 50 drivers. In other words,

the number of society member is dependent upon the number of parking spaces owned. There are also 3W groups, which is not society and do not have parking space by Municipal Council. The number of members are different among groups and some group have their own parking space.

### (3) Welfare service of society

Each society has their own management system. Some society collect membership fee regularly, average 280Rs/month, and save collected money in their bank account whereas some society do not collect membership fee from belonging drivers.

As Sri Lankan welfare service, ETF, EPF and sometimes pension for public sectors and ETF, EPF and bonus for private sectors can be considered. According to interview survey with drivers of several societies, the purposes of utilizing membership fee are driver's wedding expenses, funeral expenses, expenses for accident, medical expenses and family's wedding expenses, funeral expenses, medical expenses, etc. In other words, although management style in terms of membership fee is different among societies, almost all society owns welfare service to drivers and their families. Each society has their own welfare services. However, pension service has not developed yet in almost all society. In general, society do not have precise rules about welfare services such as amount of services or condition when drivers can take services. Conceivable welfare services are only. Free drivers except group drivers do not have any welfare services.

### (4) Parking space

Each society is given their parking space by municipal council with rental fees. As mentioned above, in case the number of drivers in society is large, two or three parking spaces are given. The upper limit of drivers is decided by each society on the basis of the relationship between supply and demand. According to interview survey, 3W industry in Sri Lanka is basically oversupply as a current condition (i.e. al-

most all society reaches maximum number of member for each society). Normally, two to four vehicles of 3Ws can be parked at one society's parking space. However, many society drivers park 3Ws nearby society's parking space. Some of the societies expand their parking space in order to park more vehicles. Institutionally Municipal Council can punish society which park over maximum number of 3Ws. In case 3W drivers desire to have official parking space, they ask municipal council to settle it. After the survey by municipal council and police, municipal council can decide to accept the request of drivers in Colombo. In Moratuwa and un-city area of Kandy, police can decide the acceptance, location and maximum parking numbers of 3W. In Kandy city area, Traffic Committee decide an acceptance. Padukka local council and police made laws about 3W management and enforced in January,2017. Before enforcement, some 3W driver group were recorded as society, however, there were no formal parking space. Now in Padukka, 3W drivers are not allowed to park 3W except official parking space institutionally. The reason to make laws are traffic problem like congestion especially weekend, and high accident rate. 3W drivers agreed with the laws since they feel necessity of control of 3Ws.

After granting driver's request, as shown in **Fig.2**, sign of parking space is installed nearby the parking

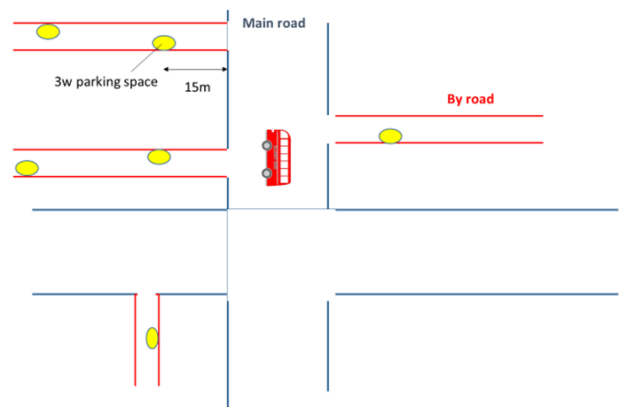


**Fig.2** An example of sign of society's parking space by municipal council

Although there are precise rules to settle parking space, an effect of traffic and surrounding building after settling parking space can be criteria. For example, Municipal Council settle parking space in junction. Although there is demand of 3Ws in area close to school, Municipal Council do not settle parking space since school bus sometimes exist. Sometimes Municipal Council cannot settle parking space since surrounding society oppose to settlement. Municipal Council in big city like Colombo and Kandy have power to control society, therefore they can settle parking space even though opposition. However, Moratuwa Municipal Council cannot control society and sometimes they cannot settle parking space because of opposition of surrounding societies. In Kandy, some societies are deleted or moved their parking space since Kandy transport plan. Kandy driver do not prefer this action of city government. Parking fee is different among cities. Basically, all society members need to pay parking fee for Municipal Council or local council annually. Although the fee is free in Colombo and 500Rs in Moratuwa, 5000Rs in Kandy city area. In Kandy, un-city area drivers need only 500Rs for local council. Therefore, 3W drivers in Kandy city area face serious problems between city government. Therefore, Trade union called Kandy 3W Driver Association exist. It established in 1998 in order to oppose increase in price of 3W vehicle. It consists of about 2,500 3W drivers in Kandy city area and show their opinion by holding May Day regularly.

Roughly speaking, the class of roads can be divided two types, such as “main road” and “by road”. Main road in Sri Lankan cities is defined as a road where buses are operated whereas by road is defined as a road which is narrower and smaller than main road. By roads exist between main road and used as access to dwellings of local people. In general, as shown in **Fig.3**, a 3W parking space(society) can be found in almost all by roads approximately 15m away from main road while they do not exist in main road,

in general. Sometimes multiple societies exist in one by road. In Colombo city area and Kandy city area, about 1050 parking spaces, about 160 parking space each exist and the number is constant. In Moratuwa city area, about 200 parking space exist and the number is increasing. In Padukka, 9 societies exist. However, the members of each society are unclear and one society has very strong power and the number of members is big compared to other 8 societies.



**Fig.3** 3W parking space

Society drivers are making queue and wait for passengers in parking space as shown in **Fig.4**. Passenger takes first 3W of a driver's queue and next passenger will take second 3W in a queue. After driver send a passenger to a destination, driver will go back to parking space and line up in the end of queue.



**Fig.4** System of parking space

In Colombo city and Kandy city area, according to interview survey, municipal council no longer accept driver's requests for setting new parking spaces since

the number of 3Ws are saturated. However, the number of 3Ws are still increasing since the number of free driver is increasing. There is no regulation to control the entry of new free drivers. Moratuwa and Kandy in-city area do not limit the parking space and the number of society and free drivers are increasing in Moratuwa, the cities. One of the reason why Moratuwa Municipal Council do not limit the number of parking space is employment issue. 3W driver job is valuable job for low educated people who face difficulty to get job since driver do need special skill or academic ability.

### (5) Fare system

There are no official rules regarding the determination of 3W fare. Therefore, fare is different among cities and even societies since it is determined by society (driver) themselves considering the market condition such as relationship between supply and demand. Consequently, fare system and fare itself are almost same in the same region. In the cities of Colombo and Moratuwa, in the most of cases, the fare is set as 50Rs for the first 1km, and 40Rs is added per 1km. Note that in general, fare in the night time (i.e. after 10pm) become higher than day time, for example 60Rs for the first 1km, and 50Rs is added per 1km.

As an exception, the society which is close to marketplace sets higher fare. For example, one of the societies near the marketplace in Moratuwa is that 60Rs for the first 1km, and 50Rs for additional 1km. This is because passenger's baggage is often heavier and thus fuel cost becomes higher than taking usual passengers. In Padukka, fare is set as 40Rs for the first 1km, and 30Rs is added per 1km. This is the lowest among target four cities.

In Kandy, fare is sometimes the same system of Colombo and Moratuwa, and sometimes 45Rs for the first 1km and 250Rs for the total about 5km. Since Kandy is hilly area, the funeral cost is high, therefore fare in Kandy is more expensive.

In western province, where Colombo, Moratuwa, and Padukka are belong to among target four cities, Western Province Passenger Transport Authority is starting new registration system in order to control 3W in western province. Drivers are registered by paying 350Rs as registration fee and they need to pay 400 Rs annually as member fee. Registered drivers are able to get medical insurance service including their family by paying 30 Rs per month. In addition, they can receive other services, such as discount of tires, part of 3W vehicles and household items. And promoting 3W to install Meter onto 3Ws in 2016. Therefore, the number of 3W which installs taxi meter is increasing. However, some drivers do not use a meter even though meter have already attached, and some driver counterfeit the meter to get much money.

## 4. SATISFACTION LEVEL OF 3W DRIVERS

### (1) Sample configuration

**Fig. 5** shows Each city's driver types and cities are divided into several area. Some free drivers make group by themselves (Called Group driver). In Colombo and Kandy city, there are more free drivers in city area than other area. The reason is that drivers in city area be able to catch passengers easily than other area drivers. In other words, although drivers do not belong to society, they can get enough passengers. In Moratuwa city, more drivers in university area belong to society and group than other area. The reason is that many percentage of passengers in university area are students or teachers, and they use 3W in the same roads. Therefore, to catch passengers in university are is more difficult than in other area. On the other hands, rate of society drivers is not so difference between area in Padukka city.

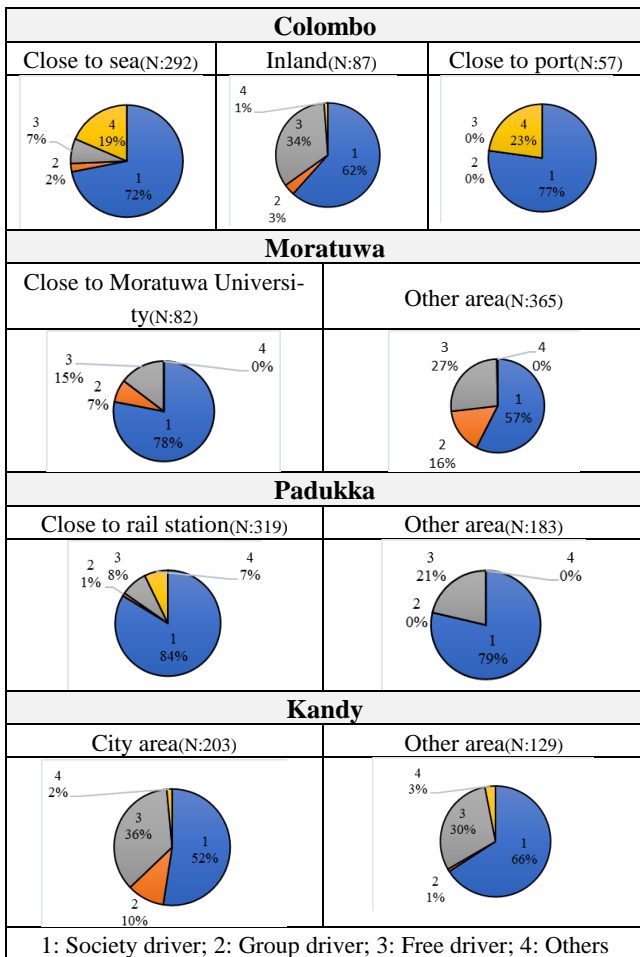


Fig 5. Share of society driver, Group driver and Free driver

**(2) Importance level of welfare service**

Table 3 shows importance level of each welfare service for each city. From this table, it is revealed that funeral expenses service is important welfare service in all cities. In addition, many driver's welfare service is more important than family's welfare service.

Table 3 Average importance level of welfare services

		Colombo	Moratuwa	Padukka	Kandy
Wedding expense	D	3.16 (197)	3.71 (171)	4.21 (57)	4.17 (448)
	F	3.13 (200)	3.52 (177)	5.11 (44)	4.02 (348)
Funeral expense	D	5.17 (417)	5.25 (366)	5.47 (271)	5.24 (322)
	F	4.99 (370)	5.09 (373)	5.43 (170)	5.08 (379)
Expense for accidnt	D	4.94 (376)	5.21 (318)	5.29 (176)	4.69 (350)
	F	4.26 (276)	4.57 (245)	5.27 (85)	4.44 (280)
Medical expense	D	4.62 (290)	4.68 (246)	5.13 (148)	4.44 (344)
	F	4.05 (239)	4.19 (217)	5.14 (79)	4.23 (305)
Pension system	D	3.76 (202)	4.1 (163)	4.71 (72)	3.43 (369)
	F	-	-	-	-

1 Extremely unimportant ⇔ Extremely important 6  
D: Driver's welfare service; F: Family's welfare service

Sample size in bracket

**(3) Satisfaction of salary as 3W driver**

Table 4 shows satisfaction of 3W driver's salary and income in each city. Although satisfaction of salary is relatively high in both Colombo and Kandy, Kandy's 3W driver income is the lowest among four cities and 342 Rs lower than that of Colombo. The potential reason for this is that the living cost in Kandy is lower than in Colombo.

Although Padukka is the city where economically behind after other three cities, driver's income is higher than those of Moratuwa and Kandy. However, their satisfaction level towards salary is low. On the other hand, although 3W fare in Padukka is lower than other three cities, Padukka driver's income is relatively high. The reason of this is a lot of residents take 3W as transport mode because of other public transport (i.e. bus) is significantly poor. Therefore, there is the large number and long distance of a trip.

Regarding average income in each city, society driver's income is higher than free/group driver's income in all cities. Therefore, it can be inferred that parking place is important to catch more passengers. Colombo driver's income is the highest among four cities since population is the largest and many business person use 3W. Therefore, the number of trip is large and driver's income is also high. @@..

Table 4 Satisfaction of salary and driver's average income [per day]

	Colombo	Moratuwa	Padukka	Kandy
Satisfaction of salary	4.26	4.01	3.97	4.27
1 Extremely unsatisfied ⇔ Extremely satisfied 6				
Satisfied	81%	67%	64%	75%
Unsatisfied	19%	33%	36%	25%
Average Monthly	Rs 2,134	Rs 1,846	Rs 1,974	Rs 1,792
Society driver in-	Rs 2,140	Rs 1,879	Rs 1,983	Rs 1,813
Free/group driver in-	Rs 2,120	Rs 1,809	Rs 1,931	Rs 1,765
N	459	457	463	500

**(4) Satisfaction of 3W driver**

Fig. 6 shows average satisfaction level towards 3W driver job. Satisfaction is the highest in Kandy, following Padukka, Moratuwa and Colombo. Although Kandy drivers are not satisfied with Provincial Government and Municipal Council, their satisfaction of 3W driver job is relatively high.

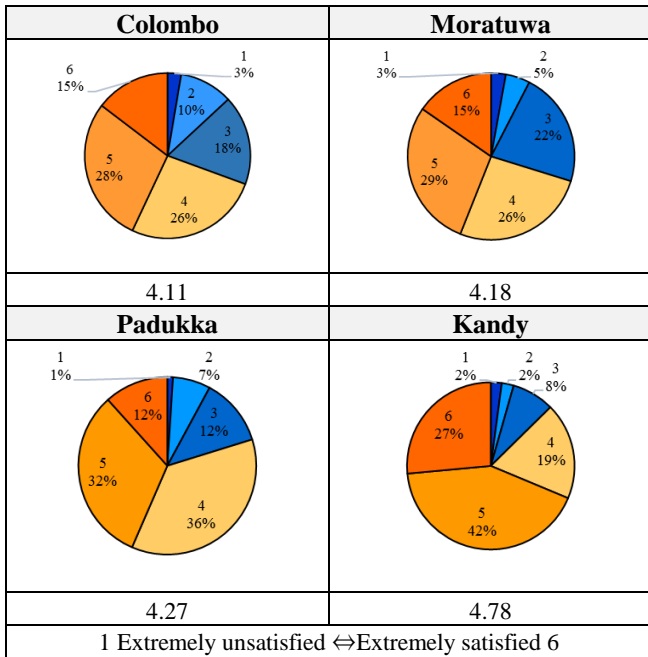


Fig. 6 Satisfaction of 3W driver job

**(5) Satisfaction towards local government**

Satisfaction level towards local governments in each city is evaluated by 3W drivers. The results are shown in Table 4. Among four cities, Kandy received the lowest satisfaction level towards local government. This is an expected result since the Kandy Municipal Council are not positive attitude with 3W industry and drivers. As mentioned, Kandy Municipal Council sets approximately 10 times higher parking fees comparing to other three cities. Thus, drivers in Kandy establishes trade union in order to protect their jobs.

Table 5 Satisfaction of PG/MC

	Colombo	Moratuwa	Padukka	Kandy
Satisfaction of MC/PG	3.2	2.8	3.1	2.6
1 Extremely unsatisfied ⇔ Extremely satisfied 6				

**5. CONCLUSION**

In this study, reveal operational system of 3W and (ii) to clarify the relationship between stakeholders of 3W industry in Sri Lanka. Additional objective is (iii) to analyze driver's satisfaction level towards operation and administrative system (policies) of 3W industry.

From interview survey, 3W industry stakeholders and 3W driver's working condition were revealed. Now 3W industry is not under control of government and government is introducing or making new policy in order to control 3W. 3W drivers form local 3W driver groups and make their own rules and welfare services. From questionnaire survey, 3W driver's satisfaction of salary, Provincial Government, and 3W driver job itself etc. were revealed. In addition, from these two surveys, the difference among four target cities were revealed.

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