

# Motorcycle Taxi (Ojek) as one of Indonesian's Future Sustainable Transportation

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**Abstract** - Motorcycle taxi (ojek) is one of the paratransit modes that have not been formally permitted from the Indonesian government. Paratransit is modes of transportation between private and transit use, with advantages and capabilities on demand responsive and service from door to door. Paratransit modes in developing countries is often regarded as a form of weakness of the transportation services provided by the government. The existence of this mode does not get the attention and be considered as an informal transportation. On the other hand, the existence of ojek becomes important to regulated as part of paratransit modes when is long term. Ojek that complement existing modes of transportation shortage, affordable user, operates fairly and efficiently, offers a choice of transport mode, and supports a competitive economy, as well as balanced regional development are the sense of sustainable transport systems. Therefore, the objectives of this study is to highlight the opportunities motorcycle taxi (ojek) as one of Indonesian's future sustainable transportation base on socio-economic characteristics of the motorcycle taxi operators and financial feasibility of its operational service

The method of analyses used in this study is quantitative descriptive, and it is used to investigate the variables of socio-economy and service characteristics of respondents, whom were the operators of Ojek. Financial analysis is used to find the BCR from the operational ojek service. The Analysis are deducted from primary data collected through questionnaires survey and interviews of 95 respondents in the City of Surakarta, representing the ojek operators in urban area, and 100 respondents in the District of Wonogiri, representing the ojek operators in rural area in Indonesia.

This research concluded that ojek has a value of economic efficiency, liveable streets and neighbourhoods, support the community and the social conditions that contribute to economic growth derived and employment in both urban and rural areas to prove the potential of ojek as one of Indonesia's sustainable transportation modes in the future. Ojek is believed will be held within a long period, due to ojek able to provide operational benefits for the operators in the long term and the needs of society, therefore it is very is important to regulate ojek immediately as part of a paratransit modes Indonesia.

**Key words-** *ojek, motorcycle taxi, paratransit, urban transportation, rural transportation*

## I. INTRODUCTION

Ojek, as paratransit (the mode between private and transit, or for hire) [8], is a motorcycle that is rented by provide a lift passenger or renter the motorcycle. Motorcycle as paratransit

also found in many other countries, such as in Bangkok, Thailand, [5], Akure, Nigeria, named Okada [3], Cotonou, Benin, named Zemidjan, and in Douala, Cameroon [6]. The existence of a motorcycle as one of paratransit modes have recognized the benefits of public transport services [1 ] [3] [5].

Ojek in the form of two-wheeled motor vehicles have the advantages in passing through various types of terrain at high enough speed. Ability speed of the ojek equivalent to a passenger car. The advantages through various types of terrain proven by the ability of ojek to pass the terrain that is not easily passed other vehicles, such as narrow roads, damaged pavement conditions, and steep roads. In other words ojek is a reliable mode of the limitations infrastructure transportation that are often found in rural areas, as well as overcome the limitations of transportation in the unserved urban public transportation route [2]. Ojek is very demand responsive and fill the emptiness of transportation services provided by the government, but also ojek services are drawbacks, mainly related to the issues of safety, security, and convenience [2].

The existence of ojek in serving the needs of the community in both urban area such as Surakarta and rural area such as Wonogiri has been going on for decades. Formally, ojek has not been recognized in the regulation of transportation in Indonesia, but in rural area such as Wonogiri, Central Java, ojek are recognized as a formal transportation as a transport filler is contained in master plan for the region.

Ojek that complement existing modes of transportation shortage, affordable user, operates fairly and efficiently, offers a choice of transport mode, and supports a competitive economy, as well as balanced regional development are the sense of sustainable transport systems by the United States Environmental Protection Agency [7]. On the other hand ojek potential to satisfy several objectives of sustainable transportation, among others: economic efficiency, livable streets and neighborhoods, support the community and the social conditions that contribute to economic growth [4].

The existence of ojek does not get the attention and be considered as an informal transportation. On the other hand, the existence of ojek becomes important to regulated as part of paratransit modes when is long term. Therefore, the objectives of this study is to highlight the opportunities motorcycle taxi (ojek) as one of Indonesian's future sustainable transportation base on socio-economic characteristics of the motorcycle taxi operators and financial feasibility of its operational service.

## II. METHODOLOGY

The method of analyses used in this study is quantitative descriptive, and it is used to investigate the variables of socio-economy and service characteristics of respondents, whom were the operators of Ojek. Financial analysis is used to find the Benefit Cost Ratio (BCR) from the operational ojek service. The Analysis are deducted from primary data collected through questionnaires survey and interviews of 95 respondents in the City of Surakarta, representing the ojek operators in urban area, and 100 respondents in the District of Wonogiri, representing the ojek operators in rural area in Indonesia (Fig.1). Primary data was collected in 2012.

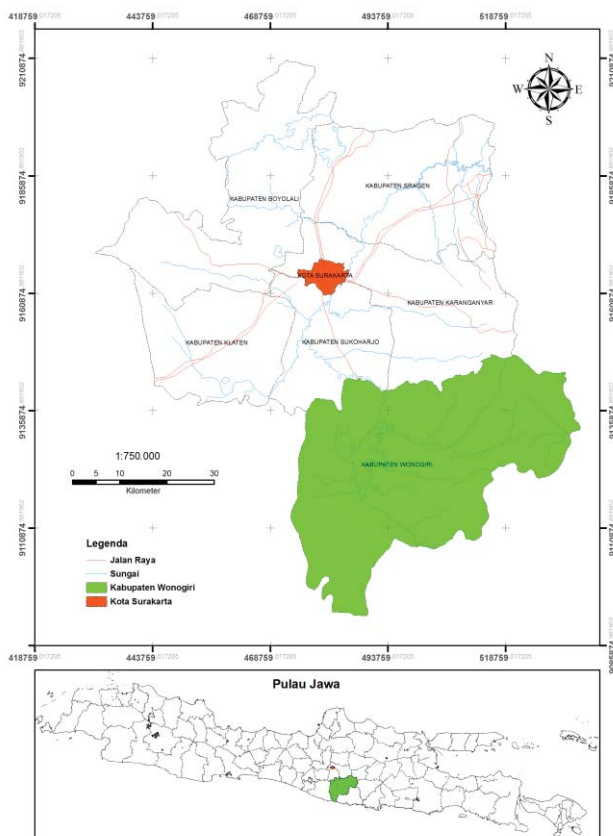


Fig. 1 Research Location

## III. RESULT AND DISCUSSION

Analysis consisted of descriptive quantitative analysis and financial feasibility analysis ojek service operations. Quantitative descriptive analysis include socioeconomic characteristics of ojek operators, modal characteristics of ojek, and the operational characteristics of ojek service. Furthermore, the results of this analysis will be used in the financial analysis. Discussion of socio-economic characteristics of the ojek operators include long work as ojek operator, ojek vehicle ownership status, average income and

the number of working days in a week. In the discussion of the socioeconomic characteristics of ojek operators will presented as age, education and employment in addition to joke. The data will be useful for deepening the discussion prospects for the existence of ojek in the future. Discussion of the characteristics of ojek modes consist of the type of model and engine capacity, while the operational characteristics of ojek service, the discussion covers the cost of fuel, maintenance costs, as well as license fees and the membership contributions group.

### A. Socio-Economic Characteristics

Majority of ojek operators are at working age (16-55) years, 80% in Surakarta (urban area) and 91% in Wonogiri (rural area). There are 20% (in Surakarta) and 9% (in Wonogiri), operators over of 55 years. This shows that the work as a ojek operators can be done by a variety of ages. Viewed from the distribution of the age of the operator, in Surakarta there is 2.86% (16-25) years, 14.29% (26-35) years, 22.86% (36-45) years and 40% (46-55) years, whereas in Wonogiri there were 10% (16-25) years, 21% (26-35) years, 29% (36-45) years and 31% (46-55) years. The distribution of age showed that many ojek operators in old age and no significant difference between urban and rural life of the operator. This shows that the work as ojek operator does not require great physical ability. Ojek are also an alternative for people who have lost their main job in middle age and the difficulty to get a new job because of competition with young job seekers. In relation to sustainable transport showed indications that ojek is a job that will exist all the time. The existence of ojek supports social conditions in developing countries who lack employment.

Level of education ojek operators in the study area varies greatly, from a maximum of elementary school, as much as 54.29% in Surakarta and 36% in Wonogiri, to higher than high school as much as 5% are found in rural areas. Majority of urban ojek operators are elementary education (44.29%), while the majority of rural ojek operator was high (35%). In urban areas showed potential ojek in employment with low education, because formal employment has been a lot of labor is absorbed by the higher level of formal education. This is different in a rural location with limited formal jobs available force to ojek operators as an alternative livelihood that is quite important for job seekers in rural areas. In relation to sustainable transport shows that ojek support social conditions contributing to economic growth through employment.

The length of time working as ojek operator is an indicator of the existence of a ojek in a location and also the data that will be used to calculate the average payback period on a financial analysis. The length of time working as a ojek operators vary widely, from less than 5 years to more than 25 years. ojek service in the study area has been going on for decades, with 14.28% of urban ojek operators and 11.0% of rural ojek operators who have worked for more than 20 years. The average length of employment as ojek operator was 9.79 years for the urban and rural areas was 9.55 years. The length of time this will be used as the basis of a return on investment

in a financial analysis, which will be taken as 10 years. In relation to sustainable transport shows that the existence of ojek that has been going on for decades proves ojek is able to serve needs of society with a complete lack of transportation exist, the user is relatively affordable and can be operated easily making it feasible to operate on roads and settlements.

Ojek can be relied on as the main work is shown by the number of ojek operators who do not have a second job besides ojek. There are 50% of urban ojek operators and 27% of rural ojek operators who do not have a second job. The existence of a second job is more in a rural location as subsistence farmers in the village is still wide open, while in the more urban ojek is regarded as the main work due to the limited availability of jobs. In relation to sustainable transport shows that ojek support the community and the social conditions.

Ownership of vehicles used for ojek can be divided into self-owned and hired. The data obtained showed that 95.71% of urban ojek operators and 96.0% rural ojek operators are self-owned. This data will be used as the basis for calculating capital vehicles in a financial analysis. In regard to sustainable transport shows that ojek can be operated easily and to this day is considered feasible for users can be operated in the road and settlements.

Number of working days in a week ojek operators will be used in the financial analysis as a multiplier value of benefits earned annual income on ojek service operations. The number of working days in a week is very varied, ranging from work on market days and holidays (less than 4 days / week) to the work every day (7 days / week). The majority of ojek operators work 7 days a week, which is 85.71% for urban operators and 82% for rural operators. From the calculation, the average number of working days in a week ojek operator is 6.79 for urban operators and 6.40 for rural operators.

The average income of ojek operators ranges from Rp 20,000/day to more than Rp80,000/day. Most of the income urban ojek operator Rp (20000-30000)/day amounting to 38.57%, while the income of rural ojek operator Rp (30000-40000)/day amounting to 41%. There are 1.43% of urban ojek operators and 4.0% of rural ojek who earn more than Rp70,000/day. Average income of urban ojek operator is Rp41.058/day and rural ojek operator Rp42.831/day. When compared to the regulation of minimum wage (UMR) in the study area, the average income as ojek operator is much higher than the minimum wage. UMR Surakarta in 2012 amounted Rp864.450/month and Wonogiri amounting to Rp775,000/month. The condition when calculated against the average working day per week for urban operators ojek 6.79 and for rural operators 6.40, in order to obtain an average income per month for urban ojek amounted Rp1.080.277/month and rural ojek Rp1.062.186/ month. This value is relatively very large, especially if the average income is derived from a second job as a ojek operators and not as the main livelihood. In regard to sustainable transport shows that the ojek has a contribution to economic growth through income derived working as operator ojek.

## B. *Mode Characteristics*

Characteristics of ojek modes will be based on models of motorcycles and engine capacity. This data is subsequently used as the basis of the type of motorcycle that will be calculated as a capital of a vehicle on a financial analysis. Type of vehicle models used for ojek are divided into female and male type. The data obtained showed that 97.14% of urban ojek operators and 80.0% of rural ojek operators using the vehicle women type. The engine capacity of vehicles used for the discussion of this paper distinguished four kinds, ie less than 100 cc, between (100-110) cc, between (111-125) cc, and more than 125 cc. The majority of the vehicle's engine capacity used is between (100-110) cc, which is about as much as 65.71% of urban ojek operators and 67.0% of rural ojek operators.

## C. *Operational Service Characteristics*

Cost of Fuel (BBM) ojek is one of the data used for the analysis of financial feasibility. Average fuel consumption of ojek vary, ranging from Rp 5.000/day to more than Rp 20.000/day. Majority of urban ojek operator (77.14%) and rural ojek (45%) to pay for fuel Rp. (6000-10000)/day. The average cost of fuel ojek was Rp7.785/day in urban area and Rp7.400/day in rural area. Maintenance costs are also part of the cost in the financial analysis are costs incurred for the purchase of vehicle parts, maintenance and repair by a mechanic, as well as the cost of lubricants. The average cost incurred by the ojek operator is equal Rp36.071/month in urban area and Rp26.750/month in rural area. Contribution ojek groups are routine costs incurred ojek operators in a community or post ojek. The fund collection system manifold. There is a fee paid in the form of weekly, monthly, or yearly, and there is also the contribution of each system to get passengers. The contributions in a group of ojek ranging from Rp. 1,000 per month to more than Rp. 20,000 per month. The average cost for ojek group dues amounted Rp422/day in urban area and Rp163/day in rural. Data fuel costs, maintenance costs, contributions group that has been presented above will be used in the financial analysis as part of variable cost.

Membership of ojek operator license fees are funds deposited by the candidate to the post ojek operator or ojek operator community in a location that is concerned be allowed to operate at that location. The cost of licensing is diverse, from none to more than Rp3.000.000,-. The average cost for ojek permit amounted Rp478.572 in urban area and Rp660.000,- in rural area. Membership of ojek operator license fees only paid once in the initial period will be working as a ojek operators. In some locations, a license becomes the property which can be sold to other operators, so that in the analysis of the financial feasibility of licensing membership fee is included in the fixed cost (capital).

## D. *Financial Feasibility Operational Ojek*

Benefit Cost Ratio (BCR) Method is used in the analysis of the financial feasibility of ojek. Used a few assumptions, which consists of the cost of fixed costs and variable costs.

Fixed costs consist of capital costs of vehicles, vehicle taxes and licensing fees membership ojek operators and variable costs consisting of fuel costs, maintenance costs, the cost of tuition groups, and operator salary. Benefits are calculated from the amount of income and the residual value of the vehicle. The capital costs of vehicles used is Rp7,000,000, - based on the results of the analysis of the characteristic modes of ojek, namely the price of used motorcycle with more than 1 year of age, the type of female models, with engine capacity of 110 cc. Residual value of the vehicle is 40% of the purchase price, based on the results of the survey vehicle selling points that have been aged 10 years with the same brand and model. Based on the average length of working operators motorcycles, used investment horizon is 10 years. Another assumption is that the bank interest rate used is 5.75% per year, according to the average interest rate of Bank Indonesia in 2012. Salary ojek operators based on the regulation minimum wage in the study area in 2012 which Rp864.450,-/month in Surakarta and Rp775,000/month in Wonogiri.

The feasibility of an activity is one indicator of the sustainability of these activities. An activity that is worth doing is sustainable because these activities can provide benefits for implementing these activities. The results of the feasibility analysis of the age of 10 years investment BCR value of 1.02 for urban area and 1.12 for rural area. The value of a business is feasible if it has a value of BCR > 1.0. Based on this it can be stated that the business of operating ojek service is feasible. With the financial feasibility owned, ojek service is believed to have sustained and will held in a long period of time, due to ojek able to provide operational benefits for the operators in the long run.

In regard to sustainable transport shows that ojek has a value of economic efficiency, liveable streets and neighbourhoods, support the community and the social conditions that contribute to economic growth. It is recognized that ojek has a weakness in he convenience, safety and security, therefore the findings of this study are expected to be increasingly aware of the importance to immediately regulate ojek as part of a mode of paratransit in Indonesia. This is important because the existence of ojek is the needs of the community and will be long-term. Potential ojek as a mode of paratransit future in Indonesia that is safe and free of pollution is very likely to be achieved by providing an electric motorcycle, thereby reducing the exhaust emissions with a lower engine capacity so that the speed of service is more easily controlled. Setting the operational area ojek will also further ensure the security and safety of users.

#### IV. CONCLUSIONS

From the results and discussion of the ojek as one of Indonesia's sustainable modes of paratransit in the future can be concluded as follows:

- Ojek has a value of economic efficiency, livable streets and neighborhoods, support the community and the social conditions that contribute to economic growth

derived and employment in both urban and rural areas to prove the potential of ojek as one of Indonesia's sustainable transportation modes in the future.

- Ojek is believed will be held within a long period, due to ojek able to provide operational benefits for the operators in the long term and the needs of society, therefore it is very is important to regulate ojek immediately as part of a paratransit modes Indonesia.

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