

Sustainable Transportation Reform Development Through Partnerships Based on Bounded Rationality and Incremental Model

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Abstract: Transportation in modern era is an important factor in the mobilization as well as being a complex issue, especially in big cities. International data suggests that congestion is getting higher and exacerbated by the impact of air pollution to secure and safety public transportation. Based on Boolean Logic, the study was conducted through the study of Literature Review. That was then, this study provides insight into how a sustainable transport reform seen from the stage and influential factors of country classifications based material and non-material welfare. To which developing countries and developed countries apply different systems and methods according to the recommended model.

1 INTRODUCTION

Transportation of modern life has become a fundamental need throughout society, where the transport function has an important role in influencing the ease of accessibility in it (Chairunnisa, 2012). In addition, public transport is needed to provide a high degree of flexibility to compete effectively move termed private or personal mobility (Lyon on Putri, 2015).

However, in practice, there are still many experienced various constraints. As stated by Jolley (2001) explains that the main problem in big cities such as traffic congestion, traffic safety, lack of accessibility of transport for many groups, significant air pollution which contribute to global warming. Supported by data from the research institute of transport in the UK, INRIX in 2018 argued that Los Angeles become most jammed cities in the world with at least 100 hours spent stuck in traffic on the road for a year (Rayanti, 2019. <https://oto.detik.com>, accessed June 26, 2019). As well, the INRIX report 2018, shows Americans have been affected due to congestion economic losses equivalent to Rp 113, 5 billion (1 USD = Rp 14,000) per busy hour (Novianty, 2019. www.suara.com). This suggests that congestion does not only occur in developing countries, but also occur in cities in

developed countries. However, Western countries have much better control in regulating the rate of the number of vehicles on the road combined with supporting infrastructure (Syed, 2014).

One of the many factors that lead to increasingly high number of traffic problem in developing countries are the limited fund in infrastructure contraction, poor quality of the main road, and the car production policy (Syed, 2014). According to Maji (2017), explain that the congestion are caused by high population density, improper planning, illegal parking, street vendors, irregularity of public transport, and increased purchase of private cars. Even from 2015 to 2018 based on statistical data of production OICA, argues that each year, an average of more than 93 million vehicles are produced in the world and tend to increase (<http://www.oica.net/category/production-statistics>).

From the environmental side, congestion that causes poor traffic performance has a negative impact on environmental quality (Sutandi, 2009). Based on WHO data, air pollution is the cause of death of around 7 million people worldwide each year with 90% in Asia and Africa (<https://news.detik.com/dw/d-4001541/who-7-juta-orang-tewas-tiap-tahun-karena-polusi-udara>). The source of air pollution is caused by increased human activities that produce pollutants, one of which is the

use of vehicles that produce vehicle exhaust emissions (Sastrawijaya in Kurniawati, 2017). Where the transport sector's contribution to air pollution reached 60 percent (Gusnita, 2016).

Not far from the problems of transportation, The Global status report on road safety 2018, launched by WHO in December 2018, highlighting that the number of road traffic deaths per year has reached 1.35 million and road traffic injuries are the leading killer of people aged 5- 29 years with the highest proportion in developing countries (https://www.who.int/violence_injury_prevention/road_safety_status/2018/en/). Nearly 90% of all traffic accidents occur in low and middle-income countries (Wegman, 2017). This shows how great the risks facing the world community in this modern era, especially in developing countries.

Thus, Chen (2016) explains, as an important component of the transportation system, public transport should be managed properly to meet the needs of the community and contribute to the environment-friendly. So it is important for the government began to develop sustainable transport and environmentally based. Liyanage (2017) explains that sustainable transportation tends to support more integrated solution including technological innovation with the aim of improving quality of life for present and future generations. Because, according to the paradigm change of the government bureaucracy explain that the information technology is now a difficult thing to be avoided and the technology has been embedded in our daily lives (Thoha, 2000).

And in this article, the authors analyze on the perspective of the implementation of sustainable systems in transportation through partnerships, specifically based on the Bounded Rationality and Incremental models that are deemed necessary to maintain stability and improve services not only for now but also for the future with renewable technology-based.

2 THEORETICAL

2.1 Bounded Rationality and Incremental

In achieving and developing this Sustainable Transportation Reform, the authors use alternative policies with the Bounded Rationality and Incremental models. Bounded Rationality considers that in reality, when a policy makers makes a decision, sometimes still has limitations in

rationality (Asmara, 2011). In the study Firmansyah (2013) explains that Herbert Simon describes rationalities individual decision built on two sides of the limitations, the limited information and cognition by emphasizing the adequacy because no man is able to maximize their utility in a variety of limitations. According to Way Land and Greve (in, Firmansyah, 2013) the substance of bounded rationality is the limitations of humans in managing information and solving problems that are used in deciding a policy, because humans as a decision makers face limited information, attention, and the ability to process information.

While the incremental model tends to focus on the continuation of bounded rationality. Described in Muadi study (2015) that this model approach is taken when policy makers are dealing with limitation time, information availability and adequacy of funds, so that this model can be regarded as a model of pragmatic or practical. He stressed that with the uncertainty of a pluralistic environment, policy makers are faced with periodic modifications to suit the needs.

2.2 Partnership in Sustainable Reform Transportation

In implementing the Sustainable Transportation reform, the government will not be able to optimally solve its own problems. As expressed by the incremental model, that the government has various limitations such as financial, time, resources, and intellectual. So there is a need for private and public participation to complement these limitations through partnerships. From one of the studies explain that the Public Private Partnership is an appropriate alternative to solve various problems of limited resources owned by the government (Oluwasanmi, 2014). Vestikowati (2012) agreed that partnership is one of the alternative solutions for local governments that have limited capabilities in various fields in developing the economy. Many government projects were somewhat successful when they implemented the Public-Private Partnership (PPP) (in Xiong, 2018). For example in Malaysia and in Nigeria, in the construction of housing infrastructure (Muhammad, 2018).

3 METHOD

In this intensive search using Boolean Logic Literature Review through an online journal literature (Sarwono, 2006). The use of Boolean

Logic is based on the specifications of major search operators such as AND, OR, NOT to narrow the journal search. With the aim of finding new variables, to distinguish between things that have been studied and determine what needs to be done, then do synthesis and gain new perspectives (Sarwono, 2006). Through several databases such as emeraldinsight, sciendirect, and googlescholar, journals are downloaded based on relevance and keywords such as Sustainable, Transportation, Reformation, and Partnership to find several journals that meet the research needs.

4 RESULT AND DISCUSSION

A Reform should be implemented if the existing system suffers from many deficiencies that cause losses. But not only reforms, sustainable systems are needed to maintain current and future services. In this discussion, the author gives an example of how the reforms carried out in several countries in Asia and Europe have indeed been proven to be effective and efficient.

In Mishra's research (1993) explains that in India there is a fierce competition between private companies that focus only on profitable transportation routes. And the impact, the services provided are not optimal. By involving the private sector through various types of management such as systems, management, recruitment, and bus fleets, reforms are implemented to solve problems regarding poor bus services.

In Korea, based on Pucher's study (2005), reform was motivated by the increasingly serious impact of the transportation system. The reform was carried out by introducing an innovative transportation programs through the management of bus services, Bus Rapid Transit (BRT), integration of bus services, fares, structures, and ticketing systems. From these reforms, almost 90 percent of Seoul residents expressed their satisfaction with the bus service reform. The researcher also stressed that the reform through the BRT was an important factor in resolving the issue of efficient use of funds.

In Chen's research (2016), the government of Arao City, Japan, demands for faster transportation are accompanied by higher fuel prices and poor service and transportation modes. One of the alternatif solution who taken by the government is to work with private companies.. The finding shows that the selection of tender credibility is an important factor in devolving authority. Supported by strategic policies, clear legal frameworks, effective

institutional capacity, and qualified participants make the reforms work optimally. Chen gave some recommendations, first, to utilize the contract system by involving more private companies with competitive tenders. Second, the appropriate contract and clear rules of the contracting parties.

As a way to create a good transportation system, it is important to have a sustainable system It needs continuous development, namely in the aspects of infrastructure and transportation modes. As stated by Sohail, Maunde, & Cavill, that the transportation system combines two main important aspects namely infrastructure and modes of transportation and is also emphasized by Egan, transportation and connectivity are the main requirements for creating sustainable communities and also for sustainable development (Liyanage, 2017). In addition, there are three elements of the concept of sustainable transportation explained by the World Bank (Jolley, 2001) namely economically efficient transportation, environmentally sustainable transportation and socially sustainable transportation.

Based on Jolley's research (2001) explains that based on its application, this sustainable transportation system cannot be generalized. Because there are some underlying differences, namely the level of income per capita, the size and shape of cities, and transportation infrastructure that varies greatly. In the study, there are three scenarios that can be applied to achieve a sustainable transportation system, which are integration of urban planning and transportation planning, development of transit infrastructure, and new traffic management approaches.

Stefansson (2008) explained that, in creating a sustainable transportation, it's should have a smart transportation system. In its findings, it shows that a smart transportation management must at least include such as smart goods, smart vehicles, and smart infrastructure that are equipped with modern technology and integrated in showing position, communication, even to exchange the information. With the aim to react swiftly in case of deviation from the schedule and change the plan in accordance with the situation. Although it takes a lot of money, savings can be made in the form of more efficient transportation in dealing with delays and resources. According to Stefansson, it has an impact on improving customer services, safety, and security for the community.

On the other hand, Liyanage (2017) explained that there are some obstacles in the sustainable transportation system based on the problem of population density. Problems were encountered such

as rural transport access low, an increase in the amount of traffic, the number of accidents, and high emissions. Therefore, according to the researchers, one of the actions that need to be taken by the government is to introduce safety regulations, build emission test centers to reduce CO2 emissions, and introduce public-private partnerships intended to establish the cooperation between the private sector as a form of intertwining and complementarity shortcomings for the attainment of goals.

Based on research in various countries, the implementation of Sustainable Transportation Reform through Partnerships based on the Bounded Rationality and Incremental model can be formulated into a model, where the need for sustainable transportation reform must be based on environmental, social and economic sustainability. Then, seen from the characteristics of the country can be divided into two actions, namely in developing and developed countries. Based on Bounded Rationality with all the limitations of a decision maker, a partnership between the government and the private sector is conducted. And in the end, the policy will go through a cycle. Where the formulation and application of policies depends on the needs of the government, so they can be changed and even stopped at any time.

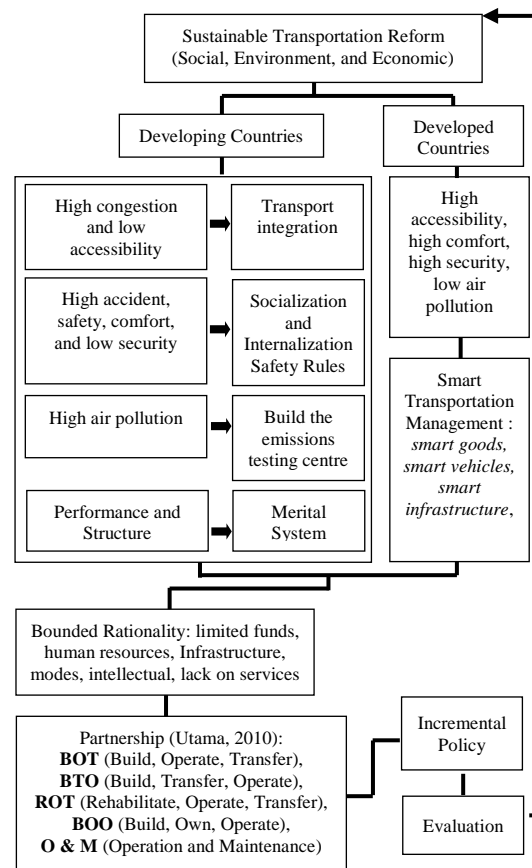


Figure 1 : Sustainable Transportation Reform Development through Partnerships Based on Bounded Rationality and Incremental Model.

5. CONCLUSION

In all the problems, the transport system is expected to achieve Sustainable Transport System in terms of integration, reduce the number of accidents, as well as reduce the number of air pollution. Therefore, a partnership between the government and the private sector is needed to resolve all the limitations. Based on these limitations, recommendations that can be given are through partnerships that are seen from whether the country is developing or developed by building infrastructure based on long-term investment through the Bounded Rationality and Incremental models. From this partnership, the infrastructure built is intended to be able to meet long-term needs that have an impact on the efficiency of government budgets in development and maintenance through periodic changes or policy changes as needed.

The recommendation that the author gives is first, in the aspect of accessibility, in developing countries, it is expected to start focusing on developing and developing Bus Rapid Trans modes throughout the city because it has proven successful in Korea and Japan. Second, recommendations that can be given are through partnerships with building long-term investment-based infrastructure, both BOT (Build, Operate, Transfer), BTO (Build, Transfer, Operate), ROT (Rehabilitate, Operate, Transfer), BOO (Build, Own, Operate), or O&M (Operation and Maintenance). Third, implementing other driving forces besides fuel-based. For the examples, such as the application of the electric system, hydrogen-fueled transportation in Germany, or a train with a magnetic system in Shanghai.

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