Book Chapter

URBAN INFRASTRUCTURE AND COMMUNITY DEVELOPMENT

Community is an integral part of the urban infrastructure planning. In this context, the community plays a significant role as a subject and object. In the past, infrastructure planning has primarily focused on how to build "physical infrastructure." As the increased growth of the urban population, we discuss more and beyond this hard infrastructure, and community development takes part in it.

This book is a collection of writings from academicians related to infrastructure planning and community development. Thirty titles from 34 authors in this book chapter portray many perspectives on infrastructure planning and community development in micro and macro scale with a comprehensive point of view both in research and project approaches.

In addition, this book also consists of students' work that is part of the Summer Course Program in 2019, which is part of the collaboration project between School of Architecture, Planning and Policy Development (SAPPD) Institut Teknologi Bandung, Department of Civil and Environmental Engineering Ritsumeikan University, and School of Architecture, Design and Planning the University of Sydney.

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Foreword

As one of the leading Indonesia's higher education institutions, Institut Teknologi Bandung (ITB) plays a significant role in educating Indonesia's future leaders to excel in an ever-competitive global market. School of Architecture, Planning and Policy Development (SAPPD) organizes annual Summer Course Program back in 2012 with an aim to internationalize the faculty and allows collaboration with globally renowned universities. Through this program, the participants not only can learn and explore various issues, but also share techniques and methodologies in the area of built environments focusing on Indonesia case studies.

This book covers the observation and synthesis of Summer Course Program in 2019, which is part of the collaboration project between ITB, Ritsumeikan University, and the University of Sydney. The theme selected for 2019 program is "Urban Infrastructure and Community Development". Participants engaged in a robust discussion during classes and fieldwork, whilst exploring implementation of infrastructure practices in real life situation.

We would like to express our sincere gratitude to all who presented, shared, contributed and exhibited. The last but not the least, let we encourage you to have a look into details of this book to appreciate the ideas and depth perspectives.

Editor

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Current Issues in Bus Rapid Transit Service Quality Assessment
(Case Study: Trans Jateng Tawang – Bawen)

Miming Miharja and Renny Desiana

ABSTRACT

Just like other regions in Indonesia, traffic congestion in Central Java Province is the result of high private vehicle ridership. In dealing with this problem, the government of Central Java Province provided mass transportation services, i.e. Trans Central Java Bus Rapid Transit (*BRT Trans Jateng*). In implementing a sustainable, effective and efficient public transportation, an assesment is required to give feedback for continuous improvement. The purpose of this research is to understand the factors contribute to the quality of the *BRT Trans Jateng* service as to prepare inputs for future improvement program. The analytical method used in the research is based on good governance indicator and service quality indicator (*servqual*). The research method used in this research is quantitative as well as qualitative approaches. Data collection is conducted through questionnaire on the *BRT Trans Jateng* passengers, interview with the Koperasi Muda Serasi Operator, and documentary study. The result of the research shows that 72% of the passengers are satisfied with the *BRT Trans Jateng*; however, improvements are still needed in the fleet provision, improvement of the human resources quality, and law enforcement.

Keywords: bus rapid transit; good governance; servqual.

INTRODUCTION

City is the center of economic, social, and political activities and has an influential geographical and governmental position. This has made the city as the center of public life (Simonds and Starke, 2006). To facilitate population movement and activities, there has been an increase in private transporation from time to time. In the period of 2012 – 2016, Indonesia experienced a quite significant increase in the number of motor vehicle, i.e. 8.19% annually (BPS, 2016). The impact of the increase in private transportation is traffic congestion which keeps increasing as the result of the lack of public willingness to shift to public transportation. Furthermore, the increased congestion has implied a negative impact on transportation cost, time and energy consumption, as well as social and environmental problems. In the long term, this would endanger the livability of the cities up to the threat of its inhabitants life.

Central Java is one of the provinces with major congestion problem, particularly in large city such as Semarang. The city of Semarang is experiencing a 12% annual growth of motor vehicle, whereas the annual growth of road is only 1%. This City filled with 500 thousands four-wheeled vehicles, more or less 1.6 million motor vehicles that significantly influence the increase of congestion in Semarang (Muhammad Khalid in Radar Semarang, 2018).

The problem would be worsening by the lack of good public transportation services, which can be influenced by (Setyawan and Agapitus, 2010):

- Vague definition of services by which public transportation entrepreneurs often encounter constraints and the government is unresponsive in solving the problem.
- The purpose of service is often not concretely explained and so as a result, public transportation planning becomes so difficult and is not well directed.
- Limited number of human resources with the knowledge related to transportation service.
- Transportation management that relies solely on regulations is ineffective, therefore it should be supported by a good quality of human resources (limited law enforcement awareness)
- Human resources development program that is not well implemented.

As part of the solution to the problem, the Central Java Province has introduced The Bus Rapid Transit (BRT). *BRT Trans Jateng* consists of corridor 1 and 2 that are managed by the government and operator (private sector).

Trans Jateng was operational for the first time in Central Java Province in 2017, i.e. Corridor 1 (Tawang Station – Bawen Bus Terminal) connecting the city of Semarang and the Regency of Semarang.

The BRT service is expected to attract the existing private mode users, yet reduce the total trip volume. This would certainly require a sustainable, effective and efficient strategy. As an effort to that, this research aims at assessing the service quality of BRT Trans Jateng. The objectives of the assesment are (1) to analyze the institutional aspects based on good governance indicator, and (2) to analyze technical aspect based on servqual indicators.

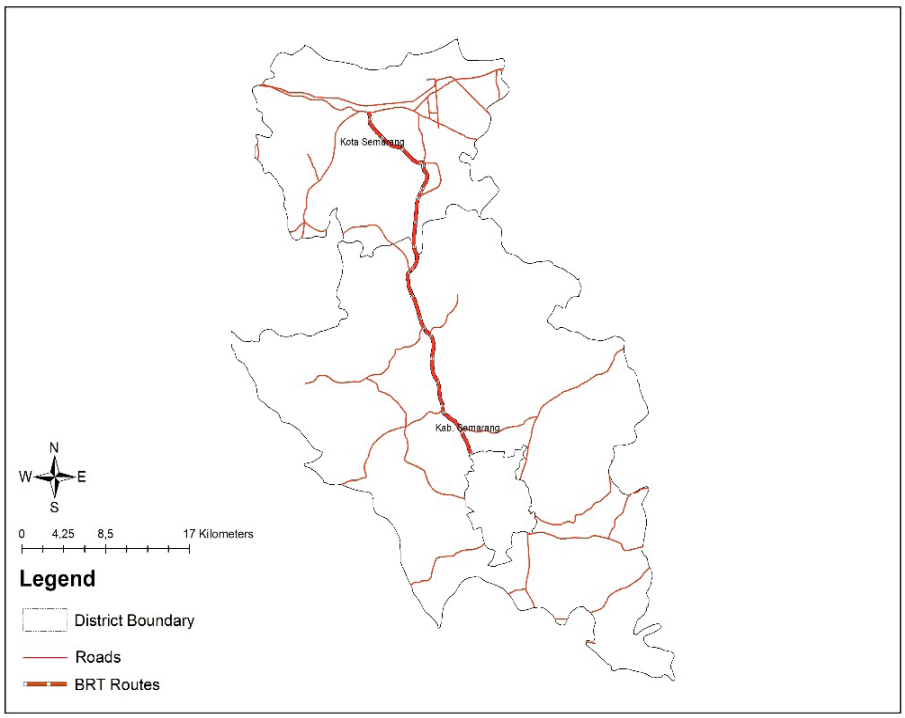


Figure 1. Study Area
Source: Analysis, 2019

LITERATURE REVIEW

A. Public Service

Law No. 25 Year 2009 states that public service is an activity or a series of activities in fulfilling service demand based on rules and regulations for each

citizen over service, goods and/or administrative services provided by the public service provider. Each public service must have a published service standard as a guarantee on the certainty for the service provision. The service standard components based on Law No. 25 Year 2009 consists of legal basis, technical and administrative requirements, implementation procedure, duration of completing the service process, cost, service product, infrastructure/ facility, implementation competence, internal monitoring, complaint handling, the number of operators, security and safety assurance and evaluation on implementation performance.

B. The Quality of Public Service

The quality of public service is the government effort to satisfy the service users; if the service users are satisfied with the service, it might be concluded that the government has provided a service in accordance with the standard quality.

C. The Correlation between Institutional Aspect and Technical Aspect

Each policy taken by the government would imply a certain service quality felt by the public (BHP UMY, 2010). The aggregate result of the whole policy would have an impact on the level of the public trust to the government, which would furthermore affect investment climate. Threfore, a reliable assessment is needed to make sure that the government strategy is on the right track. In this research, government performance would be assessed using good governance analysis, both at the institutional and technical aspect. In institutional aspect, a good governance would seriously take into account the existing policy and translate it to the program properly. In technical aspect, a good government would go down to the detail issues of every program implementions. This assessment covers both aspects, so it would be able to balance the assessment of the both aspects.

D. The Assessment of the Institutional Aspect Service

Institutional performance assessment is performed to figure out whether or not a government system succeeded in achieving the objectives of the program implementation. By looking at the success or the failure, the analist would aware of the degree of effectiveness from the ways that have been practiced. Performance assessment is an effective method for individuals and organizations to learn the good and the bad contributed to the final outputs (Osborne & Gaebler, 1992). Good governance is a good government.

Table 1. Good Governance Assessment

Principle	Indicator	Supporting Device Indicator
Participation	• Public participation in various policies • Understanding of participative method • Decision making based on common consensus	• The guideline of participatory process implementation • Regulation that accommodates various interests • Consultative Forum and public meeting • National as well as local mass media as a channel of public aspiration
Supremacy of Law	• Firm and consistent regulation • The management of BRT Trans Jateng that is in accordance with the existing laws and regulations and has been approved by the central government • Fair and non-discriminatory law enforcement • Punishment for each law breaker • Awareness and obedience to the law	• Laws and regulations • Integrated court system • reward and punishment for law enforcement officer • Monitoring system for the law enforcement institution that is objective, independent, and accessible to the public • Socialization of the laws and regulations
Consensus oriented	• Meeting in eah policy • Decision made based on common decision • Active community	• Socialization • Consultative forum and public meeting including stakeholder forum
Effective and efficient	• The implementation of a qualified and right on target administration with optimum use of resources • Monitoring with evaluation for improvement • Reduction in overlapping organization functions	• Standard and indicator to assess the efficiency and effectiveness of government operation • Surveys on stakeholders satisfaction • Organization regulations and state operational governance that is effective and efficient • Non-overlapping working program
Justice and equality	• Policies oriented toward the fulfilment of public basic needs • Services for less fortunate community • Gender equality and justice	• Regulations for the reduction of regional disparity, economy, law and gender empowerment, and less fortunate community
Transparency	• Appropriate information in each process of political policy formulation and implementation • Information from the government that is clear, accurate, and easy to understand • The information from the government should be right on time • The information is accessible by the public with the media or facility provided by the government	• Regulation that guarantees the right to obtain information • Information center • Website • Public service advertisement • Electronic and printed media • Announcement board • Development exhibition
Responsibility	• The existence of Complaint service • Standard in following up the complaint report	• Minimum service standard • Complaint procedure and service, hotline • Free of charge for access to information facility

Principle	Indicator	Supporting Device Indicator
Accountability	• The government has the responsibility to respond to everything asked by the public • Training for government officials • Measured output and outcome • Sanction on mistakes or negligence in an activity, • Conformity in the implementation	• SOP in the violation of authority/policy implementation • Accountability mechanism • Annual report • Accountability report • Monitoring system of the state operational performance • Monitoring system • Reward and punishment mechanism
Strategic vision	• Planning for the future with vision and strategy • Clarity in each goal of program and policy • Support from practitioners to implement the vision	• SOP in governmental affair or violation of authority/policy implementation • Accountability mechanism • Annual report • Accountability report • Monitoring system of the state operational performance • Monitoring system • Reward and punishment mechanism
Professionalism and competence	• Highly performed • Obedience in the principle • Creative and innovative • Qualified in his/her field	• Competence standard that is in accordance with the function • Professional code of ethic • Transparent reward and punishment system • Human resources development system • Performance standard and indicator,

Source: Astriandy (2018), Bappenas (2007), data processed (2019)

E. The Assessment of Technical Aspect Service

Zeitmal, Parasuraman and Berry (1999) stated that sevice quality (servqual) is based on the following criteria.

Table 2. The Assessment of Service Quality

Dimension	Indicator
Tangible (direct evidence)	The cleanliness and comfort of the waiting room and the bus
	Clear signs at the bus stop
	Separator between male and female zone or special place for specific passenger (pregnant, ill)
	Easy access to and from the bus stop
	Bus service amenities
	Employee's neat appearance
	The attraction of the Promotional media
Reliability	Fare affordability
	Conformity in departure and arrival schedule
	Equality in service to passenger
	Information clarity and amenities
	The trip can be completed in relatively accurate and rapid time

Dimension	Indicator
Assurance	The ability of the driver to drive the bus
	Ability of the employees to serve the passengers
	The feeling of safety, comfort and calm
	Hospitality and politeness in serving the passengers
Empathy	A clear and complete information delivered by the employee at the counter
	The ability of the BRT fleet to accommodate all passengers at the bus stop
	Service to specific passengers (elderly, disabled, etc.)
	The concern of staff on passengers when they get in/out of the bus
Responsiveness – willingness to assist customers and provide a fast service	Quick response in fulfilling the demand of the passengers
	Easy access to information
	Quick response in responding to complaint, critique and suggestion
	Speed and skill in the service of bus ticket purchase,

Source: Parasuraman (1985), Rizal (2012), Nurvia (2007) and analysis (2019)

METHOD

This research mainly uses quantitative approach as the tool to explore the topic based on the related theories. Theory or concept is then discussed related to transportation service quality.

Data Collection Method

Data collection is conducted using primary survey such as field observation, questionnaire and interview. It is also performed through secondary survey by studying document, literature review, internet, and statistical data.

Sample Collection Method

The sampling method used is random sampling technique (Soetomo, 2002), i.e. sampling collection from the population that is selected randomly regardless the stratum. The formula used in determining the sample is Slovin formula (Prasetyo and Jannah, 2005):

$$N = \frac{No}{1+ N\,(e)^2} = \frac{5.990}{1+5.990\,(0.1)^2} = 98{,}35 \approx 98$$

Sampling collection is conducted on week days (Monday-Friday) as well as weekend (Saturday-Sunday) during the office hour. Respondents are *BRT Trans Jateng* users who objectively provide input on the services quality of BRT Trans Jateng. The questionnaire refers to five servqual dimensions using 24 variables.

Data Analytical Method

To answer research questions, the data analyses are performed as follow:

1. Analyze institutional aspect of *BRT Trans Jateng* by looking at the government management. The indicators used are participation, justice and equality, supremacy of law, accountability, transparency, consensus oriented, effective and efficient, responsibility, strategic vision and professionalism and competence.
2. Analyze the technical aspect of *BRT Trans Jateng* using user satisfaction related to performance and service provided. Indicators used in this assessment are tangibility, realibility, responsiveness, assurance and empathy (Zeitmal, Parasuraman and Berry (1990)).

Servqual Calculation

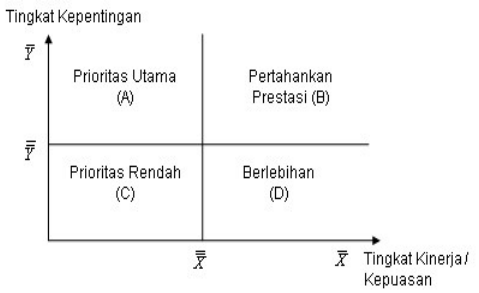
Table 3. Servqual Calculation

	Formula	Remark
Degree of conformity	$Tk = \frac{Xi}{Yi} X\ 100\%$	Tki: degree of conformity Xi: score of performance assessment Yi: score of importance assessment
Degree of importance	$Wj = \frac{\sum Wij}{N}$	Wj: score of the degree of importance Wij: the score of the degree of importance of respondent 1 with dimension j N: total respondent
Average importance score	$Hij = \frac{\Sigma THij}{ni}$	Hij: importance score of passenger at dimension j Tjij importance score of the passenger on service attribute 1 Ni: the number of attribute in dimension j
Average performance score	$Pij = \frac{\sum TPij}{ni}$	Pij: the score of passenger performance at dimension j. TPij: the score of passenger on attribute of service I ni: the number of attribute in dimension j
Servqual Score	performance score – importance score	
WSC	Servsqual score X degree of importance	
ASC	$\frac{\text{Performance score}}{\text{Importance score}} x\ 100\%$	
Mean Importance Score (MISi)	$MIS = \frac{\sum Yi}{n}$	n = number of respondent Yi = degree of importance of the I^{th} attribute
Mean Satisfication Score (MSS)	$MSS = \frac{\sum Xi}{n}$	n = number of respondent Xi= performance score the I^{th} attribute
Weighted Factor	$WF = \frac{MIS}{\text{Total MIS}}$	
Weighted Score (WS)	WS = MSS X WF	
Weight Average Total (WAT)	$WAT = WS\alpha_1 + WS\alpha_2 + \ldots\ldots WS\alpha_n$	
Customer satisfication index(CSI)	$CSI = \frac{WA}{HS} \times 100\%$	

Source: Parasuraman (1985)

Importance Performance Analysis

Importance Performance Analysis compares user importance with company performance in measuring the consumer satisfaction on a certain company.



Quadrant A: High importance degree, low performance
Quadrant B: High importance degree, high performance
Quadrant C: Low importance degree, low performance
Quadrant D: Low importance degree, high performance

Figure 2. Cartesian Diagram of Importance Performance Analysis

DISCUSSION

Institutional Aspect Assessment

Institutional analysis is conducted by looking at the implementation of good governance in the management of *BRT Trans Jateng*. The results of the analysis are shown below:

A. Participation

Government regulation no. 45 year 2017 on community participation in regional government management states that community participation includes regional development planning and monitoring and evaluation of regional development. The existing implementation in the *BRT Trans Jateng* management is that public can participate in the planning development meeting (musrenbang) to express their aspiration. Public complaints can also be addressed through social media owned by the agency. In addition to musrenbang, public can participate in the monitoring which can be done by complaining to the Transportation Agency or operator. This implementation shows that public is active to participate in the provision of *BRT Trans Jateng*.

B. Supremacy of Law

Supremacy of law looks at the constitutional assurance whether law enforcement in the political process run by the executive, legislative and judiciary power, will always be based on regulations stipulated by the law.

In the operation of *BRT Trans Jateng*, there are some services that are not in accordance with the regulation such as some drivers who do not follow the rules or driving recklessly, as well as allowing the over bus carrying capacity (load factor up until 105%). Unfortunately, the BRT Trans Jateng has no clear legal framework on this issu, i.e. related to the attitude of the officer and the bus service hour. This condition would certainly give a negative impact on the service quality. Ideally, the implementation of this regulation should be monitored by a field coordinator and reported regularly to the head of the agency, so a proportional act of law enforcement could be imposed.

C. Consensus Oriented

The government acts as a bridge for different interests in order to create a common consensus. In the case of *BRT Trans Jateng*, the public plays an active role in monitoring the operational of the BRT. Problems in the BRT Trans Jateng are solved through a discussion among the stakeholders. The decision made is based on the decision of the government and the public. This implementation shows that the implementation of *BRT Trans Jateng* has been consensus oriented.

D. Effective and Efficient Principle

Effective and efficient are shown with the result of the government in fulfilling public needs using the available resources. *BRT Trans Jateng* is considered to be less than maximum in coordinating the stakeholders, so that the available resources cannot be managed optimally. This is shown by the minimum cost and time assurance at the *BRT Trans Jateng* that cannot be managed to provide a good service. This issue is subject to the problem of the waiting time and unfriendly attitude of the *BRT Trans Jateng* officials.

E. Justice and Equality

The provision of BRT Trans Jateng is based on public need, including gender issue. This has been responded appropriately with the provision of a boundary between male zone and female zone inside of the bus. This arrangement has created a much better comfort and security feeling, particularly for the female passengers. The principle of justice and equality also shows the existence of special space for passengers with special need, such as disabled people, pregnant woman, elderly and sick people.

F. The Principle of Transparency

This principle is accommodated with an easy access for the public to the government implementation report. To facilitate the access, the government provided social media and website. However, for documents related to

budgeting, people must come to the government office (Transportation Agency).

G. Responsibility

Responsibility in the implementation of *BRT Trans Jateng* is shown with the government action in responding to public complaint. Public complaint and aspiration are accommodated and discussed in a forum. However, the follow up action is based on the priority. In accommodating the complaint, a suggestion box is provided as well as a phone number and social media to accommodate the aspiration.

H. Accountability

Accountability is a form of government responsibility in fulfilling public need. The type of accountability is different from one place to another. In the case of BRT Trans Jateng the form of responsibility is a realization report or annual report that can be accessed by the public.

I. Strategic Vision

An institution should have a target or vision in planning a program. The institutions in charge in the implementation of *BRT Trans Jateng* are Transportation Agency, Regional Development Planning Board (Bappeda) and each operator –each of which has had vision and mission as well as main duty and function in implementing the BRT.

J. Profesionalism and Competence

In providing services to the passengers, the attitude of the officials have been the subject of complains from the public since they lack the friendliness and concern with the passenger need. This could be the result of the training that was given only at the beginning of the recruitment wihout any further training. Lack of training for the officials also results in the late submission of the report.

Table 4. The Summary of *BRT Trans Jateng* Institutional Assessment

Principle	Analysis Result
Participation	Optimum
Supremacy of Law	Not optimum
Consensus oriented	Optimum
Effective and efficient	Not optimum
Justice and equality	Optimum
Transparency	Optimum
Responsibility	Optimum
Accountability	Optimum
Strategic vision	Optimum
Profesionalism and Competence	Not optimum

Source: Analysis, 2019

Technical Aspect Assesment

The technical assessment is based on questionnaire related to customer satisfaction. The result shows that the degree of conformity of the BRT Trans Jateng Service Quality is 85.05% (out of 100%), which means that the achievement of passenger expectation is still sub-optimum. As a consequence, the system requires to improve its service performance. Table 5 shows the gap between importance and the highest performance, i.e. at the responsiveness attribute. The number shown at the responsiveness is -0.69 which shows the lack of assurance given by the BRT such as driving comfortability and the behaviour of the officials. The actual performance shows 85.07% which means that the government is close to fullfill passenger need.

Table 5. Servqual Calculation for Each Dimension

Dimension	Gap	Rank	ASC
Tangible	-0.63	3	84.83%
Realibility	-0.58	5	86.28%
Assurance	-0.66	2	84.47%
Emphaty	-0.59	4	86.14%
Responsiveness	-0.69	1	83.14%
			85.07%

Source: Analysis, 2019

The result of CSI calculation on the above table shows that the score 72% indicates a degree of satisfaction of the customer on services provided by Trans Jateng which is categorized as satisfactory. The result of servqual is processed to become a Cartesian diagram (Importance Performance Analysis)

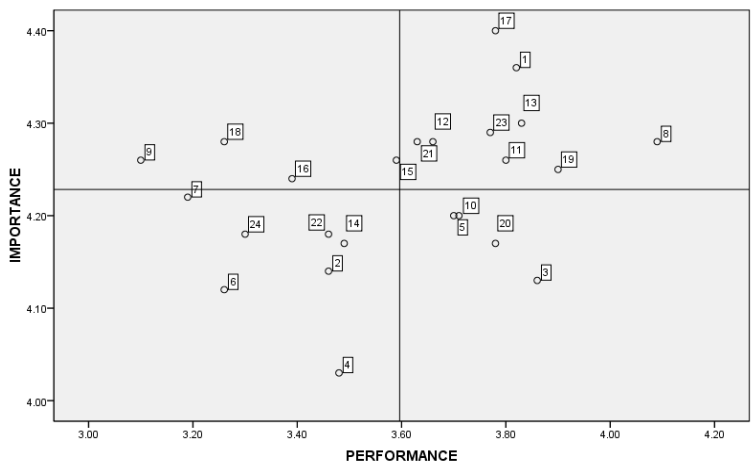


Figure 3. The Result of Importance Performance Analysis
Source: Analysis, 2019

The result of the analysis above shows:

Table 6. The Result of Importance Performance Analysis

Quadrant 1	Schedule conformity, bus velocity, carrying capacity, friendliness of the official
Quadrant 2	Cleanliness, fare, rapid trip, comfort, security, equal service, care of the official, speed of the official, responses to complain
Quadrant 3	Clear information, facilities completeness, accessible bus stop, the ability of the officials in providing services, speed in fulfilling customer need, easy payment system
Quadrant 4	Separator between male zone and female zone, oficials with neat appearance, easy information, care in passenger when they get in and get off the bus

Source: Analysis, 2019

The improvement of *BRT Trans Jateng* based on the result of the quadrant is focused on quadrant 1 with the following elaboration:

A. The Conformity Departure and Arrival Schedule

The departure schedule does not conform as supported by the following calculation:
H = t2- t1

With:
H = headway (minute)
t2 = departure time of the second vehicle
t1 = departure time of the first vehicle
Therefore H = 06.10-06.00 = 10 minutes (at peak hour)
Realization = 10 – 25 minutes

During the peak hour, headway that is based on observation is 10 minutes on average. However, at noon or during the evening, the headway can be 10-30 minutes depending on the arrival of the bus and the condition of the bus in front of it. During the day, the headway could be 5 – 15 minutes and in the evening could be 30 minutes. With this condition, more consistent timetable is needed to be implemented.

B. Bus velocity

Velocity is the most important thing in the use of public transportation, since it influences various public interests on the public transportation, particularly comfort. Based on BRT Trans Jateng regulation, the bus velocity should be 20 – 30 km/hour.

Table 6. Bus Velocity

Bus Route Distance (Km)	Bus Time Travel (Hour)	Velocity = 60, Distance/Time Travel
36.5	1	36.5
36.5	1.5	24,3
36.5	2	18,25

Source: Analysis, 2019

The calculation above shows that bus velocity can reach 36.5 km/hour which is not in accordance to the existing standard.

C. Load Factor

The number of passenger that can be carried by the Trans Jateng is highly influenced by the number of bus in operation. The more buses in operation, the more passenger can be carried. This condition will provide satisfaction of the customer since their need is fulfilled by the government and *organda* (land transportation association). The number of passenger in 2019 is 1,695,496 which are based on the capacity and condition that are studied.

Given some required information, load factor is calculated as follows:
The number of bus: 25 units
Trip: 6 trips
Hence, 25 units x 6 trips = 150
The number of passenger that are carried is 5167
Hence, 5167/150 = 34 persons, carrying capacity of 1 bus is 34 (20 sit down and 13 stand up, based on regulation issued by the Governor of Central Java).
To answer the calculation above, then the load factor
Lf = pnp/tddkx100%= 34/33 x100% =103%
This means that the average passenger in a bus is 103% or 34 in one trip.
However, there is a data with over capacity:
LF = P/K X 100% or (the total number of passenger-km)/(capacity) x 100% = 42/33 x 100% = 110%
Therefore, Trans Jateng passenger could reach average load factor 110%.

D. Friendliness and Politeness of the Officials

Friendliness and politeness of the officials are related to the training system of a government. The implementation at the Transportation Agency shows that the service training is only given during the recruitment. The similar situation applies for the driver. Monitoring on the attitude of the officials or the drivers is discussed in every meeting. In addition, customer complaint is also monitored but to be cross checked with the existing condition. If there is a violation, the sanctions to be imposed are warning letter 1, 2 and 3, and finally a dismissal.

Strategy for Service Improvement

Based on institutional and technical analysis, the problem during the operation is related to the institutional support of the *BRT Trans Jateng*. In other words, good governance would influence a good operation.

Table 7. Strategy for Service Improvement

	Waiting Time	Driver Ability	Capacity	Attitude of the Officials
Supremacy of Law	v	v	v	v
Effective and Efficient	v		v	v
Profesionalism and competence		v		v

Source: Analysis, 2019

Based on table 7, the improvement of service quality can be done as follows:

A. Fleet Addition

The frequency of public passenger transportation service can be defined as the number of passenger public transportation unit serving or operating on a certain route per unit of time (vehicle/hour). The result of the survey shows that the frequency of service is 5 – 8 buses each hour during peak hour and 6 – 9 buses each hour during non rush hour time.

The result of the service frequency calculation is still far away from the standard of service frequency stipulated by DLLAJR (Traffic and Road Transporation Agency) which is 12 buses each hour during the peak hour and 6 buses during the non-rush hour period. The fleet calculation is:

A. 1 Calculating the Circulation Time

CTaba = circulation time from A to B and back to A

Tab = Average time travel from A to B = 120 minutes

Tba = σAB = Travel time deviation from A to B
= 5% x 90 minutes = 6.10 minutes

σAB = Travel time deviation from B to A = 5% x 90 minutes = 6.75 minutes.
Vehicle stopping time at A = 10% x 120 = 12 minutes
Vehicle stopping time in B = 10% x 135 = 13.5 minutes

CTaba $= (T_{AB} + T_{BA}) + (_{AB} +_{BA}) + (T_{TA} + T_{TB})$
= (120+ 135) + (6,10+6,75) + (12+13,5) = 298 minutes

A. 2 Calculating the Headway with Transportation Agency Standard

$$H = \frac{60 X 33 X 0.7}{266}$$

H = headway

P = the number of passenger each hour at the most congested section
= 266 (pnp/hour)

C = vehicle capacity = 33

LF = load factor (70% is used at dynamic condition)

$$H = \frac{60\,X\,C\,X\,LF}{P}$$

$$H = \frac{60\,X\,33X0.7}{266} = 5 \text{ minutes}$$

However, the headway according to the transportation agency is 10 minutes

A. 3 Calculating the Desired Vehicle
K = CT /(HXFA)
CT = 309 minutes
H = 60 minutes
FA = 1

If the headway is 5 minutes:
K = CT /(HXFA) = 298/(5x 100%) = 59 vehicle units

If the headway is 10 minutes:
K = CT /(HXFA) = 298/(10x 100%) = 29 vehicle units

Whereas the number of vehicle during peak hour is

K' = K x $\frac{W}{CTAB}$ =59 x $\frac{120}{298}$ = 23 vehicle trips

K' = K x $\frac{W}{CTAB}$ =29x $\frac{120}{298}$ = 11 vehicle trips

The calculation above shows that if the operation of Trans Jateng conforms to the existing regulation the need of vehicle during peak hour is 11 units (between 06.00–08.00). Hence, during peak hour, there are 11 units of bus with 266 passengers, then the average passenger of 1 trip is 24 passengers or with load factor of 72%. In reality, the number of bus units available during the peak hour or non peak hour is 8 – 9 bus units.

B. Officials Training and Socialization

The strategy given in solving the problem of the officials is a monitoring related to the performance of the officials. Limited number of officials can be solved with shift system or scheduling. Therefore, a continuous training can enhance the performance of the services to the public. Training can be conducted twice a year (at the planning of a program and at the program evaluation), which can at least improve the skill to serve the public better.

The institutions in-charge in the training is the Transportation Agency and Operator. Law No 13 Year 2003 on Manpower states that whoever conducted

a violation, a sanction will be imposed in the form of a fine, in accordance with the work agreement. Sanction given is related to monitoring or service implementation or can be a dismissal from the work place.

Training can be conducted as follow (Agus, interview with local government, 2019):

1. If the Transportation Agency considers that training is important and is capable of running the program by itself, then the Transportation Agency can conduct the training without the coordination with the Training and Education Board.
2. If the Transportation Agency cannot conduct the training by itself then the agency can coordinate with the Training and Education Board.
3. Training can be conducted based on the agency need. However, it is better if it is conducted during the planning process, so the program implementation is in the duration of 1 (one) fiscal year (planned in advance at the beginning of the year for the preparation of a budget).

C. Law Enforcement

Law enforcement is mandatory in a government operation. Stages in law enforcement are:

1. The need for the perfection, renewal and completion of laws and regulations.
2. Improvement of human resources quality in morality and intellectualism.
3. The formation of a governmental institution capable of monitoring law enforcement so that the institution has the authority to issue sanction.

CONCLUSION

The result of the research explains that the services provided by the BRT Trans Jateng is not optimum yet, particularly the one that is related to the service performance in relation to waiting time and load factor. Daily load factor average is 103% but in reality the condition in the field is even reach 113%. Training for driver and customer servant should be increased since it is only conducted once during the reqruitment. Driver and customer servant are the frontliner who directly interact with the customers. Many complain have been addressed regarding the performances and atitudes of driver and customer servant. With this condition it is imperative to anticipate related to the fleet addition or the improvement of timetable developed by the *BRT Trans Jateng*. It is also an urgent need to improve the training programs for the officials and law enforcement agency.

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