



PERFORMANCE ATTRIBUTES DETERMINATION OF TAWANG ALUN TERMINAL IN JEMBER

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ABSTRACT

Tawang Alun Terminal is a terminal type-A located in the district of Jember, East Java Province. This terminal serves as transit transport between cities across the province (AKAP) that connects the western and eastern region of East Java and Bali. The terminal is established since 1992 and the current conditions are devoid of passengers and decrease in the number of public vehicles. This study aims to determine the performance attributes of Tawang Alun terminal with reference to the principles of environmentally friendly terminal or Green Terminal. The used method is a survey and interviews with distributing questionnaires as research instruments. The survey results gained 12 performances attributes of Green Terminal, where the attributes Application of Environmental-Friendly Concept is an attribute with the highest score in level needs, while the frequency and density attributes become attributes with the lowest score. The twelve attributes can be developed as research instrument in the continuation survey.

Keywords

Attributes performance, green terminal.

INTRODUCTION

A road transport passenger terminal is one of the transportation infrastructures that serve as a transit node for public transport modes. Tawang Alun terminal is a terminal type-A located in the district of Jember, East Java Province. As in KM 31/1995, this terminal serves as a transit node of public transport inter-city and inter-province (AKAP) which connects the western region to the eastern region of East Java. In East Java, this terminal connects the city of Surabaya, Malang, Pasuruan and Probolinggo to Banyuwangi, Situbondo and Bondowoso. The terminal is established since 1992 and the current conditions are devoid of passengers and decrease in the number of public vehicles. It's required an evaluation to improve the terminal performance. This study aims to determine the performance attributes of Tawang Alun terminal with reference to the principles of

environmental-friendly terminal or Green Terminal. The Consideration of the Green Terminal principle is some environmental damage caused by transportation activities mainly occur in the terminal. **Figure 1** and **2** shows the existing condition of Tawang Alun terminal in Jember.



Figure 1. The front of Tawang Alun terminal

**MATERIAL AND METHOD**

Table 1 shows the previous studies and researches as reference in this study. Many indicators and methodology of the previous

researches are referred in this study. This study has the novelty in comparison with previous studies.

Table 1. The Previous Researches

No	Researcher	Year	Novelty	Method	Variables	Something to be referred
1	Mendis	2008	Eco-friendly concept in highway and its region	<ul style="list-style-type: none"> • Focus Group Discussion (FGD) • Conceptual Study 	<ul style="list-style-type: none"> • Bio-retention • Infiltration median • Natural concrete • Vegetation • Water patch area • Water drainage • Life circulation • Soil maintenance 	<ul style="list-style-type: none"> • The research variables are referred and adapted • Method of conceptual studies to be adapted with the voice of user • Part of the research stages surveys are used
2	Jarsemskiene	2009	Perform analysis for performance productivity of the terminal according to some indicators	<ul style="list-style-type: none"> • Analysis-Constant Return to Scale (DEA-CRS) • Data Envelopment Analysis (DEA) 	<ul style="list-style-type: none"> • Time • Efficiency • Cost • Responsibility • Accessibility 	<ul style="list-style-type: none"> • The research variables are referred and adapted • Data Envelopment Analysis (DEA) is developed as basic of QFD
3	Sedayu	2012a	Design in minimum service standards for terminal	<ul style="list-style-type: none"> • Description • Conceptual Study 	<ul style="list-style-type: none"> • Management and organization • Technical facilities • Quality of service • User satisfaction 	<ul style="list-style-type: none"> • The research variables are developed • To continue the research step and method
4	Sedayu	2012b	The determination in Minimum Service Standards for attribute public transport terminal	<ul style="list-style-type: none"> • Survey and scoring • Visualization with Visual Basic 6.0 	<ul style="list-style-type: none"> • Availability of facilities • Transport services 	<ul style="list-style-type: none"> • The research variables are developed • To continue the research step and method
5	Lindstrom	2013	Design in efficiency useable of energy at bus terminal	<ul style="list-style-type: none"> • Simulation • Modeling 	<ul style="list-style-type: none"> • Building material • Construction system • Energy source • Vehicle type • Spacial 	<ul style="list-style-type: none"> • The research variables are referred and adapted • The method is used in making modeling for terminal performance



Table 1. The Previous Researches (the continuation)

N o	Researcher	Year	Novelty	Method	Variables	Something to be referred
6	El-Geneidy	2013	Distance evaluation that safe and affordable for pedestrians to the bus stop	<ul style="list-style-type: none"> • Field survey and observation • Interview • Circulation and walking study 	<ul style="list-style-type: none"> • Waiting time • Pedestrian ways • Walkways • Distance • Landscape and vegetation 	<ul style="list-style-type: none"> • The research variables are referred and adapted • The method is used in the research steps to support the used method
7	Pusporini	2013	Integration of environmental requirements for environmentally friendly products	<ul style="list-style-type: none"> • Quality Function Deployment (QFD) • Fuzzy Logic 	<ul style="list-style-type: none"> • Material • Product dimension • Useable • Pollutant • Vehicle Emission 	<ul style="list-style-type: none"> • The research variables are referred and adapted • QFD is used in the research step
8	Wayne	2013	The using LCA in determination Green Building rating	<ul style="list-style-type: none"> • Life Cycle Assessment (LCA) • Modeling with software 	<ul style="list-style-type: none"> • Building material • Energy useable • Environment • Building element 	<ul style="list-style-type: none"> • The research variables are referred and adapted • Method of LCA is used
9	Hermawan	2013	The role of construction materials in declining the CO ₂ emission	Life Cycle Assessment (LCA)	<ul style="list-style-type: none"> • Construction material • Construction steps 	Method of LCA is used
10	Sedayu	2013	Target and improvement terminal according to user	<ul style="list-style-type: none"> • Importance Performance Analysis (IPA) • Quality Function Deployment (QFD) 	<ul style="list-style-type: none"> • Security • Safety • Aesthetics • Accessibility • Reliability • Comfort • Facility 	<ul style="list-style-type: none"> • The research variables are developed and connected with Green Terminal principals • To continue the research step and method

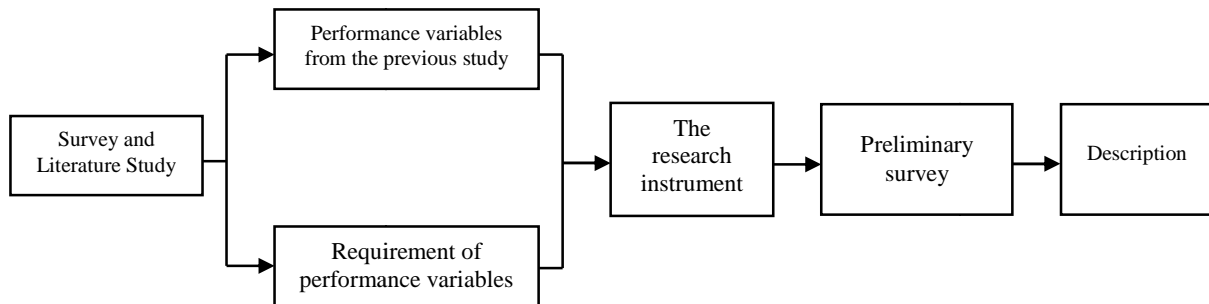


Figure 2. The developed method



The developed method in this research is shown in **Figure 2**. The performance terminal attributes is obtained from a field survey and previous studies. The performance attributes is arranged in accordance with the principles of environmentally friendly terminal or green terminal. The Attributes for further research are arranged in instruments format that is distributed to the respondents in the preliminary survey. The result to be describe in the description analysis. At this preliminary survey, amount of the respondents are 30 persons as a minimum respondents for preliminary survey (according to Sugiyono, 2009). The respondents consisted of passengers that often or using every day the services of Tawang Alun terminal and make this terminal as a travel transit using public transport. At the final stage of the preliminary survey results are described. The measurement scales of the requirement level in the preliminary survey include:

- a. Scale 1 = not required
- b. Scale 2 = less required
- c. Scale 3 = quite required
- d. Scale 4 = required
- e. Scale 5 = very required

RESULT AND DISCUSSION

The survey results obtain a global description and existing condition of Tawang Alun Terminal. **Figure 3** shows the arrival area for inter-city and inter-province bus (AKAP), inter-city in the province (AKDP), MPU, taxi, public vehicle, and private cars. From these results can be explained that the terminal condition tends to be devoid of passenger and freight vehicles.



Figure 3. Bus and local freight arrival area in Tawang Alun terminal

Figure 4 shows the access to the highway in front of the terminal. This road is province road level became the main access roads into and out of Tawang Alun terminal.



Figure 4. The road access in front of the terminal

Figure 5 is parking area for Passenger Vehicles (MPU). It's shown that the frequency in this parking area is still relatively rare. For the condition of physical facilities such as pavement is still good.

**Figure 5. The parking area for MPU**

At the stage of preliminary survey that distributing questionnaires containing 12 Green Terminal performances attributes to 30 respondents obtain the level ranking of user needs. **Table 2** shows the scoring of requirements level. It's shown that the application of the environmental-friendly concept (no.12) has the highest score with a mean in need level of 4,322 (required), while the frequency and density attributes (no.9) is the attribute with the lowest score in needs level with a mean value of 3,608 (required).

Table 2. Performance Attributes Determination of Tawang Alun Green Terminal

No	Performance Green Terminal Attributes	Mean	Rank
1	Security Assurance in the availability of security service and facilities, free from crime, and free from illegal persons	3,620	11
2	Safety and health assurance in the availability of health care facilities, free from accident, disaster management facilities are available, and free from hazardous materials	3,667	10
3	Responsiveness of management employees in care providing, responsiveness to problems, polite and friendly, and have adequate skills	3,692	9
4	Building utility performance that include natural and artificial lighting, natural and artificial air conditioning, and the availability of rubbish facilities	3,755	6
5	Architectural aesthetics in building design, good space inside and outside of building	3,902	4
6	Ease and affordability in terminal location, circulation, ease of getting a ticket, available in information and telecommunications facilities, and integration with the environment around	3,708	8
7	Transportation reliability in the timeliness of arrival and departure, waiting time of freight, availability of travel information, and availability of transport modes	3,982	3
8	The building durability include the physical condition or the durability of the main and support building terminal	3,864	5
9	The frequency and density in terminal visitors, there is no congestion, queuing passengers is norm, and the availability of parking spaces	3,608	12
10	Comfort and regularity in the cleanliness and orderliness terminal, free from disturbance and pollution, and comfort in outdoor and indoor space	3,748	7
11	The availability and capacity of public facilities in the completeness and performance of major and supporting facilities	4,076	2
12	Application of the environmental-friendly concept include alternatives energy of solar and wind, green building, disabled person services, and electrical transport systems	4,322	1

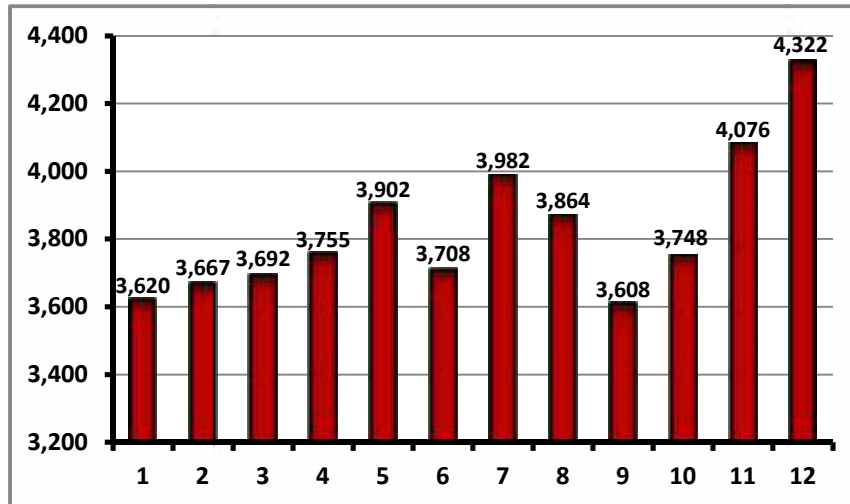


Figure 6. Requirement level to Performance attributes of Green Terminal

Figure 6 shows a graph of the Requirement level to terminal performance attributes. The details of the availability and capacity of terminal facilities (no.11) are shown in **Table 3**. From **Table 3** it's shown that the

waiting room to get the highest score level of needs with mean value of 4,122 (required), while the money changer to get the lowest score level of needs with mean value of 2,421 less (less required).

Table 3. Availability Facilities Determination Tawang Alun Green Terminal Jember

No	Facility	Mean	Rank
1	Parking area for bicycle	3,368	20
2	Parking area for motorcycle	3,415	19
3	Parking area for private cars	3,437	18
4	Waiting room	4,122	1
5	Kiosk and Retail	3,733	7
6	Waste facilities	3,912	5
7	Hostelry and lodgement	2,782	21
8	Cafeteria, restaurant, and food shop	4,004	2
9	Trip information board	3,554	15
10	Information and complaint center	3,566	14
11	Storage of goods	3,955	4
12	List or board for travel tariffs	3,517	16
13	Toilet	3,972	3
14	Prayer facility: musholla	3,578	12
15	Prayer facility: mosque	3,622	11
16	Sign of traffics	3,570	13
17	Telecommunication facilities (phone), enternet, or TV	3,887	6
18	Travel agents	3,632	10
19	Health aid center	3,691	9
20	Bank	3,446	17
21	ATM center	3,706	8
22	Money changer	2,421	22



CONCLUSION

The existing conditions at Tawang Alun terminal tends to be devoid of passengers and public transport vehicles. The condition of the road pavement and vehicle parking area in the terminal is still good, while access roads into and out of terminal still support because the road class to become main access as provincial roads. Based on the field survey results and previous research gained 12 performance attributes of Tawang Alun Green Terminal namely Security, Safety and Health, Responsiveness of management institution, Utility building performance, Architectural aesthetics, convenience and affordability, Transport reliability, Building durability, Frequency and density, Comfort and regularity, availability and capacity of public facilities, and application of environmental-friendly concept. The twelve attributes were compiled into a research instrument which is distributed in a preliminary survey to 30 passengers of public transport as a respondent. The 12 performance attributes, The application of environmental-friendly concept is the attribute with the highest level according to the user needs of terminal (public transport passenger). The frequency and density attributes become the attributes with the lowest level according to the user needs. This results show that the environmental-friendly concept is needed on the Tawang Alun terminal. This reason is accepted because the environmental pollution is already high in this terminal, because terminal as place for transport activities. The Lonely condition can be judged by the terminal passenger that still support the convenience, so that the frequency and density in the terminal is not required for treatment because it does not cause problems. In the details of the availability and capacity of main and supporting terminals facilities can be seen that the waiting room is needed by passengers, while the facilities of money

changer is still needed. The twelve performance attributes of Green Terminal can be specified into the research instrument at the stage of continuation survey so can be tested and analyzed in the next steps.

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