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Study of economic impact of terminals type A and weigh stations management handover in East Java province to the central government

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Abstract. Purpose of this study is to know the operational performance of terminals type A and weigh stations in East Java Province, analyse the economic contribution to the regional government, assessing the operational impact terminals type A and weigh, and examine the strategy of minimizing the operational impact if terminals are taken over by the central government. Analysis used in this study are growth analysis, efficiency analysis, Importance-Performance Analysis (IPA) method, and Strength Weakness Opportunity Threat method. The operational economic performance of Terminals Type A (Arjosari Terminal), obtained retribution of 2,346,495,500 IDR and Bayuangga Terminal obtained retribution of 1,796,877,000 IDR. The operational economic performance of weigh stations is 35,668,880,000 IDR. The operational economic contribution of Terminals Type A and weigh stations is very small/less. The operational impact of Terminals Type A that taken over by the Central Government for the next 15 years is still considered good. Strategy to minimize the operational impact of Terminals Type A with: 1. Strategy S-O (Strength-Opportunity), 2. Strategy S-T (Strength-Threat), 3. Strategy W-O (Weak-Opportunity), 4. Strategy W-T (Weak-Threat). For weigh stations we cannot do IPA and SWOT analysis because all samples of weigh bridges are no longer operating when this study is conducted.

Keywords: Terminals Type A, Weigh Stations, IPA, SWOT.

1. Introduction

The transportation system in Indonesia, approximately around 70 to 80 percent, is on the land and it supposed to be the best, it should not be inferior to airports and train stations. If the province government is deemed not be able to provide information technology, the central government ought to foster and guide them.

The Ministry of Transportation (Kemenhub) will begin to take over the management of 120 weigh stations and terminals type A throughout Indonesia. Previously, since the enactment of regional autonomy, the management of weigh stations and terminals type A was managed by Regional Transportation Agency. The handover of terminals and weigh stations is only in the bookkeeping process, so that the incoming retributions can be directly used for the maintenance and development of those two facilities. In addition, the Ministry of Transportation will transfer the employee status of

Regional Transportation Agency who manage terminals type A and weigh stations, for them to be proposed as official government employees at the Ministry of Transportation.

Law number 23 of 2014 states terminals type A and weigh stations will be taken into operation by the central government. Therefore, discussions must be held to discuss the matter. These discussions included experts from the Ministry of Transportation (Kemenhub) and the Ministry of Home Affairs (Kemendagri) who were followed by all heads of Transportation Departments in East Java with BPKAD (Regional Financial and Asset Management Agency) in both East Java Province and Districts/Cities in East Java. It is expected that Law number 23 of 2014 provides opportunities and benefits to the regional government.

Supervision and guidance are carried out by the central government, but the operation remains in the regional of either province or district/city in East Java Province. Many problems, pros and cons arising from this policy.

The objectives of this study are:

1. Knowing the economic performance of terminals type A and weigh stations in the study area of East Java Province.
2. Analysing the economic contributions to the regional government if terminals type A and weigh stations are taken over by the central government.
3. Assessing operational impacts if terminals type A and weigh stations in East Java Province are taken over by the central government.
4. Assessing strategies for minimizing the operational impact if terminals type A and weigh stations in East Java Province are taken over by the central government.

2. Material and Methods

Methods used for data collection in this study is primary and secondary methods. Secondary data collection method is collecting data from related institutions, data from the destination of passengers and goods movement. Primary data needed in this study is by taking data directly in the field, using questionnaires. Interviews are conducted with the government at the study site.

2.1. The Operational Economic Performance Analysis

1. Overload Analysis in Weigh Stations

Overload of goods can be detected through weighing freight loads in the weigh station that is passed. Overload analysis in weigh stations includes:

- Analysis of the freight transport amount in weigh stations.
- Analysis of cargo freight loads.
- Analysis of the freight overload percentage.

The violation occurrence of goods load can be known if the freight transport vehicle carries a load that is not in accordance with the specified JBI (Total Permitted Weight). Under current conditions, the freight loads excess tolerance is set at 25%.

2. Analysis of Freight Loads Transportation Cost

Based on two aspects and procedures commonly used in freight load transportation cost, there are:

- Holding a classification of goods in several groups for the purpose in determining the rating, and
- Conducting preparations regarding the rate scale and how they are used in a tariff list. The first aspect is about or related to what or what goods that will be transported, meanwhile the second aspect is related to where or where between places the goods are transported and the calculation is based on the first aspect.

According to Morlok [5] and Warpani [9], in the classification of goods that are transported, it is necessary to pay attention to various factors, including type of transported goods, volume or weight, price or value and so forth. Therefore, goods that are identical or almost the same in characteristic and type, they will be classified into one group, then they are going to be set by a certain tariff for the group.

2.2. The Economic Contribution Analysis

1. Analysis of PAD Source Contribution

For the purpose to find out the contribution of each APBD source to the total APBD, the contribution of each PAD source to the total PAD, the contribution of each regional tax type to the total regional tax. Adawiyah [1] describe the contribution of each regional retribution type to the total regional retribution, and BUMD respective contribution to the total portion of BUMD profits, the following formulation is used:

$$P_n = \frac{Q_X \, x \, 100}{Q_Y}$$

with,

Pn = Contribution of PAD component revenue to the APBD (Rupiah)
QY = Amount of APBD revenue (Rupiah)
QX = Amount of PAD revenue component (Rupiah)
n = A certain year (period)

2.3. The Operational Impact Analysis

1. Analysis of IPA (Importance-Performance Analysis)

Jonathan [7] describe that IPA has the main function to display information related to service factors that according to consumers greatly influence their satisfaction and loyalty, and service factors that according to consumers need to be improved because current conditions are not satisfactory. Bakhtiar [2] and Saputra [4] used IPA method for the terminals performance analysis. IPA combines the measurement of importance level and satisfaction level factors into two-dimensional graph that facilitates explanation of data and practical proposal acquirements.

In this study, there are two variables used, X to indicate the satisfaction performance level and Y to indicate the importance level indicators. Using the formula:

$$Tk_i = \frac{X_i}{Y_i} x \, 100\%$$

with,

Tki = Respondent suitability level.
Xi = Performance assessment score.
Yi = Importance assessment score.

2. Analysis of SWOT (Strength Weakness Opportunity Threat)

The SWOT analysis is needed in this study used to help finding out potential areas at the study site. Rangkuti [3] present an internal and external factors are carried out in this SWOT analysis. Internal analysis is intended to identify strengths and weaknesses, while external analysis is intended to know opportunities and threats.

Method used to construct strategic factors of terminal effectiveness is using the SWOT matrix. This matrix can be clearly illustrated how external opportunities and threats can be adjusted to the internal strengths and weaknesses they have.

The purpose of SWOT analysis is providing an overall image of analysis results of strength, weakness, opportunity and threat that used as a basis for objectivity and strategies making in terminal development.

The analysis of SWOT consists of four factors, there are:

1. Strength

   It is a strength condition contained in terminals. The strength analysed is a factor found in the terminal itself.

2. Weakness
   It is a weakness condition contained in terminals. The weakness analyzed is a factor found in the terminal itself.
3. Opportunity
   It is an opportunity condition to develop in the future that occurs. Conditions that occur are opportunities from outside the terminal. For example, accessibility, government policies, environmental conditions.
4. Threat
   It is a threatening condition from the outside. The threats can interfere with the concept of terminals planning and development.

3. Result and Discussion

3.1. The Operational Economic Performance of Terminals Type A and Weigh Stations

3.1.1 The Operational Economic Performance of Terminals Type A

1. Arjosari Terminal
   There are several criteria used to find out the economic performance of Arjosari Terminal, as follows:
   1) Terminal service
      Based on the calculation result, the annual income from terminal service is 1,241,632,500 IDR.
   2) Passengers boarding and unboarding parking service
      Based on the calculation result, the income from passengers boarding and unboarding parking service every year is 373,629,000 IDR.
   3) Waiting for departure parking service
      Based on the calculation result, the income from parking service while waiting for departure every year is 268,274,000 IDR.
   4) Parking service other than public transportation
      Based on the calculation result, the income from the motorized vehicles parking service every month is 462,960,000 IDR.

2. Bayuangga Terminal
   There are several criteria used to find out the economic performance of Bayuangga Terminal, as follows:
   1) Terminal service
      Based on the calculation result, annual income from terminal service is 1,019,859,000 IDR.
   2) Passengers boarding and unboarding parking service
      Based on the calculation result, the income from passengers boarding and unboarding parking service every year is 464,454,000 IDR.
   3) Waiting for departure parking service
      Based on the calculation result, the income from parking service while waiting for departure every year is 290,604,000 IDR.
   4) Parking service other than public transportation
      Based on the calculation result, the income from the motorized vehicles parking service every month is 21,960,000 IDR.

3.1.2 The Operational Economic Performance of Weigh Stations

1. Rejoso Weigh Station
   There are two criteria to determine the economic performance of the weigh station, there are:
   1) Costs of Unloading and/or Storing of Over Loads.
      In the activities of unloading, storing or stacking goods and re-loading the loads using warehouse and land owned by the Province Regional Government are subject to retribution in the use of regional asset with provision of:

a) The use of warehouses and land for storing goods that are unloaded for less than 1(one) day is calculated as 1 (one) day.
b) The use of warehouses and land for storing goods shall be carried out no later than 15 (fifteen) days from the date of storage.
c) If the period expires and the goods stored are not taken, they belong to the Province Regional Government.

2) Fines value for violations of loading, carrying capacity and dimensions.
Based on the analysis result, the amount of fines value of Rejoso Weigh Station in East Java is explained in Table 1 below.

Table 1. Fines Value for Violations in Rejoso Weigh Station 2016

No	Weigh Station	Vehicle Groups	Number of Violations	Amount of Fines	Total
1	Rejoso	Group I	129,073	20,000	2,581,460,000
		Group II	12,021	40,000	480,840,000
		Group III	23,627	50,000	1,181,350,000
		Group IV	16,622	60,000	997,320,000
				Total	4,808,214,000

2. Sedarum Weigh Station
There are two criteria to determine the economic performance of the weigh station, there are:
1) Costs of Unloading and/or Storing of Over Loads.
In the activities of unloading, storing or stacking goods and re-loading the loads using warehouse and land owned by the Province Regional Government are subject to retribution in the use of regional asset with provision of:
a) The use of warehouses and land for storing goods that are unloaded for less than 1(one) day is calculated as 1 (one) day.
b) The use of warehouses and land for storing goods shall be carried out no later than 15 (fifteen) days from the date of storage.
c) If the period expires and the goods stored are not taken, they belong to the Province Regional Government.
2) Fines value for violations of loading, carrying capacity and dimensions.
Based on the analysis results, the amount of fines value of Sedarum Weigh Station in East Java is explained in Table 2 below.

Tabel 2. Fines Value for Violations in Sedarum Weigh Station 2016

No	Weigh Station	Vehicle Groups	Number of Violations	Amount of Fines	Total
1	Sedarum	Group I	101,225	20,000	2,024,500,000
		Group II	22,809	40,000	912,360,000
		Group III	64,899	50,000	3,244,950,000
		Group IV	23,174	60,000	1,390,440,000
				Total	7,572,250,000

3. Widang Weigh Station
There are two criteria to determine the economic performance of the weigh station, there are:
1) Costs of Unloading and/or Storing of Over Loads.
In the activities of unloading, storing or stacking goods and re-loading the loads using warehouse and land owned by the Province Regional Government are subject to retribution in the use of regional asset with provision of:
a) The use of warehouses and land for storing goods that are unloaded for less than 1(one) day is calculated as 1 (one) day.

b) The use of warehouses and land for storing goods shall be carried out no later than 15 (fifteen) days from the date of storage.
c) If the period expires and the goods stored are not taken, they belong to the Province Regional Government.

2) Fines value for violations of loading, carrying capacity and dimensions.
Based on the analysis results, the amount of fines value of Widang Weigh Station in East Java is explained in Table 3 below.

Tabel 3. Fines Value for Violations in Widang Weigh Station 2016

No	Weigh Station	Vehicle Groups	Number of Violations	Amount of Fines	Total
1	Widang	Group I	3,431	20,000	68,620,000
		Group II	918	40,000	36,720,000
		Group III	3,064	50,000	153,200,000
		Group IV	3,639	60,000	218,340,000
				Total	476,880,000

4. Weigh Stations in East Java
There are two criteria to determine the economic performance of weigh stations, there are:
1) Costs of Unloading and/or Storing of Over Loads.
In the activities of unloading, storing or stacking goods and re-loading the loads using warehouse and land owned by the Province Regional Government are subject to retribution in the use of regional asset with provision of:
a) The use of warehouses and land for storing goods that are unloaded for less than 1(one) day is calculated as 1 (one) day.
b) The use of warehouses and land for storing goods shall be carried out no later than 15 (fifteen) days from the date of storage.
c) If the period expires and the goods stored are not taken, they belong to the Province Regional Government.
2) Fines value for violations of loading, carrying capacity and dimensions.
Based on the analysis results, the amount of fines value of weigh stations in East Java is explained in Table 4 below.

Tabel 4. Fines Value for Violations in Weigh Stations 2016

No	Weigh Station	Vehicle Groups	Number of Violations	Amount of Fines	Total
1	East Java	Group I	692,323	20,000	13,846,460,000
		Group II	86,331	40,000	3,453,240,000
		Group III	218,376	50,000	10,918,800,000
		Group IV	124,173	60,000	7,450,380,000
				Total	35,668,880,000

3.2. The Operational Economic Contribution of Terminals Type A and Weigh Stations

Criteria used to measure the operational performance of Terminals Type A and Weigh Stations (Palealu, A.S. and others, 2016) are:

- Growth of Retribution Revenue
- Efficiency of Retribution Revenue

3.2.1 Terminals Type A

1. Arjosari Terminal
1) Growth Analysis:
Measuring how much revenue is realized compared to the previous year.

$$G = \frac{(2{,}346{,}495{,}500 - 2{,}182{,}088{,}000)}{2{,}182{,}088{,}000} x\ 100\ \% = 7.53\%$$

Therefore, the growth analysis for Arjosari Terminal is equal to 7.53%.

2) Efficiency Analysis:
Comparing costs used to achieve certain goals with results that have been obtained.

$$E = \frac{1{,}795{,}200{,}000}{2{,}346{,}495{,}500} x\ 100\ \% = 76.5\%$$

Therefore, the efficiency analysis for Arjosari Terminal is equal to 76.5%.

3) Economic Contribution
Comparing the revenues realization with GDRP from transportation sector.

$$K = \frac{2{,}346{,}495{,}500}{1{,}122{,}300{,}000{,}000} x\ 100\ \% = 0.2\%$$

Therefore, the economic contribution of Arjosari Terminal to the GDRP in Malang City is 0.2 %.

2. Bayuangga Terminal
1) Growth Analysis:
Measuring how much revenue is realized compared to the previous year.

$$G = \frac{(1{,}796{,}877{,}000 - 1{,}809{,}870{,}000)}{1{,}809{,}870{,}000} x\ 100\ \% = -0.71\%$$

Therefore, the growth analysis for Bayuangga Terminal is equal to -0.71%.

2) Efficiency Analysis:
Comparing costs used to achieve certain goals with results that have been obtained.

$$E = \frac{2{,}199{,}948{,}000}{1{,}796{,}877{,}000} x\ 100\ \% = 122.43\%$$

Therefore, the efficiency analysis for Bayuangga Terminal is equal to 122.43 %.

3) Economic Contribution
Comparing the revenues realization with GDRP from transportation sector.

$$K = \frac{1{,}796{,}877{,}000}{1{,}169{,}753{,}160{,}000} x\ 100\ \% = 0.15\%$$

Therefore, the economic contribution of Bayuangga Terminal to the GDRP in Probolinggo City is 0.15 %.

3.2.2 Weigh Stations

1. Rejoso Weigh Station
1) Growth Analysis:
Measuring how much revenue is realized compared to the previous year.

$$G = \frac{(4{,}808{,}214{,}000 - 7{,}006{,}840{,}000)}{7{,}006{,}840{,}000} x\ 100\ \% = -31.38\%$$

Therefore, the growth analysis for Rejoso Weigh Station is equal to – 31.38%.

2) Economic Contribution
Comparing the revenues realization with GDRP from transportation sector.

$$K = \frac{4{,}808{,}214{,}000}{543{,}236{,}300{,}000} x\ 100\ \% = 0.89\%$$

Therefore, the economic contribution of Rejoso Weigh Station to the GDRP in Pasuruan District is 0.89 %.

2. Sedarum Weigh Station
   1) Growth Analysis:
   Measuring how much revenue is realized compared to the previous year.

$$G = \frac{(1{,}390{,}440{,}000 - 6{,}828{,}580{,}000)}{6{,}828{,}580{,}000} x\ 100\ \% = -79.64\%$$

   Therefore, the growth analysis for Sedarum Weigh Station is equal to -79.64%.
   2) Economic Contribution
   Comparing the revenues realization with GDRP from transportation sector.

$$K = \frac{1{,}390{,}440{,}000}{543{,}236{,}300{,}000}\ x\ 100\ \% = 0.26\%$$

   Therefore, the economic contribution of Sedarum Weigh Station to the GDRP in Pasuruan District is 0.26 %.

3. Widang Weigh Station
   1) Growth Analysis:
   Measuring how much revenue is realized compared to the previous year.

$$G = \frac{(476{,}880{,}000 - 6{,}847{,}870{,}000)}{6{,}847{,}870{,}000} x\ 100\ \% = -93.04\%$$

   Therefore, the growth analysis for Widang Weigh Station is equal to – 93.04%.
   2) Economic Contribution
   Comparing the revenues realization with GDRP from transportation sector.

$$K = \frac{476{,}880{,}000}{350{,}633{,}060{,}000}\ x\ 100\ \% = 0.14\%$$

   Therefore, the economic contribution of Widang Weigh Station to the GDRP in Tuban City is 0.14 %.

4. Weigh Stations in East Java
   1) Growth Analysis:
   Measuring how much revenue is realized compared to the previous year.

$$G = \frac{(35{,}668{,}880{,}000 - 58{,}895{,}210{,}000)}{58{,}895{,}210{,}000} x\ 100\ \% = -39.44\%$$

   Therefore, the growth analysis for Weigh Stations is equal to – 39.44%.
   2) Economic Contribution
   Comparing the revenues realization with GDRP from transportation sector.

$$K = \frac{35{,}668{,}880{,}000}{41{,}107{,}640{,}000{,}000} x\ 100\ \% = 0.08\%$$

   Therefore, the economic contribution of Weigh Stations in East Java to the GDRP in East Java is 0.08 %.

3.3. The Operational Impact of Terminals Type A and Weigh Stations Management Handover to the Central Government

3.3.1. Analysis of Terminal Type A and Weigh Station Facilities

The main and supporting facilities of terminal type A based on Decree of the Minister of Transportation number 132 of 2015 concerning the implementation of passenger road transport terminals are shown in Table 5 below:

Table 5. Conditions of Terminal Main Facilities with Type A Standards

No	Main Facilities Requirement Terminal Type A Standards	Facilities Condition in Arjosari Terminal	Facilities Condition in Bayuangga Terminal
1	Vehicles lane of departure	√	√
2	Vehicles lane of arrival	√	√
3	Passengers waiting room	√	√
4	Vehicles parking lot	√	√
5	Environmental management facilities	√	√
6	Road equipment	√	√
7	Technology use facilities	√	√
8	Media information	√	√
9	Drivers handling	√	-
10	Customer service from bus companies	√	√
11	Safety surveillance facilities	√	√
12	Passengers lane of arrival	√	√
13	Departure waiting room	√	√
14	Ticket counters	√	-
15	Shared ticket counters	√	-
16	Online ticket counters	√	-
17	Information centre	√	√
18	Browser board in the terminal	√	√
19	Bulletin board	√	√
20	Baggage service	√	-
21	Storage room	√	√
22	Emergency meeting points	√	-
23	Disaster evacuation routes	√	-

Table 6. Conditions of Terminal Supporting Facilities with Type A Standards

No	Supporting Facilities Requirement Terminal Type A Standards	Facilities Condition in Arjosari Terminal	Facilities Condition in Bayuangga Terminal
1	Disabled and pregnant women facilities	√	√
2	Security facilities	√	√
3	Security service facilities	√	√
4	Vehicles crew rest facilities	√	-
5	Ramp check facilities	√	√
6	Vehicles deposition facilities	√	√
7	Workshop facilities for bus operations	√	-
8	Health facilities	√	√
9	Worship/Praying facilities	√	√
10	Passengers transit area	√	√
11	Fire extinguishers	√	√
12	Public facilities	√	√

3.3.2. Analysis of Terminal Type A Queue

1. Arjosari Terminal

Frequency of arrivals is the number of vehicles entering the terminal unit of a certain time. It is expressed by the value of Arrival Rate (λ). Frequency of arrivals in Arjosari Terminal is shown in Table 7 below:

Table 7. Frequency of Bus Arrivals

No	Month	Vehicles	λ
1	January	10,442	19
2	February	10,940	22
3	March	10,465	19
4	April	10,555	20
5	May	10,350	19
6	June	10,902	20
7	July	12,015	22
8	August	11,162	20
9	September	11,143	21
10	October	11,237	20
11	November	11,790	22
12	December	13,136	24
	Total	134,137	248
	Average		21

Frequency of service is the number of vehicles that depart from the terminal after getting service per unit of time. Frequency of service in Arjosari Terminal is shown in Table 8 below:

Table 8. Frequency of Bus Departures

No	Month	Vehicles	μ
1	January	9,408	19
2	February	9,900	22
3	March	9,593	19
4	April	10,107	20
5	May	9,796	19
6	June	10,228	20
7	July	10,723	22
8	August	10,557	20
9	September	10,438	21
10	October	10,511	20
11	November	11,217	22
12	December	12,065	24
	Total	124,543	229
	Average		19

GRDP (Gross Regional Domestic Product) is used to predict the condition of passenger's amount in the next 15 years. The prediction of passengers amounts to arrive in the next 15 years is shown in Table 9 below.

Table 9. Prediction of the Passengers Increasing Amount in the Next 15 Years

Year	Passengers		Year	Passengers	
	Departure	Arrival		Departure	Arrival
2017	2,622,328	2,864,558	2025	4,055,070	4,429,646
2018	2,769,178	3,024,974	2026	4,282,154	4,677,706
2019	2,924,252	3,194,372	2027	4,521,954	4,939,658
2020	3,088,010	3,373,257	2028	4,775,184	5,216,279
2021	3,260,939	3,562,159	2029	5,042,594	5,508,390
2022	3,443,551	3,761,640	2030	5,324,979	5,816,860
2023	3,636,390	3,972,292	2031	5,623,178	6,142,604
2024	3,840,028	4,194,741	2032	5,938,076	6,486,590

Based on analysis of the queue on routes that exist in Arjosari Terminal for the next 15 years, the analysis results for the value of traffic intensity (ρ) can be seen in Table 10.

Table 10. Prediction of Terminal Performance in the Next 15 Years

Year	Frequency of Arrival (λ)	Frequency of Departure (μ)	Traffic Intensity (ρ)	Year	Frequency of Arrival (λ)	Frequency of Departure (μ)	Traffic Intensity (ρ)
2017	22	20	1.1	2025	32	27	1.2
2018	23	20	1.1	2026	34	28	1.2
2019	24	21	1.1	2027	35	29	1.2
2020	25	22	1.1	2028	37	30	1.2
2021	27	23	1.2	2029	39	31	1.2
2022	28	24	1.2	2030	41	32	1.3
2023	29	25	1.2	2031	43	33	1.3
2024	31	26	1.2	2032	45	35	1.3

Based on analysis that has been done, the terminal performance for the next 15 years has a value of traffic intensity (ρ) = 1.3. And based on the value of traffic intensity (ρ) that has been analyzed, the terminal performance is good because the value of traffic intensity (ρ) is more than 1.

2. Bayuangga Terminal

Frequency of arrivals is the number of vehicles entering the terminal unit of a certain time. It is expressed by the value of Arrival Rate (λ) (Table 11).

Table 11. Frequency of Bus Arrivals

No	Year	Vehicles	λ
1	2016	145302	22

Frequency of service (μ) is the number of vehicles that depart from the terminal after getting service per unit of time (Table 12).

Table 12. Frequency of Bus Departures

No	Year	Vehicles	μ
1	2016	154818	24

GRDP (Gross Regional Domestic Product) is used to predict the condition of passenger's amount in the next 15 years. The prediction of passengers amounts to arrive in the next 15 years is shown in Table 13 below.

Table 13. Prediction of the Passengers Increasing Amount in the Next 15 Years

Year	Passengers		Year	Passengers	
	Departure	Arrival		Departure	Arrival
2017	2,159,653	1,629,137	2025	3,411,108	2,573,174
2018	2,286,641	1,724,931	2026	3,611,682	2,724,477
2019	2,421,096	1,826,357	2027	3,824,048	2,884,676
2020	2,563,456	1,933,746	2028	4,048,903	3,054,295
2021	2,714,187	2,047,451	2029	4,286,978	3,233,888
2022	2,873,781	2,167,841	2030	4,539,052	3,424,040
2023	3,042,760	2,295,310	2031	4,805,949	3,625,374
2024	3,221,674	2,430,274	2032	5,088,538	3,838,546

Based on analysis of the queue on routes that exist in Bayuangga Terminal for the next 15 years, the analysis results for the value of traffic intensity (ρ) can be seen in Table 14.

Table 14. Prediction of Terminal Performance in the Next 15 Years

Year	Frequency of Arrival (λ)	Frequency of Departure (μ)	Traffic Intensity (ρ)
2017	23	25	0.9
2018	24	26	0.9
2019	25	27	0.9
2020	27	28	0.9
2021	28	29	0.9
2022	29	30	1.0
2023	31	31	1.0
2024	32	32	1.0
2025	34	34	1.0
2026	35	35	1.0
2027	37	36	1.0
2028	39	38	1.0
2029	41	39	1.0
2030	43	41	1.0
2031	45	42	1.0
2032	47	44	1.1

Based on analysis that has been done, the terminal performance for the next 15 years has a value of traffic intensity (ρ) = 1.1. And based on the value of traffic intensity (ρ) that has been analysed, the terminal performance is good because the value of traffic intensity (ρ) is more than 1.

3.4. Minimization Strategies of The Operational Impact on Terminals Type A and Weigh Stations Management Handover to the Central Government

Importance-Performance Analysis (IPA) and SWOT (Strength-Weakness-Opportunity-Threat) methods are used to develop strategies to minimize the operational impact of terminals type A and weigh stations after being taken over by the central government.

The amount of terminal type A users (respondents) used in this analysis is approximately 47 people consisting of 15 passengers and 20 transport drivers and 12 stakeholders. Whereas for service quality attributes that will be sought satisfaction level is in the amount of 29 attributes spread over 4 subcategories, they are facilities, accessibility, services and security. Meanwhile, respondents for weigh station user after being taken over by the central government were not obtained, considering that all weigh station samples were no longer operating when the study was conducted. The next discussion is focused on minimizing the operational impact of terminals type A.

1. Arjosari Terminal

Analysis of satisfaction and importance levels of users is used to measure the suitability level of users satisfaction and importance from the comparison result between performance score and importance score. This suitability level will determine the priority order for increasing factors that affect user satisfaction. This priority is included in the Cartesian diagram. The importance value (4.11) is bigger than satisfaction value (3.70), therefore $\frac{\overline{X}}{\overline{Y}} = \frac{3.70}{4.11} = 0.90$ *or* $\frac{\overline{X}}{\overline{Y}} < 1$. It can be concluded that user satisfaction level in Arjosari Terminal service is still not satisfactory or Arjosari Terminal service is considered not optimal.

The suitability level variables to describe the comparison between conditions that are currently felt and conditions that desired by Arjosari Terminal users, is shown in Table 15 below:

Table 15. Suitability Level for Each Variable in Arjosari Terminal

No	Code	Indicators		Average
1	Y1	Facilities		0.90
	Y1.1	Vehicles Lane of Departure	0.89	
	Y1.2	Vehicles Lane of Arrival	0.90	
	Y1.3	Passengers Waiting Room,	0.90	
	Y1.4	Vehicles Parking Lot	0.90	
	Y1.5	Environmental Management Facilities	0.94	
	Y1.6	Road Equipment	0.92	
	Y1.7	Technology Use Facilities	0.93	
	Y1.8	Media Information	0.94	
	Y1.9	Drivers Handling	0.94	
	Y1.10	Customer Service from Bus Companies	0.94	
	Y1.11	Safety Surveillance Facilities	0.89	
	Y1.12	Passengers Lane of Arrival	0.92	
	Y1.13	Departure Waiting Room	0.87	
	Y1.14	Ticket Counters	0.92	
	Y1.15	Information Centre	0.93	
	Y1.16	Browser Board in Terminal	0.91	
	Y1.17	Bulletin Board	0.93	
	Y1.18	Baggage Service	0.91	
	Y1.19	Storage Room	0.91	
	Y1.20	Emergency Meeting Points	0.83	
	Y1.21	Disaster Evacuation Routes	0.84	
	Y1.22	Toilets	0.76	
	Y1.23	Retails and Cafeteria	0.82	
	Y1.24	Praying Facilities (Musholla)	0.86	
2	Y2	Accessibility		0.89
	Y2.1	Located on a road network with activities centre	0.88	
	Y2.2	Strategic Location	0.89	
	Y2.3	Easily accessed by passengers and public transportation	0.89	
3	Y3	Service		0.90
	Y3.1	Customer Service	0.90	
4	Y4	Security		0.92
	Y4.1	Passengers and Goods Safety	0.92	

Based on Table 15, it shows there is no variable that has a satisfaction level equal to or more than 1, which means the satisfaction level of service in Arjosari Terminal is still not optimal. However, it can be seen from the table that security suitability variable has the highest score of 0.92. It means respondents are quite satisfied with security service of terminal type A since the score is close to the value of 1.

The calculated data is then entered into Cartesian diagram (shown in Figure 2) to determine the priority of each variable to improve Arjosari Terminal service.

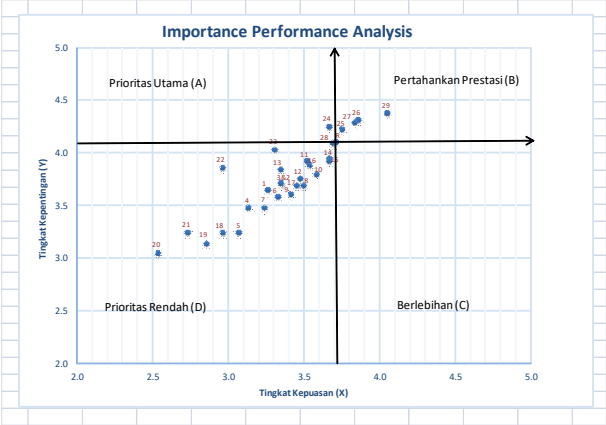

Figure 2. Variables of Arjosari Terminal Service in Cartesian Diagram

The SWOT matrix (Strength-Weakness-Opportunity-Threat) is used to formulate minimization strategies for the operational impact of the terminal, based on internal and external strategy factors. These factors are obtained from the results of previous IPA analysis based on the result of interviews/field observations obtained, as follows:

a) Strength

IPA analysis results in quadrant B with high levels of performance/satisfaction and importance, are the strength on internal factors, they are:

- Located on a road network with activities centre
- Strategic location
- Easily accessed by passengers and public transportation
- Passengers and Goods Safety

b) Weakness

Indicators in quadrant A as a result of IPA analysis with high importance level, but low in performance/satisfaction level. It becomes a weakness on internal factors, they are:

- Praying Facilities (Musholla)
- Customer Service

c) Opportunity

Opportunity factors as external factors are based on interviews/field observations result, among others:

- High interest in service that has the potential to increase the amount of public transportation;
- Government policies to provide business opportunities in the field of providing public transport service.

d) Threat

Threat factors as negative external factors are based on interviews/field observations result, as follows:

- Increasing number of online transportation systems;
- Increasing access to private vehicles ownership used as public transportation.

2. Bayuangga Terminal

Analysis of satisfaction and importance levels of users is used to measure the suitability level of users satisfaction and importance from the comparison result between performance score and importance score. This suitability level will determine the priority order for increasing factors that affect user satisfaction. This priority is included in the Cartesian diagram. The importance value (3.67) is bigger than satisfaction value (4.34), therefore, $\frac{\overline{X}}{\overline{Y}} = \frac{4.34}{3.67} = 0.85\ or\ \frac{\overline{X}}{\overline{Y}} < 1$. It can be concluded that user

satisfaction level in Bayuangga Terminal service is still not satisfactory or Bayuangga Terminal service is considered not optimal.

The suitability level variables to describe the comparison between conditions that are currently felt and conditions that desired by terminal type A users, is shown in Table 16 below:

Table 16. Suitability Level for Each Variable in Bayuangga Terminal

No.	Code	Indicators		Average
1	Y1	Facilities		0.92
	Y1.1	Vehicles Lane of Departure	0.92	
	Y1.2	Vehicles Lane of Arrival	0.92	
	Y1.3	Passengers Waiting Room,	0.92	
	Y1.4	Vehicles Parking Lot	0.96	
	Y1.5	Environmental Management Facilities	1.00	
	Y1.6	Road Equipment	1.00	
	Y1.7	Technology Use Facilities	1.00	
	Y1.8	Media Information	1.00	
	Y1.9	Drivers Handling	1.00	
	Y1.10	Customer Service from Bus Companies	0.95	
	Y1.11	Safety Surveillance Facilities	0.95	
	Y1.12	Passengers Lane of Arrival	1.05	
	Y1.13	Departure Waiting Room	1.00	
	Y1.14	Ticket Counters	1.00	
	Y1.15	Information Centre	0.96	
	Y1.16	Browser Board in Terminal	0.92	
	Y1.17	Bulletin Board	0.91	
	Y1.18	Baggage Service	0.87	
	Y1.19	Storage Room	0.96	
	Y1.20	Emergency Meeting Points	0.70	
	Y1.21	Disaster Evacuation Routes	0.73	
	Y1.22	Toilets	0.79	
	Y1.23	Retails and Cafeteria	0.73	
	Y1.24	Praying Facilities (Musholla)	0.72	
2	Y2	Accessibility		0.87
	Y2.1	Located on a road network with activities centre	0.81	
	Y2.2	Strategic Location	0.92	
	Y2.3	Easily accessed by passengers and public transportation	0.88	
3	Y3	Service		0.86
	Y3.1	Customer Service	0.86	
4	Y4	Security		0.76
	Y4.1	Passengers and Goods Safety	0.76	

Based on Table 16, it shows there is no variable that has a satisfaction level equal to or more than 1, which means the satisfaction level of service in Bayuangga Terminal is still not optimal. However, it can be seen from the table that facilities variable has the highest score of 0.92. It means respondents are quite satisfied with facilities service in Bayuangga Terminal, since the score is close to the value of 1.

The calculated data used to determine the priority of each variable to improve Bayuangga Terminal service, then entered into Cartesian diagram shown in Figure 3 below.

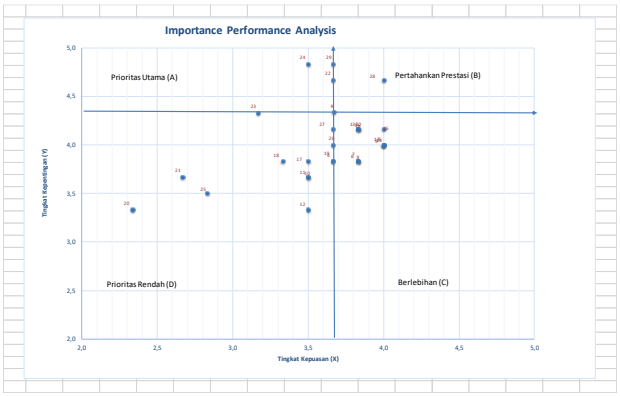

Figure 3. Variables of Bayuangga Terminal Service in Cartesian Diagram

The SWOT matrix (Strength-Weakness-Opportunity-Threat) is used to formulate minimization strategies for the operational impact of the terminal, based on internal and external strategy factors. These factors are obtained from the result of previous IPA analysis that based on interviews/field observations result obtained, as follows:

a) Strength

IPA analysis results in quadrant B with high levels of performance/satisfaction and importance are the strength in internal factors, they are:

- Toilets
- Customer Service
- Passengers and Goods Safety
- Weakness

Indicators in quadrant A as a result of IPA analysis with high importance level, but low in performance/satisfaction level. It becomes a weakness on internal factors, they are:

- Praying Facilities (Musholla)

b) Opportunity

Opportunity factors as external factors are based on interviews/field observations result, among others:

- High interest in service that has the potential to increase the amount of public transportation;
- Government policies to provide business opportunities in the field of providing public transport service.

c) Threat

Threat factors as negative external factors are based on interviews/field observations result, as follows:

- Increasing number of online transportation systems;
- Increasing access to private vehicles ownership used as public transportation.

4. Conclusions

Based on the analysis results in previous chapter in this study, it can be concluded that:

1. The Operational Economic Performance of Terminals Type A and Weigh Stations
   a) The operational economic performance of terminals type A:
      - Arjosari Terminal that serves a total of 258,680 vehicles and 5,195,915 passengers for 2016, obtained retribution of 2,346,495,500 IDR.
      - Bayuangga Terminal that serves a total of 300,120 vehicles and 3,578,382 passengers for 2016, obtained retribution of 1,796,877,000 IDR
   b) The operational economic performance of weigh stations in East Java shows vehicle violations in total of 1,121,203 vehicles for 2016 and obtained retribution of 35,668,880,000 IDR. Detail explanation on 3 weigh stations in this study, as follows:

- Rejoso Weigh Station, violations amount is 181,343 vehicles and obtained retribution of 4,808,214,000 IDR.
- Sedarum Weigh Station, violations amount is 212,107 vehicles and obtained retribution of 7,572,250,000 IDR.
- Widang Weigh Station, violations amount is 11,052 vehicles and obtained retribution of 476,880,000 IDR.

2. The Operational Economic Contribution of Terminals Type A and Weigh Stations
   a) The operational economic contribution of terminals type A:
      - Arjosari Terminal is classified as a very/less small with a retribution-revenue growth of 7.53% is 0.2%,
      - Bayuangga Terminal is classified as very/less small with a retribution-revenue growth of -1.22% is 0.15%.
   b) The operational economic contribution of weigh stations in East Java with the retribution-revenue growth of -39.437% is 0.08%. Detail explanation on 3 weigh stations in this study, as follows:
      - Rejoso Weigh Station with a revenue growth of -31.38% is 0.89%.
      - Sedarum Weigh Station with a revenue growth of -79.64% is 0.26%.
      - Widang Weigh Station with a revenue growth of -93.04% is 0.14%.
3. The Operational Impact of Terminals Type A Management Handover to the Central Government.
   - Arjosari Terminal is still considered good of being taken over by the central government for the next 15 years, there are changes in arrival frequency by 45 buses/hour, service frequency by 35 buses/hour and traffic intensity of 1.3.
   - Bayuangga Terminal is still considered good for the next 15 years, there are changes in arrival frequency by 47 buses/hour, service frequency by 44 buses/hour and traffic intensity of 1.1.
4. Strategies to Minimize the Operational Impact of Terminals Type A and Weigh Stations
   a) Arjosari Terminal
      1) The satisfaction level of service in Arjosari Terminal is still not optimal with the comparison value on the satisfaction level to the importance level $\frac{\overline{X}}{\overline{Y}} = \frac{3.70}{4.11} = 0.90$.
      2) The availability level of main and supporting facilities in Arjosari Terminal is relatively sufficient.
      3) The sustainability level of security variable for Arjosari Terminal users has the highest score of 0.92. This means the respondents are quite satisfied with service in Arjosari Terminal, while the accessibility variable has the lowest score of 0.89. This means it should have improvements in terminal accessibility.
      4) IPA analysis results obtained by these indicators must be given the highest priority for the performance improvement, they are: 1. Being on a road network with activities centre; 2. Strategic location; 3. Easily accessed by passengers and public transportations; and 4. Passengers and goods safety.
   b) Bayuangga Terminal:
      1) The satisfaction level of service in Bayuangga Terminal is still not optimal with the comparison value on the satisfaction level to the importance level $\frac{\overline{X}}{\overline{Y}} = \frac{4.34}{3.67} = 0.85$.
      2) The availability level of main and supporting facilities in Bayungga Terminal is sufficient.
      3) The sustainability level of facilities variable for Bayuangga Terminal users has the highest score of 0.92. This means the respondents are quite satisfied with facilities in Bayuangga Terminal, while the security variable has the lowest score of 0.76. This means it should have improvements in terminal security
      4) IPA analysis result obtained by these indicators that must be given the highest priority to be improved is praying facilities (Musholla). Meanwhile, indicators with conditions have

met expectations and need to be maintained are: 1. Toilets; 2. Customer service; and 3. Passengers and goods safety.

c) Strategies to minimize the operational impact of terminals type A and weight stations management handover to the central government using S-O strategy (Strength-Opportunity), which includes:
   1) Improved road maintenance.
   2) Providing special lanes for public transportation.
   3) Providing bus stop facilities at each sufficient distance (500 meters).
   4) Controlling the area around terminals and weigh stations location for development purposes.
   5) Development of integrated terminals (Interchange) for the convenience and security of passengers and goods.

d) Strategies to minimize the operational impact of terminals type A and weight stations management handover to the central government using S-T strategy (Strength-Threat), which includes:
   1) Providing a special base for online transportation.
   2) Limiting the acceleration of private vehicles ownership by implementing high tax on vehicle ownership and high parking fees.
   3) Providing mass public transportation.

e) Strategies to minimize the operational impact of terminals type A and weight stations management handover to central government using W-O strategy (Weakness-Opportunity), which includes:
   1) Completing and maintaining an adequate place for praying/worship (Musholla).
   2) Human resources recruitment that meet standards of terminals and weigh stations operation.
   3) Utilizing outsourcing human resources to meet the needs of terminal and weigh station employees.
   4) Utilizing cleaning service employees to maintain praying facilities.
   5) Preparing SOP for terminals and weigh stations operation.

f) Strategies to minimize the operational impact of terminals type A and weight stations management handover to the central government using W-T strategy (Weakness-Threat), which includes:
   1) Completing Regional Regulations concerning conventional public transportation system and online public transportation system.
   2) Customer service application using digital/online information system.

g) IPA analysis and SWOT cannot be carried out on weigh stations since the respondents were not obtained after weigh stations management was taken over by the central government, considering that all weigh station samples were no longer operating when the study was conducted

Recommendations

SWOT analysis results based on internal and external factors obtain 4 (four) strategies to minimize the operational impact of terminals type A that taken over by the central government, among others:

1. S-O strategy (Strength-Opportunity) for increasing road maintenance is prioritized on available accessed roads. Providing special road lanes for public transportation needs to be carried out on sufficient road sections. Providing bus stop facilities at each sufficient distance (500 meters) needs to be accompanied by the making of Regional Regulations for the implementation. Controlling the area around terminals location needs to be included in district/city spatial planning. Development of integrated terminals (Interchange) needs to be synchronized with airport and station planning.
2. S-T strategy (Strength-Threat) is used to avoid threat factors with strength factors, which is providing a special base for online transportation needs to be included in district/city spatial

planning. Limiting the acceleration of private vehicles ownership needs to implement vehicle tax regulation. Providing mass public transportation needs to be synchronized with the transportation system planning.

3. Based on the improvement results obtained by the existence of internal factors strength that can provide directions for improvement, then W-O strategy (Weakness-Opportunity) is recommended. Completing and maintaining praying facilities (Musholla) needs to pay attention to minimum standards of space requirement and number of users. Recruitment of human resources and cleaning service employees need to pay attention to local government needs and capabilities. Utilizing outsourcing human resources needs to pay attention to availability of existing human resources.
4. Then, for W-T strategy (Weakness-Threat), which is complementing Regional Regulations on conventional public transportation and online public transportation systems, it is necessary to pay attention to the vehicles amount proportion. Customer service application using digital/online information system needs to be made in a website form.

Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

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