

The Sustainability of Public Transport Operation Based on Financial Point of View

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Introduction

- Public transport is a transport for the transfer of persons and / or goods from one place to another by means of a vehicle.
- Public transport is not only used to transport humans but also to transport goods.
- The existence of public Transport is very needed by the people, especially for the community groups who can not facilitate their movement by private Transport mode
- Therefore, in Law No. 22 of 2009 Article 139 is confirmed that the government must guarantee the availability of public Transport for humans or/ and goods for inter-city movement between provinces, as well as across national borders [1].

Introduction

- Lately there are congestion everywhere, this are because people use more private transport than public transport, so that transport infrastructure cannot accommodate traffic.
- For example :
 - ✓ private car usage in Surabaya : 82.83% [2]
 - ✓ Vehicles in Jakarta grew an average of 7.93% per year [7], While length of road only grew 0.33 % per year [8].
- From these data it can be concluded that the congestion is unlikely to be resolved, even will be worse if the government as a stakeholder of transport let vehicle ownership grow up without restrictions and does not seriously fix the performance of public transport.
- Traffic congestion is a serious issue that occupies urgent priority in finding its solution

Introduction

- The traffic congestion is one of many disadvantages of Transport activity which will lead to waste energy and time and decrease road user productivity as well.
- Another negative impact of traffic congestion is the occurrence of road users' stress, causing environmental pollution that will decrease public's health.
- Government must return to the basic essence of the transport system, that we should actually facilitate is the movement of people or goods, not the movement of a vehicle.
 - ✓ Public Transport is a highly efficient mode for the use of road spaces. For that reason,
 - ✓ Maximizing the use of public Transport becomes a very important solution to solve the Transport problem

Introduction

- So the sustainability of public transport must be maintained.
- A sustainable transport system is a Transport system that does not create negative impacts that the next generation can not anticipate [9].
- One solution that can still be strived is by maximizing the use of mass public transport that constitutes one of the strategies handling traffic congestion at regional level.
- One of the aspects that must be considered in maintaining the sustainability of public transport is **how to maintain financial resilience in its operation**
- The operation of public transport must be profit, because if operation of public transport get a profit then its performance will be easy to improve
- Thus the passengers will feel satisfied and the longer the number will increase as well.

Concept of Management and Portrait of Public Transport Management in Indonesia

- Managing public Transport is the same as managing a company, which must be managed well by implementing management functions
- Management is an attempt to achieve the goal by planning an activity well, organizing, implementing, and supervising [13].
- While the main function in a management is a matter of finance, personnel, marketing, and production.
- Management of a Transport service business is an Operations-Production management type.
- Operations-Production Management has repetitive properties, and its activity is usually permanent or may be semi-permanent to produce a product or service [14].
- The product or service is produced for the purpose of obtaining profit.

The Concept Of Loss And Profit

- Profit is the excess of revenues over expenses related to operating expenses, but If the cost burden is greater than the income, the difference is called loss
- Similarly, in the management of public Transport, the operation of public Transport will be more sustainable when the profit gained is higher
- Through interviews with some public Transport managers type 'angkot' in Surakarta, it can be concluded that the concept of profit and loss in the operation of public transport has not been well understood.
- For example: Actually, if calculated correctly, the operation of public transport suffered losses, but managers feel still get a profit. This is because the manager also as a driver is not paid his wages.

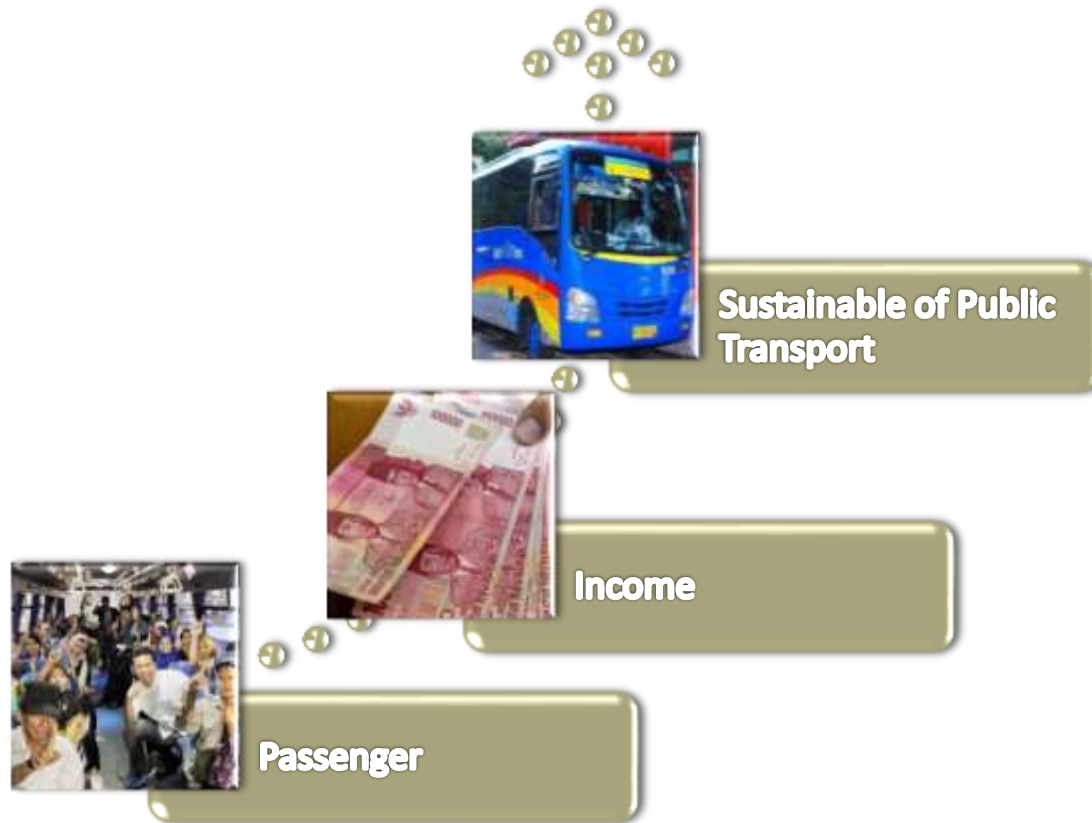
The Concept Of Cost

- Basically the cost has in common, ie economic sacrifices as measured by the value of the currency to acquire goods or services or to generate income or sales [18], [19], [20]
- For planning and cost control purposes, as well as decision making, costs can be grouped into three types i.e. **fixed costs, variable costs, and semi variable costs** [21]
- **Fixed costs** are fixed total costs, not affected by changes in activity volume, but if sales volume increases then unit cost will become smaller and vice versa
- **Variable costs** are costs that are proportional to changes of production volume or activity.
- **While the semi-variable cost** is the cost between fixed and variable, the total amount will change according to the volume change of activity, but the nature of the change is not proportional

The Concept Of Cost

- the understanding of managers 'Angkot' on the concept of costs to be taken into account in the management of public transport services is still inadequate
- Even many public transport managers never allocate the cost to meet long-term goals that are part of fixed costs, especially depreciation expenses. As a result when vehicle rejuvenation is required, no funds are available at all.
- Similarly, in the case of periodic budget provision, for example the cost for periodic services, light services, heavy services, resulting in poor vehicle performance
- Both issues cause the sustainability of the operation of public Transport can not be maintained well

The Concept Of Income



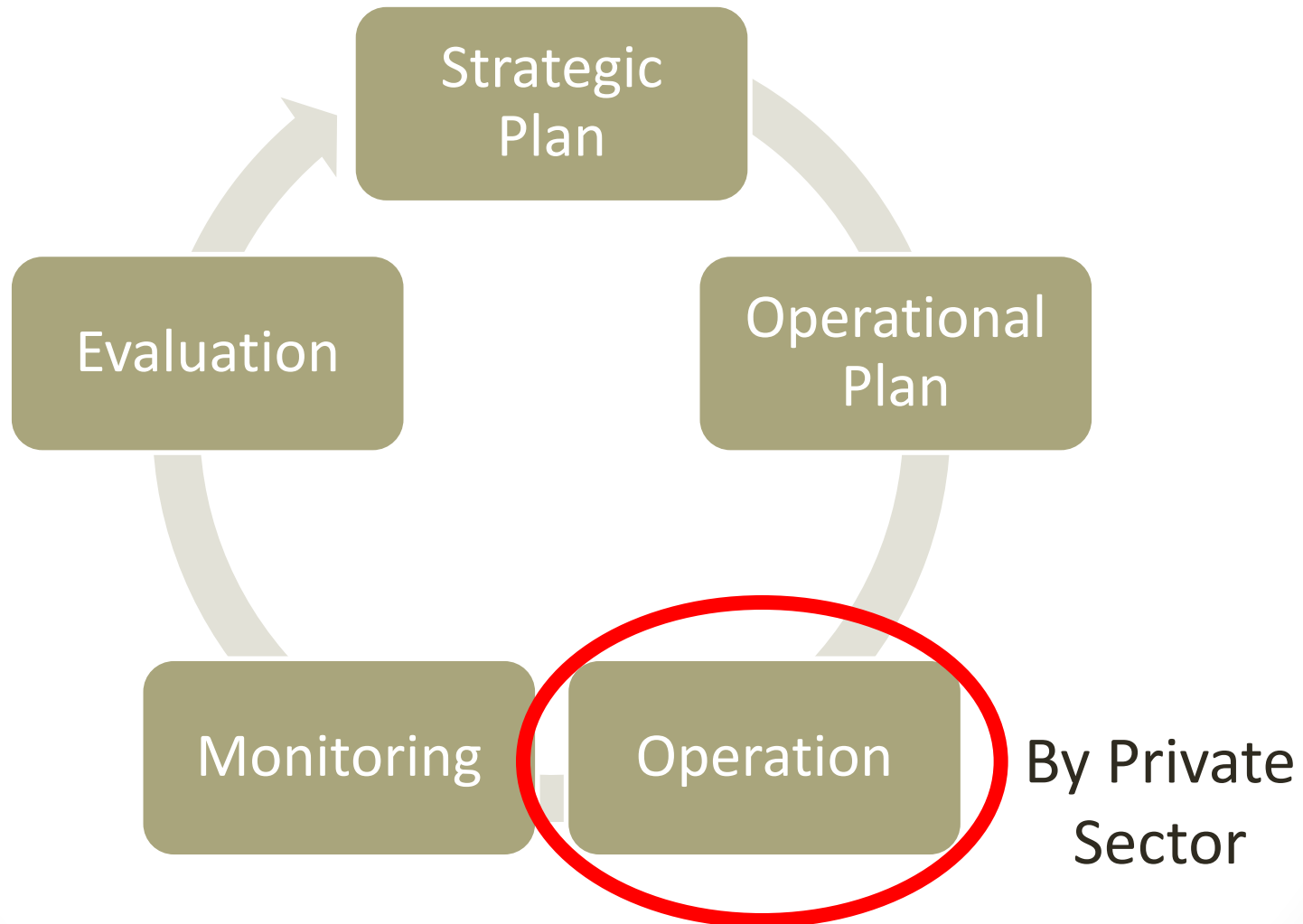
The Concept Of Income / Revenue

- Revenue is the amount of money coming into cash as a result of the sale of production goods or services provided to consumers.
- In the management of public Transport, the only source of revenue is the sale of tickets to passengers in accordance with the amount of fare set by the government as a stakeholder. The more the number of passengers, the higher the revenue will be.
- Many public transport managers do not realize that the key to success in managing public transport depends largely on the level of passenger satisfaction as a user or buyer. Thus, the struggle to mapping the attributes of public transport expected by passengers becomes a very important thing to understand and to fulfill well.
- If the number of passengers is high then the income earned will be higher and the operation of public transport can be maintained its sustainability and vice versa

Financial Feasibility of Public Transport in Surakarta (Case Study)

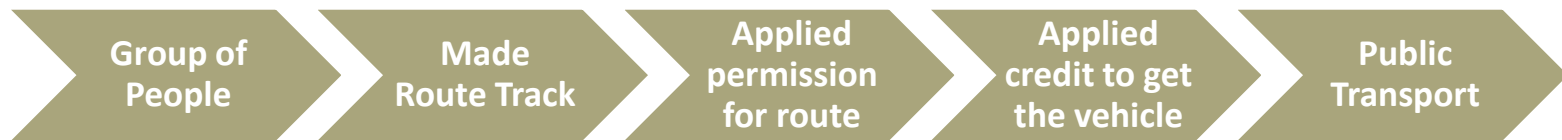
- In accordance with the spirit of Law no. 22 of 2009 concerning road transport traffic [1], the government is **responsible for the management of public transport.**
- Public transport is **not a tool for** the government to earn **revenues**, even subsidy must be given to certain routes which are not yet profitable.

Financial Feasibility of Public Transport in Surakarta (Case Study)



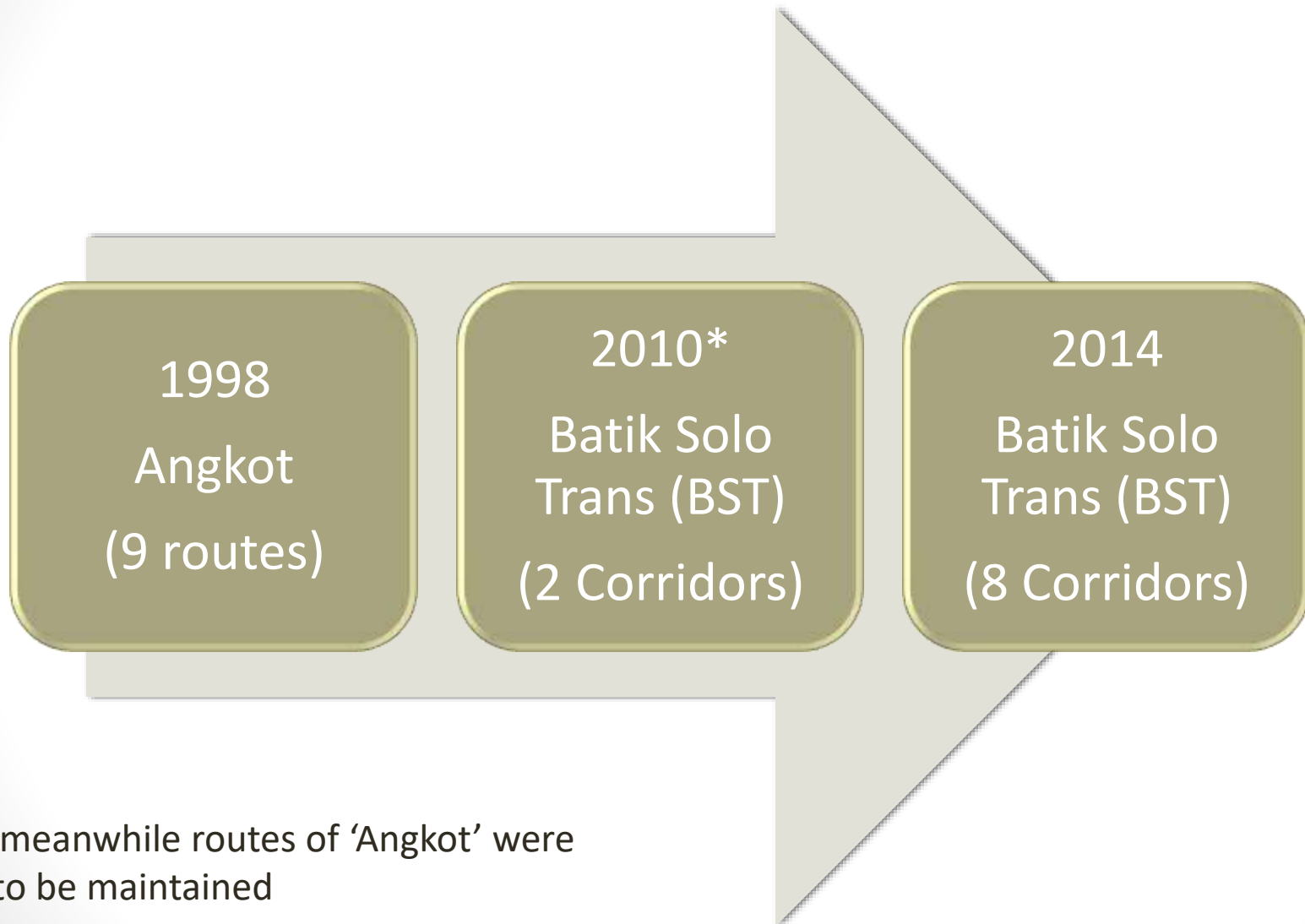
Old System of implementation of public Transport operations

- Determining a route by “approx” method
- A 'group of people' that offers public Transport management with their own Operational Planning concepts: route path, mode type, and so on [23].



- The type of vehicle used:
 - ✓ small minibus (max. 14 passengers)
 - ✓ commonly referred as a ‘Angkot’.

The history of the operation of Angkot in Surakarta City



Financial Feasibility of Public Transport in Surakarta (Case Study)

BST Koridor 1 Route :

Palur -Pasar Gede - Gladak - Kustati - Tipes - Bayangkara– Baron- Gendengan
- Purwosari - Kleco - Pabelan – Kartosuro - Terminal - Adisumarmo Airport.

Tabel 1. Operational Data of BST Koridor 1

Operational Data	Unit	Quantity
Route Distance	km	22
Number of Bus	bus	14
Average Headway	minute	12
Bus Capacity	passenger	45
Number of Trip/day	trip/days	4
Cycle Time	minute	190

(source : primary survey data)

Tabel 2. Passenger Data of BST Koridor 1

Type of Days	Time	Number of passenger by Type of travel		
		Inbound	Outbound	Round trip
Free Day	morning	18	28	46
	noon	41	27	68
	afternoon	39	19	58
Work day	morning	26	27	53
	noon	41	34	75
	afternoon	26	27	53

(source : Primary survey data)

Rate of fare :

1. General Public : Rp 4,500.00
2. Student : Rp 2,000.00

Assumed :

○ Percent of Passenger

- General Public 75%
- student 25%

○ Cost Scenario

✓ Alt. 1 :

- the bus is purchased through a leasing system with a tenor 6 years
- a fleet depreciation for 15 years.

✓ Alt. 2 :

- the bus is a grant from the central government
- the operator does not must pay interest and installments of principal loan.

✓ Alt. 3 :

- the bus is a grant from the central government
- the operator does not must pay interest and installments of principal loan, and
- depreciation is not calculated

Table 3 . Actual Revenue of Operation

Time	Trip	Passenger			Portion of Passanger	Tariff Rate (Rp)	Revenue (Rp.)	
		per trip	Daily	Annually Total				
Holidays	inbound	33	132	12,672				
	outbound	25	100	9,600	22,272	100%	4,500.00	100,224,000.00
Workdays	inbound	31	124	33,356				
	outbound	30	120	32,280	65,636	25%	2,000.00	32,818,000.00
						75%	4,500.00	221,521,500.00
				Total	87,908			354,563,500.00

Percent of passanger :

1. Holiday

General Public : 100 %

2. Weekdays

General Public : 75 %

Student : 25 %

Cost Calculation

a. Fixed Cost (Rp.)

Table 4. Calculation of Fixed Cost

Description	Scenario 1	Scenario 2	Scenario 3
• Vehicle Tax	5,200,000.00	5,200,000.00	5,200,000.00
• Depreciation	78,500,000.00	78,500,000.00	0
• Interest of Loan	179,866,667.00	0	0
• Opportunity of DP	45,600,000.00	45,600,000.00	45,600,000.00
• Jasa Raharja Insurance	14,250,000.00	14,250,000.00	14,250,000.00
• TLO Insurance	9,500,000.00	9,500,000.00	9,500,000.00
• Office and Gerrage Rent	14,285,715.00	14,285,715.00	14,285,715.00
• Phone, Electrical, Water	4,285,715.00	4,285,715.00	4,285,715.00
• Employee Salary	7,714,285.00	7,714,285.00	7,714,285.00
Total	59,202,382.00	179,335,715.00	100,835,715.00

b. Variable Cost

Table 5. Calculation of Variable Cost

Description	Scenario 1	Scenario 2	Scenario 3
• Fuel	131,400,000.00	131,400,000.00	131,400,000.00
• Engine Oil	1,319,840.00	1,319,840.00	1,319,840.00
• Axle Oil	43,300.00	43,300.00	43,300.00
• Transmission Oil	230,972.00	230,972.00	230,972.00
• Grease	428,948.00	428,948.00	428,948.00
• Brake Oil	263,968.00	263,968.00	263,968.00
• Oil Filter	197,976.00	197,976.00	197,976.00
• Air Filter	659,920.00	659,920.00	659,920.00
• Engine Overhaul	31,346,200.00	31,346,200.00	31,346,200.00
• Body Overhaul	9,403,860.00	9,403,860.00	9,403,860.00
• Body Maintenance	9,500,000.00	9,500,000.00	9,500,000.00
• Spare part	47,500,000.00	47,500,000.00	47,500,000.00
• Tire	23,757,120.00	23,757,120.00	23,757,120.00
• Terminal Tax	2,920,000.00	2,920,000.00	2,920,000.00
• Employee Salary	27,691,020.00	27,691,020.00	27,691,020.00
Total	286,663,124.00	2 86,663,124.00	286,663,124.00

Table 6. Profit based on Actual number of passanger (Rp.)

Description	Scenario 1	Scenario 2	Scenario 3
• Fixed Cost	359,202,382.00	179,335,715.00	100,835,715.00
• Variable Cost	286,663,124.00	286,663,124.00	286,663,124.00
• Total Cost	645,865,506.00	465,998,839.00	387,498,839.00
• Revenue	354,563,500.00	354,563,500.00	354,563,500.00
Profit	(291,302,006.00)	(111,435,339.00)	(32,935,339.00)

Table 7. The simulation of Passengers Number achieving Break Even Point (Rp.)

Description	Scenario 1	Scenario 2	Scenario 3
Cost Calculation			
• Fixed Cost	359,202,382.00	179,335,715.00	100,835,715.00
• Variable Cost	286,663,124.00	286,663,124.00	286,663,124.00
• Total Cost	645,865,506.00	465,998,839.00	387,498,839.00
Pasanger Calculation			
• Actual (Daily)	476	476	476
• Expected (Daily)	833	608	512
• Addition	357	132	36
• Percentage	75%	28%	8%
• Annual	161,056.00	116,021.00	96,317.00
Revenue (Rp.)	645,867,246.00	466,000,241.00	387,499,315.00
Profit (Rp.)	1,740.00	1,402.00	476.00

Conclusion

- The operation of BST in the city of Surakarta is still less desirable by the community, so number of bus passengers are very small
- For 3 cost scenarios have made in this study, all of them suffer lost.
- From 3 cost scenarios above, the first scenario is the most realistic from business behavior point of view
- The second scenario : operators are heavily dependent on the government in bus procurement even after the bus is not feasible to use, operators have funds for procurement independently
- The third scenario is the worst because operators are heavily dependent on the government in bus procurement and after the bus is not suitable to use, the operator does not have the funds for procurement independently so the government should help the procurement of new buses.

Conclusion

- If it's loss continues to happen, then the sustainability bus operation is difficult to maintain, unless the Surakarta Municipal Government is willing to cover of the loss.
- To increase bus revenue, so that bus operation does not loss, the only one possibility ie to increase the number of passengers.
- from the simulation of the number of passengers to achieve the break-even point, it takes an additional number of passengers :
 - ✓ Scenario 1 : 357 people/days or 45 people/trip
 - ✓ scenario 2 : 132 people/days or 17 people/trip
 - ✓ scenario 3 : 36 people/days or 5 people/trip

Suggestion

- the effort required to increase the number of passengers is by :
 - ✓ do a study to find out what factors make people prefer to facilitate their movement by using private cars or motorcycles.
 - ✓ From this study will be obtain a variations parameter values of the attributes
 - ✓ Test the sensitivity of each attribute to find out which attributes are sensitive to influence the perception of private cars users and motorcycle users to switch to public transport modes
- Sensitivity test results then need to be followed up with concrete actions by the government as the holder of the public transport mandatory.