TRANSCAL - A MASS TRANSIT PERFORMANCE CALCULATOR FOR DEVELOPING NATIONS

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ABSTRACT

Mass transit operations in most developing countries are still at a rudimentary level when the fleet sizes are compared with those in advanced nations. As the fleet size of a system increases, the complexity of transit operation management increases and a more effective management tool that encompasses market and operational coverage, fleet utilization, quality of service, financial control and personnel management is required. It is in this vein that the paper attempts to discuss the attributes and application of TRANSCAL - an interactive computer program designed to calculate the values of transit performance indicators for each route of any system. The Kwara State Transport Corporation is used as a case study. The results of the analysis are discussed, and some recommendations are suggested to the Federal Urban Mass Transit Programme (FUMTP), Nigeria.

1.0 INTRODUCTION

Paratransit operations require less sophisticated and more profit-oriented management approach as the vehicles are owned by private individuals and are thus more prevalent than mass transit operations that are offered by the government in developing countries. Mass transit operations offer a sort of socio-economic and political service which are subsidized in most advanced countries on less profitable routes. In developing countries however, the governments are reluctant to subsidize the social burdens of transport organisations and each organization should be managed as a self-sustaining system without exploiting the transit patrons. Since mass transit operations are not a profit-making venture per se, performance indicators are often set aside as managerial exponents for assessing the performance and hence the viability of transit operation on a route, of a corporation and of a nation.

The performance of transit operations is not limited to finance control but market and operational coverage, fleet utilization, quality of service and personnel management (Padam, 1984). These major indicators are often considered as a unit in order to determine the effectiveness and efficiency of operations. Mass transit operations in a developing country, such as Nigeria were revisited nation-wide about seven years ago, and it seems there are no proper standards for evaluating the performance of each route of its 31 transport corporations, each corporation and the nation as a whole.

Each corporation has its own management methods. In view of the fact that transit operations are profit-motivated, but not a profit-maximisation business, general management principles are necessary but not sufficient to assess equitably the effectiveness and efficiency of operations.

Hence, it is in this vein, that the paper attempts to discuss the layout and application of a new mass transit performance calculator (TRANSCAL) designed as a transit management tool. TRANSCAL is a friendly user-oriented interactive computer package developed by the author for developing nations. The applicability of the program is illustrated with the Kwara State Transport Corporation as a case study.

2.0 PERFORMANCE INDICATORS

Mass transit systems consume both human and financial resources to produce transport work for all patrons in a bid to conserve the national energy. The human resources are naturally the personnel required to operate a transit system, while the financial resources are fixed costs, variable costs and revenues. The fixed costs are essentially capital investment costs on vehicles, and route infrastructures such as Right-of-way, Route, Bus stops, Control Facilities, Garages and depreciation. Whereas, the variable or operating costs comprise of Vehicle Maintenance/Repair cost, Driver's Wage, Conductor's wage, Administrative/ Overhead cost, Marketing/Advertizement Expenses, Taxes and Licenses, Insurance Premiums, Fuel Consumption cost, Genera/Normal service charges and Tyre Replacement costs. However, the transport work is defined by Vuchic (1984) as the movement of a number of objects over a distance during an elapsed

interval of time. It is usually measured in terms of passenger-kilometer, Seat-kilometer and Vehicle-kilometer. Since the systems are not profit-exploitative the management concentrates on the effectiveness and efficiency with which the resources are transformed to useful work by considering the values of performance indicators.

Performance indicators are defined as attributes or measures of transit system operations management to assess transit capacity, productivity, effectiveness and utilization (Vuchic, 1981 & Homburger, 1982). The major indicators are essentially grouped into five categories viz: (i) Marketing and Operational Coverage or Market Penetration, (ii) Quality of Service, (iii) Fleet Utilization, (iv) Financial Control, and (v) Personnel Management (Padam, 1984). Furthermore, each major performance indicator has a list of minor attributes discussed as follows:

i) **Transit Marketing and Operational Coverage**

The market penetration by a transit organization may be measured in terms of fleet size of buses it operates, population it serves and the lengths of routes over which it operates. Consequently, lengths of routes, number of buses per 100,000 people, and kilometers travelled per capita or population are selected for estimating the effectiveness of operational coverage. The higher the values of these indicators the greater the market penetration of a transit organization.

ii) **Transit Fleet Utilization**

The fleet utilization deals with the level of usage to which transit vehicles are subjected while in operation. The relevant indices for measuring the values of this performance Indicator comprise of annual volume of passengers, passengers/seat, passengers/vehicle, annual vehicle-kilometers, seat-kilometers and passengers-kilometers, and average commercial speeds. Vehicle utilization is also measured in terms of annual vehicle-kilometers/vehicle and service effectiveness in terms of passengers/vehicle-kilometer. With these parameters, the efficiency of transit vehicles is estimated.

iii) **Transit Quality of Service**

The quality of service is usually assessed in terms of safety and reliability; vehicle accidents/100,000 vehicle-kilometer and passengers injured/100,000 vehicle-kilometer as a measures of relative safety, and number of breakdowns and disappointments as measures of reliability. The higher these values the poorer the quality of transit service offered.

iv) **Transit Financial Control**

The financial control enables the cost efficiency and financial viability of a route and an organization to be estimated among others. It is measured in terms of annual revenue, operating cost and total cost per passenger, vehicle or unit transport work, profit or loss, return on investment, revenue/cost ratio, break-even fare (total cost/passenger) etc. The level of subsidy per route or corporation can also be determined outright. A route or an organization is said to be profitable if the rate of return is equal to or greater than the discount rate, but said to be non-viable when the revenue/operating cost ratio is less than unity. Any route or organization that operates between the two extremes is said to be socio-economically viable.

v) **Transit Personnel Management**

The personnel management deals with the control of labour in a transit corporation. Thus, to control the overhead cost the following indicators are essential: revenue, total cost, operating cost, profit or loss per employee. Vehicle-kilometers/employee is also used kto determine relative labour utilization.

3.0 ATTRIBUTES OF TRANSCAL

TRANSCAL is a mass Transit performance Calculator designed to eliminate the repetitiveness that abounds in computing the values of performance indicators for a transit system. TRANSCAL is an interactive computer programme developed in GWBASIC Language. It consists of only about 800 computer statements and requires less than 35 Kbytes.

But the GWBASIC requires a memory of about 81 Kbytes. The calculator can run on any IBM compatible machine. TRANSCAL has been developed on the premise of or with a sound knowledge of transportation engineering, economic principles computer programming techniques. Figure 1. presents TRANSCAL as a 'Black box' capable of transforming some input quantities to output quantities. The computer programme for the development of TRANSCAL is presented in the Appendix.

TRANSCAL requires elaborate and comprehensive input data that encompass all the vital management attributes of a mass transit system. Table 1, shows a list of 41 tangible input quantities for the performance calculator. The input quantities range from the Name of Transport Corporation to 'General or Normal Service Charge/Bus/Type'. In addition, the corresponding output quantities of TRANSCAL are the major performance indicators discussed previously. Again, these are: Transit 'Market and Operational Coverage'. 'Fleet Utilization', 'Quality of Service', 'Financial Control' and 'Personnel Management'.

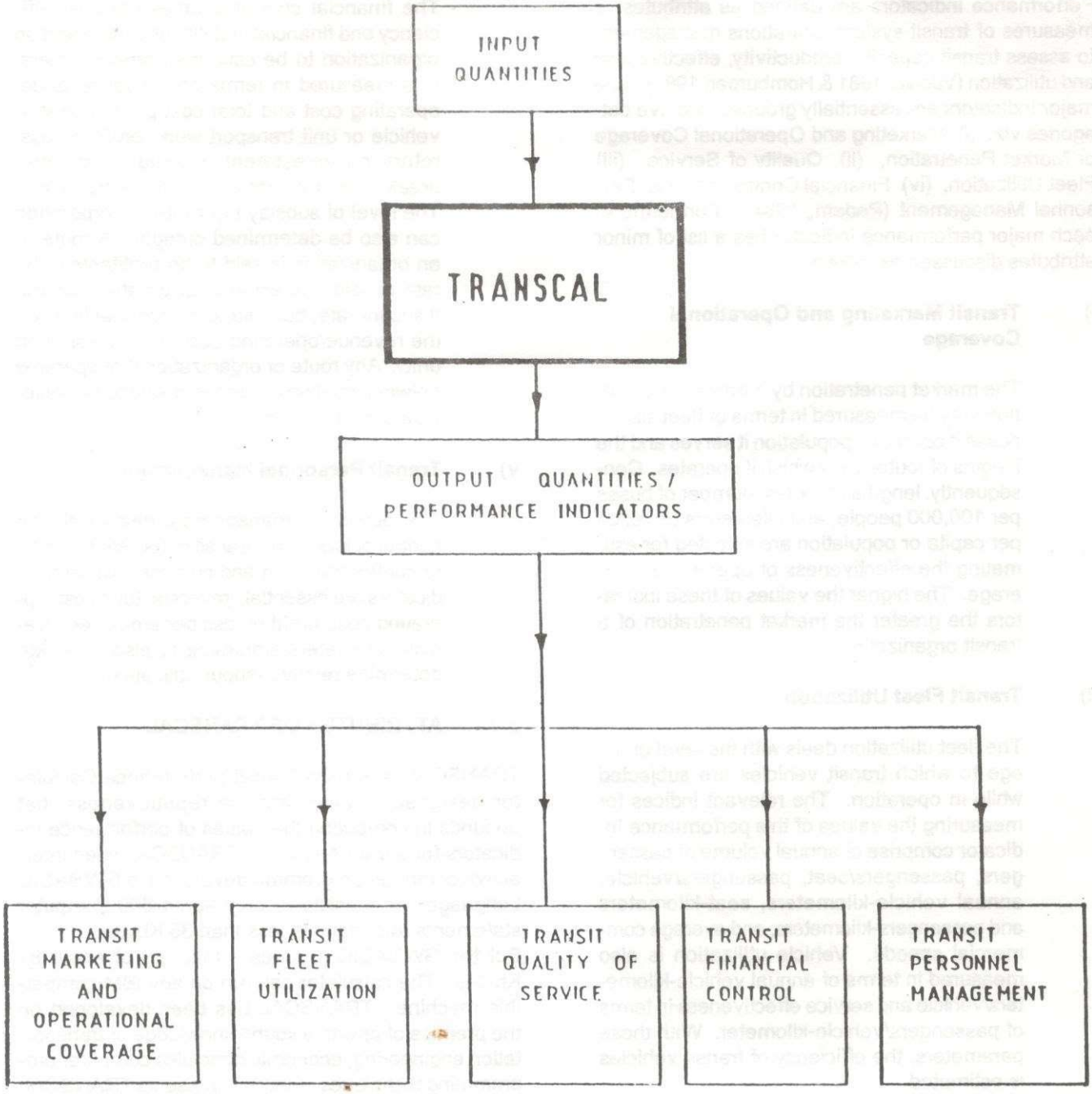


FIGURE 1. LAYOUT OF A MASS TRANSIT PERFORMANCE CALCULATOR

TABLE 1. INPUT QUANTITIES FOR TRANSCAL

NO	INPUT QUANTITIES
1.	Name of Transport Corporation
2	City Population
3	Number of Routes
4	Types of Buses
5	Names of Routes
6	Names of Buses
7	Annual cost of Garage
8	Annual Incidental Costs
9	Annual Incidental Revenues
10	Annual Cost of Routes of Infrastructures
11	Average seat capacity / Bus / Route
12	Life Span of Buses
13	Number of Employees
14	Administrative and Overhead cost
15	Initial cost of Buses
16	Annual Maintenance & Repair Cost/Bus
17	Salvage Value
18	Discount Rate
19	Fuel Consumption Rates
20	Unit cost of Fuel / Bus
21	Cost of Tyre Set / Bus
22	Life Span of Tyres
23	Insurance Premium / Bus
24	License Fee / Bus
25	Annual Driver's Wage
26	Annual Conductor Wage
27	Average Fare / Route
28	Average weekday Passenger Demand / Bus - Trip / Route
29	Average Weekend Passenger Demand / Bus - trip / Route
30	Average weekly Trips / Bus / route
31	Average Weekend Trip / Bus / Route
32	Length of Route
33	One-way Travel Time / Trip / Route
34	Number of Breakdown / Year / Route
35	Number of Accidents Year / Route
36	Average Weekend Number of Buses / Route
37	Average Weekend Buses / Type / Route
38	Number of Weekday Buses / Type / Route
39	Fleet size of stored or reserved Buses
40	Number of Reserved Buses / Type
41	General Normal Service Charge / Bus / type

TRANSCAL has been developed meticulously to have the following characteristics or capabilities in one execution. The Calculator is:

i) applicable to urban or intercity mass transit service,
ii) capable of handling as many routes as possible in one run,
iii) capable of printing out values of performance indicators on a 'route-by-route' basis optionally,
iv) capable of printing the 'Grand Summary for 'Route Average' and 'Route Total' for either urban or intercity service of a corporation optionally,
v) capable of printing out a comprehensive input data optionally
vi) a laboratory apparatus for experimental design involving demand levels, fares, travel times, discount rates, costs, route lengths, etc.
vii) capable of being used to pre-assess the viability of a new transit route

Furthermore, it is essential that TRANSCAL is executed based on yearly transit operation of an organization. The values of some vital performance indicators are often presented as trends shown in Figure 2. With this chart, the relative performance of a route or corporation or nation can be assessed quite easily.

4.0 APPLICATION OF TRANSCAL

The application of TRANSCAL as a transit management tool is illustrated with a case study of the Kwara State Transport Corporation, which is one of the 31 corporations whose activities are coordinated by the Federal Urban Mass Transit Programme (FUMTP). The corporation was understudied in 1989 with a view to providing the necessary input data to TRANSCAL, which was only conceived at that time. The corporation operates both urban and intercity transit service like other transit corporations in Nigeria. There are 5 Urban and 10 Intercity routes. In addition, the Corporation has a fleet size of 75 buses of four denominations: Burem 24-seater, Burem 30-seater, Mercedez Benz 41-seater and Peugeot J5. 16-seater buses. Of the fleet size, only 12 buses were operated on urban routes, while about 50 buses were operated on intercity routes; and the rest were reserved. Furthermore, the corporation had a labour force of 172 personnel of different grades.

TRANSCAL was applied to the urban and intercity routes of the transit corporation in two runs. The input data, which encompassed all the necessary attributes of routes, buses and the corporation, was prepared

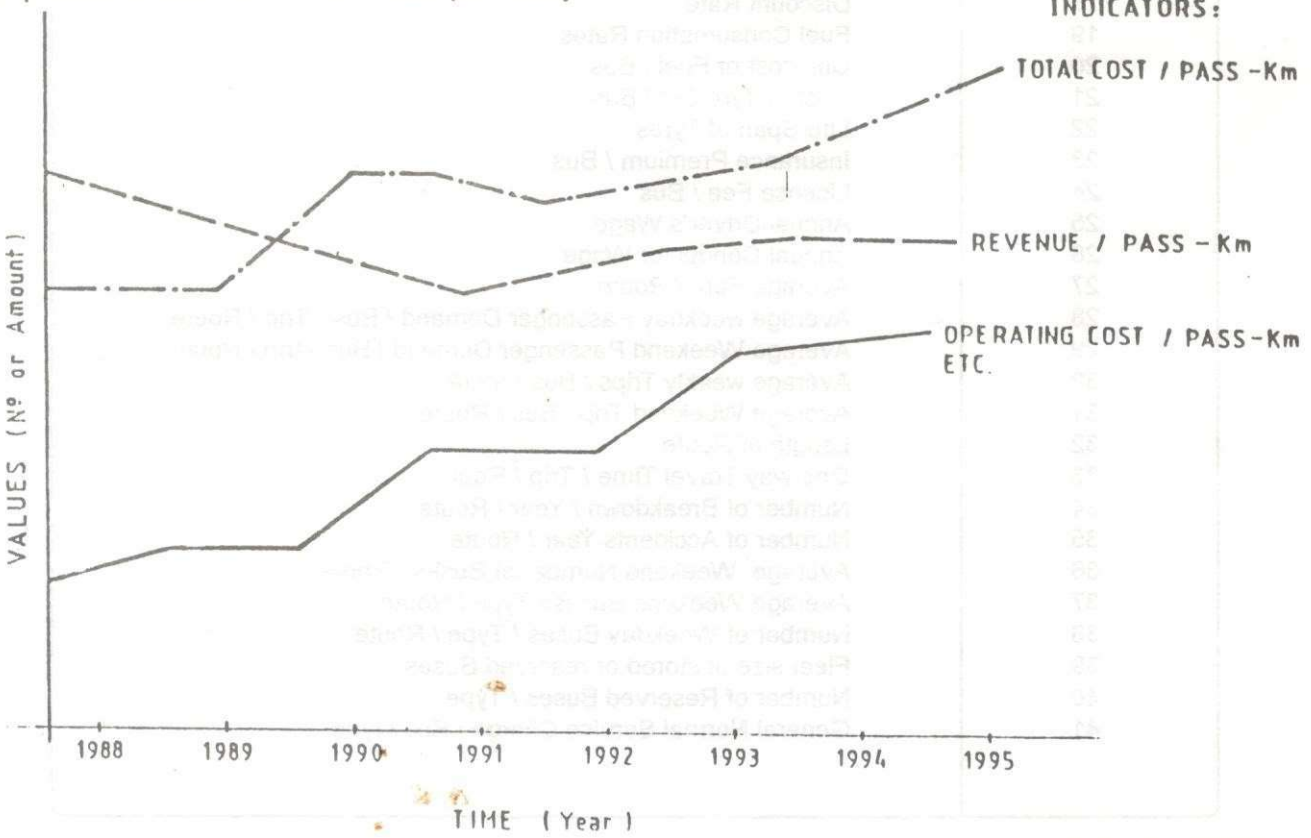


FIGURE 2. A GRAPHICAL ILLUSTRATION OF TRENDS IN PERFORMANCE INDICATORS

and entered into TRANSCAL interactively for each run. Subsequently, al typical summary of urban transit input data is presented in Table 2. It is clear that all the data pertaining to other route begin with 'GPO-KWARAPOLY' and end with 'OJA OBA-AIRPORT/ EGBEJILA' route while those related to buses begin with 'Burem 24-seater' and end with 'Peugeot J5 16-seater' bus in this order. A similar input data was prepared for the intercity routes. The output quantities of the two runs are presented in Tables 3 to 5.

Transit performance indicators are often analyzed on relative rather than absolute basis. At the micro-level, the performance of each route is compared to the State average performance; while at the macro-level, the State performance is compared to the Federal Average performance. It is in this context that the performance indicators for the Kwara Transport Corporation are discussed briefly for exhaustive discussion of these indicators is beyond the scope of this paper.

The urban transit service analysis (Table 3.) shows that Oja Oba-Airport/Egbejila route performs below the State Average (in the last column of Figure 3.) in all ramifications. For instance, the cost efficiency is 26% compared to the state average value of 48%. All the urban service attracts on the average 52% subsidy and revenue/operating cost ratios that are greater than unity. Hence, all the routes are socio-economically viable. The routes are ranked in a descending order of viability as Afon, Kwarapoly, Shao, University and Egbejila. This shows that Oja Oba-Afon route is the best while Oja Oba-Egbejila is the worst of all. The average break-even fare (total cost/passenger) is 48 kobo while 30 kobo was charged per passenger on all routes with the exception of Afon route where the fare/ passenger was N1.00 as of that time. The unit cost of transport work is 5 kobo/pass-km. The average vehicle utilization rate is computed as 90301 Veh-km/ Veh; and Afon is the highest with 118260 while Egbejila is the least with 70080 Veh-km/Veh.

Similarly, the intercity transit service analysis (Table 4.) shows that Kaduna route performs well above the State Average in all facets of management. All the routes attract an average return on investment of 21% which is obviously greater than the applied discount rate of 15%. The routes are ranked in a descending order of viability as Kaduna, Lafiaji, Offa, Lagos, Omu Aran, Lokoja, Okene, New Bussa, Kabba and Oke-Ode. The first 5 routes are profitable, while the rest are socio-economically viable. The unit cost of transport work is 3 kobo/pass-km. In addition, the average vehicle utilization rate is computed as 119121 Veh-Km/Veh; and Kaduna is the highest with 213160 while Lagos is the least with 11059 Veh-Km/Veh.

The overall performance of the corporation is presented in Table 5. The analysis shows that about 82.67% of the entire fleet size is in operation while the rest is reserved. A loss of about N0.78m results from revenue of N6.4m and total cost of N7.12m. From the revenue/total cost ratio, the corporation bears a social burden of about 11%. However, since the revenue/operating cost is 3.23 (greater than unity), the corporation operates plainly socio-economic service overall.

At this point, the macro-level analysis of performance indicators is incomplete and thus, requires the 'National Average' values for urban, intercity transit service and corporation. These values are to be compiled by and disseminated to each state of the Federation by the FUMTP, Lagos

In summary, the assessment of performance indicators can assist the management of transit corporations to identify areas of deficiency where efforts should be expended more effectively.

5.0 CONCLUSIONS AND RECOMMENDATIONS

1. The paper has thus far discussed rather exhaustively the very essence of transit performance indicators upon which premise TRANSCAL is developed. The comprehensiveness of the input and output quantities clearly demonstrates the potency of TRANSCAL as a management tool.

.2. The application of TRANSCAL is illustrated with a case study of the Kwara State Transport Corporation, which is one of 31 State Corporations in Nigeria. The performance indicators of all its 5 urban routes and 10 intercity routes are calculated, using the program, and analyzed briefly.

3. The analysis shows on the average that the urban routes are socio-economically viable while the intercity routes are profitable. However, the overall results indicate that the corporation operates In a socio-economic rather than profitable manner.

4. The nation-wide application of TRANSCAL is recommended for more effective management of transit operations in Nigeria as a developing nation. This is only feasible if the Federal Urban Mass Transit Programme (FUMTP), Lagos, appreciates and adopts the performance calculator.

5. TRANSCAL has been developed locally and is thus capable of being revised to address the needs of the transit operators.

TABLE 2. A TYPICAL SUMMARY OF URBAN TRANSIT INPUT DATA

Name of Corporation	KWARA TRANSPORT CORPORATION	Cost of Tyres / Set / Bus	3720	No of Accident / Year	4
City Population	400000	Cost of Tyres / Set / Bus	7800	No of Accident / Year	3
Number of Routes	5	Cost of Tyres / Set / Bus	2000	No of Accident / Year	2
Type of Buses	4	Life Span of Tyres	50000	No of Accident / Year	2
Total Fleet Sizes	75	Insurance Premium / Bus	5000	Weekday No. of Buses / Route	4
Fleet sizes In service	12	Insurance Premium / Bus	5000	Weekday No. of Buses / Route	4
Name of Routes	GPO - KWARAPOLY	Insurance Premium / Bus	120000	Weekday No. of Buses / Route	2
Name of Routes	GPO-UNIVERSITY	Insurance Premium / Bus	5000	Weekday No. of Buses / Route	1
Name of Routes	OJA OBA SHAO	General / Norma Services / Bus	25000	Weekday No. of Buses / Route	1
Name of Routes	OJA OBA AFON	General / Norma Services / Bus	25000	Weekend-No. of Buses / Route	2
Name of Routes	OJA OBA -AIRPORT / EGBEJILA	General / Norma Services / Bus	13500	Weekend-No. of Buses / Route	2
Name of Buses	Burem 24 - seater	General / Norma Services / Bus	2500	Weekend-No. of Buses / Route	1
Name of Buses	Burem 30 - seater	License Fee / Bus	330	Weekend-No. of Buses / Route	1
Name of Buses	M/Benz 41 - seater	License Fee / Bus	330	Weekend-No. of Buses / Route	1
Name of Buses	Peogeot J5 16 - seater	License Fee / Bus	420	Number of Buses / Tyre / Route	2
Annual Cost of Garage	0	License Fee / Bus	330	Number of Buses / Tyre / Route	0
Annual Incidental Cost	0	Driver' Wage	3000	Number of Buses / Tyre / Route	2
Annual Cost of Route infrastructures	0	Conductor's Wage	3000	Number of Buses / Tyre / Route	0
Annual Cost of Route infrastructures	0	Fare / Route	.3	Number of Buses / Tyre / Route	0
Annual Cost of Route infrastructures	0	Fare / Route	.3	Number of Buses / Tyre / Route	2
Annual Cost of Route infrastructures	0	Fare / Route	.3	Number of Buses / Tyre / Route	2
Annual Cost of Route infrastructures	0	Fare / Route	1	Number of Buses / Tyre / Route	0
Average Seat Capacity / Buses / Routes	33	Fare / Route	.3	Number of Buses / Tyre / Route	0
Average Seat Capacity / Buses / Routes	36	Weekday Demand / Bus - Trip / Route	28	Number of Buses / Tyre / Route	1
Average Seat Capacity / Buses / Routes	36	Weekday Demand / Bus - Trip / Route	29	Number of Buses / Tyre / Route	1
Average Seat Capacity / Buses / Routes	30	Weekday Demand / Bus - Trip / Route	30	Number of Buses / Tyre / Route	0
Life Span of Buses	5	Weekday Demand / Bus - Trip / Route	21	Number of Buses / Tyre / Route	0
Life Span of Buses	5	Weekday Demand / Bus - Trip / Route	19	Number of Buses / Tyre / Route	1
Life Span of Buses	10	Weekend Demand / Bus - Trip / Route	14	Number of Buses / Tyre / Route	0
Life Span of Buses	5	Weekend Demand / Bus - Trip / Route	15	Number of Buses / Tyre / Route	0
Number of Employees	172	Weekend Demand / Bus - Trip / Route	15	Number of Buses / Tyre / Route	0
Administrative / Overhead Cost	480000	Weekend Demand / Bus - Trip / Route	10	Number of Buses / Tyre / Route	1
Initial Cost of Buses	166000	Weekend Demand / Bus - Trip / Route	10	Number of Buses / Tyre / Route	0
Initial Cost of Buses	166000	Weekday Trip / Bus Route	20	Number of Buses / Tyre / Route	0
Initial Cost of Buses	200000	Weekday Trip / Bus Route	16	Fleet Size of Stored/Reserved Buses	13
Initial Cost of Buses	61000	Weekday Trip / Bus Route	16	Number of Stored/Reserved Buses	4
Annual Maintenance / Repair Cost / Bus	12000	Weekday Trip / Bus Route	12	Number of Stored/Reserved Buses	3
Annual Maintenance / Repair Cost / Bus	12000	Weekday Trip / Bus Route	12	Number of Stored/Reserved Buses	2
Annual Maintenance / Repair Cost / Bus	36000	Weekend Trip / Bus Route	20	Number of Stored/Reserved Buses	4
Annual Maintenance / Repair Cost / Bus	12000	Weekend Trip / Bus Route	16		
Salvage value / Bus (% of initial cost)	10	Weekend Trip / Bus Route	16		
Salvage value / Bus (% of initial cost)	10	Weekend Trip / Bus Route	12		
Salvage value / Bus (% of initial cost)	10	Weekend Trip / Bus Route	12		
Salvage value / Bus (% of initial cost)	10	Length of Route - Km	12.1		
Discount Rate (%)	15	Length of Route - Km	15.7		
Fuel Consumption (L/Km)	.26	Length of Route - Km	15		
Fuel Consumption (L/Km)	.26	Length of Route - Km	27		
Fuel Consumption (L/Km)	.38	Length of Route - Km	16		
Fuel Consumption (L/Km)	.38	One-way Travel Time / Trip - Hrs	.26		
Unit cost of Fuel / Bus (N/L)	.34	One-way Travel Time / Trip - Hrs	.4		
Unit cost of Fuel / Bus (N/L)	.34	One-way Travel Time / Trip - Hrs	.45		
Unit cost of Fuel / Bus (N/L)	.34	One-way Travel Time / Trip - Hrs	.75		
Unit cost of Fuel / Bus (N/L)	.6	One-way Travel Time / Trip - Hrs	.66		
Cost of Tyres /Set / Bus	3720	Number of Breakdowns / year	20		
		Number of Breakdowns / year	20		
		Number of Breakdowns / year	15		
		Number of Breakdowns / year	10		
		Number of Breakdowns / year	10		
		No. of Accidents / year	4		

TABLE 3. A TYPICAL SUMMARY OF URBAN TRANSIT PERFORMANCE INDICATORS

INDICATORS	GPO KWARA POLY	GPO UNIVERSITY	OJA OBA - SHAO	OJA OBA - AFON	OJA OBA EGBEJILA	AVERAGE
1.0 MARKETING AND OPERATIONAL COVERAGE						
Length of Routes	12.1	15.7	15.0	27.0	16.0	17.16
Fleet Size	4	4	2	1	1	2.4
Buses / 100,000 Population	5	5	2.5	1. 25	1.25	3
Kilometer / Population	4.42	4.59	2.19	1.48	.88	2.71
2.0 FLEET UTILIZATION						
Annual Volume of persemgers	642880	534336	275520	78252	71988	320595.2
Perssengers / Seat	67	64	66	6	.55	.82
Perssengers / Vehicle	22.02	22.87	23.59	17.87	16.44	20.58
Annual Vehicle - Kilometre	353320	366752	175200	118260	70080	216722.4
Annual Seat - Kilometer (million)	1165956	1320307	6307200	3547800	2.102100	7.304007
Annual passenger - kilometer (million)	7778848	8389075	4132800	2.112804	1.151808	4.713087
Average Coomercial speed - Km/h	45.54	39.25	33.33	36	24.24	35.87
3.0 QUALITY OF SERVICE						
Breakdown / 100,000km	5.65	5.45	856001	8.46	14.27	8.479999
Accidents / 100,000 km	113	1.00	171	1.69	2.85	1.7
4.0 FINANCIAL CONTROL - Naira						
Annual revenue	192864	160300.9	82656	78252	2159.8	107133.8
Annual Revenue / Bus	48216	40025.2	41328	78252	21596.4	45893.53
Revenue / Vehicle - km	55	44	47	66	31	.48
Revenue / seat - km	02	01	01	02	01	.01
Revenue / Perssenger - km	02	02	02	04	02	.02
Revenue / passenger	3	3	3	1	3	.44
Annual Operating Cost	1265127	127941	65097.48	24284.18	20025.07	72278.68
Operating Cost / Vehicle - km	35	35	36	21	29	.31
Operating Cost / seat - km	01	01	01	01	01	.01
Operating Cost / Passenger - km	02	02	02	01	02	.02
Operating Cost / Paseenger	2	24	23	31	08	.25
Annual Total Cost or Expenses	4143479	4158031	2070151	88594.47	84335.35	242020.4
Total Cost / Vehicle - km	117	1.13	118	75	1.2	1.09
Total Cost / seat - km	04	03	03	02	.04	.03
Total cost / perssenger - km	05	05	05	04	.07	.05
Total Cost / Perssenger	64	78	75	1.13	1.17	.9
Revenue / Total Cost Ratio	47	30	4	88	26	.48
Revenue / Operating Cost	152	125	131	3.22	1.08	1.69
Annual Profit or Loss	-2214829	-255065	124359.1	-10342.47	-62738.98	-13488.6
Profit or Loss / Persenger	-34	-49	-45	-13	-.87	-46
Profit or Loss / Buss	-55370.95	-63877.11	62179.53	-10342.47	-62738.96	50901.81
Return on Investment	-53.45	-61.45	-60.07	-11.67	-74.39	-52.21
Revenue / Bus / Day	132.1	1000	113.23	214.39	59.17	121.74
Total Cost / Bus / Day	283.8	281.9	283.58	242.72	231.06	265.19
Operating Cost / Bus / Day	8665	87.65	86.43	66.53	54.66	79.43
5.0 PERSONNEL MANAGEMENT Naira						
Employee / Bus	277	2.77	2.77	2.77	2.77	2.77
Annual Revenue / Employee	1738019	14445.71	14887.12	28207.12	7784.749	1654.01
Annual Total Cost / Employee	37339.49	37471.18	37310.86	31935.22	30399.95	34891.34
Annual Operating Cost / Employee	11400.85	27471.18	11375.22	8753.599	7218.34	100055.51
Annual Profit or Loss / Employee	-19959.3	-23025.47	-22413.55	-3728.1	-22815.2	-18348.32

TABLE 4 A TYPICAL SUMMARY OF URBAN TRANSIT PERFORMANCE INDICATORS

INDICATORS	LAGOS	KADUNA	NEW BUSSA	LAFIAJI	LOKOJA	OMU ORAN	OKE ODE	OKENE	KABBA	OFFA	AVERAGE
1.0 MARKETING AND OPERATIONAL COVERAGE											
Length of Routes	303	584	325	112	331	80	92	301	245	56	242.9
Fleet Size	28	4	2	1	2	1	1	8	4	1	5
Buses / 100,000 Population	70	10	5	2.5	5	2.5	2.5	15	10	2.5	12.5
Kilometer / Population	77.42	21.32	5.93	4.09	6.64	2.92	1.68	18.48	8.939999	4.09	44.89
2.0 FLEET UTILIZATION											
Annual Volume of persemgers	312424	38792	18668	41712	18685	41712	20856	55998	37332	83424	66958.21
Perssengers / Seat	.96	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Perssengers /Vehicle	30.57	26.57	25.57	28.57	25.57	28.97	28.57	25.57	25.57	28.57	27.37
Annual Vehicle - Kilometre	3096660	852640	237250	183520	241630	116800	67160	659190	357700	163520	695607
Annual Seat - Kilometer (million)	99.09312	2387392	8.405750	4.905600	8.524010	3.504000	2.014800	17.79813	9.657900	4.905600	17.86828
Annual passenger - kilometer (million)	9466446	223.65453	6.066450	4.671744	6.178446	3.338960	1.918752	16.8554	9.146340	4.671744	17.01648
Average Coomercial speed - Km/h	68.59	80	54.17	62.92	62.45	70.8	70.77	63.77	55.43	80.87	64.78
3.0 QUALITY OF SERVICE											
Breakdown / 100,000km	.97	.47	1.69	2.45	1.68	3.42	5096	.61	1.12	2.45	2.08
Accidents / 100,000 km	.32	.23	.84	1.22	.93	1.71	2.98	.3	.56	1.22	1.02
4.0 FINANCIAL CONTROL - Naira											
Annual revenue	3438864	872820	149328	166848	186660	104280	82568	447984	261324	166848	585532.5
Annual Revenue / Bus	122738	219205	74864	166848	933330	104280	62588	74884	65331	166848	114947.6
Revenue / Vehicle - km	1.11	1.02	63	1.02	.77	.89	.93	.88	.73	1.02	.88
Revenue / seat - km	.03	.04	.02	.03	.03	.03	.03	.03	.03	.03	.03
Revenue / Perssenger - km	.04	.04	.02	.04	.03	.03	.03	.03	.03	.04	.03
Revenue / passenger	11	22.5	8	4	10	2.5	3	8	7	2	7.8
Annual Operating Cost	948763.6	243791.5	48832.9	28285.17	49020.1	24155.12	19766.94	141252.4	86940.68	2828.5.17	61888.4
Operating Cost / Vehicle - km	31	29	2	17	2	.21	.29	.21	.24	.17	.23
Operating Cost / seat - km	01	01	01	01	.01	.01	.01	.01	.01	.01	.01
Operating Cost / Passenger - km	01	01	01	01	.01	.01	.01	.01	.01	.01	.01
Operating Cost / Paseenger	3.04	6.28	2.61	68	2.53	058	.95	2.52	2.33	.34	2.19
Annual Total Cost or Expenses	2789659	475235.1	177253.5	92595.46	177640.7	88465.4	84077.22	527114.1	344181.8	92595.48	484881.7
Total Cost / Vehicle - km	9	56	.75	.57	.74	.76	1.25	.8	.96	.57	.78
Total Cost / seat - km	03	.02	.03	.02	.03	.03	.04	.03	.04	.02	.03
Total cost / perssenger - km	03	.02	.03	.02	.03	.03	.04	.03	.04	.02	.03
Total Cost / Perssenger	8.93	12.25	9.5	2.22	9.520001	2.12	4.03	9.41	9.22	1.11	6.83
Revenue / Total Cost Ratio	1.23	1.84	.94	1.8	1.05	1.19	.74	.95	.76	1.8	1.21
Revenue / Operating Cost	3.62	8.58	3.07	5.9	3.81	4.32	3.17	3.17	3.01	5.9	3.95
Annual Profit or Loss	647005.5	397565	-27925.47	74252.55	9019.344	15814.6	-21509.23	-79130.13	-82857.81	74252.55	00650.7
Profit or Loss / Persenger	2.07	10.25	-1.5	1.73	.48	.38	-1.03	-1.41	-2.22	.89	.97
Profit or Loss / Buss	23107.34	99396.24	-13982.74	7425255	4509.672	15814.6	-21509.23	-1318838	-20714.45	74252.55	22195.82
Return on Investment	23.19	8366001	-15.75	80.19	5.08	17.58	-25.58	-15.01	-24.07	80.19	20.98
Revenue / Bus / Day	338.27	597.82	204.56	457.12	255.7	285.7	171.42	204.58	178.99	457.12	314.92
Total Cost / Bus / Day	272.96	325.5	242.81	253.69	243.34	242.37	230.35	240.89	235.74	253.89	254.11
Operating Cost / Bus / Day	92.83	188.97	66.62	77.49	67.15	66.18	54.16	64.5	59.55	77.49	79.29
5.0 PERSONNEL MANAGEMENT Naira											
Employee / Bus	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.77
Annual Revenue / Employee	44242.77	78655.29	28913.77	80142.89	33642.21	37589.3	22553.58	26913.77	23549.55	60142.89	42212.8
Annual Total Cost / Employee	35913.38	42826.42	31946.85	33377.43	32016.63	31.888.69	30306.91	31667.71	31018.38	33377.43	34956.6
Annual Operating Cost / Employee	12214.15	21968.68	8785.231	10195.82	8835.019	8707.08	7125.29	8486.09	7834.77	10195.82	11671.0
Annual Profit or Loss / Employee	8329.39	35828.88	-503308	26785.45	1825.58	5700.81	-7753.33	-4753.94	-7466.84	26765.45	7256.2

TABLE 5: A TYPICAL SUMMARY OF PERFORMANCE INDICATORS FOR A TRANSIT CORPORATION

INDICATORS	URBAN	INTERCITY	TOTLA
Grand No. of Buses in Service	12	50	62
Grand % of Fleet Size in Service	16	66.67	82.67
Grand Length of Routes (km)	85.8	2429	2514.5
Buses / 100,000 Population	3	12.5	15.5
Killometer / Population	2.71	14.89	17.6
Annual Volume of Passenger	1602976	669582	2272558
Annual Vehicle - Kilimeter	1083612	5956070	7039682
Annual Seat - Kilometer (million)	36.82003	178.6829	215.50
Annual Passenger - Km (milions)	23.56534	170.1648	193.33
Breakdown / Year / 100,000km	8.48	2.078	10.56
Accidents / Year / 100,000 km	1.7	1.023	2.72
Annual Revenue (+ Incidental)	535669.2	5855325	6390992.3
Annual Operating Cost	361893.4	1618884	1980777.4
Annual Total Cost or Expenses (Others)	1751641	5424736	7176377
Annual Profit or Loss	-125972	430588.5	-785383.5
Annual Revenue / Employee	16090.84	42212.18	58303.65
Annual Total Cost / Employee	52617.13	39108.58	91725.69
Annual Operating Cost / Employee	50277.56	104328	154605
Annual Profit or Loss /Employee	-36526.29	3104.24	-33422.05
Annual Revenue / Total Cost	0.48	1.21	0.89
Annual Revenue / Operating Cost	1.68	3.95	3.23

6.0 REFERENCES

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1 INPUT "NUMBER OF ROUTES"; N: INPUT "TYPE OF BUSES"; M
2 DIM SC%(N), LS%(N), IC(N), MC(N), S%(N), FR(N), UF(N)
3 DIM CT(N), IP(N), GS(N), LF(N), WF(N), DI%(N),D2%(N)
4 DIM T1(N), T2(N), RL(N), AT(N), N1(N), N2(N), NB(N,N), NA(N), BN(N)
5 DIM AD(N), AR(N), XC(N,M), CC(N),X1(N),NR$(N)
6 DIM AC(N), XM(N,M), AM(N), XS(N,M), DS(N), YC(N,M), FC(N)
7 DIM UC(N,M), TC(N), BUS$(M)
8 DIM IS(N), ZC(N,M), LC(N), DC(N,M), GC(N), EC(N,M), OC(N)
9 DIM BQ(N), AE(N), CRI(N), GCR(N)
10 DIM AS(N), VP(N), VE(N), SX(N),MR(N), RCE(N)
11 DIM PE(N), PV(N), PS(N), TR(N), RV(N), RS(N), RP(N), BR(N), RD(N)
12 DIM OV(N), OS(N), OP(N), CV(N), CS(N), CP(N),PC(N), OD(N), OE(N)
13 DIM RC(N), RO(N), PL(N), PP(N), RI(N), BC(N), PB(N)
14 DIM EB(N), RE(N), CE(N), BP(N), EP(N), BE(N), OE(N), PE(N)
15 TNI=0!: TBD=0!: TEP=0!: TVP=0!: TPS=0!: TPV=0!:TVE=0!
16 TSE=0!: TPE=0!: TAS=0!: TBE=0!: TAE=0!: TAR=0!: TBR=0!:TRV=0!
17 TRS=0!: TRP=0!: TWP=0!: TOC=0!: TOV=0!: TOS=0!: TOP=0!:TOE=0!
18 TAE=0!: TCV=0!: TCS=0!: TCP=0!: TPC=0!: TRC=0!: TRO=0!:TPL=0!
19 TPP=0!: TPB=0!: TRI=0!: TRD=0!: TBC=0!: TOD=0!: TEB=0!:TRE=0!
20 TCE=0!: TRL=0!: TOE=0!: TPE=0!
21 LPRINT CHR$(12);
22 LPRINT CHR$(27);"N";CHR$(4);:REM LEAVES 4 SPACES AT BOTTOM OF PAGE
23 LPRINT CHR$(27);"r";CHR$(4);:REM LEAVES 4 SPACES AT TOP OF PAGE
24 LPRINT CHR$(27);"r";CHR$(4);:REM LEAVES 4 SPACES AT TOP OF PAGE
25 FOR J =1 TO M
26 INPUT "NAME OF BUSES";BUS$(J)
27 NEXT J
30 GOSUB 7000
36 PRINT "MASS TRANSIT PERFORMANCE CALCULATOR"
37 LPRINT "MASS TRANSIT PERFORMANCE CALCULATOR"
38 PRINT "-------------------------------------"
39 LPRINT "-------------------------------------"
40 INPUT "NAME OF TRANSIT CORPORATION";NC$
41 PRINT:PRINT NC$
42 LPRINT:LPRINT NC$
43 INPUT "CITY POPULATION";LP
45 PRINT "NUMBER OF ROUTES  = ";N
46 LPRINT "NUMBER OF ROUTES  = ";N
50 INPUT "IS IT URBAN TRANSIT SERVICE-YES/NO";IU$
55 IF  IU$ ="YES" GOTO 59
56 PRINT :PRINT "      INTERCITY TRANSIT SERVICE    "
57 LPRINT :LPRINT "      INTERCITY TRANSIT SERVICE    "
58 GOTO 65
59 PRINT : PRINT "       URBAN TRANSIT SERVICE      "
60 LPRINT :LPRINT "       URBAN TRANSIT SERVICE      "
65 INPUT "DO YOU WANT PRINT/ROUTE ANALYSIS-YES/NO";PRA$
67 INPUT "DO YOU WANT KNOW THE MASS TRANSIT EXPERT-YES/NO";BAB$
69 FOR I=1 TO N
70 INPUT "NAME OF ROUTE";NR$(I)
71 NEXT I
80 INPUT "TOTAL FLEET SIZE OF BUSES";FS%
85 PRINT : PRINT "TOTAL FLEET SIZE OF BUSES = ";FS%
86 LPRINT :LPRINT "TOTAL FLEET SIZE OF BUSES = ";FS%
90 INPUT "FLEET SIZE OF URBAN OR INTERCITY BUSES";FU%
91 PRINT "FLEET SIZE OF URBAN OR INTERCITY BUSES";FU%
92 LPRINT "FLEET SIZE OF URBAN OR INTERCITY BUSES";FU%
95 INPUT "DO YOU WANT PRINT OF INPUT DATA -YES/NO ";ID$
110 INPUT "DO YOU WANT GRAND SUMMARY-YES/NO";DG$
115 INPUT "ANNUAL GARAGE COST/BUS";GCB
116 INPUT "ANNUAL INCIDENTAL COSTS ";AIC
117 INPUT "ANNUAL INCIDENTAL REVENUES ";AIR
118 INPUT "DRIVER'S WAGE ";DW
119 INPUT "CODUCTOR' WAGE";CW
120 REM
139 FOR J=1 TO M
140 INPUT "LIFE SPAN OF BUSES";LS%(J)
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141 NEXT J
150 INPUT "NUMBER OF EMPLOYEES";NE
160 INPUT "ADMINISTRATIVE/OVERHEAD COST";AC
169 FOR J=1 TO N
170 INPUT "INITIAL CAPITAL COST OF BUSES";IC(J)
171 NEXT J
179 FOR J=1 TO N
180 INPUT "ANNUAL MAINTENANCE/REPAIR COST OF BUSES";MC(J)
181 NEXT J
189 FOR J=1 TO N
190 INPUT "SALVAGE VALUE OF BUSES-% OF INITIAL COST";SX(J)
191 NEXT J
200 INPUT "DISCOUNT OR INTEREST RATE";IR
209 FOR J=1 TO N
210 INPUT "FUEL CONSUMPTION RATE OF BUSES IN L/KM";FR(J)
211 NEXT J
219 FOR J=1 TO N
220 INPUT "UNIT FUEL COST OF BUSES IN N=/L";UF(J)
221 NEXT J
225 REM
229 FOR J=1 TO N
230 INPUT "COST OF A SET OF TYRES";CT(J)
231 NEXT J
235 INPUT "LIFE SPAN OF TYRES IN KM";LT
239 FOR J=1 TO N
240 INPUT "INSURANCE PREMIUM";IP(J)
241 NEXT J
249 FOR J=1 TO N
250 INPUT "GENERAL/NORMAL SERVICE PER BUS";GS(J)
251 NEXT J
259 FOR J=1 TO N
260 INPUT "LICENSE FEE PER BUS";LF(J)
261 NEXT J
265 INPUT "FLEET SIZE OF STORED /RESERVED BUSES";FSX
266 FOR J=1 TO N
267 INPUT "NUMBER OF STORED/RESERVED BUSES BY TYPE";NR(J)
268 NEXT J
270 FOR I=1 TO N
271 INPUT "AVERAGE SEAT CAPACITY/BUS/ROUTE"; SCX(I)
272 NEXT I
280 FOR I=1 TO N
281 INPUT "ANNUAL COST OF ROUTE INFRASTRUCTURES";CRI(I)
282 NEXT I
289 FOR I=1 TO N
290 INPUT "WEIGHTED AVERAGE FARE/PASSENGER ON ROUTES";WF(I)
291 NEXT I
299 FOR I=1 TO N
300 INPUT "WEIGHTED WEEKDAY DEMAND/BUS/ONE-WAY TRIP ON ROUTES";D1X(I)
301 NEXT I
309 FOR I=1 TO N
310 INPUT "WEIGHTED WEEKEND DEMAND/BUS/ONE-WAY TRIP ON ROUTES";D2X(I)
311 NEXT I
319 FOR I = 1 TO N
320 INPUT "AVERAGE NUMBER OF WEEKDAY TRIPS/BUS/DAY ON ROUTES";T1(I)
321 NEXT I
329 FOR I =1 TO N
330 INPUT "AVERAGE NUMBER OF WEEKEND TRIPS/BUS/DAY ON ROUTES";T2(I)
331 NEXT I
339 FOR I = 1 TO N
340 INPUT "LENGTH OF ROUTE =";RL(I)
341 NEXT I
349 FOR I = 1 TO N
350 INPUT "AVERAGE ONE-WAY TRAVEL TIME";AT(I)
351 NEXT I
354 FOR I = 1 TO N
355 INPUT "NUMBER OF BREAKDOWNS PER YEAR";BN(I)
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356 NEXT I
359 FOR I = 1 TO N
360 INPUT "AVERAGE NUMBER OF BUSES/ROUTE/DAY-WEEKDAY";N1(I)
361 NEXT I
369 FOR I = 1 TO N
370 INPUT "AVERAGE NUMBER OF BUSES/ROUTE/DAY-WEEKEND";N2(I)
371 NEXT I
378 FOR I = 1 TO N
379 FOR J = 1 TO M
380 INPUT "AVERAGE NUMBER OF BUSES ON ROUTES/DAY";NB(I,J)
381 NEXT J
382 NEXT I
384 FOR I = 1 TO N
385 INPUT "NUMBER OF ACCIDENTS PER YEAR";NA(I)
386 NEXT I
390 REM CALCULATIONS
395 REM
400 FOR I=1 TO N
410 REM ANNUAL REVENUE CALCULATION (AR)
420 REM ANNUAL TRANSIT DEMAND ON ROUTE I
430 AD(I)=261*D1%(I)*N1(I)*T1(I)+104*D2%(I)*N2(I)*T2(I)
440 AR(I)=AD(I)*VF(I)
450 REM
455 CC(I)=0
460 REM ANNUAL CAPITAL COST CALCULATION (CC)
465 FOR J=1 TO M
470 X1(J) = (1+.01*IR)^LS%(J)
480 CF(J) =(IR * X1(J)/(X1(J)-1))*.01
490 XC(I,J) =  IC(J)*(1-S%(J)/100)*CF(J)*NB(I,J)
500 CC(I) = CC(I)+XC(I,J)
510 NEXT J
511 FD% = FS% - FR%
515 REM GARAGE COST/ROUTE (GCR)
516 GCR(I) =N1(I)*GCR/FD%
520 REM
530 REM ADMINISTRATION/OVERHEAD COST CALCULATION (AC)
540 AC(I) = AC*N1(I)/FD%
545 REM
550 REM
555 TC(I) = 0.0
560 REM ANNUAL MAINTENANCE COST CALCULATION (AM)
565 AM(I) = 0.0
570 FOR J=1 TO M
580 XM(I,J) = MC(J) * NB(I,J)
590 AM(I) = AM(I) + XM(I,J)
600 NEXT J
610 REM
620 REM OPERATING COST CALCULATION (OC)
625 DS(I) = 0.0
630 REM FUEL COST (FC)
635 FC(I) = 0.0
640 REM ANNUAL DISTANCE COVERED (DS)
645 FOR J = 1 TO M
650 XS(I,J) = 365 * NB(I,J) * ((5*T1(I)+2*T2(I))/7)*RL(I)
660 TC(I,J) = XS(I,J) * FR(J) * UF(J)
670 REM
680 REM TYRE COST (TC)
690 UC(I,J) = XS(I,J) * CT(J)/LT
700 DS(I) = DS(I) + XS(I,J)
710 FC(I) = FC(I) + TC(I,J)
720 TC(I) = TC(I) + UC(I,J)
730 NEXT J
740 REM INSURANCE COST (IS)
750 REM
760 IS(I) = 0
770 GC(I) = 0.0
780 LC(I) = 0
790 FOR J = 1 TO M
800 ZC(I,J) = IP(J) * NB(I,J)
810 REM GENERAL/NORMAL SERVICE COST (GC)
820 EC(I,J) = GS(J) * NB(I,J)
830 REM LICENSE COST (LC)
840 DC(I,J) = LF(J) * NB(I,J)
850 IS(I) = IS(I) + ZC(I,J)
860 GC(I) = GC(I) + EC(I,J)
870 LC(I) = LC(I) + DC(I,J)
875 NEXT J
880 REM DRIVER/CONDUCTORS WAGES (DQ)
888 REM
890 DQ(I) = (DW + CW) * (5*N1(I) + 2*N2(I))/7
900 OC(I) = FC(I) + IS(I) + GC(I) + LC(I) + DQ(I)
910 REM
920 REM TOTAL ANNUAL COST/EXPENSES (AE)
930 AE(I) = CC(I) + AC(I) + AM(I) + OC(I) + GCR(I) + CRI(I)
940 REM
950 REM
960 REM CALCULATION OF PERFORMANCE INDICATORS
970 REM AVERAGE SPEED (AS)
980 AS(I) = RL(I)/AT(I)
990 REM ANNUAL VOLUME OF PASSENGERS (VP)
1000  VP(I) = AD(I)
1010 REM ANNUAL VEHICLE KILOMETER(VK)
1020 VK(I) = DS(I)
1030 REM ANNUAL SEAT KILOMETER (SK)
1040 SK(I) = SCX(I) * VK(I)
1050 REM ANNUAL PASSENGERS KILOMETER (PK)
1060 REM
1070 PK(I) = VP(I) * RL(I)
1080 REM PASSENGER/VEHICLE (PV)
1090 PV(I) = PK(I)/VK(I)
1100 REM PASSENGER/SEAT (PS)
1110 PS(I) = PK(I)/SK(I)
1120 REM ANNUAL REVENUE/BUS (BR)
1125 BR(I) = AR(I)/N1(I)
1130 REM ANNUAL TOTAL REVENUE(TR)
1134 REM REVENUE/BUS/DAY(RD)
1135 RD(I) = BR(I)/365
1140 TR(I) = AR(I)
1150 REM REVENUE/VEHICLE-KILOMETER(RV)
1160 RV(I) = TR(I)/VK(I)
1170 REM REVENUE/SEAT-KILOMETER(RS)
1180 RS(I) = TR(I)/SK(I)
1190 REM REVENUE/PASSENGER-KILOMETER (RP)
1200 RP(I) = TR(I)/PK(I)
1210 REM ANNUAL OPERATING COST (OC)
1220 REM
1230 REM OPERATING COST/VEHICLE-KILOMETER (OV)
1240 OV(I) = OC(I)/VK(I)
1250 REM OPERATING COST/SEAT-KILOMETER (OS)
1260 OS(I) = OC(I)/SK(I)
1264 REM OPERATING COST/BUS/DAY(OD)
1265 OD(I) = OC(I)/(N1(I)*365)
1270 REM OPERATING COST/PASSENGER - KILOMETER (OP)
1280 OP(I) = OC(I)/PK(I)
1284 REM OPERATING COST/PASSENGER(OK)
1285 OK(I) = OC(I)/VP(I)
1290 REM ANNUAL TOTAL COST/EXPENSES (AE)
1300 REM TOTAL COST/VEHICLE - KILOMETER (CV)
1310 CV(I) = AE(I)/VK(I)
1320 REM TOTAL COST/SEAT - KILOMETER (CS)
1330 CS(I) = AE(I)/SK(I)
1340 REM TOTAL COST/PASSENGER-KILOMETER(CP)
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1350 CP(I) = AE(I)/PK(I)
1360 REM TOTAL COST/PASSENGER (PC)
1370 PC(I) = AE(I)/VP(I)
1380 REM
1390 REM REVENUE/COST RATIO (RC)
1400 RC(I) = AR(I)/AE(I)
1410 REM REVENUE/OPERATING COST RATIO (RO)
1420 RO(I) = AR(I)/OC(I)
1430 REM ANNUAL PROFIT OR LOSS (PL)
1440 PL(I) = AR(I) - AE(I)
1450 REM PROFIT OR LOSS/PASSENGER (PP)
1460 PP(I) = PL(I)/VP(I)
1464 REM PROFIT OR LOSS/BUS(PB)
1465 PB(I) = PL(I)/N1(I)
1470 REM RETURN ON INVESTMENT (RI)
1480 RI(I) = 100 * PL(I)/AE(I)
1510 REM ANNUAL COST/BUS (BC)
1515 BC(I) = AE(I)/(N1(I) * 365)
1520 REM PERSONNEL INFORMATION
1530 REM.
1540 REM EMPLOYEE/BUS (EB)
1550 EB(I) = NE/FD%
1560 REM ANNUAL REVENUE/EMPLOYEE (RE)
1570 RE(I) =(AR(I)*FD%)/(NE*N1(I))
1580 REM ANNUAL COST/EMPLOYEE (CE)
1590 CE(I) =(AE(I)*FD%)/(NE*N1(I))
1591 OE(I) = (OC(I)*FD%)/(NE*N1(I)): REM OPERATING COST/EMPLOYEE(OE)
1592 PE(I) = (PL(I)*FD%)/(NE*N1(I)): REM PROFIT OR LOSS/EMPLOYEE(PE)
1600 REM COVERAGE INFORMATION
1610 REM BUSES/100,000 POPULATION (BP)
1620 BP(I) = N*N1(I) * 10^5/LP
1630 REM KILOMETER/ POPULATION (KP)
1640 KP(I) = N*VK(I)/LP
1650 REM QUALITY OF SERVICE
1660 REM BREAKDOWNS/100000KM (BK)
1670 BK(I) = BN(I) * 10^5/ VK(I)
1680 REM ACCIDENTS/100000KM (AK)
1690 AK(I) = NA(I) * 10^5/ VK(I)
1700 REM
1710 IF PRA$ = "YES" GOTO 1725
1720 GOTO 2200
1725 LPRINT CHR$(12);
1730 PRINT : PRINT "NAME OF ROUTE   =";NR$(I)
1731 LPRINT :LPRINT "NAME OF ROUTE   =";NR$(I)
1740 PRINT "LENGTH OF ROUTE = ";RL(I)
1741 LPRINT "LENGTH OF ROUTE = ";RL(I)
1750 PRINT : PRINT TAB (3);" INDICATORS"; TAB(50); "VALUES"
1751 LPRINT :LPRINT TAB (3);" INDICATORS"; TAB(50); "VALUES"
1752 PRINT "------------------------------------------------------------"
1753 LPRINT "------------------------------------------------------------"
1760 PRINT "1.0 MARKETING AND OPERATIONAL COVERAGE"
1761 LPRINT "1.0 MARKETING AND OPERATIONAL COVERAGE"
1770 PRINT TAB(3); "FleetSize"; TAB(50); N1(I)
1771 LPRINT TAB(3); "FleetSize"; TAB(50); N1(I)
1790 PRINT TAB(3); "Buses/100,000 Population"; TAB(50);BP(I)
1791 LPRINT TAB(3); "Buses/100,000 Population"; TAB(50);BP(I)
1800 PRINT TAB(3); "Kilometer/ Population"; TAB(50); KP(I)
1801 LPRINT TAB(3); "Kilometer/ Population"; TAB(50); INT(KP(I)*100+.5)/100
1810 PRINT "2.0 FLEET UTILIZATION"
1811 LPRINT "2.0 FLEET UTILIZATION"
1820 PRINT TAB(3); "Annual Volume of Passengers"; TAB(50); VP(I)
1821 LPRINT TAB(3); "Annual Volume of Passengers"; TAB(50); VP(I)
1830 PRINT TAB(3); "Passengers/Seat"; TAB(50); PS(I)
1831 LPRINT TAB(3); "Passengers/Seat"; TAB(50); INT(PS(I)*100+.5)/100
1840 PRINT TAB(3); "Passengers/Vehicle"; TAB(50); PV(I)
1841 LPRINT TAB(3); "Passengers/Vehicle"; TAB(50); INT(PV(I)*100+.5)/100
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1850 PRINT TAB(3); "Annual Vehicle - Kilometer"; TAB(50); VK(I)
1851 LPRINT TAB(3); "Annual Vehicle - Kilometer"; TAB(50); VK(I)
1860 PRINT TAB(3); "Annual Seat-Kilometer"; TAB(50); SK(I)
1861 LPRINT TAB(3); "Annual Seat-Kilometer"; TAB(50); SK(I)
1870 PRINT TAB(3); "Annual Passenger-Kilometer"; TAB(50); PK(I)
1871 LPRINT TAB(3); "Annual Passenger-Kilometer"; TAB(50); PK(I)
1880 PRINT TAB(3);"Average Commercial Speed"; TAB(50); AS(I)
1881 LPRINT TAB(3);"Average Commercial Speed-Km/h";TAB(50);INT(AS(I)*100+.5)/100
1890 PRINT "3.0 QUALITY OF SERVICE"
1891 LPRINT "3.0 QUALITY OF SERVICE"
1900 PRINT TAB(3); "Breakdowns/100,000Km"; TAB(50); BK(I)
1901 LPRINT TAB(3); "Breakdowns/100,000Km"; TAB(50);INT(BK(I)*100+.5)/100
1910 PRINT TAB(3); "Accidents/100,000Km"; TAB(50); AK(I)
1911 LPRINT TAB(3); "Accidents/100,000Km"; TAB(50);INT(AK(I)*100+.5)/100
1920 PRINT "4.0 FINANCIAL CONTROL"
1921 LPRINT "4.0 FINANCIAL CONTROL  -Naira"
1930 PRINT TAB(3); "Annual Revenue"; TAB(50); AR(I)
1931 LPRINT TAB(3); "Annual Revenue"; TAB(50); AR(I)
1940 PRINT TAB(3); "Annual Revenue/Bus"; TAB(50); BR(I)
1941 LPRINT TAB(3);"Annual Revenue/Bus"; TAB(50); BR(I)
1950 PRINT TAB(3); "Revenue Vehicle-Km"; TAB(50); RV(I)
1951 LPRINT TAB(3); "Revenue/Vehicle-Km"; TAB(50);INT(RV(I)*100+.5)/100
1960 PRINT TAB(3); "Revenue/Seat-Km"; TAB(50); RS(I)
1961 LPRINT TAB(3); "Revenue/Seat-Km"; TAB(50);INT(RS(I)*100+.5)/100
1970 PRINT TAB(3); "Revenue/Passenger-Km";TAB(50); RP(I)
1971 LPRINT TAB(3); "Revenue/Passenger-Km";TAB(50);INT(RP(I)*100+.5)/100
1975 PRINT TAB(3); "Revenue/Passenger"; TAB(50); WF(I)
1976 LPRINT TAB(3); "Revenue/Passenger"; TAB(50); WF(I)
1980 PRINT TAB(3); "Annual Operating Cost"; TAB(50); OC(I)
1981 LPRINT TAB(3); "Annual Operating Cost"; TAB(50); OC(I)
1990 PRINT TAB(3); "Operating Cost/Vehicle-Km"; TAB(50);OV(I)
1991 LPRINT TAB(3);"Operating Cost/Vehicle-Km";TAB(50);INT(OV(I)*100+.5)/100
2000 PRINT TAB(3); "Operating Cost/Seat-Km"; TAB(50); OS(I)
2001 LPRINT TAB(3); "Operating Cost/Seat-Km"; TAB(50);INT(OS(I)*100+.5)/100
2010 PRINT TAB(3); "Operating Cost/Passenger-Km"; TAB(50); OP(I)
2011 LPRINT TAB(3);"Operating Cost/Passenger-Km";TAB(50);INT(OP(I)*100+.5)/100
2015 PRINT TAB(3); "Operating Cost/Passenger"; TAB(50); OK(I)
2016 LPRINT TAB(3); "Operating Cost/Passenger"; TAB(50);INT(OK(I)*100+.5)/100
2020 PRINT TAB(3); "Annual Total Cost or Expenses"; TAB(50); AE(I)
2021 LPRINT TAB(3); "Annual Total Cost or Expenses"; TAB(50); AE(I)
2030 PRINT TAB(3); "Total Cost/Vehicle-Km"; TAB(50); CV(I)
2031 LPRINT TAB(3); "Total Cost/Vehicle-Km"; TAB(50);INT(CV(I)*100+.5)/100
2040 PRINT TAB(3); "Total Cost/Seat-Km"; TAB(50); CS(I)
2041 LPRINT TAB(3); "Total Cost/Seat-Km"; TAB(50);INT(CS(I)*100+.5)/100
2050 PRINT TAB(3); "Total Cost/Passenger-Km"; TAB(50); CP(I)
2051 LPRINT TAB(3); "Total Cost/Passenger-Km"; TAB(50);INT(CP(I)*100+.5)/100
2060 PRINT TAB(3); "Total Cost/Passenger"; TAB(50); PC(I)
2061 LPRINT TAB(3); "Total Cost/Passenger"; TAB(50);INT(PC(I)*100+.5)/100
2070 PRINT TAB(3); "Revenue/Total Cost Ratio"; TAB(50); RC(I)
2071 LPRINT TAB(3); "Revenue/Total Cost Ratio"; TAB(50);INT(RC(I)*100+.5)/100
2080 PRINT TAB(3); "Revenue/Operating Cost Ratio"; TAB(50); RO(I)
2081 LPRINT TAB(3);"Revenue/Operating Cost  ";TAB(50);INT(RO(I)*100+.5)/100
2090 PRINT TAB(3); "Annual Profit or Loss"; TAB(50); PL(I)
2091 LPRINT TAB(3); "Annual Profit or Loss"; TAB(50); PL(I)
2100 PRINT TAB(3); "Profit or Loss/Passenger"; TAB(50); PP(I)
2101 LPRINT TAB(3); "Profit or Loss/Passenger"; TAB(50);INT(PP(I)*100+.5)/100
2105 PRINT TAB(3); "Profit or Loss/Bus"; TAB(50);PB(I)
2106 LPRINT TAB(3); "Profit or Loss/Bus"; TAB(50);PB(I)
2110 PRINT TAB(3); "Return on Investment" ; TAB(50); RI(I)
2111 LPRINT TAB(3); "Return on Investment" ; TAB(50);INT(RI(I)*100+.5)/100
2130 PRINT TAB(3); "Revenue/Bus/Day"; TAB(50); RD(I)
2131 LPRINT TAB(3); "Revenue/Bus/Day"; TAB(50);INT(RD(I)*100+.5)/100
2140 PRINT TAB(3); "Total Cost/Bus/Day"; TAB(50); BC(I)
2141 LPRINT TAB(3); "Total Cost/Bus/Day"; TAB(50);INT(BC(I)*100+.5)/100
2150 PRINT TAB(3); "Operating Cost/Bus/Day"; TAB(50); OD(I)
2151 LPRINT TAB(3); "Operating Cost/Bus/Day"; TAB(50);INT(OD(I)*100+.5)/100
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2160 PRINT "5.0 PERSONNEL MANAGEMENT"
2161 LPRINT "5.0 PERSONNEL MANAGEMENT  Naira"
2170 PRINT TAB(3); "Employee/Bus"; TAB(50); EB(I)
2171 LPRINT TAB(3); "Employee/Bus"; TAB(50); INT(EB(I)*100+.5)/100
2180 PRINT TAB(3); "Annual Revenue/Employee"; TAB(50); RE(I)
2181 LPRINT TAB(3); "Annual Revenue/Employee"; TAB(50); RE(I)
2190 PRINT TAB(3); "Annual Total Cost/Employee"; TAB(50); CE(I)
2191 LPRINT TAB(3);"Annual Total Cost/Employee";TAB(50);INT(CE(I)*100+.5)/100
2192 PRINT TAB(3); "Annual Operating Cost/Employee";TAB(50); OE(I)
2193 LPRINT TAB(3);"Annual Operating Cost/Empl.";TAB(50);INT(OE(I)*100+.5)/100
2194 PRINT TAB(3);"Annual Profit or Loss/Employee";TAB(50);PE(I)
2195 LPRINT TAB(3);"Annual Profit or Loss/Emple.";TAB(50);INT(PE(I)*100+.5)/100
2200 IF DG$ ="YES" GOTO 2250
2210 GOTO 4550
2250 REM GRAND SUMMARY
2300 TN1 = TN1 + N1(I)/N
2310 TBP = TBP + BP(I)/N
2320 TKP = TKP + KP(I)/N
2330 TVP = TVP + VP(I)/N
2340 TPS = TPS + PS(I)/N
2350 TPV = TPV + PV(I)/N
2360 TVK = TVK + VK(I)/N
2370 TSK = TSK + SK(I)/N
2380 TPK = TPK + PK(I)/N
2390 TAS = TAS + AS(I)/N
2400 TBK = TBK + BK(I)/N
2410 TAK = TAK + AK(I)/N
2420 TAR = TAR + AR(I)/N
2430 TBR = TBR + BR(I)/N
2440 TRV = TRV + RV(I)/N
2450 TRS = TRS + RS(I)/N
2460 TRP = TRP + RP(I)/N
2470 TWP = TWP + WP(I)/N
2480 TOC = TOC + OC(I)/N
2490 TOV = TOV + OV(I)/N
2500 TOS = TOS + OS(I)/N
2510 TOP = TOP + OP(I)/N
2520 TOK = TOK + OK(I)/N
2530 TAE = TAE + AE(I)/N
2540 TCV = TCV + CV(I)/N
2550 TCS = TCS + CS(I)/N
2560 TCP = TCP + CP(I)/N
2570 TPC = TPC + PC(I)/N
2580 TRC = TRC + RC(I)/N
2590 TRO = TRO + RO(I)/N
2600 TPL = TPL + PL(I)/N
2610 TPP = TPP + PP(I)/N
2620 TPB = TPB + PB(I)/N
2630 TRI = TRI + RI(I)/N
2640 TRD = TRD + RD(I)/N
2650 TBC = TBC + BC(I)/N
2660 TOD = TOD + OD(I)/N
2670 TEB = TEB + EB(I)/N
2680 TRE = TAR/(TN1 * TEB)
2690 TCE = TAE/(TN1 * TEB)
2700 TRL = TRL + RL(I)/N
2710 TOE = TOC/(TN1 * TEB)
2720 TPE = TPL/(TN1 * TEB)
2750 IF I < N  GOTO 4550
2755 LPRINT CHR$(12);
2760 PRINT : PRINT "GRAND SUMMARY OF TRANSIT PERFORMANCE INDICATORS"
2770 LPRINT :LPRINT "GRAND SUMMARY OF TRANSIT PERFORMANCE INDICATORS"
2780 PRINT "-------------------------------------------------------"
2790 LPRINT "-------------------------------------------------------"
2792 PRINT: PRINT ;NC$
2793 LPRINT:LPRINT ;NC$
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2800 IF  IU$ ="TBS" GOTO 2813
2810 PRINT :PRINT "      INTERCITY TRANSIT SERVICE     "
2811 LPRINT :LPRINT "      INTERCITY TRANSIT SERVICE     "
2812 GOTO 2815
2813 PRINT : PRINT "      URBAN TRANSIT SERVICE      "
2814 LPRINT :LPRINT "      URBAN TRANSIT SERVICE      "
2815 PRINT: PRINT "(A)   GRAND  ROUTE  AVERAGE  "
2816 LPRINT:LPRINT "(A)   GRAND  ROUTE  AVERAGE  "
3000 PRINT : PRINT TAB (3);" INDICATORS"; TAB(50); "VALUES"
3010 LPRINT :LPRINT TAB (3);" INDICATORS"; TAB(50); "VALUES"
3011 PRINT "-------------------------------------------------------------"
3012 LPRINT "-------------------------------------------------------------"
3020 PRINT "1.0 MARKETING AND OPERATIONAL COVERAGE"
3030 LPRINT "1.0 MARKETING AND OPERATIONAL COVERAGE"
3040 PRINT TAB(3); "FleetSize"; TAB(50);TNI
3050 LPRINT TAB(3); "FleetSize"; TAB(50);TNI
3060 PRINT TAB(3); "Buses/100,000 Population"; TAB(50);TBP
3070 LPRINT TAB(3); "Buses/100,000 Population"; TAB(50);TBP
3080 PRINT TAB(3); "Kilometer/ Population" ;TAB(50);TKP
3090 LPRINT TAB(3); "Kilometer/ Population";TAB(50);INT(TKP*100+.5)/100
3100 PRINT "2.0 FLEET UTILIZATION"
3110 LPRINT "2.0 FLEET UTILIZATION"
3120 PRINT TAB(3); "Annual Volume of Passengers"; TAB(50);TVP
3130 LPRINT TAB(3); "Annual Volume of Passengers"; TAB(50);TVP
3140 PRINT TAB(3); "Passengers/Seat"; TAB(50);TPS
3150 LPRINT TAB(3);"Passengers/Seat"; TAB(50); INT(TPS*100+.5)/100
3160 PRINT TAB(3); "Passengers/Vehicle"; TAB(50);TPV
3170 LPRINT TAB(3); "Passengers/Vehicle"; TAB(50); INT(TPV*100+.5)/100
3180 PRINT TAB(3); "Annual Vehicle - Kilometer"; TAB(50);TVK
3190 LPRINT TAB(3); "Annual Vehicle - Kilometer"; TAB(50);TVK
3200 PRINT TAB(3); "Annual Seat-Kilometer"; TAB(50);TSK
3210 LPRINT TAB(3); "Annual Seat-Kilometer"; TAB(50);TSK
3220 PRINT TAB(3); "Annual Passenger-Kilometer"; TAB(50);TPK
3230 LPRINT TAB(3); "Annual Passenger-Kilometer"; TAB(50);TPK
3240 PRINT TAB(3);"Average Commercial Speed"; TAB(50);TAS
3250 LPRINT TAB(3);"Average Commercial Speed"; TAB(50); INT(TAS*100+.5)/100
3260 PRINT "3.0 QUALITY OF SERVICE"
3270 LPRINT "3.0 QUALITY OF SERVICE"
3280 PRINT TAB(3); "Breakdowns/100,000Km"; TAB(50);TBK
3290 LPRINT TAB(3); "Breakdowns/100,000Km"; TAB(50);INT(TBK*100+.5)/100
3300 PRINT TAB(3); "Accidents/100,000Km"; TAB(50);TAK
3310 LPRINT TAB(3); "Accidents/100,000Km"; TAB(50);INT(TAK*100+.5)/100
3320 PRINT "4.0 FINANCIAL CONTROL"
3330 LPRINT "4.0 FINANCIAL CONTROL  -Naira"
3340 PRINT TAB(3); "Annual Revenue"; TAB(50);TAR
3350 LPRINT TAB(3); "Annual Revenue"; TAB(50);TAR
3360 PRINT TAB(3); "Annual Revenue/Bus"; TAB(50);TBR
3370 LPRINT TAB(3); "Annual Revenue/Bus"; TAB(50);TBR
3380 PRINT TAB(3); "Revenue Vehicle-Km"; TAB(50);TRV
3390 LPRINT TAB(3); "Revenue/Vehicle-Km"; TAB(50);INT(TRV*100+.5)/100
3400 PRINT TAB(3); "Revenue/Seat-Km"; TAB(50);TRS
3410 LPRINT TAB(3); "Revenue/Seat-Km"; TAB(50);INT(TRS*100+.5)/100
3420 PRINT TAB(3); "Revenue/Passenger-Km";TAB(50);TRP
3430 LPRINT TAB(3); "Revenue/Passenger-Km";TAB(50);INT(TRP*100+.5)/100
3440 PRINT TAB(3); "Revenue/Passenger"; TAB(50);TWF
3450 LPRINT TAB(3); "Revenue/Passenger"; TAB(50);TWF
3460 PRINT TAB(3); "Annual Operating Cost"; TAB(50);TOC
3470 LPRINT TAB(3); "Annual Operating Cost"; TAB(50);TOC
3480 PRINT TAB(3); "Operating Cost/Vehicle-Km"; TAB(50);TOV
3490 LPRINT TAB(3);"Operating Cost/Vehicle-Km";TAB(50);INT(TOV*100+.5)/100
3500 PRINT TAB(3); "Operating Cost/Seat-Km"; TAB(50);TOS
3510 LPRINT TAB(3); "Operating Cost/Seat-Km"; TAB(50);INT(TOS*100+.5)/100
3520 PRINT TAB(3); "Operating Cost/Passenger-Km"; TAB(50);TOP
3530 LPRINT TAB(3);"Operating Cost/Pasenger-Km";TAB(50);INT(TOP*100+.5)/100
3540 PRINT TAB(3); "Operating Cost/Passenger"; TAB(50);TOK
3550 LPRINT TAB(3); "Operating Cost/Passenger"; TAB(50);INT(TOK*100+.5)/100
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3560 PRINT TAB(3); "Annual Total Cost or Expenses"; TAB(50);TAE
3570 LPRINT TAB(3); "Annual Total Cost or Expenses"; TAB(50);TAE
3580 PRINT TAB(3); "Total Cost/Vehicle-Km"; TAB(50);TCV
3590 LPRINT TAB(3); "Total Cost/Vehicle-Km"; TAB(50);INT(TCV*100+.5)/100
3600 PRINT TAB(3); "Total Cost/Seat-Km"; TAB(50);TCS
3610 LPRINT TAB(3); "Total Cost/Seat-Km"; TAB(50);INT(TCS*100+.5)/100
3620 PRINT TAB(3); "Total Cost/Passenger-Km"; TAB(50);TCP
3630 LPRINT TAB(3); "Total Cost/Passenger-Km"; TAB(50);INT(TCP*100+.5)/100
3640 PRINT TAB(3); "Total Cost/Passenger"; TAB(50);TPC
3650 LPRINT TAB(3); "Total Cost/Passenger"; TAB(50);INT(TPC*100+.5)/100
3660 PRINT TAB(3); "Revenue/Total Cost Ratio"; TAB(50);TRC
3670 LPRINT TAB(3); "Revenue/Total Cost Ratio"; TAB(50);INT(TRC*100+.5)/100
3680 PRINT TAB(3); "Revenue/Operating Cost Ratio"; TAB(50);TRO
3690 LPRINT TAB(3);"Revenue/Operating Cost ";TAB(50);INT(TRO*100+.5)/100
3700 PRINT TAB(3); "Annual Profit or Loss"; TAB(50);TPL
3710 LPRINT TAB(3); "Annual Profit or Loss"; TAB(50);TPL
3720 PRINT TAB(3); "Profit or Loss/Passenger"; TAB(50);TPP
3730 LPRINT TAB(3);"Profit or Loss/Passenger"; TAB(50);INT(TPP*100+.5)/100
3740 PRINT TAB(3); "Profit or Loss/Bus"; TAB(50);TPB
3750 LPRINT TAB(3); "Profit or Loss/Bus"; TAB(50);TPB
3760 PRINT TAB(3); "Return on Investment" ; TAB(50);TRI
3770 LPRINT TAB(3); "Return on Investment" ; TAB(50);INT(TRI*100+.5)/100
3780 PRINT TAB(3); "Revenue/Bus/Day"; TAB(50);TRD
3790 LPRINT TAB(3); "Revenue/Bus/Day"; TAB(50);INT(TRD*100+.5)/100
3800 PRINT TAB(3); "Total Cost/Bus/Day"; TAB(50);TBC
3810 LPRINT TAB(3); "Total Cost/Bus/Day"; TAB(50);INT(TBC*100+.5)/100
3820 PRINT TAB(3); "Operating Cost/Bus/Day"; TAB(50);TOD
3830 LPRINT TAB(3); "Operating Cost/Bus/Day"; TAB(50);INT(TOD*100+.5)/100
3840 PRINT "5.0 PERSONNEL MANAGEMENT"
3850 LPRINT "5.0 PERSONNEL MANAGEMENT  -Naira"
3860 PRINT TAB(3); "Employee/Bus"; TAB(50);TEB
3870 LPRINT TAB(3); "Employee/Bus"; TAB(50);INT(TEB*100+.5)/100
3880 PRINT TAB(3); "Annual Revenue/Employee"; TAB(50);TRE
3890 LPRINT TAB(3); "Annual Revenue/Employee"; TAB(50);TRE
3900 PRINT TAB(3); "Annual Total Cost/Employee"; TAB(50);TCE
3910 LPRINT TAB(3);"Annual Total Cost/Employee";TAB(50);INT(TCE*100+.5)/100
3920 PRINT TAB(3); "Annual Operating Cost/Employee";TAB(50);TOE
3930 LPRINT TAB(3);"Annual Operating Cost/Empl.";TAB(50);INT(TOE *100+.5)/100
3940 PRINT TAB(3);"Annual Profit or Loss/Employee";TAB(50);TPE
3950 LPRINT TAB(3);"Annual Profit or Loss/Emplo.";TAB(50);INT(TPE *100+.5)/100
3954 RSC= 0!
3955 FOR J=1 TO N
3956 RCE(J)=NR(J)*(IC(J)*(1-SX(J)/100)*CF(J) + LC(J) + LP(J))
3957 RSC=RSC + RCE(J)
3958 NEXT J
3959 FX = FD%/(FU% * ME)
3960 GFS = FU% * 100!/FS%
3970 GRL = N * TRL
3980 GBP = TBP
3990 GKP = TKP
4000 GVP = N * TVP
4010 GVK = N * TVK
4020 GSK = N * TSK
4030 GPK = N * TPK
4040 GBK = TBK
4050 GAK = TAK
4060 GAR =(N * TAR) + AIR*FU%/FD%
4070 GOC = N * TOC
4080 GAE =(N * TAE) + AIC*FU%/FD% + RSC
4090 GPL = GAR - GAE
4100 GRE = GAR*FX
4110 GCE = GAE*FX
4120 GOE = N * TOE
4130 GPE = GPL*FX
4135 LPRINT CHR$(12);
4140 PRINT: PRINT "(B)   GRAND   ROUTE   TOTAL  "
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4150 LPRINT:LPRINT "(B)   GRAND   ROUTE   TOTAL "
4155 PRINT "-------------------------------------------------"
4156 LPRINT "-------------------------------------------------"
4160 PRINT TAB(3);"Grand No. ofBuses in Service ";TAB(50);FUX
4170 LPRINT TAB(3);"Grand No. ofBuses in Service ";TAB(50);FUX
4180 PRINT TAB(3);"Grand % of Fleet Size in Service";TAB(50);GFS
4190 LPRINT TAB(3);"Grand % of Fleet Size in Serv.";TAB(50);INT(GFS*100+.5)/100
4200 PRINT TAB(3);"Grand Length of Routes ";TAB(50);GRL
4210 LPRINT TAB(3);"Grand Length of Routes ";TAB(50);INT(GRL*100+.5)/100
4220 PRINT TAB(3); "Buses/100,000 Population"; TAB(50);GBP
4230 LPRINT TAB(3); "Buses/100,000 Population"; TAB(50);INT(GBP*100+.5)/100
4240 PRINT TAB(3); "Kilometer/ Population"; TAB(50);GKP
4250 LPRINT TAB(3); "Kilometer/ Population";TAB(50);INT(GKP*100+.5)/100
4260 PRINT TAB(3); "Annual Volume of Passengers"; TAB(50);GVP
4270 LPRINT TAB(3); "Annual Volume of Passengers"; TAB(50);INT(GVP*100+.5)/100
4280 PRINT TAB(3); "Annual Vehicle - Kilometer"; TAB(50);GVK
4290 LPRINT TAB(3); "Annual Vehicle - Kilometer"; TAB(50);INT(GVK*100+.5)/100
4300 PRINT TAB(3); "Annual Seat-Kilometer"; TAB(50);GSK
4310 LPRINT TAB(3); "Annual Seat-Kilometer"; TAB(50);GSK
4320 PRINT TAB(3); "Annual Passenger-Kilometer"; TAB(50);GPK
4330 LPRINT TAB(3); "Annual Passenger-Kilometer"; TAB(50);GPK
4340 PRINT TAB(3); "Breakdowns/100,000Km"; TAB(50);GBK
4350 LPRINT TAB(3); "Breakdowns/100,000Km"; TAB(50);INT(GBK*100+.5)/100
4360 PRINT TAB(3); "Accidents/100,000Km"; TAB(50);GAK
4370 LPRINT TAB(3); "Accidents/100,000Km"; TAB(50);INT(GAK*100+.5)/100
4380 PRINT TAB(3); "Annual Revenue (+Incidental)"; TAB(50);GAR
4390 LPRINT TAB(3); "Annual Revenue (+Incidental)";TAB(50);GAR
1400 PRINT TAB(3); "Annual Operating Cost"; TAB(50);GOC
4410 LPRINT TAB(3); "Annual Operating Cost"; TAB(50);GOC
4420 PRINT TAB(3); "Annual Total Cost or Expenses (+Others)"; TAB(50);GAE
4430 LPRINT TAB(3); "Annual Total Cost or Expenses (Others)"; TAB(50);GAE
4440 PRINT TAB(3); "Annual Profit or Loss"; TAB(50);GPL
4450 LPRINT TAB(3); "Annual Profit or Loss"; TAB(50);GPL
4460 PRINT TAB(3); "Annual Revenue/Employee"; TAB(50);GRE
4470 LPRINT TAB(3); "Annual Revenue/Employee"; TAB(50);GRE
4480 PRINT TAB(3); "Annual Total Cost/Employee"; TAB(50);GCE
4490 LPRINT TAB(3);"Annual Total Cost/Employee";TAB(50);INT(GCE*100+.5)/100
4500 PRINT TAB(3); "Annual Operating Cost/Employee";TAB(50);GOE
4510 LPRINT TAB(3);"Annual Operating Cost/Empl.";TAB(50);INT(GOE *100+.5)/100
4520 PRINT TAB(3);"Annual Profit or Loss/Employee";TAB(50);GPE
4530 LPRINT TAB(3);"Annual Profit or Loss/Emplo.";TAB(50);INT(GPE *100+.5)/100
4550 NEXT I
4600 IF ID$ = "YES" GOTO 5000
4610 GOTO 6000
5000 REM INPUT DATA
5005 LPRINT CHR$(12);
5010 PRINT: PRINT "              SUMMARY  OF  INPUT  DATA      "
5020 LPRINT:LPRINT "             SUMMARY  OF  INPUT  DATA      "
5030 PRINT "      ------------------------------------------------"
5040 LPRINT "     ------------------------------------------------"
5050 PRINT TAB(10);"Name of Corporation";TAB(40);NC$
5060 LPRINT TAB(10);"Name of Corporation";TAB(40);NC$
5070 PRINT TAB(10); "City Population"; TAB(50);LP
5080 LPRINT TAB(10); "City Population"; TAB(50);LP
5090 PRINT TAB(10); "Number of Routes"; TAB(50);N
5100 LPRINT TAB(10); "Number of Routes"; TAB(50);N
5110 PRINT TAB(10); "Type of Buses"; TAB(50); N
5120 LPRINT TAB(10); "Type of Buses"; TAB(50); N
5130 PRINT TAB(10); "Total Fleet Size"; TAB(50); FSX
5140 LPRINT TAB(10); "Total Fleet Size"; TAB(50); FSX
5150 PRINT TAB(10); "Fleet Size in Service";TAB(50); FUX
5160 LPRINT TAB(10); "Fleet Size in Service";TAB(50); FUX
5165 FOR I=1 TO N
5170 PRINT TAB(10); "Name of Routes"; TAB(50); NR$(I)
5180 LPRINT TAB(10); "Name of Routes"; TAB(50); NR$(I)
5185 NEXT I
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5186 FOR J = 1 TO N
5190 PRINT TAB(10); "Name of Buses";TAB(50); BUS$(J)
5191 LPRINT TAB(10); "Name of Buses";TAB(50); BUS$(J)
5195 NEXT J
5200 PRINT TAB(10); "Annual Cost of Garage    "; TAB(50); GCB
5210 LPRINT TAB(10); "Annual Cost of Garage    "; TAB(50); GCB
5211 PRINT TAB(10);"Annual Incidental Cost";TAB(50);AIC
5212 LPRINT TAB(10);"Annual Incidental Cost";TAB(50);AIC
5213 PRINT TAB(10);"Annual Incidental Revenues";TAB(50);AIR
5214 LPRINT TAB(10);"Annual Incidental Revenues";TAB(50);AIR
5215 FOR I = 1 TO N
5220 PRINT TAB(10); "Annual Cost of Route Infrastructures"; TAB(50); CRI(I)
5230 LPRINT TAB(10); "Annual Cost of Route Infrastructures"; TAB(50); CRI(I)
5235 NEXT I
5236 FOR I = 1 TO N
5240 PRINT TAB(10); "Average Seat Capacity/Bus/Route";TAB(50); SC%(I)
5250 LPRINT TAB(10); "Average Seat Capacity/Bus/Route";TAB(50); SC%(I)
5255 NEXT I
5256 FOR J = 1 TO N
5260 PRINT TAB(10); "Life Span of Buses"; TAB(50); LS%(J)
5270 LPRINT TAB(10); "Life Span of Buses"; TAB(50); LS%(J)
5275 NEXT J
5280 PRINT TAB(10); "Number of Employees"; TAB(50); NE
5290 LPRINT TAB(10); "Number of Employees"; TAB(50); NE
5300 PRINT TAB(10); "Administrative/Overhead Cost"; TAB(50); AC
5310 LPRINT TAB(10); "Administrative/Overhead Cost"; TAB(50); AC
5315 FOR J = 1 TO N
5320 PRINT TAB(10); "Initial Cost of Buses"; TAB(50); IC(J)
5330 LPRINT TAB(10); "Initial Cost of Buses"; TAB(50); IC(J)
5335 NEXT J
5336 FOR J = 1 TO N
5340 PRINT TAB(10); "Annual Maintenance/Repair Cost/Bus"; TAB(50); MC(J)
5350 LPRINT TAB(10); "Annual Maintenance/Repair Cost/Bus"; TAB(50); MC(J)
5355 NEXT J
5356 FOR J = 1 TO N
5360 PRINT TAB(10); "Salvage Value/Bus(% of Initial Cost)"; TAB(50); S%(J)
5370 LPRINT TAB(10); "Salvage Value/Bus(% of Initial Cost)"; TAB(50); S%(J)
5375 NEXT J
5380 PRINT TAB(10); "Discount Rate(%)"; TAB(50); IR
5390 LPRINT TAB(10); "Discount Rate(%)"; TAB(50); IR
5395 FOR J = 1 TO N
5400 PRINT TAB(10); "Fuel Consumption Rate(L/Km)"; TAB(50); FR(J)
5410 LPRINT TAB(10); "Fuel Consumption Rate(L/Km)"; TAB(50); FR(J)
5415 NEXT J
5416 FOR J = 1 TO N
5420 PRINT TAB(10); "Unit Cost of Fuel/Bus (N/L)"; TAB(50); UF(J)
5430 LPRINT TAB(10); "Unit Cost of Fuel/Bus (N/L)"; TAB(50); UF(J)
5435 NEXT J
5436 FOR J = 1 TO N
5440 PRINT TAB(10); "Cost of Tyres/Set/Bus"; TAB(50); CT(J)
5450 LPRINT TAB(10); "Cost of Tyres/Set/Bus"; TAB(50); CT(J)
5455 NEXT J
5460 PRINT TAB(10); "Life Span of Tyres"; TAB(50); LT
5470 LPRINT TAB(10); "Life Span of Tyres"; TAB(50); LT
5475 FOR J = 1 TO N
5480 PRINT TAB(10); "Insurance Premium/Bus"; TAB(50); IP(J)
5490 LPRINT TAB(10); "Insurance Premium/Bus"; TAB(50); IP(J)
5495 NEXT J
5496 FOR J = 1 TO N
5500 PRINT TAB(10); "General/Normal Service/Bus"; TAB(50); GS(J)
5510 LPRINT TAB(10); "General/Normal Service/Bus"; TAB(50); GS(J)
5515 NEXT J
5516 FOR J = 1 TO N
5520 PRINT TAB(10); "Licence Fee/Bus"; TAB(50); LF(J)
5530 LPRINT TAB(10); "Licence Fee/Bus"; TAB(50); LF(J)
5535 NEXT J
```

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5540 PRINT TAB(10); "Driver's Wage" TAB(50); DW
5550 LPRINT TAB(10); "Driver's Wage" TAB(50); DW
5560 PRINT TAB(10); "Conductor's Wage"; TAB(50); CW
5570 LPRINT TAB(10); "Conductor's Wage"; TAB(50); CW
5575 FOR I = 1 TO N
5580 PRINT TAB(10); "Fare/Route"; TAB(50); WF(I)
5590 LPRINT TAB(10); "Fare/Route"; TAB(50); WF(I)
5595 NEXT I
5596 FOR I = 1 TO N
5600 PRINT TAB(10); "Weekday Demand/Bus-Trip/Route";TAB(50); D1%(I)
5610 LPRINT TAB(10); "Weekday Demand/Bus-Trip/Route";TAB(50); D1%(I)
5615 NEXT I
5616 FOR I = 1 TO N
5620 PRINT TAB(10); "WeekEnd-Demand/Bus-Trip/Route"; TAB(50); D2%(I)
5630 LPRINT TAB(10); "WeekEnd-Demand/Bus-Trip/Route"; TAB(50); D2%(I)
5635 NEXT I
5636 FOR I = 1 TO N
5640 PRINT TAB(10); "Weekday Trips/Bus/Route"; TAB(50); T1(I)
5650 LPRINT TAB(10); "Weekday Trips/Bus/Route"; TAB(50); T1(I)
5655 NEXT I
5656 FOR I = 1 TO N
5660 PRINT TAB(10); "WeekEnd-Trips/Bus/Route"; TAB(50); T2(I)
5670 LPRINT TAB(10); "WeekEnd-Trips/Bus/Route"; TAB(50); T2(I)
5675 NEXT I
5676 FOR I = 1 TO N
5680 PRINT TAB(10); "Length of Route"; TAB(50); RL(I)
5690 LPRINT TAB(10); "Length of Route -Km"; TAB(50); RL(I)
5695 NEXT I
5696 FOR I = 1 TO N
5700 PRINT TAB(10); "One-Way Travel Time/Trip"; TAB(50);AT(I)
5710 LPRINT TAB(10); "One-Way Travel Time/Trip  -Hrs"; TAB(50);AT(I)
5715 NEXT I
5716 FOR I = 1 TO N
5720 PRINT TAB(10); "Number of Breakdowns/year"; TAB(50); BN(I)
5730 LPRINT TAB(10); "Number of Breakdowns/year"; TAB(50); BN(I)
5735 NEXT I
5736 FOR I = 1 TO N
5740 PRINT TAB(10); "No. of Accidents/year"; TAB(50); NA(I)
5750 LPRINT TAB(10); "No. of Accidents/year"; TAB(50); NA(I)
5755 NEXT I
5756 FOR I = 1 TO N
5760 PRINT TAB(10); "Weekday No. of Buses/Route"; TAB(50); N1(I)
5770 LPRINT TAB(10); "Weekday No. of Buses/Route"; TAB(50); N1(I)
5775 NEXT I
5776 FOR I = 1 TO N
5780 PRINT TAB(10); "WeekEnd-No. of Buses/Route"; TAB(50); N2(I)
5790 LPRINT TAB(10); "WeekEnd-No. of Buses/Route"; TAB(50); N2(I)
5795 NEXT I
5796 FOR I = 1 TO N
5797 FOR J = 1 TO M
5800 PRINT TAB(10); "Number of Buses/Type/Route"; TAB(50); NB(I,J)
5805 LPRINT TAB(10); "Number of Buses/Type/Route"; TAB(50); NB(I,J)
5810 NEXT J
5820 NEXT I
5830 PRINT TAB(10);"Fleet Size of Stored/Reserved Buses";TAB(50);FR%
5840 LPRINT TAB(10);"Fleet Size of Stored/Reserved Buses";TAB(50);FR%
5850 FOR J=1 TO M
5860 PRINT TAB(10);"Number of Stored/Reserved Buses";TAB(50);NR(J)
5870 LPRINT TAB(10);"Number of Stored/Reserved Buses";TAB(50);NR(J)
5880 NEXT J
6000 IF BA$="NO" GOTO 6300
6010 LPRINT CHR$(12);
6020 PRINT "£££££££££££££££££££££££££££££££££££££££££££££££££££££££"
6025 LPRINT "£££££££££££££££££££££££££££££££££££££££££££££££££££££££"
6030 PRINT: PRINT TAB(20);"Thank you for using my MASS TRANSIT CALCULATOR."
6035 LPRINT:LPRINT TAB(20);"Thank you for using my MASS TRANSIT CALCULATOR."
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6040 PRINT: PRINT TAB(20);"Hav· a nice day!!!"
6045 LPRINT:LPRINT TAB(20);"Have a nice day!!!"
6050 PRINT: PRINT TAB(25);"****DR. ABAYOMI BABALOLA****"
6055 LPRINT:LPRINT TAB(25);"****DR. ABAYOMI BABALOLA****"
6060 PRINT TAB(25);"Department of Civil Engineering"
6065 LPRINT TAB(25);"Department of Civil Engineering"
6070 PRINT TAB(25);"University of Ilorin"
6075 LPRINT TAB(25);"University of Ilorin"
6080 PRINT TAB(25);"P.M.B.1515 Ilorin"
6085 LPRINT TAB(25);"P.M.B.1515 Ilorin"
6090 PRINT TAB(25);"Kwara State,NIGERIA"
6095 LPRINT TAB(25);"Kwara State,NIGERIA"
6100 PRINT "£££££££££££££££££££££££££££££££££££££££££££££££££££££"
6105 LPRINT "£££££££££££££££££££££££££££££££££££££££££££££££££££££"
6300 END
7000 REM SUBROUTINE 1.
7001 LPRINT "AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"
7002 LPRINT "  "
7003 LPRINT "  "
7004 LPRINT "  "
7005 LPRINT "  "
7006 LPRINT "  "
7007 LPRINT "  "
7008 LPRINT "  "
7009 LPRINT "  "
7010 PRINT "            £££££  ££££    £   £  £   ££££  £££  £   £"
7015 LPRINT "            BBBBB  BBBB    B   B  B   BBBB  BBB  B   B"
7020 PRINT "             £   £  £  £ £  ££ £ £   £   £   £ £ £"
7025 LPRINT "            B   B  B  B B  BB B B   B   B   B B B"
7030 PRINT "            £   £  £  £ £  ££ £ £   £   £   £ £ £"
7035 LPRINT "            B   B  B  B B  BB B B   B   B   B B B"
7040 PRINT "            £   £ £  £  £ £ £ £ £   £   £   £ £"
7045 LPRINT "            B   B B  B  B B B B B   B   B   B B"
7050 PRINT "            £   ££   £££££ £ £ £  £££ £   £   £ £"
7055 LPRINT "            B   BB   BBBBB B B B  BBB B   B   B B"
7060 PRINT "            £   £ £  £  £ £ £ ££    £ £   £   £ £"
7065 LPRINT "            B   B B  B  B B B BB    B B   B   B B"
7070 PRINT "            £   £ £  £  £ £ £ ££    £ £   £   £ £"
7075 LPRINT "            B   B B  B  B B B BB    B B   B   B B"
7080 PRINT "            £   £ £  £  £ £ £ £     £ £   £   £ £"
7085 LPRINT "            B   B B  B  B B B B     B B   B   B B"
7090 PRINT "            £   £ £  £  £ £ £ £ ££££  £££ £  £ £££££"
7095 LPRINT "            B   B B  B  B B B B BBBB  BBB B  B BBBBB"
7100 LPRINT "  "
7110 LPRINT "AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA"
7120 LPRINT "  "
7130 LPRINT "  "
7140 LPRINT "  "
7150 LPRINT "  "
7160 LPRINT "  "
7170 LPRINT "  "
7180 LPRINT "  "
7200 RETURN
```

INDICATORS	GPO – KWARAPOLY	GPO – UNIVERSITY	OJA OBA – SHAO	OJA OBA – AFON	OJA OBA – EGBEJILA	AVERAGE
1.0 MARKETING AND OPERATIONAL COVERAGE						
Length of Routes	12.1	15.7	15.0	27.0	16.0	17.16
Fleet Size	4	4	2	1	1	2.4
Buses/100,000 Population	5	5	2.5	1.25	1.25	3
Kilometer / Population	4.42	4.58	2.19	1.48	.88	2.71
2.0 FLEET UTILIZATION						
Annual Volume of Passengers	642880	534336	275520	78252	71988	320595.2
Passengers / Seat	.67	.64	.66	.6	.55	.62
Passengers / Vehicle	22.02	22.87	23.59	17.87	16.44	20.56
Annual Vehicle – Kilometer	353320	366752	175200	118260	70080	216722.4
Annual Seat – Kilometer (million)	11.65956	13.20307	6.307200	3547800	2.102400	7.364007
Annual passenter – Kilometer (million)	7.776848	8.389075	4.132800	2.112804	1.151808	4.713087
Average Commercial speed–km/h	46.54	39.25	33.33	36	24.24	35.87
3.0 QUALITY OF SERVICE						
Breakdowns/100,000km	5.66	5.45	8.560001	8.46	14.27	8.479999
Accidents / 100,000km	1.13	1.09	1.71	1.69	2.85	1.7
4.0 FINANCIAL CONTROL – Naira						
Annual Revenue	192864	160300.8	82656	78252	21596.4	107133.8
Annual Revenue / Bus	48216	40075.2	41328	78252	21596.4	45893.53
Revenue / Vehicle – km	.55	.44	.47	.66	.31	.48
Revenue / Seat – km	.02	.01	.01	.02	.01	.01
Revenue / Passenger – km	.02	.02	.02	.04	.02	.02
Revenue / passenger	.3	.3	.3	1	.3	.44
Annual Operating Cost	126512.7	127974.1	63097.48	24284.18	20025.07	72278.68
Operating Cost / Vehicle – km	.36	.35	.36	.21	.29	.31
Operating Cost / Seat km	.01	.01	.01	.01	.01	.01
Operating Cost / Passenger – km	.02	.02	.02	.01	.02	.02
Operating Cost / Passenger	.2	.24	.23	.31	.28	.25
Annual Total cost or Expenses	414347.9	415809.3	207015.1	88594.47	84335.35	242020.4
Total Cost / Vehicle – km	1.17	1.13	1.18	.75	1.2	1.09
Total Cost / Seat – km	.04	.03	.03	.02	.04	.03
Total cost / Passenger – km	.05	.05	.05	.04	.07	.05
Total Cost / Passenger	.64	.78	.75	1.13	1.17	.9
Revenue / Total Cost Ratio	.47	.39	.4	.88	.26	.48
Revenue / Operating Cost	1.52	1.25	1.31	3.22	1.08	1.68
Annual Profit or Loss	–221483.9	–255508.5	–124359.1	–10342.47	–62738.96	–134886.6
Profit or Loss / Passenger	–.34	–.48	–.45	–.13	–.87	–.46
Profit or Loss / Bus	–55370.96	–63877.11	–62179.53	–10342.47	–62738.96	–50901.81
Return on Investment	–53.45	–61.45	–60.07	–11.67	–74.39	–52.21
Revenue / Bus / Day	132.1	109.8	113.23	214.39	59.17	125.74
Total Cost / Bus / Day	283.8	284.8	283.58	242.72	231.06	265.19
Operating Cost / Bus / Day	86.65	87.65	86.43	66.53	54.86	79.43
5.0 PERSONNEL MANAGEMENT Naira						
Employee / Bus	2.77	2.77	2.77	2.77	2.77	2.77
Annual Revenue / Employee	17360.19	14415.71	14897.3	28207.12	7784.749	16543.01
Annual Total Cost / Employee	37339.49	37471.18	37310.88	31935.22	30399.95	34891.34
Annual Operating Cost / Employee	11400.85	11532.55	11372.22	8753.599	7218.34	10055.51
Annual Profit or Loss / Employee	–19959.3	–23025.47	–22413.55	–3728.1	–22815.2	–18348.32

TABLE 2. A TYPICAL SUMMARY OF URBAN TRANSIT INPUT DATA

SUMMARY OF INPUT DATA

Name of Corporation	KWARA TRANSPORT CORPORATION	Cost of Tyres/Set/Bus	3720	No. of Accidents/year	4
City Population	400000	Cost of Tyres/Set/Bus	7800	No. of Accidents/year	3
Number of Routes	5	Cost of Tyres/Set/Bus	2000	No. of Accidents/year	2
Type of Buses	4	Life Span of Tyres	50000	No. of Accidents/year	2
Total Fleet Size	75	Insurance Premium/Bus	5000	Weekday No. of Buses/Route	4
Fleet Size in Service	12	Insurance Premium/Bus	5000	Weekday No. of Buses/Route	4
Name of Routes	GPO-KWARAPOLY	Insurance Premium/Bus	12000	Weekday No. of Buses/Route	2
Name of Routes	GPO-UNIVERSITY	Insurance Premium/Bus	5000	Weekday No. of Buses/Route	1
Name of Routes	OJA OBA-SHAO	General/Normal Service/Bus	2500	WeekEnd-No. of Buses/Route	1
Name of Routes	OJA OBA-AFON	General/Normal Service/Bus	13500	WeekEnd-No. of Buses/Route	2
Name of Routes	OJA OBA-AIRPORT/EGBEJILA	General/Normal Service/Bus	2500	WeekEnd-No. of Buses/Route	1
Name of Buses	Burem 24-seater	Licence Fee/Bus	330	WeekEnd-No. of Buses/Route	1
Name of Buses	Burem 30-seater	Licence Fee/Bus	330	WeekEnd-No. of Buses/Route	1
Name of Buses	M/Benz 41-seater	Licence Fee/Bus	420	Number of Buses/Type/Route	2
Name of Buses	Peugeot J5 16-seater	Driver's Wage	3000	Number of Buses/Type/Route	0
Annual Cost of Garage	0	Conductor's Wage	3000	Number of Buses/Type/Route	2
Annual Incidental Cost	0	Fare/Route	.3	Number of Buses/Type/Route	2
Annual Incidental Revenues	0	Fare/Route	.3	Number of Buses/Type/Route	0
Annual Cost of Route Infrastructures	0	Fare/Route	1	Number of Buses/Type/Route	0
Annual Cost of Route Infrastructures	0	Fare/Route	.3	Number of Buses/Type/Route	1
Annual Cost of Route Infrastructures	0	Weekday Demand/Bus-Trip/Route	28	Number of Buses/Type/Route	0
Annual Cost of Route Infrastructures	0	Weekday Demand/Bus-Trip/Route	29	Number of Buses/Type/Route	0
Annual Cost of Route Infrastructures	0	Weekday Demand/Bus-Trip/Route	30	Number of Buses/Type/Route	1
Average Seat Capacity/Bus/Route	33	Weekday Demand/Bus-Trip/Route	21	Number of Buses/Type/Route	0
Average Seat Capacity/Bus/Route	36	Weekday Demand/Bus-Trip/Route	19	Number of Buses/Type/Route	1
Average Seat Capacity/Bus/Route	36	WeekEnd-Demand/Bus-Trip/Route	14	Number of Buses/Type/Route	0
Average Seat Capacity/Bus/Route	30	WeekEnd-Demand/Bus-Trip/Route	15	Number of Buses/Type/Route	0
Average Seat Capacity/Bus/Route	30	WeekEnd-Demand/Bus-Trip/Route	15	Number of Buses/Type/Route	0
Life Span of Buses	5	WeekEnd-Demand/Bus-Trip/Route	10	Number of Buses/Type/Route	1
Life Span of Buses	5	WeekEnd-Demand/Bus-Trip/Route	10	Number of Buses/Type/Route	0
Life Span of Buses	10	Weekday Trips/Bus/Route	20	Number of Buses/Type/Route	0
Life Span of Buses	5	Weekday Trips/Bus/Route	16	Fleet Size of Stored/Reserved Buses	13
Number of Employees	172	Weekday Trips/Bus/Route	16	Number of Stored/Reserved Buses	4
Administrative/Overhead Cost	480000	Weekday Trips/Bus/Route	12	Number of Stored/Reserved Buses	3
Initial Cost of Buses	166000	Weekday Trips/Bus/Route	12	Number of Stored/Reserved Buses	2
Initial Cost of Buses	166000	WeekEnd-Trips/Bus/Route	20	Number of Stored/Reserved Buses	4
Initial Cost of Buses	200000	WeekEnd-Trips/Bus/Route	16		
Initial Cost of Buses	61000	WeekEnd-Trips/Bus/Route	16		
Annual Maintenance/Repair Cost/Bus	12000	WeekEnd-Trips/Bus/Route	12		
Annual Maintenance/Repair Cost/Bus	12000	WeekEnd-Trips/Bus/Route	12		
Annual Maintenance/Repair Cost/Bus	36000	Length of Route -Km	12.1		
Annual Maintenance/Repair Cost/Bus	12000	Length of Route -Km	15.7		
Salvage Value/Bus(% of Initial Cost)	10	Length of Route -Km	15		
Salvage Value/Bus(% of Initial Cost)	10	Length of Route -Km	27		
Salvage Value/Bus(% of Initial Cost)	10	Length of Route -Km	16		
Salvage Value/Bus(% of Initial Cost)	10	One-Way Travel Time/Trip -Hrs	.26		
Discount Rate(%)	15	One-Way Travel Time/Trip -Hrs	.4		
Fuel Consumption Rate(L/Km)	.26	One-Way Travel Time/Trip -Hrs	.45		
Fuel Consumption Rate(L/Km)	.26	One-Way Travel Time/Trip -Hrs	.75		
Fuel Consumption Rate(L/Km)	.38	One-Way Travel Time/Trip -Hrs	.66		
Fuel Consumption Rate(L/Km)	.38	Number of Breakdowns/year	20		
Unit Cost of Fuel/Bus (N/L)	.34	Number of Breakdowns/year	20		
Unit Cost of Fuel/Bus (N/L)	.34	Number of Breakdowns/year	15		
Unit Cost of Fuel/Bus (N/L)	.34	Number of Breakdowns/year	10		
Unit Cost of Fuel/Bus (N/L)	.6	Number of Breakdowns/year	10		
Cost of Tyres/Set/Bus	3720	No. of Accidents/year	4		