Bus Route Concessions in Maputo

August 2008

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BACKGROUND

FEMATRO proposes to operate selected public transport services in Maputo as a pilot project to demonstrate the concept of operating routes under concessions awarded by the municipality or other authorities responsible for urban transport. This document details the routes which have been selected and sets out the requirements for implementing and operating the services concerned.

FEMATRO-SELECTED ROUTES

The routes listed in the following table have been selected by FEMATRO.

Table 1

Details about FEMATRO-selected Routes, by Route Number

	Route 1	Route 2	Route 3
Association	UTRAMAP	UNICOTRAMA	ATROMAP
From	Museu	Museu	Museu
To	Machava Socimol	Zona Verde	Zimpeto
via	Av 24 Julho	Av Ed Mondlane	Av Ed Mondlane
Route length (kms)	25	20	24
Vehicles 15 seats	35	4	12
Vehicles 25-33 seats	15	60	158
Total Chapas	50	64	170
TPM buses	?	0	?
Total vehicles	?	64	?
Est. daily passengers	17,750	29,250	78,000
Total est. passengers (chapas)	23,510	29,250	81,840
Est. daily passengers TPM	5,760	0	3840
Peak frequency (minutes)	10-12	10-12	10-12
Off-peak frequency	30	30	30

Note: These details were provided by FEMATRO and may not be accurate.

The route to Zimpeto has three variations at the outer end: the main route terminates at Zimpeto, one route branches off to Malhazine, and another branches off to Matandene.

Details of the number of buses operated by TPM on these routes could not be obtained, but it is understood that none are operated on the Zona Verde route. From observation, TPM is operating several buses (including new VWs), at a relatively high frequency, on the Machava route, and a smaller number on the Zimpeto route.

Terminal facilities on these routes are basic. The terminal at Museu consists of on-street curbside loading points and a poorly surfaced parking space between the main carriageways. Loading points are poorly organized, and there are no facilities for passengers, crews, or supervisors. Outer terminals are no more than roadside areas where vehicles can stand and load—again with no facilities. Parking space at the outer terminals is limited, so vehicles can stand for only short periods.

Road conditions on some parts of the routes are very poor. Parts of the road surface between Jardim and Machava are badly potholed and require vehicles to travel at very low speeds. The road between Matandene and its junction with Mozambique Avenue is unsurfaced and also necessitates low speed.

It is not clear how the TPM passenger load figures were calculated. The passenger loads for chapas were estimated on the assumption that each vehicle makes 12 round trips per day. This is an unrealistic assumption: 12 trips equates to approximately 600 kilometers per day, which is not possible in city service: over a 16-hour day it represents continuous running at 37.5 kilometers per hour, without allowing for time spent at terminals or intermediate stops. Also, no accurate information is available regarding the number of passengers actually carried on each journey: the number depends not only on the capacity of the vehicle but also on the number of passengers picked up and set down along the route. Accurate information is essential for planning purposes and must be obtained by means of surveys. Details of the necessary surveys are given in Appendix A.

Other information that is not available but is required for planning includes

- Number of owners and fleet size of each owner,
- Revenue for each route (can be estimated from the results of the traffic surveys), and
- Other routes on the same corridor and numbers of vehicles on each

COMMENT ON SELECTED ROUTES

Routes 2 and 3 run along Av Eduardo Mondlane and therefore might be regarded as variations of one route; they should therefore be coordinated as far as possible. All three routes run together along Mozambique Avenue for about 5 kilometers. Some therefore argue for implementing concessions on the three routes simultaneously. Setting up one concession will already be a difficult task, and to attempt to set up two or three concessions simultaneously would dilute resources and make the task even more difficult. It would be preferable to set up one concession first and resolve any problems that arise before commencing the second. Lessons learned from implementing the first will speed up the implementation of the second and third. It should be possible to implement all three concessions over a period of two to three months.

TPM operates on two of the routes. To demonstrate how a concession should work, the concession should be exclusive; i.e., there should be no other operator on the route. Even with TPM's withdrawal, on some sections of the three routes concerned, chapas operating with licenses for other routes also provide service along these three routes , which will reduce the

effectiveness of the demonstration on the sections of route concerned. Where other, legitimate services do not duplicate the selected routes, it is important that there are no illegal operators competing with the concession. Cooperation from enforcement agencies is essential to ensure that the concession is exclusive in practice and not just on paper.

In practice it may not be possible to have TPM buses withdrawn from these routes, so that TPM and chapas will in effect be operating in parallel. Rather than regarding this as a competitive situation, however, it would be preferable to treat the two operators as complementary, catering to different markets. The chapas, which charge higher fares, should aim at the segment of the market that can pay higher fares for superior service: it is up to the chapa operators to ensure that the service that they provide is in fact superior to that offered by TPM. Superiority may take the form of more comfortable and faster service. The smaller chapas have better acceleration and will spend less time at stops than the larger TPM buses, so that running times will be more competitive. And if adequate capacity is provided, the chapas should be able to offer a more comfortable journey. This is to a large extent the situation at present, although there is inadequate capacity on most chapa routes, particularly at peak times.

If TPM cannot be persuaded to withdraw from these routes, it is recommended that the first concession implemented be on the route to Zona Verde, which is not duplicated by TPM.

ORGANIZATION OF CONCESSIONS

Operating Units

A single operating unit must have sole responsibility for controlling all vehicles operating on the route concerned. The operating unit may take one of several forms but in practice the two practical alternatives for Maputo are a cooperative of vehicle owners or a joint stock company. The latter is preferable in the longer term, but in the short term, owners are unlikely to agree to give up their vehicles in return for paper shares. Initially, therefore, owners should form a cooperative for each route, which may later develop into a formal company when its members learn more about the benefits of such an organization.

The cooperative will be responsible for

- Producing timetables for all vehicles used on the route,
- Allocating duties to vehicles and drivers,
- Ensuring that drivers operate in accordance with timetables,
- Keeping accurate records of the journeys operated by each vehicle,
- Ensuring that drivers make the correct payments to the cooperative and vehicle owners,
- Monitoring the use and performance of the service, and adjusting timetables as required,
- Ensuring that vehicles are properly maintained and safely operated,
- Ensuring that vehicles and crews are properly presented (e.g., cleanly, appearance is professional, etc.),
- Dealing with enquiries and complaints from passengers and other road users, and
- Ensuring that sufficient vehicles and drivers are available to meet demand at all times.

The owners should appoint a board of directors to represent their interests; the board should consist of between six and ten qualified members of the cooperative, with skills and expertise such as accountancy, law, and general business management if these are available amongst the chapa owners. The cooperative will require the following full-time salaried officers to manage the business on a day-to-day basis:

- General Manager (with one assistant)
- Operations Manager (assisted by supervisors and mechanics)
- Financial Manager (assisted by cashiers)
- Administrative Manager (assisted by clerks).

The number of supervisors, mechanics, cashiers, and clerks will depend on the number of vehicles operated and the number of terminals on the route concerned, as discussed later.

The expertise required for planning and scheduling services is highly specialized, and expecting a cooperative that is responsible for only one route to have such expertise is not realistic. FEMATRO should provide assistance with this function—setting up a small office (one to three people) providing expert assistance to concession holders. External assistance to FEMATRO will be necessary for the establishment of this office and training of its staff.

Operating Systems

Chapas do not operate to any timetable but normally depart from the terminals only when they have a full load. It is proposed that under the new concession arrangement, chapas operate in accordance with timetables designed to match supply with demand as closely as possible, and to optimize the use of vehicles and crews. This will mean that service frequencies will vary according to the time of day and day of the week. On some routes, particularly the longer ones, frequency may also vary on different portions of the route, by operating some vehicles for less than the full length of the route. Typically, frequencies will be higher on the portion of route closer to the city center. It may be appropriate for some journeys to operate on a limited-stop basis, stopping at only a few major stops, or even nonstop between terminals, to reduce journey times and improve vehicle utilization. Depending on the demand characteristics of the routes, such journeys might operate at peak periods only, or it may be appropriate for them to operate throughout the day.

More chapas will be operated at busy times than at less-busy times, so the length of the working day for vehicles and drivers will vary. Every day each chapa and driver will be allocated a duty—a number of trips to be operated at specified times. Duties will vary in length and in the number of trips operated. Duties will be allocated on a rotating basis, with each chapa remaining on the same duty for one week, then moving to the next duty on the list, until all duties have been operated. In this way every chapa and driver will have an equal workload over a period of time.

Some chapas will be required to operate for the full working day of over 16 hours. Because the utilization of vehicles will be more intensive than at present, in order to maximize efficiency, the amount of time spent standing at terminals between trips will be substantially reduced, and there will be only minimal time for drivers to rest between trips. In such cases, chapas must be driven by two drivers working in shifts. This will be another departure from present practice but will make the operation more profitable and permit drivers' and owners' earnings to increase.

At present every chapa driver pays a predetermined amount of money daily to the chapa owner. In some cases no salary is paid, while in other cases a drivers must pay the owner a greater daily amount, but receives a monthly salary. These simple but effective methods of driver emolument and revenue control are reasonably equitable at present because most drivers operate the same number of journeys and collect a similar amount of revenue each day. However, if vehicles are scheduled for maximum efficiency, some will operate more journeys per day than others, and all will operate more journeys on some days than on other days. Some chapas will operate at peak times only, while others will operate all day; of these, some may work a longer day than others. When a chapa is working it will spend a greater proportion of its time moving than it does at present, so that the revenue earned per hour will increase, but daily revenue will vary substantially between one duty and another.

This means that it will no longer be equitable to charge drivers the same amount each day, because some will earn more revenue on some days than on others. There are various ways of addressing this problem, but it is important to keep the procedure as simple as possible. It is therefore recommended that the present systems remain broadly unchanged, except that drivers should be required to pay the chapa owner a fixed rate for every journey operated, instead of per day worked. This payment would include a sum for the vehicle owner plus a contribution to the costs of running the cooperative. If the owner requires, the cooperative would collect this money daily, and after deducting its contribution, would pay the balance to the vehicle owner; otherwise, the cooperative would collect its charges daily from the drivers, and the drivers would pay the owner's charge direct. It is also recommended that each week all chapas rotate through the duties, so that over a period (probably of about six months) all will have an equal share of the high- and low-revenue duties.

It will be necessary to introduce controls if more than one driver is allocated to a vehicle. In particular, it will be necessary to implement controls over fuel. At present the driver pays for the fuel used by his own vehicle from revenue collected, but with more than one driver, the cost of fuel must be apportioned equitably between them.

Cooperative officers should supervise the departure of vehicles from each terminal, to ensure that they leave the terminal in accordance with the timetable, and record the arrival and departure of each vehicle so that an accurate record is kept of the number of trips made by each, and that drivers are charged for the correct number of trips.

At present, although bus stops and shelters are provided at some points on most routes, chapa drivers stop virtually anywhere to pick up and set down passengers. For a more formal operation it is preferable for vehicles to stop at recognized stopping places only, which should be clearly marked so that passengers know where to wait for vehicles and drivers know where to stop. Drivers should be penalized for stopping at other points. Bus stops should be located according to passengers' requirements, taking into account the need to minimize obstruction of other traffic and with particular consideration for safety.

Finally, it is essential that appropriate routines ensure that safety requirements are met. This will involve the development of procedures, including regular inspection of vehicles and monitoring of driver performance, together with appropriate recordkeeping systems and disciplinary procedures.

Vehicles

Ideally all vehicles on a route are of similar capacity. Already the majority of chapas on the selected routes are of 25 to 33 seat capacity, and it is to be hoped that the new 25-to-29–seat chapas financed through Millennium-bim will also be used on these routes. Some will replace small chapas that are due for scrapping or that can be transferred to other routes. If possible, chapas should be transferred between routes so that only the larger vehicles are used on the pilot concessions.

When more accurate information on demand is available, permitting vehicles to be scheduled more efficiently, the present number of vehicles may be found to be insufficient or excessive to meet demand. If there are excess vehicles, the surplus should be transferred to other routes. If there are insufficient vehicles, a decision must be made either to transfer additional vehicles from other routes (which would leave those routes short of vehicles unless they have excess vehicles), or to schedule the pilot routes to use the vehicles that are available and to allocate any new vehicles to those routes. It is probable, however, that with efficient vehicle utilization and adequate preventive maintenance, which will improve vehicle availability, sufficient vehicles will be available to provide service.

For the longer term, analysis of traffic on the pilot concession routes will indicate what the optimum vehicle size is for those routes, and vehicle acquisitions should be based on this analysis.

A decision should be made as to whether there should be any distinctive livery or route branding for the routes concerned. The new buses are painted in an advertising livery for Millennium-bim, which restricts the options in this respect. However, designing a distinctive brand for the remaining vehicles on the routes concerned would have publicity benefits. It is recommended that each route be allocated a unique route number; variations of a route should be identified, possibly with a suffix letter, for example:

- 1—Museu–Machava Socimol
- 2—Museu–Zona Verde
- 3—Museu–Zimpeto
- 3A—Museu–Malhazine
- 3B—Museu–Matandene

Maintenance

Vehicle maintenance should be more formally organized than is now the case. The cooperative should employ one or more mechanics whose main responsibility is to check that vehicles are roadworthy and safe and to carry out minor repairs.

The cooperative should implement a preventive maintenance program, with vehicle inspections and servicing scheduled in coordination with the operating timetable. Most minor maintenance will take place on days when vehicles are scheduled to operate at peak periods only. Vehicles should be scheduled for a day out of service for major maintenance. Initially owners will have the option of having vehicles maintained either at a workshop of their choice or by a workshop selected by the cooperative. The latter option should be encouraged in the short term and made compulsory in the longer term. Eventually the cooperative may acquire its own maintenance workshops.

As well as improving safety and environmental standards, the preventive maintenance program will minimize the number of vehicles breaking down while in service and improve the number of vehicles available for service at any time. A small number of vehicles may be scheduled each day as standbys for vehicles that break down in service, but the exact number can be determined only in light of operating experience. As operators become more familiar with the maintenance system, and vehicle condition improves, the number of standby vehicles required will decline.

INFRASTRUCTURE REQUIREMENTS

The efficiency of the operation will improve if suitable infrastructure is provided. This includes

- Terminal facilities,
- Depot,
- Offices,
- Bus stops,
- Pavement improvements near bus stops, and
- Road improvements

Existing terminal facilities, particularly those at the outer ends of routes, are basic and could be improved by the provision of clearly defined loading platforms, shelters for passengers, a good surface, and basic facilities for staff. Staff facilities include a small office or shelter for officers supervising the operation, with, at the main terminal, a small storage space for frequently required vehicle parts such as light bulbs and fan belts. At the main terminal an inspection pit or ramp where mechanics can inspect vehicles and carry out minor repairs would be ideal. The provision of terminal facilities should be the responsibility of the municipality, although the operators using them should be consulted on the design of the facilities.

If possible the cooperative should have the use of depot facilities where vehicles can be parked overnight, cleaned, serviced, and maintained. If the depot is located near the main terminal, an inspection pit or ramp at the terminal would not be required. At present most chapa owners have their own arrangements for parking and servicing. Many simply use on-street parking overnight, but as the size of vehicles increases, this solution will become less satisfactory. Depot facilities may be used exclusively by one cooperative, but in certain circumstances several cooperatives might share a single large facility. The operators should make their own arrangements with regard to depot facilities.

Office accommodation will be required for the staff of the cooperative. Offices may be at one of the terminals or at the depot if there is one. Otherwise offices should be close to a terminal or the depot. The provision of offices should be the responsibility of the cooperative.

Chapas on these routes should stop only at designated intermediate bus stops. These should be clearly marked, and passenger shelters should be provided at busy stops. It may be necessary for the pavements to be improved in the vicinity of some stops to improve the safety and convenience of passengers. This should be the responsibility of the municipality.

The cooperatives should identify any requirements for road improvements on the routes concerned, and bring these to the attention of the municipality.

MONITORING AND EVALUATION

Procedures for monitoring the operation of the service and the number of passengers carried must be put into place, so that timetables can be amended to rectify deficiencies that become evident and updated to reflect changes. For example, additional journeys may be needed to accommodate an increase in the number of passengers traveling, or running times may have to be increased if vehicles suffer from increasing delays due to traffic congestion.

It will also be necessary to monitor trends in performance, such as increases in ridership, and to compare these with other services that are operated under the present arrangements, so that the benefits of operating under a more organized regime can be highlighted. This will entail a management information system for each operating unit and periodic surveys of other services for comparison.

A management information system generating key performance indicators should be developed for these purposes, including:

- Number of passengers carried per vehicle per day
- Number of kilometers operated per vehicle per day
- Number of hours worked per driver per day
- Number of kilometers operated per driver per day
- Number of vehicles available for service each day as a percentage of the total fleet
- Number of breakdowns per 10,000 kilometers
- Number of accidents per 100,000 kilometers
- Proportion of operating to idle time
- Fuel consumption (liters per 100 kilometers)

PREPARATORY WORK REQUIRED

The following tasks will be necessary before operations can commence:

- Select owners and operators
- Conduct route surveys
- Conduct traffic surveys
- Set up organization of cooperative
- Recruit staff
- Develop schedules
- Decide fare structure and levels
- Develop operating systems and procedures
- Train staff
- Negotiate agreement with vehicle owners and operators
- Formally establish cooperative

Selection of Owners and Operators

The members of the cooperatives may be the chapa owners currently operating on the routes concerned, but the associations may consider it desirable to replace some owners with those from other routes, for example if their vehicles are more suitable or if it is believed that they will perform more satisfactorily. This task should be undertaken by the associations currently managing the operation of the routes concerned, with assistance from FEMATRO.

For this exercise it would be useful for FEMATRO to set up and maintain a database of all vehicles operated by the various owners, including registration number, make, model, age, capacity, route, etc. This would be valuable for planning future concessions as well as for identifying the vehicles and operators involved in the pilot concessions.

An essential task will be to "sell" the concession concept to the owners, operators, and drivers, most of whom probably will have concerns, in particular that drivers' incomes and job security will be threatened and that owners will lose control of their vehicles and their investment. All must be convinced that the new method of operation will be beneficial to them and that their cooperation will benefit all concerned. A series of presentations and workshops should be arranged to give the opportunity for owners, operators, and drivers to raise their concerns and FEMATRO to answer them.

It is particularly important that drivers understand the need for the surveys and that they give their full cooperation. They may fear that the surveys will provide information that chapa owners will use to the drivers' disadvantage; this fear must be dispelled. Otherwise the drivers will obstruct the surveyors and the data collected will be unreliable.

Route Surveys

A detailed survey must be carried out of each of the routes concerned to identify stops, terminals, potential intermediate turning points, and other features relevant to the operation. Bus stops should be located in accordance with passenger requirements but should also take into account safety and avoiding obstruction of other traffic. Any need for improvements in road or pavement condition or to bus stops and terminals should be identified and brought to the attention of authorities. Ideally this task will be carried out by an officer of the new cooperative.

It will also be necessary to determine any other bus services operating along the roads concerned, those of chapa associations, TPM, or illegal operators, so that the services can be taken into account when the capacity requirements along each section of the route are determined

During the route surveys, suitable locations should be identified for the roadside surveys (see below).

Traffic Surveys

To produce realistic timetables in tune with passenger demand and to ensure that the appropriate number of vehicles is operated, it will be necessary to carry out surveys to determine the

- Number of passengers carried per trip, at different times of the day and on different days of the week;
- Journey times between terminals and between main intermediate points, at different times of the day and on different days of the week;
- Actual number of chapas operating each day (as opposed to those licensed to operate on the route);
- Number of trips currently operated per day by each chapa

- The proportion of running time to standing time at terminals
- Levels of demand on different portions of each route

Surveys should be carried out on three days, including one weekday (Monday–Friday), a Saturday, and a Sunday, since travel patterns are likely to be different on these days. Details of how the surveys should be carried out and examples of the survey forms to be used are given in Appendix A.

Set up Organization of Cooperative

The organization and management structure of the new cooperative for each route must be clearly defined. The broad structure was outlined earlier, but the exact numbers of staff must be agreed. These will depend largely on the number of vehicles and terminals and the amount of administrative work involved in handling cash on behalf of the chapa owners. Approximate numbers for each route are likely to be as follows:

General manager	1
General manager's assistant	1
Operations manager	1
Supervisors	3 per outer terminal (5 at Museu terminal) + 3 per route
Mechanics	1 for every 25 vehicles
Financial manager	1
Cashiers	2
Administrative manager	1
Clerks	1 for every 25 vehicles

In addition to these operational staff, it may be necessary to employ security staff and unskilled laborers for general duties at terminals, offices, and depots.

The principal responsibilities of each of these staff categories are shown in Appendix B.

Recruit Staff

Staff must be capable of carrying out the duties to be assigned to them or of being trained to carry out those tasks. Staff should be recruited from existing operators if possible so that they have some knowledge of the operation: for example a chapa owner may have the required skills to fill the general manager's position, while drivers wishing to transfer to a nondriving job may be suitable as supervisors, if they have the level of literacy required for the administrative aspects of the job. Selection should be carried out by the members of the association forming the cooperative, but some assistance from FEMATRO may be appropriate.

Develop Timetables and Schedules

Developing timetables and schedules is one of the most important tasks. Timetables must be constructed that show the departure times of each journey from each terminal and at main intermediate points. Timetables should be in tune with passengers' travel patterns (as revealed by the surveys). Because travel patterns vary from one day to another, different timetables will be required for different days of the week. Three different timetables will probably be required: one for weekdays (Monday–Friday), one for Saturdays, and one for Sundays.

The schedules should take into account other services operating along part of the routes. These will cater for some of the demand on short sections. In the long term the schedules of

all routes in the city should be coordinated for maximum efficiency and this will be possible when all routes are operated under concessions. Initially, however, timetables must be compiled on the assumption that services on other parallel routes will remain unchanged.

From the timetables, schedules should be compiled showing the working of each vehicle. This will show the times (departure from one terminal and arrival at the other, and at main intermediate points) for every journey to be operated by the vehicle during the course of its working day. Vehicle schedules should be compiled to optimize utilization of each vehicle: idle time at terminals should be minimized while sufficient time should be allotted for loading, crews' rest breaks, and recovery from delays caused by traffic congestion. The length of the working day for each vehicle may vary, since fewer vehicles are required in the early morning, late evening and between the peak periods. It is likely that some vehicles will have to work two spells of duty in a day— the morning and evening peaks—a break between. This arrangement is more efficient than keeping all vehicles in service for the full day, but increasing the idle time at terminals at off-peak times, as occurs at present. During such off-peak breaks the vehicles will be available for preventive maintenance, which should be programmed in coordination with the operating schedules.

On basis of the individual bus schedules, duties should be compiled for drivers and conductors. If vehicles are to be utilized efficiently, and crews are not to be required to work excessive hours, some, if not all, vehicles will have to be manned by more than one crew, working in shifts.

Finally, it will be necessary to compile duty rotas for both vehicles and crews, in which each vehicle and crew works a different duty each week in rotation, so that over a period (which will be several months on a route with a large number of vehicles) each vehicle and each crew will have a turn on every duty, so that the workload, and revenue-earning potential, is shared equally among operators and crews. The rota must take into account the need for rest days for crews, and the need to allocate full days to each vehicle periodically for major maintenance.

Development of schedules requires expertise which is unlikely to be available within the association, and assistance from FEMATRO will be necessary, initially also involving external technical assistance. In the longer term FEMATRO should develop this capability in-house, and should provide assistance and on-the-job training to concession-holders as one of its services to its members.

Decide Fare Structure and Levels

Fares charged must comply with those approved by government. However, it is understood that at present chapa crews charge higher fares than those approved, by such means as splitting journeys so that passengers pay two fares for one journey. In effect, fares are based partially on distance traveled, and higher fares are charged at peak times than at off-peak times. If such practice is common, and accepted by passengers, FEMATRO should attempt to obtain official approval for the fares that are actually charged. It is government policy for fares to be based on distance, and chapa operators should take advantage of this. FEMATRO should take the initiative by proposing a simple fare structure in which fares are related to distance traveled, and also to propose modest increases in fare levels at frequent intervals thereafter.

Fares should be such that the passengers can afford them. To some extent this can be established only by trial and error, but the level of demand at existing fares (including fares charged illegitimately by crews which are higher than the approved fares) indicates that most passengers can pay fares higher than those authorized.

Fares should also be high enough that total revenue is sufficient to cover fully the costs of operating the service, including maintenance of vehicles in a safe and roadworthy condition and their replacement when necessary. Crews should be fairly and fully compensated for their work, and chapa owners should receive an adequate, but not excessive, return on their investment.

Develop Operating Systems and Procedures

Systems will be required for ensuring that services are operated in accordance with schedules, and for keeping basic records of activities and performance as a basis for management control and for future planning. Such systems should be kept as simple as possible, with no unnecessary duplication of tasks.

The principal requirements are systems and procedures for

- Allocating duties to chapas and crews
- Recording work done by chapas and crews
- Dispatching vehicles from terminals according to schedule
- Preventive maintenance of vehicles
- Control of fare revenue
- Control of expenditure on vehicle fuel, servicing and maintenance
- Control of payments between chapa owners and the cooperative
- Dealing with vehicle breakdowns and accidents
- Dealing with passenger enquiries and complaints
- Staff discipline
- Collecting and analyzing management information

The task of developing systems and procedures should be undertaken by the management of the cooperative, with assistance from FEMATRO.

Staff Training

All staff will require some training. Management and supervisory staff must be trained in basic management principles, as well as in matters specific to the public transport operation. Vehicle crews will require instruction in the new procedures, in particular in operating in accordance with schedules.

Most of this training should be on-the-job training, provided by FEMATRO or external trainers, and supplemented by classroom training. Initial classroom sessions will be appropriate for instructing managers and supervisors in principles of management and transport operation, followed by on-the-job training in the form of external assistance in developing and implementing systems and procedures, and in their initial operation.

Vehicle crews should be given instructions in the new operating systems in classroom sessions. Initially these will have to be organized in small groups and be of short duration to

avoid disrupting services, but when the new schedules are operational, follow-up training can be arranged when crews are off duty.

In addition to instruction in operating procedures, drivers should also be given classroom instruction in safety. In the longer term, FEMATRO should organize practical instruction for drivers, involving sessions on the road with qualified driving instructors, to raise standards of safety and to encourage drivers to drive with greater sympathy for their vehicles and drive in such a way that they minimize wear and tear on their vehicles and to encourage fuel-efficient driving techniques.

Negotiate Agreement with Vehicle Owners and Operators

If the operation is to function properly, the cooperative must have full control over all vehicles and crews working on the route concerned. There must therefore be a formal agreement between the cooperative and chapa owners that sets out the responsibilities of all parties—the vehicle owners, the crews, and the cooperative. The agreement should cover

- The cooperative's right to issue instructions to vehicle owners and crews;
- Owners' and crews' obligation to comply with instructions issued by the cooperative;
- Owners' and crews' obligation to comply with all rules, regulations, and instructions;
- Compliance with timetables;
- Vehicle roadworthiness;
- Vehicle presentation;
- Driver presentation;
- Payments to cooperative;
- Accounting for revenue and expenditure; and
- Penalties for failure to comply with the cooperative's rules and regulations.

The agreement should be drafted by FEMATRO after taking legal advice. The agreement should be a standard document applicable to all concessions, with route-specific content appended as an attachment.

Formal Establishment of Cooperative

It will be necessary to register the cooperative as a legal entity that is eligible to operate public transport services under a concession or license. FEMATRO should assist in this process.

IMPLEMENTATION PROGRAM

The sequence of tasks involved in setting up the operation will be broadly as follows:

1. Hold meeting (FEMATRO and operators) to define responsibilities and tasks
2. Set up operator database
3. Finalize selection of owners and operators
4. Hold detailed discussions with owners and drivers
5. Establish cooperative(s) formally
6. Negotiate agreement with vehicle owners and operators
7. Finalize organization of cooperative
8. Recruit staff
9. Route survey
10. Traffic surveys

11. Set up FEMATRO scheduling capability
12. Develop timetables and schedules
13. Decide fare structure and levels
14. Develop operating systems and procedures
15. Train staff
16. Implement operating systems and procedures
17. Issue publicity
18. Prepare vehicles (signage, etc.)
19. Commence operation
20. Monitor operation (continuous)
21. Fine tune as necessary (periodic)

This sequence may vary slightly. For example, if the cooperative staff are not involved in the initial surveys and timetable compilation, these tasks could be carried out earlier in the program; this would have the advantage of providing more accurate information on demand for the services and the number of vehicles required.

Estimating the time required for some of these tasks is difficult, and FEMATRO probably can do this best for most tasks. Completing the surveys for all three routes and analyzing the data should be possible in three to four weeks; timetable and schedule compilation should take approximately one week for each route. Development of systems and procedures will require approximately one week, although these would have to be reviewed from time to time and amended after the operation has commenced.

BEING REALISTIC

For the concession to work properly it should be exclusive to one operator, with full enforcement of all relevant laws, rules, and regulations. There should be off-road terminal facilities, suitably located and configured, with adequate capacity and all necessary facilities for passengers and crews, and the cooperative should have the use of adequate and suitably equipped depot facilities. Along the route there should be clearly marked stopping places, with passenger shelters at busy stops.

Not all of this will be possible, at least in the early stages, and it will be necessary for the operator to try its best to provide the service in less than ideal conditions. It will be possible to operate, albeit not with maximum effectiveness, without some of these requirements being met, but some requirements must be met if the service is to have any chance of success.

In particular, as mentioned earlier, it is unlikely that TPM will be excluded from any of the concession routes, and TPM and the cooperative will have to operate alongside each other. A complementary rather than competitive relationship between the two operators would be preferable, with each catering to a different market.

Enforcement of regulations, in particular the elimination of illegal or unlicensed operators from the routes, is highly desirable, and every attempt should be made to persuade the authorities to address this issue. If illegal or unlicensed operators continue to operate along the routes, this will jeopardize the operation, but the cooperative should nevertheless endeavor to operate the service in accordance with its own rules and continue to lobby the authorities to improve enforcement.

Infrastructure improvements will also be unlikely in the short term, and the operator will have to manage with existing terminal facilities and bus stops. However, it is essential that bus stops be clearly defined at every point that chapas are permitted to stop so that the use of authorized stopping places by drivers and passengers can be enforced.

It is also essential that the cooperative have suitable office accommodation for its management and administrative staff and basic facilities where vehicles may be subjected to mechanical inspection.

It is highly desirable that each terminal have a basic shelter where the terminal supervisor can keep the paperwork required to discharge his duties.

BENEFITS FROM THIS SYSTEM

The proposed system of operation will benefit all concerned. Passengers will benefit from a more regular service and increased capacity at certain times. Abandoning the practice of waiting for a full load before departure will save time for passengers boarding at terminals, while there will be more room for passengers boarding at intermediate points. At most times of the day, traveling will be more convenient and more comfortable, and for many passengers, total journey times will be reduced because waiting times will be shorter. Improved vehicle maintenance and better training and discipline for drivers will improve safety.

Drivers and conductors will have shorter working days, although they will spend a greater portion of their time working rather than waiting at terminals. This will improve their quality of life and increase their earning potential per hour. Their total earnings will also probably increase.

Vehicle owners will benefit from the increased revenue that will result from more efficient utilization of their vehicles. When the preventive maintenance program begins to take effect, reliability of the vehicles will improve, while operating costs will decline. Net earnings from each vehicle will therefore increase.

FUTURE CONCESSIONS

If the pilot concessions prove successful, the concept should be extended throughout Maputo and to other cities in Mozambique. If the pilot succeeds in persuading the authorities that the private sector is capable of operating an efficient public transport service, they may entrust it with genuinely exclusive concessions in the future, with TPM being awarded exclusive concessions for other routes. Alternatively, the concept of a two-tier service may be developed, with TPM providing basic low-cost services and the private sector providing better quality services at a higher cost. The private sector should be permitted to operate vehicles of the sizes and configurations of its choosing—small vehicles on some routes and large ones on others.

Ideally, TPM and the private sector will operate on equal terms. Both should be eligible to bid for concessions for low-cost and higher-quality services, and if low-cost services are subsidized, both TPM and the private sector should be eligible for subsidy on equal terms.

Appendix A. Traffic Surveys

SURVEY PROCEDURES

Three types of survey are required:

- Terminals surveys
- Passenger load surveys
- Roadside surveys

The terminal and roadside surveys must be continuous throughout the working day. This will require the survey personnel to work in shifts, and arrangements must be made to ensure that there is no break in the surveys. In practice this will mean that two surveyors must be working together at each point, so that they can assist one another and one can continue working alone while the other takes a short break.

Some surveys must be carried out simultaneously. This is particularly important for the terminal surveys, which require surveyors at both ends of each route, recording the arrival and departure of every vehicle at both ends of the route. It is also important that all surveyors have reliable watches that are synchronized at the start of each day and checked periodically by the survey supervisor.

The surveyors will complete survey forms, shown at the end of this Appendix. The data from the survey forms will then be processed and presented on analysis and summary forms, which are also shown.

TERMINAL SURVEY

Purpose

The terminal survey is the most important of all the surveys. It will provide the following information:

- Journey times between one terminal and another
- Number of trips operated per day by each vehicle
- Frequency of departures at different times of the day
- Idle time for each vehicle at terminals between arrival and departure
- Passenger loads arriving at and leaving terminals at different times of the day
- The number of chapas operating on each route on the day of the survey

This information is essential for scheduling purposes.

Procedure

Surveys must be carried out on the same day at all terminals on the route concerned. Only chapas operating on the three concession routes should be recorded for the terminal survey.

Two pairs of surveyors will be required at the Museu terminal, one pair to record arrivals and the other to record departures, using the "Terminal Survey Form—Arrivals" and "Terminal Survey Form—Departures," respectively. At the outer terminals, one pair of surveyors will be able to record both arrivals and departures, using the "Terminal Survey Form—Arrivals and Departures." The surveyors must be located at points from which they can observe every vehicle as it arrives or departs.

Surveyors recording arrivals must record the time at which every vehicle arrives, together with the registration number of the vehicle, the terminal from which it has arrived (this should be evident from the signage on the vehicle, but if necessary the surveyor must ask the driver or conductor), and the load on the vehicle. It is not necessary to count the number of passengers on the vehicle. It will be sufficient to place a tick in one of the columns indicating whether the vehicle is empty, approximately one-quarter, one-half, or three-quarters full, or entirely full. When the forms are analyzed, the approximate number of passengers can be calculated, depending on the size of the vehicle.

Surveyors recording departures must record the time at which every vehicle departs, together with the registration number of the vehicle, the destination terminal, and the load on the vehicle, recorded as described above.

The data are analyzed using Terminal Survey Analysis Forms 1 and 2. A separate copy of Form 1 is required for every chapa recorded during the day. The form header should show the chapa registration number and its seating capacity, which should be ascertained from FEMATRO's records. A 15-seater normally carries approximately 20 passengers when full, and a 30-seater carries about 40, but the actual figures should be obtained from the passenger load surveys. The total capacity figures should be multiplied by the load factor shown on the surveyor's form to provide an estimated number of passengers. This method of estimating passenger numbers is sufficiently accurate for the purpose of this exercise.

Arrival and departure times at both terminals on the route should be entered for every trip made by the chapa during the day, from the survey forms, and the journey times and idle times calculated from these. The figures should be totaled for the day, to give a complete record of the operation of the chapa for the day of the survey.

The data for each chapa should then be entered onto Form 2. The totals of each column can be used to calculate the data to be entered onto the Terminal Survey Summary Form 1.

Terminal Survey Summary Form 2 is completed from the Arrival and Departure survey forms and from Analysis Form 1 for each terminal. This form shows the total number of chapas, and the passengers carried by them, in each 15-minute period throughout the day. Provision is made on the form for a full 24-hour period, although in practice it will normally be used only for the period from about 0400 to 2400. Against each hour on the form are boxes for the first 15 minutes (marked "15"), from 16 to 30 minutes past the hour (marked "30"), from 31 to 45 minutes past the hour (marked "45"), and from 46 minutes past the hour until the end of the hour (marked "00"). It is also useful to present this data graphically as a histogram or bar chart.

PASSENGER LOAD SURVEY

Purpose

This survey will give an indication of the number and turnover of passengers along the route, at different times of the day. It is essential to calculate the revenue to be earned from each trip and to determine the number of nonstop and limited-stop journeys that may be operated at different times. As indicated above, it will also provide information about the total capacity (seated plus standing passengers) of vehicles with different seating configurations.

Procedure

This survey requires one surveyor to travel on a chapa for an entire journey from one terminal to the other: the surveyor should carry out several trips in a day, not necessarily on the same chapa. At least three, and preferably six, surveyors should work on each route, covering the entire working day on a shift basis. In the case of the Zimpeto route, which has three variations, there should be at least one surveyor on each of the variations.

A separate Passenger Load Survey Form should be filled in for each journey. The surveyor should sit in a position in the vehicle from which all passengers boarding and leaving the vehicle can be observed. When the vehicle departs from the terminal, the surveyor should enter the total number of passengers on the vehicle (including himself/herself) in the "Number Boarding" and "Load" columns of the line marked "Depart Terminal". Every time the vehicle stops, the number of passengers boarding and leaving the vehicle should be entered in the appropriate columns, together with the number of passengers on the vehicle as it leaves the stop: this figure should be a running balance. At the end of the journey, the totals of the "Number boarding" and "Number leaving" columns should be equal, and the final load should be one (i.e. the surveyor).

The surveyor should also record details on the reverse of this form of any relevant incidents—e.g., stop to refuel, breakdown, accident, vehicle stopped for police check—noting start and finish time, location, and other relevant information.

Passenger Load Summary Form 1 shows, for each chapa surveyed, the number of passengers carried on each trip. It will show variations throughout the day in the number of passengers carried in total and the turnover of passengers.

It will also show the journey time for each trip and whether or not there were any incidents that caused delays. This information will supplement that from the terminal surveys and act as a check.

Summary Form 2 collates this information. The information can be used in conjunction with data from the terminal and roadside surveys (which record details of every trip operated, whereas this is only a sample) to estimate the loads and revenue for the operation as a whole. It will also be used as part of the scheduling exercise.

Summary Form 3 shows the average number of passengers per journey at different times of the day. A separate form should be completed for each direction of travel. A low number of passengers may indicate that the turnover of passengers is low; i.e., most passengers are traveling for long distances. It may also mean that the vehicle is traveling with spare capacity; this must be verified by cross-checking against the individual survey forms to establish

whether vehicles are running with only partial loads at certain times. If the number of passengers is high, it indicates a high proportion of short-distance passengers. This information may also be presented graphically in the form of a histogram or bar chart. It will be used when compiling schedules to determine if and when nonstop or limited-stop journeys should be operated.

ROADSIDE SURVEY

Purpose

To determine passenger flows on different portions of each route at different times of the day, and on different days of the week. This will enable schedules to be produced which ensure that the service capacity provided is in tune with demand. It will provide an indication of running times between the terminals and intermediate points, provided that the roadside surveys are conducted on the same day as the terminal surveys, and that all surveyors' watches are synchronized. The survey will also give information of the number of vehicles operating on all routes along the roads concerned, including those on other routes and those operated by TPM. This information will be useful for planning subsequent concessions, and for coordination of chapa and TPM services, if this becomes feasible at a later date.

These surveys should be carried out at selected points on each route. They should be at busy stops where there are large numbers of passengers boarding and leaving vehicles, or at points such as road junctions where vehicles are frequently delayed in traffic so that surveyors have time to record the necessary information. Two such points should be adequate on a route of about 20 kilometers, although in certain circumstances more may be required: this may be desirable later as part of the fine-tuning process.

Procedure

Two pairs of surveyors are required, one pair on each side of the road. The surveyors must be located at points from which they can observe every vehicle as it passes.

Roadside Survey Summary Form 1 shows the number of vehicles and passengers passing each survey point at 15-minute intervals. This information may also be shown graphically using a histogram or bar chart. It will show the variations in demand at different times of the day, and when there is inadequate or excess capacity. The information will be used to determine the required frequency on different sections of a route, and at different times of the day.

Roadside Survey Summary Form 2 shows the total number of vehicle trips and passengers carried on each route at each location and in each direction for the full day, broken down by day, with figures for TPM and chapas shown separately. This information which shows the relative patronage of each route, and of TPM and chapas, is useful for coordinating the schedules of the different routes along common sections of road, and if applicable for the reallocation of chapas between routes.

Staff Requirements

Two supervisors will be required, working on shifts; they must have transport to enable them to visit each survey location several times during the shift. One of the supervisors should be

given responsibility for the entire exercise. Approximately 76 surveyors will be required, of whom the majority will be required for three days. Approximately 582 man-days will be required for the entire exercise, plus the two supervisors for approximately three weeks each.

Terminal Surveys

Two pairs of surveyors will be required at Museu terminal, and one pair at each of the five outer terminals. Therefore there should be two shifts of 14 surveyors, or a total requirement of 28 or 84 man-days for the three days of the survey.

Passenger Load Surveys

At least three surveyors should be used on each route, with two shifts, requiring a total of 18 surveyors. If possible, a greater number should be used, up to 36, or 108 man-days for the three days of the survey. These surveys need not be carried out on the same day as the other two surveys: therefore they can be carried out by some of the surveyors used on the Terminal Surveys or Roadside Surveys.

Roadside Surveys

Six survey locations should be identified. Each will require two pairs of surveyors, one on each side of the road, working in two shifts. The total number of surveyors required will therefore be 48, or 252 man-days for the three days of the survey.

Analysis

The surveys should be carried out over three days: one weekday (Monday–Friday), a Saturday, and a Sunday. Of the total of 76 surveyors required, 10 should be retained to analyze the survey results. The analysis will take a maximum of two weeks, or 100 man-days.

Terminal Survey Form—Arrivals

Location	
Date	
Surveyor 1	
Surveyor 2	
Sheet number	

	Time	Chapa Number	From	Load				
				Empty	1/4	1/2	3/4	Full
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
Number of boxes ticked								

Terminal Survey Form—Departures

Location	
Date	
Surveyor 1	
Surveyor 2	
Sheet number	

				Load				
	Time	Chapa Number	Destination	Empty	1/4	1/2	3/4	Full
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
Number of boxes ticked								

Terminal Survey Form—Arrivals and Departures

Location	
Date	
Surveyor 1	
Surveyor 2	
Sheet number	

	Chapa no.	Arrivals							Departures						
				Load							Load				
		Time	From	E*	1/4	1/2	3/4	F†	Time	To	E*	1/4	1/2	3/4	F†
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															
	Number of boxes ticked														

**E—Empty;*
† F—Full

Ensure that arrival and departure for each registration number are recorded in the same line.

Terminal Survey Analysis Form 1

Route	
Date	
Chapa Number	
Seating capacity	

Inner terminal						Outer terminal					
1	2	3	4	5	6	7	8	9	10	11	12
Journey Time	Arrive	Pax	Depart	Pax	Idle Time	Journey Time	Arrive	Pax	Depart	Pax	Idle Time
Total	-		-			-	-		-		

Column 1: elapsed time in minutes between departing from outer terminal and arriving at inner terminal

Column 2: arrival time

Column 3: number of passengers on arrival

Column 4: departure time

Column 5: number of passengers on departure

Column 6: elapsed time in minutes between arriving and departing

Column 7: elapsed time in minutes between departing from inner terminal and arriving at outer terminal

TERMINAL SURVEY ANALYSIS FORM 2
(Data from Terminal Survey Analysis Form 1)

Route	
Date	

Chapa number	No. of single trips	Journey Time		Idle Time		Inner Terminal		Outer Terminal	
		Outward	Inward	Inner Terminal	Outer Terminal	Pax Arriving	Pax Departing	Pax Arriving	Pax Departing
Total									

TERMINAL SURVEY SUMMARY FORM 1

Route	
Date	

No. of chapas operating	
No. of single trips	
Average number of single trips per chapa	
Average journey time from outer to inner terminal	
Average journey time from inner to outer terminal	
Average journey time in both directions	
Average idle time at inner terminal	
Average idle time at outer terminal	
Average idle time at both terminals	
Proportion of running time to idle time	
Total passengers on arrival at inner terminal	
Average passengers on arrival at inner terminal	
Total passengers on departure from inner terminal	
Average passengers on departure from inner terminal	
Total passengers on arrival at outer terminal	
Average passengers on arrival at outer terminal	
Total passengers on departure from outer terminal	
Average passengers on departure from outer terminal	

Terminal Survey Form—Arrivals

Route	
Terminal	
Date	

		Chapas	Pax			Chapas	Pax
		-	-				
	15				15		
	30				30		
	45				45		
00	00			12	00		
	15				15		
	30				30		
	45				45		
01	00			13	00		
	15				15		
	30				30		
	45				45		
02	00			14	00		
	15				15		
	30				30		
	45				45		
03	00			15	00		
	15				15		
	30				30		
	45				45		
04	00			16	00		
	15				15		
	30				30		
	45				45		
05	00			17	00		
	15				15		
	30				30		
	45				45		
06	00			18	00		
	15				15		
	30				30		
	45				45		
07	00			19	00		
	15				15		
	30				30		
	45				45		
08	00			20	00		
	15				15		
09	30			21	30		

Terminal Survey Form—Arrivals, continued

		Chapas	Pax			Chapas	Pax
		-	-				
	45				45		
	00				00		
	15				15		
	30				30		
	45				45		
10	00			22	00		
	15				15		
	30				30		
	45				45		
11	00			23	00		
c/f				tot			

This information may also be shown graphically using a histogram or bar chart.

Passenger Load Survey Form

Route	
From	
To	
Vehicle number	
Seating capacity	
Departure time	
Arrival time at dest.	
Date	
Surveyor	
Sheet number	

Stop	Number boarding	Number leaving	Load	Stop	Number boarding	Number leaving	Load
Depart Terminal		-		Total b/f			
1				29			
2				30			
3				31			
4				32			
5				33			
6				34			
7				35			
8				36			
9				37			
10				38			
11				39			
12				40			
13				41			
14				42			
15				43			
16				44			
17				45			
18				46			
19				47			
20				48			
21				49			
22				50			
23				51			
24				52			
25				53			
26				54			
27				55			
28				56			
Total				Total			

Terminal Survey Form—Arrivals, continued

Record details on the reverse of this form of any relevant incidents, e.g. stop to refuel, breakdown, accident, vehicle stopped for police check, noting start and finish time, location, etc.

Passenger Load Survey Summary Form 1

Route	
From	
To	
Vehicle number	
Seating capacity	
Date	

	Direction	Dep. time	Arr. time	Journey time (minutes)	Passengers carried	Incidents
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
	Total	-	-			-
	Trip average	-	-			-

Under “direction”, write “IN” for journeys to the city centre, and “OUT” for journeys from the city centre.

Under “incidents” write “yes” or “no” as appropriate.

Passenger Load Survey Summary Form 2

Route	
From	
To	
Date	

Chapa no.		No. of trips	No. of passengers
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
	Total		
	Average per trip		

Passenger Load Survey Summary Form 3

Route	
From	
To	
Date	

Departure from terminal	No. of Journeys Recorded	Total Passengers	*Average Passengers per Journey*
0001-0100			
0101-0200			
0201-0300			
0301-0400			
0401-0500			
0501-0600			
0601-0700			
0701-0800			
0801-0900			
0901-1000			
1001-1100			
1101-1200			
1201-1300			
1301-1400			
1401-1500			
1501-1600			
1601-1700			
1701-1800			
1801-1900			
1901-2000			
2001-2100			
2101-2200			
2201-2300			
2301-2400			
Total/average			

A separate form to be completed for each direction of travel.

Roadside Survey Form

Location	
Direction of travel	
Date	
Surveyor 1	
Surveyor 2	
Sheet number	

				Load				
	Time	Chapa Number*	Route	Empty	1/4	1/2	3/4	Full
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
Number of boxes ticked (chapa)								
Number of boxes ticked (TPM)								

* For a TPM bus, enter only “TPM”

Roadside Survey Summary Form 1

Location	
Direction of travel	
Date	

		Chapas		TPM		All Vehs.			Chapas		TPM		all vehs.	
		No	Pax	No	Pax	No	Pax		No	Pax	No	Pax	No	Pax
		-	-	-	-	-	-	b/f						
	15							15						
	30							30						
	45							45						
00	00							12 00						
	15							15						
	30							30						
	45							45						
01	00							13 00						
	15							15						
	30							30						
	45							45						
02	00							14 00						
	15							15						
	30							30						
	45							45						
03	00							15 00						
	15							15						
	30							30						
	45							45						
04	00							16 00						
	15							15						
	30							30						
	45							45						
05	00							17 00						
	15							15						
	30							30						
	45							45						
06	00							18 00						
	15							15						
	30							30						
	45							45						
07	00							19 00						
	15							15						
	30							30						
	45							45						
08	00							20 00						

Roadside Survey Summary Form 1 Continued

		Chapas		TPM		All Vehs.				Chapas		TPM		all vehs.	
		No	Pax	No	Pax	No	Pax			No	Pax	No	Pax	No	Pax
		-	-	-	-	-	-	b/f							
	15								15						
	30								30						
	45								45						
09	00							21	00						
	15								15						
	30								30						
	45								45						
10	00							22	00						
	15								15						
	30								30						
	45								45						
11	00							23	00						
c/f								tot							

This information may also be shown graphically using a histogram or bar chart.

Roadside Survey Summary Form 2

Location	
Direction of travel	
Date	

Route	No of vehicle trips	No of passengers
Total		

Show TPM routes as separate routes

Appendix B. Principal Tasks and Responsibilities of Operational Staff

GENERAL MANAGER

Reports to Cooperative board

- Has overall responsibility for day-to-day management and operation of the service
- Reviews management information and takes appropriate action
- Meets with relevant authorities
- Carries out planning service development and fleet replacement
- *Position requires proven general management skills, computer literacy and knowledge of public transport operation.*

GENERAL MANAGER'S ASSISTANT

Reports to the General Manager

- Assists the General Manager as required
- Deals with enquiries and complaints from passengers and other road users
- *Position requires proven basic management, computer literacy and good administrative skills.*

OPERATIONS MANAGER

Reports to the General Manager

- Produces timetables for all vehicles used on the route
- Allocates duties to vehicles and drivers
- Monitors the use and performance of the service and adjusts timetables as required
- Ensures that vehicles are properly maintained and safely operated
- Ensures that sufficient vehicles and drivers are available to meet demand at all times
- Maintains staff discipline
- *Position requires proven management and supervisory skills, computer literacy, numeracy, basic mechanical knowledge and good knowledge of transport operation.*

SUPERVISORS

Report to the Operations Manager

- Ensure that drivers operate in accordance with timetables
- Dispatch vehicles from terminals in accordance with timetables
- Ensure that drivers and conductors comply with rules and regulations
- Keep accurate records of the journeys operated by each vehicle
- Ensure that vehicles and crews are properly presented
- *Position requires literacy and good supervisory ability.*

MECHANICS

Reports to the Operations Manager

- Carry out minor repairs as required
- Carry out periodic routine vehicle inspections for safety and mechanical fitness
- *Position requires literacy and relevant qualifications and experience in a motor vehicle workshop.*

FINANCIAL MANAGER

Reports to the General Manager

- Keep management and statutory accounts of the operation
- Control the operating budget
- Ensure all cash receipts are banked
- Monitor the cooperative's bank account
- Ensure that drivers make the correct payments to the cooperative and to vehicle owners as applicable
- *Position requires relevant accountancy qualifications, computer literacy and experience in a similar position.*

CASHIERS

Report to the Financial Manager

- Receive and process cash receipts from drivers and conductors
- Record all financial transactions
- *Position requires literacy, numeracy, and experience in a similar position.*

ADMINISTRATIVE MANAGER

Reports to the General Manager

- Keep personnel records
- Keep operating records
- Recruit staff

- Maintain stocks of essential spare parts
- *Position requires computer literacy, general administrative skills and experience in a similar position.*

CLERKS

Reports to the Administrative Manager

- Assist with maintaining operating records
- Other clerical duties as required
- *Position requires literacy and numeracy.*

DRIVERS

- Carry out basic safety and mechanical checks of vehicle according to checklist provided
- Drive the vehicle in accordance with schedules provided and in compliance with rules and regulations
- *Position requires relevant driving licensees and good driving record.*