

THE MINIBUS TAXI ROUTE COLOUR-CODING PROJECT IN THE GREATER PRETORIA METROPOLITAN AREA: A project which created excitement in a nearly forgotten industry

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1. INTRODUCTION

The minibus taxi industry is part of the public transport system in the Republic of South Africa. It is operated by minibus-type vehicles with a carrying capacity of 10 to 14 passengers. The service is conducted on a shared basis where each passenger is responsible for his or her own fare. It usually works on an origin-destination basis, which is quick and relatively fast compared to conventional buses.

Prospective passengers and drivers have generally used hand signals to communicate route and destination information. Passengers who grew up in the area know these signals well, but visitors seldom know them, making it difficult for visitors to use the minibus taxi services. The new colour-coding system is aimed at improving the flow and accessibility of information to passengers, especially to visitors and tourists. The minibus taxi market is fairly saturated and new markets need to be explored in an effort to balance the demand for and supply of minibus taxi services. One such potential market is the tourism market, which attracts many visitors to the country each year, and another is commuters in the higher income groups who traditionally use private cars.

The South African combi-taxi transport system has developed informally and haphazardly. There is a lack of data and much confusion. Transport planning has to follow this development process. Therefore, route colour-coding was used as a transport planning tool to help to inform people of the taxi routes and operations on these routes. This has been a great success as transport planners have a better understanding of taxi routes and operations in Greater Pretoria, following the implementation the project.

2. ELEMENTS OF THE REGULATORY SYSTEM

The permission system has recently been upgraded based on the NTTT by converting the radius-type permits into route-type permits. The route-type permits allow operators to provide services only along a certain route between two points or areas.

The broader regulatory system consists of four main elements, namely the Permit Board, the Registrar of Taxis, the law enforcement agencies and transport planning service.

a) The Permit Board

The Permit Board is an autonomous body and has the responsibility for issuing the permits that grant permission to operators to provide a service along a specific route.

Prospective operators apply for a permit to operate a service along a route between two points. The Permit Board receives the application and advertises it in the *Government Gazette* for 21 days. Then the Permit Board considers the application on the grounds of merit and the demand for services and also considers the objections received from concerned and affected people. In the future, it is intended that the permissions should be given based on the transport plans produced by Transport Authorities. If the application is accepted, the Permit Board awards the permit (colloquially called a “permission”) for the applicant operator to operate a service between two points.

b) The Taxi Registrar

The Taxi Registrar carries the responsibility for helping transforming the taxi industry into a professionally run industry whose members are registered and adhere to a constitution and code of conduct. The Taxi Registrar acts autonomously and reports to the Member of the Executive (MEC) of the Provincial Legislature. The taxi associations and their members are registered according to the requirements laid down in legislation. If registered operators contravene the constitution, the registrar could, after following due process, deregister such operators or even the associations concerned. In essence the role of the Taxi Registrar is to keep a watchful eye on the minibus taxi associations and their members to ensure that they maintain a specified standard of professionalism.

c) Law enforcement agencies

After the Permit Board has issued a permission to operate and the Registrar has registered the minibus taxi association and its members, the law enforcement agencies ensure that these road users comply with relevant legislation. For example, the law enforcement agencies check that the taxis are roadworthy, that the operators and drivers obey the traffic rules, that the services are operated according to the authorised permission and that the operators and drivers act professionally.

To maintain the regulatory system there should be co-ordination between the different elements of the system and good, up-to-date and readily available information is needed.

d) Transport Planners

All public transport operations, including taxi services, need to conform to the transport plans prepared by transport authorities. These transport plans will involve all transport modes on all routes and are based, among other things, on transport demand management.

3. OBJECTIVES OF THE TAXI ROUTE COLOUR CODING SYSTEM

The current method of communication between a prospective passenger and a driver is by means of hand signals. When hand signals were first used, taxis provided services along a limited number of routes and the hand signals were clear and simple to understand. Lately, the network of services provided by taxis in a specific area makes it difficult to develop clear and understandable signals. It becomes even more difficult to have hand signals that

communicate clearly with visitors from other areas or with tourists from other countries. Colour coding is in essence a way to provide information to passengers and to tell them that a specific taxi is legal and provides a service between a specific origin and destination on a specific route or route network.

Many tourists and visitors from other areas of the country and abroad visit the city and need transport, but they have difficulty in understanding the routes or finding out which particular taxis operate to which destinations or indeed, in actually identifying a taxi among the myriad of combi-taxis, many privately owned. The Greater Pretoria Metropolitan Council (GPMC) intends to publicise the route colour-coding information in co-operation with the local tourism board in due course.

Although colour coding is not intended for law enforcement, it could make law enforcement easier because it would be clear to everyone if a specific taxi does not carry a sticker or is operating on the wrong route. It is the permit disk that contains the information necessary to determine what the authorised route for a specific taxi is and not the colour-coding sticker that forms the basis of the law enforcement action. Indeed, colour coding can only be implemented on permit-holding taxis.

4. DESCRIPTION OF THE SYSTEM

The system consists of two main elements. The first is the information that is visible on the vehicles and is targeted at the passenger, who is the customer of the taxi industry. The second element is the information required for controlling purposes and which appears on the permit disc. The information on the permit disc is accessible by means of electronic devices, such as a scanner. This second phase will be completed once the whole GPMC area is fully covered with respect to route colour-coding and the effectiveness of the system has been reviewed.

4.1 Route colour-coding stickers

4.1.1 The local route colour-coding system

The requirements for the route colour-coding are that it should be easy to understand but still contain all the information that the passengers, other operators and law enforcers need to see at a glance to determine the road or route on which a vehicle is supposed to operate on.

In considering various alternatives it is important to keep in mind the cost, the effectiveness of the identification displayed on the vehicles and the possibility of fraud or interference with this information.

The concept of route colour-coding consists of a system of colours which represents different areas in the operational area of the taxis. Each of the areas is allocated its own colour. If a route starts in a specific area that area's colour represents the origin of the route while the colour of the area where the route ends represents the destination of the route.

There are two types of stickers, those on the front and back of the vehicle and those on the sides of the vehicle.

The types of taxi operation and route determine to a great extent how the stickers look.

There are different types of taxi operation, namely:

- a) Local routes:
 - i) **Simple local routes**, between an origin and a destination in the same jurisdiction of a local authority;
 - ii) **More complicated network-type of local routes**, where taxis are rotated between more profitable and less profitable subroutes within the same corridor which run between an origin and a destination;
- b) Long-distance routes:

Routes over longer distances, between points within different regions in the same province (Inter Regional) or between points in different provinces (Inter Provincial).

Network of long-distance routes, where long-distance taxis are rotated between more than one long-distance route.
- c) Special services:

Special services are an integral part of taxi services. Special services involve the prior arrangement of a service from a particular place to another, usually at weekends and over long holidays. Normal colour-coded taxis undertaking such special trips will carry a special identifying feature so as not to disrupt operations on the routes.

4.1.1.1 Simple local taxi routes

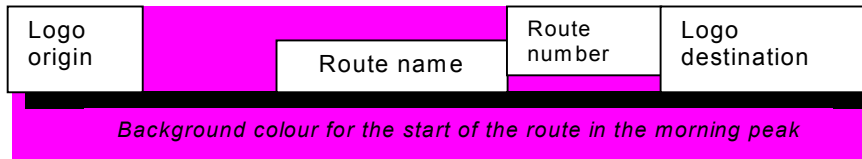
Local routes are those routes that operate between two single points along one route within the same local authority area, for example between Mamelodi and Wonderboom or the CBD in the GPMC area.

The main elements of the route colour-coding system as displayed in Figure 1, are the origin and the destination of the routes. The background of the sticker displays the origin or A-point of the route as contained in the permission issued by the Permit Board, while the B-point or destination is represented by the colour of the line. The example in Figure 2 shows a route between Mamelodi designated by the pink area, to Wonderboom, which is designated by the blue area. From Wonderboom, passengers will select the pink background to go to Mamelodi. Apart from the colours indicating the origin and destination of the route, other information is also displayed on the side sticker, which includes the logos of the metropolitan area in which the route is operated and the metropolitan local council area in which the route originates. The route number on the side sticker represents the route that is registered with the authority. The large sticker displayed in Figure 2, is affixed to the side of the minibus taxi and the two-colour stickers at the bottom are affixed to the front and to the back of the vehicle.

The front sticker allows prospective passengers alongside the road to select the correct minibus taxi as the vehicle approaches them. These front and back stickers as displayed in Figures 1 and 2 consist of two parts, namely the first sticker on the left represents the colour of the area of origin while the second colour on the right represents the area where the route ends. The stickers on the side of the vehicle provide more details and confirm that the minibus taxi is in fact going to the destination that the passenger wants to reach.

FIGURE 1: BASIC ELEMENTS OF ROUTE COLOUR-CODING STICKERS

a) Side Stickers



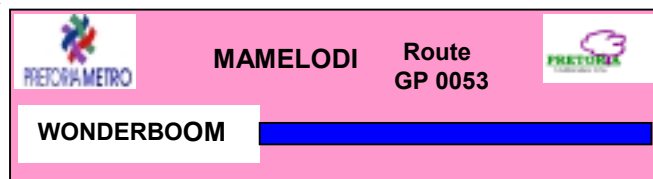
b) Front and back stickers



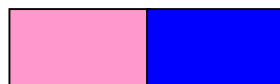
The choice of colours used is left to the local authority concerned. However, we appeal to other areas of South Africa to choose black for the Central Business District (CBD) of the city/town and red for local, so as to make the system truly South African. This would help to standardise information if at least two colours were reserved throughout South Africa, namely black for central city (CBD) and red for local area only services (e.g. within a suburb or township)

FIGURE 2: SIMPLE LOCAL ROUTE COLOUR-CODING STICKER

a) Side sticker



b) Front and back sticker



4.1.1.2 Network type of operations

There are two types of networks for which stickers were designed in the GPMC area.

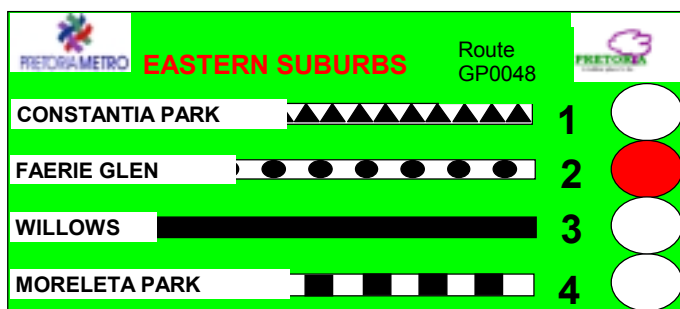
a) Network type A: A network formed by different routes

The first pilot project on network-type operations was conducted in the eastern suburbs of Pretoria (Menlyn routes) where the operators work on a network basis (see Figure 3). The routes that form the network consist of lucrative and less lucrative routes. The operators decided that the best mechanism to give everyone a fair deal would be to implement a rotation system where the passengers determine the route that the taxi would follow. The first passenger arriving in the queue would determine the destination of the taxi. So the taxis would switch between the routes according to the choice of the first passenger in the queue. However, this greatly complicated the route colour-coding system because the route on which the specific taxi is operating had to be indicated to the passengers who wanted to board the taxis at the loading points in the ranks and along the way. To solve this problem, a red dot was provided on the side sticker to indicate the chosen route to passengers boarding

at the rank. The number, allocated to the chosen route, is also displayed on the left-hand side of the vehicle's windscreen. The position of the red dot on the side of the vehicle and the number in the windscreen was changed at the beginning of each trip after the first passenger had boarded the taxi. A further problem was that the red dot did not work properly because the method of affixing the red dot to the vehicle gave endless trouble. The difficulty was that the body of the vehicle is curved, so the holder for the red dot did not stick to the body and kept falling off. For this reason it was decided that the red dot would no longer be used and instead only the number allocated to the chosen route would be displayed by the driver on the windscreen. This was learning by trial and error, but had the result that the cost of implementing the project has come down. Passenger research is done as part of the development of the project

FIGURE 3: STICKERS FOR NETWORKS CONSISTING OF DIFFERENT ROUTES

a) Side sticker



b) Front and back sticker



b) Network-type B: A network formed by deviations along the route between the same origin and destination

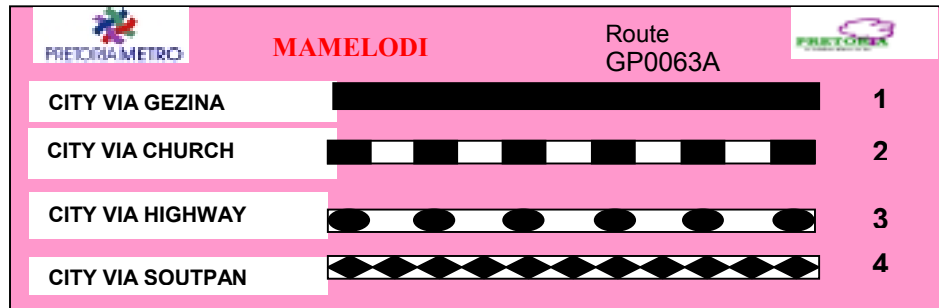
This type of network represents a case where the network consists of the deviations along a route between the same origin and destination. A good example is the route network between Mamelodi and the CBD of Pretoria, where passengers could choose to go between 4 alternatives -

- via Gezina; or
- via Soutpansberg Road; or
- via Church Street and Silverton; or
- via the Freeway (N4).

The sticker, which was designed for this type of network, is shown in Figure 4.

FIGURE 4: NETWORK TYPE WHERE THE ROUTE CONSISTS OF DEVIATIONS ALONG THE ROUTE BETWEEN THE SAME ORIGIN AND DESTINATION

a) Side sticker



b) Front and rear sticker



It is interesting to note that while the GPMC was prioritising the colour-coding of GPMC active taxis, the long-distance operators themselves asked for colour coding. The GPMC project is based on taxis, which have the GPMC as A-points (i.e. origins) according to registration procedures. The project has the advantage that it encourages the taxi operators to formalise their operations among themselves. Taxi operators and their associations are closely consulted through project development and implementation, hence there is very little resistance as problems are ironed out before actual implementation. Indeed, before each implementation there is a pilot study, as the industry has developed informally with limited educational and transport skills at the grassroots level where any taxi project has to be grounded to succeed. A top-down half-baked approach will not work.

4.1.2 Inter Regional/Metropolitan and Inter Provincial routes

The challenge for the design of the long-distance route colour coding sticker was to capture the operation of a network of long-distance routes and also to indicate to the passenger and other operators which destination the queue marshal had allocated to a particular vehicle. The basic elements of the long-distance sticker are shown in Figure 5 and consist of the following:

- Colour for the town where the route begins
 - Colour for the zone where the rank is situated in the town where the route starts
 - Logo of the local authority in whose area the route begins
 - Logo of the local authority in whose area the route ends
 - Registered route number
 - Sign indicating that this is a long-distance route
 - Destination where the route ends
- If a network has more than one route, the destinations of the rest of the routes.

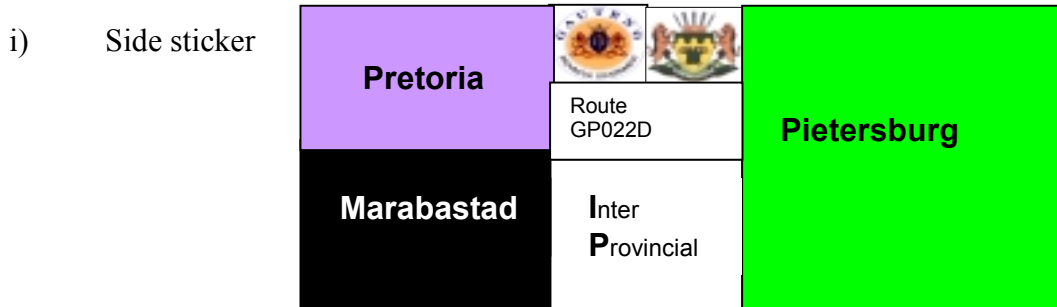
FIGURE 5: ELEMENTS OF THE INTER REGIONAL AND INTER PROVINCIAL STICKER

a) Colour for the town where the trip starts	c) Logo where trip starts	d) Logo where trip ends	g) Destination where the route ends
	e) Registered route number		
b) Colour for the zone in the town or region where the rank is situated	f) I nter P rovincial		h) If there are more destinations as part of the network

4.1.2.1 Single route

The longer-distance operations usually start at a point where the operators provide a service to one destination. The most common usage in this regard is where the service is provided between an origin in one region/ metropolitan area or province and a destination in another region/metropolitan area or province. It is therefore an operation between one point and another point. An example of such an operation is given in Figure 6.

FIGURE 6: THE INTER REGIONAL AND INTER PROVINCIAL STICKER FOR A SINGLE ROUTE OPTION



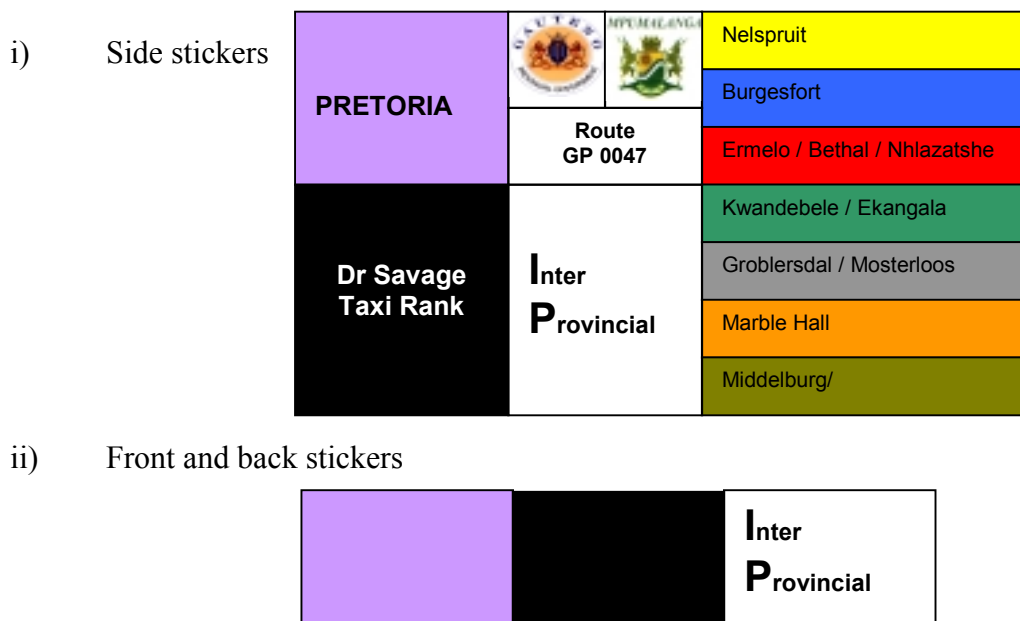
ii) Front and back sticker



4.1.2.2 Network-type of long-distance routes

In cases where there is not enough patronage on a route to make it profitable, the operator applies to the Registrar for permission to operate a second route. In many cases the two less lucrative routes together comprise a lucrative business for an operator. At the same time the operator provides a service along the less busy route, which in terms of bus transport would have been a subsidised route. The case at present is that the associations control and in a way co-ordinate the provision of services along certain routes that the association finds are lucrative as well as along less lucrative, long distance routes. All the operators have permits to operate a group of routes, which we can call a network of long-distance routes. The queue marshal (rank manager) allocates the route in such a manner that every operator gets a chance to operate all the routes, lucrative as well as less lucrative. This type of arrangement ensures that all routes are serviced and that violence is avoided. It is part of the route colour-coding research project to study route operations and the long-distance pilot sticker is shown in Figure 7.

FIGURE 7: PILOT STICKER FOR THE INTER PROVINCIAL NETWORK OF INTER PROVINCIAL ROUTES FROM THE DR SAVAGE ROAD TAXI RANK IN PRETORIA’S CBD TO DESTINATIONS IN MPUMALANGA PROVINCE



4.2 Permit disc bar-coded system

In addition to the route colour-coding that will be visible on the outside of the vehicle, the project also includes control measures that can access data by means of electronic devices.

4.2.1 Description of the bar-coded system

After consultation with the electronics industry to determine what technology was available and whether the coding system could also be used for control purposes, the following possibilities were identified.

There are not very many or varied affordable electronic options available. However, what is available ranges from quite basic and fairly expensive to highly sophisticated and extremely expensive. Microchips and 2D bar codes are also available off the shelf, but the problem with this option is that the information on these chips is fixed and the buyer cannot change

the information. This means that the code would have to be used as an identity number representing a taxi with certain particulars.

4.2.2 Elements of the electronic control system

The development of the electronic control system would consist of three main steps:

The first step would be to decide on and put together the unique information needed for controlling purposes.. The second step would be to establish and maintain a database to support the electronic system. The third would be to capture on the microchip or 2D bar-code the unique information about each of the vehicles and to have access to the information on the microchip or 2D bar-code to enable the controllers to identify the vehicle, owner, driver and route.

The electronic system has not yet been put into effect because this can only be done after finalising the special legalisation process and establishing the database of the Permit Board.

5. DEVELOPMENT AND IMPLEMENTATION OF THE PILOT PROJECT

5.1 Route-type sticker

The Atteridgeville area in the GPMC area was selected for the first pilot project in 1997 because it is relatively isolated but has enough variety to test the system's applicability to the GPMC area as a whole. The taxi association Atteridgeville Taxi Operators Association (ASTOA) had been largely formalised in its business activities by the GPMC during the period from September 1996 to April 1997. ASTOA had been registered as a co-operative. The Atteridgeville pilot project was successfully completed during the financial year ending June 1997, but only during the financial year ending 1998 were all the stickers affixed to the vehicles. This could only be possible with the co-operation of the association, at that time led by Leonard Kutumela.

5.2 Route colour-coding implementation process

The implementation process consists of a number of steps to ensure that when the final stickers are affixed to the vehicles, everybody concerned is satisfied that the stickers and the information are in order.

5.2.1 Pilot route colour-coding stickers

The pilot projects were implemented in two phases. In the first phase the concept was tested on a limited number of vehicles. As was the case in the Atteridgeville project, pilot stickers were also issued to a limited number of taxis operating in Menlyn, Mamelodi, Eersterust and to the long-distance taxis operating from the taxi rank at Dr Savage Road. In the second phase of the pilot the stickers were affixed to all the vehicles.

5.2.2 Pilot questionnaire

After the pilot stickers had been tested for one to two weeks, a sample was drawn of owners, passengers and drivers. These respondents were interviewed to establish whether they accepted the concept and if they had any proposals for improving the stickers. A short questionnaire was designed to test the following aspects of the stickers:

- (a) Respondents' understanding of what the stickers stood for
- (b) Whether there was a need for identification on the vehicles and if so, why
- (c) Whether the stickers were clearly visible from a distance
- (d) What could be done to improve the route colour-coding concept.

Members of the Taxi Associations were trained to interview the passengers, with the support of a member of an association for whose operations the process had been completed. The trained taxi researchers were paid a nominal fee to cover their expenses. This is empowerment of the taxi industry at grassroots level. Associations at higher levels could only be stable and sustainable if people at grassroots are empowered.

5.2.3 Findings of the pilot project

Like the eastern suburbs pilot project (Menlyn routes) during 1998, the findings obtained from the long-distance pilot project were most encouraging: All the respondents felt very positive about the route colour-coding system and believed that it would alleviate many of their problems. This system would make it easy for potential passengers to choose the correct taxi and it would also be easy to trace a taxi again if goods had been left behind in a taxi. These taxis looked professional, were no longer anonymous and scary, and also looked official with their city logos.

5.2.4 Implementation of the system in the GPMC area

The implementation of the project in the rest of the Greater Pretoria Metropolitan Area is progressing well. However, the project relies heavily on the provincial registration process because only taxis that have gone through the registration process, can be considered for colour coding. So far, not all of the taxis have gone through the registration process in Pretoria.

The basis for the route colour-coding system has now been laid and the industry has accepted the concept. The extension of the project to the rest of the GPMC area has started, and could be expedited and completed subject to finances being available. The system would also rely heavily on the quality of the law enforcement supporting the system. The success of the registration process would also determine the progress that could be made with the implementation of the route colour-coding system.

The following elements are part of the proposed process to extend the system not only to the rest of the Greater Pretoria area but also to other provinces:

Taxi associations should complete the registration of routes and vehicles.

- ii) There should be liaison and co-ordination by the provinces about cross-metropolitan boundaries and with the National Department of Transport about routes across provincial boundaries because Provinces cannot co-ordinate each other.
- iii) The stickers should be designed in collaboration with the taxi associations.
- iv) Stickers should be tested in a pilot project before they are affixed to all registered vehicles.
- v) Stickers should be ordered according to the agreed routes and the number of operators per route.

5.2.5 Other steps, which should also be taken to ensure the effective implementation of the route colour-coding system, include the following:

Educate the law enforcers so that they have a good knowledge of the proposed system.

Implement laws that will support the coding system.

Establish and maintain a database, which will be connected to the Provincial Registration Administration System.

5.3 Development of the industry

It is crucial to the sustainability of the route colour-coding system that the management of the taxi industry should be effective. It has been necessary to train members of the taxi association management before implementing route colour-coding, since their skills and educational level are low.

6. CONCLUSIONS

The following conclusions can be drawn:

- a) The enthusiastic response from the taxi industry and the users showed that the minibus-taxi industry and the users are ready for and accept the route colour-coding system
- b) The only obstacle to introducing the system are how quickly the operators register at the Taxi Registrar and the speed by which the Permit Board could finalised conversion of radius to route based permits and issue outstanding permits. This could then be followed by detailed design of the layout of the stickers.
- c) It can now be stated without hesitation that although the taxi industry has willingly accepted the route colour-coding system, the long-term success of the route colour-coding system can only be sustained if it was supported by strict law enforcement.
- d) Although the route colour-coding system is aimed at informing the passenger about the route along which the particular taxi is operating, the system should be regarded as being closely linked to the provincial permit system.
- e) However, colour coding ought not to be used for law enforcement in the first instance or in isolation.
- f) The time is now ripe to present and test the bar-code control device on routes in the GPMC area.

7. REFERENCE

The Development and Implementation of a Taxi Route Colour-Coding System for GPMC Area: Mamelodi, Eersterust, Centurion and Long Distance Pilot. Greater Pretoria Metropolitan Council, Metropolitan Public Passenger Transport Division. July 1999.

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Sias is a **public transport specialist** with a M Eng (Transportation) and is especially well-known for his success in the development of liaison structures between the authorities and the taxi and bus industries. He has an effective way of working with the industry at all levels, particularly at grassroots level. Other fields of his experience include the development of passenger transport plans and strategies, the determining of the need for infrastructure, conceptual planning and design of public transport facilities. The East Rand and several other parts of South Africa have many examples of his expertise and input. Of late he has become involved in projects to stimulate and create jobs at grassroots level. He was part of the team who developed, design and implemented the colour coding system in the GPMC area and North West Province.