DEPARTMENT OF TRANSPORT
TRADE AND INVESTMENT LIMPOPO

CONCEPTIONAL FRAMEWORK AND BUSINESS PLAN:

DEVELOPMENT OF PUBLIC TRANSPORT TRANSFER FACILITIES AT MINES ON THE DILOKONG CORRIDOR

INTERIM REPORT

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DEPARTMENT OF TRANSPORT & TRADE AND INVESTMENT LIMPOPO CONCEPTIONAL FRAMEWORK AND BUSINESS PLAN: DEVELOPMENT OF PUBLIC TRANSPORT TRANSFER FACILITIES AT MINES ON THE DILOKONG CORRIDOR

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1. INTRODUCTION

1.1 PURPOSE OF REPORT

This document is an interim report that is part of the first phase of the project on the development of truck-inn and public transfer facilities through out the Limpopo Province.

The interim report is aimed at the formulation of a conceptual framework and business plan for the development of public transport transfer facilities at the platinum and chrome mines within the Dilokong corridor.

Based on deliberations during workshops and other consultation events, this report follows a decision not to pursue with truck-inn facilities and road traffic control centers along the Dilokong corridor at this stage but to specify the requirements for transfer facilities at the mine areas that are developing at a fast pace.

Any further proposals with regard to truck-inn and traffic control facilities on the Dilokong Corridor will be pending the results of a more comprehensive transport corridor development investigation that would also focus on, inter alia, the most appropriate locations for such facilities.

1.2 BACKGROUND AND MOTIVATION

The specifications to develop public transport transfer facilities at the Dilokong mine areas are motivated by the following:

- Firstly the vibrant economic development process along the entire Dilokong corridor with about 12 000 -15 000 new employment opportunities particularly at the new mines that, in turn, generate new public transport needs between residential areas and the new employment areas.

- Secondly the provisions contained in the National Land Transport Transition Act, Act 22 of 2000, that regulates all public transport operations.

It is a statutory requirement that all public transport movements must be regulated through the issuing of operating licenses with defined origins and destinations (ODs). These ODs must be recognized terminal or on-route stop or load facilities such as bus terminals, taxi ranks or any other multi modal transfer facility.

The Act also requires that all activities at these facilities must be controlled or regulated by the recognized transport authorities, regardless of whether or not these facilities are situated on public or private property. For this reason all provincial governments and municipal transport authorities are required to determine and register the exact location of all public transport (PT) facilities.

It follows automatically that where such facilities do not exist or if they are not well developed, the authorities should identify the required positions and act as an initiator to develop such facilities based on a standard set of requirements formulated in consultation with the community and private sector.

1.3 APPROACH AND METHODOLOGY

Referring to the terms of reference for the entire project, of which this report covers only one section that focuses on the Dilokong Corridor, Trade and Investment Limpopo (TIL) embarked on this project to formulate a strategy and develop business plans for the development of truck-inn and public transfer facilities, acting on behalf of the provincial Department of Transport.

The end result should include a development framework with conceptual designs for the establishment of transfer and truck-inn facilities along various corridors in the Limpopo Province.

The steps that are taken to obtain the above deliverables include the following:

- Identifying the mine areas and the positioning of current load and off-load areas and the possible positions of formal transfer facilities;
- The consultation and determination of requirements for facility development, taking into account the demand and supply indicators;
- Development of standards of amenities and categories of facilities;
- Typical layouts of the facilities;
- Indications as to what type of facilities would be more appropriate for each site;
- Setting of development priorities and the programming of implementation process.

1.4 CONSULTATION AND LIAISON

Consultation is done on two levels, namely on public and private sector levels.

Consultation with the public sector mainly involves workshops and project steering committee meetings where various government departments are represented.

Consultation with the private sector is mainly focused on the management of the various mines and some of the transport operators in the region in an attempt to obtain inputs and information where possible on needs for public transport at the respective mines, particularly in terms of transfer facilities and also general public transport problems that are experienced.

Private sector consultation is done by means of interviews at the mines and with the transport operators. Based on the inputs and other research, specifications are developed for standard amenities that should assist in finalizing the development requirements for a facility at a particular point within or adjacent to the mine properties.

At a recent workshop it was decided that the area be visited to determine what transfer facilities were required at the main entrances to the mines. Two series of visits have been undertaken to mines such as Samancor Works, Steelpoort Mine, Maandagshoek (Madikwa) Works and Mine Shafts, Dilokong Chrome Mine, Marula Platinum Mine, Twickenham Platinum Mine and Lebowa Platinum Mine (Atok).

2. DEVELOPMENT PERSPECTIVES

2.1 STUDY AREA

The Dilokong corridor is defined as an area stretching from Polokwane to Burgersfort with the R37 provincial road as the spine of the corridor. Numerous small rural villages and a number of platinum and chrome mines are situated adjacent to this R37 road.

Figure 2 shows the Dilokong Corridor and the adjacent catchment area, including the rural communities and the location of the mines along the corridor.

2.2 HISTORIC DEVELOPMENT BACKGROUND

Historically the majority of the area that is now referred to as the Dilokong corridor consisted mainly of farming and rural trust land areas, inhabited by the former Lebowa tribal communities and commercial farmers.

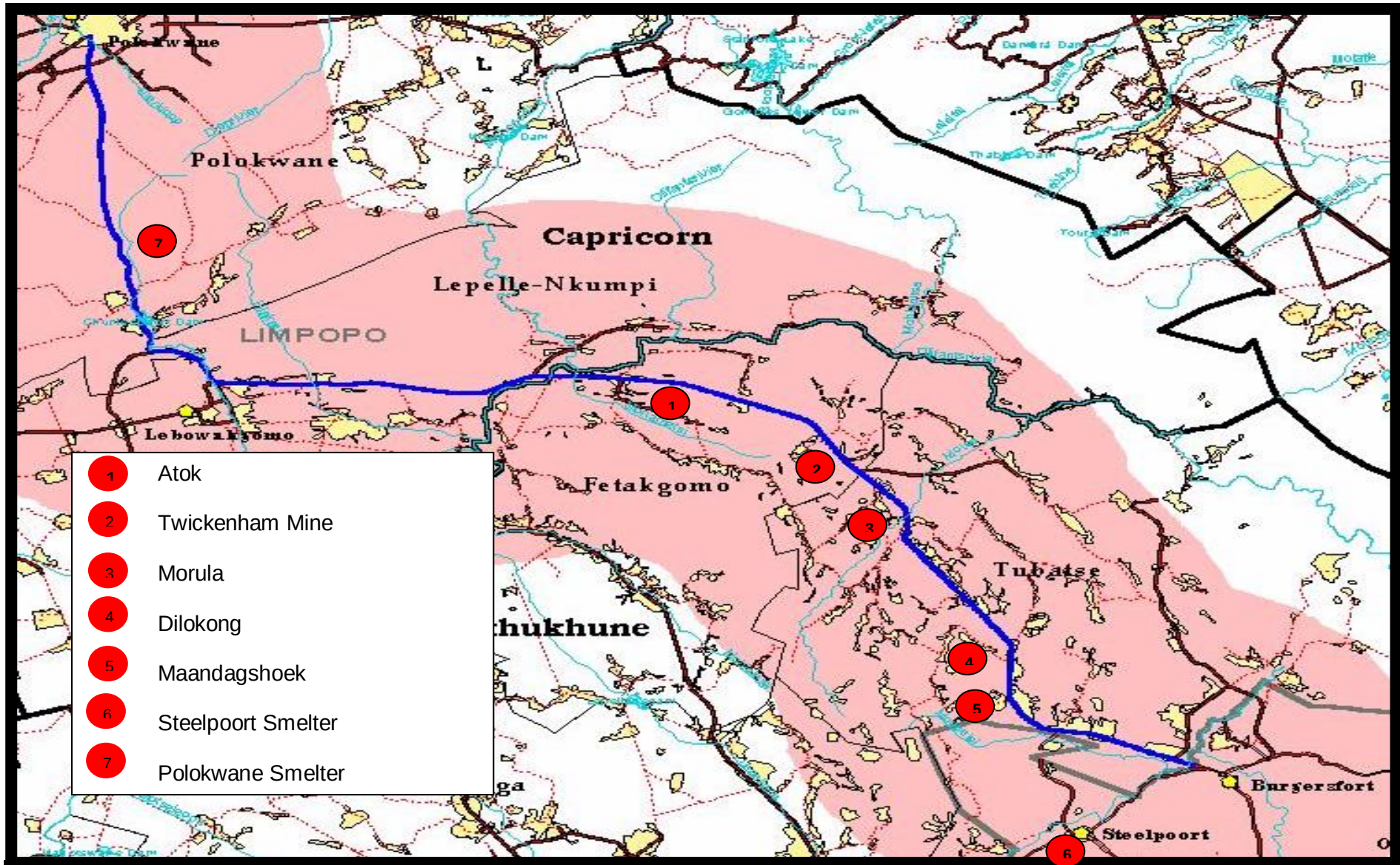
Since the early sixties, chrome and platinum deposits along the corridor were explored and small mines were established. Systematically the mining developments became quite active and more dominant as the main land use apart from residential villages, until around the late eighties and early nineties with the disintegration of the USSR.

With the USSR previously being a fairly closed market to the outside world, the mineral produce from the USSR did not have that much effect on the production on the Dilokong corridor. However since the disintegration of the former regime it started “dumping” its chrome, platinum and other of mineral ores all over the world.

This led to the plummeting of prices for the affected metals and resulted in most of the Dilokong mines closing or scaling down. More recently with the normalization of the international mineral markets, the corridor is becoming industrially re-activated.

Since its near-collapse there has been untold unemployment in the area and the upsurge of economic activity in the area will and has already begun to bring about much relief to employment conditions in the surrounding areas and generally speaking the level of economic development standards.

Since the turn of the century development programs became very vibrant with an expected spill-over effect to secondary sectors that would support and service the main economic sector for the corridor, namely mining, which would obviously also have an effect on the rest of the Limpopo Province and also the Mpumalanga Province that shares the corridor.



DILOKONG CORRIDOR
LOCATION OF PLATINUM AND CHROME MINES
FIGURE 2

2.3 CURRENT AND FUTURE DEVELOPMENT PERSPECTIVES

It is a well- known fact that the Dilokong corridor is industrially turbulent and will continue to experience even more major developments in the next couple of years with new mines being developed and opening up continuously as time moves on.

Most of the developments are already in progress, thus making it urgent and imperative that public transport development in the area be speeded up to accommodate the requirements for public transport in support of all the economic activities along the corridor and also serving the communities that are becoming more and more mobile as the level of development expands.

It has all along been recognized that the Dilokong corridor has high development potential and that as soon as most of the companies start exploiting or re-exploiting the resources around the respective nodal points, the corridor would be transformed into a vibrant economic and industrial area. Additional information in this respect can also be found in the NPii, Technical Report 3, (Item 8.3) on this corridor.

The most important economic development indicators along the corridor are:

- The development of at least 5 high volume mines in Limpopo and another two mines in Mpumalanga along the Dilokong Corridor.
- The creation of 12 000 – 15 000 employment opportunities at these mines once fully developed.
- The development of 2 new smelters in addition to the smelter at Steelpoort;
- The movement of semi-processed ore (slag) to the smelters at a rate of about 400 tons per hour, or about twenty 20-ton trucks every hour along the main provincial road.
- Depending on future developments that would determine how much of the support services and products would be “imported” from outside the Dilokong Corridor and how much would be provided from within, the multiplier effect could be a factor of between 2 and 3.
- Based on the above, the total employment opportunities in the area resulting from the mining activities could be between 25 000 and 45 000, with income generation that could support a population of between 150 000 and 270 000 people.

Specific details regarding the mines include:

- Lebowa Mine at Atok is expected to double up in size in the next year or two that could result in a truck leaving the mine for the smelter every five minutes.
- Maandagshoek (Megamine) Mine, scheduled to start at full production capacity around the beginning of January 2003 but that is already partly operational, is expected to produce at a level that one 20-ton truck could be dispatched to the smelter in Polokwane every twenty minutes.
- The Dilokong, Marula and Twickenham Mines that will produce at the same level as Maandagshoek.
- Smelters being developed near Polokwane and at Rooipoort Dam.
- Apart from the existing developments, additional new mine areas are being considered along the R555, from Burgersfort to Roossenekal and around the Sekhukhuneland, Driekop, Dilokong and other areas there. The possibility of at least another 8 shafts is under investigation.

Other related activities include:

- A major trucking company being established on the corridor to move cargo between the corridor and Richards Bay.
- The expansions at Maandagshoek (Modikwa), could amount to about R1.3 billion in value.
- No housing developments will take place at the mines themselves and all employees will be commuting from either the nearby villages or from Burgersfort or from Polokwane. Some of the mines are currently accommodating some of the personnel near the mine but this cannot be relied on to take care of these explosive developments.
- Burgersfort had about 500 families traditionally and is now expected to accommodate at least another 1000 families. Transporting these people to and from work would become an issue immediately.
- Polokwane also would have to deal with much of these new developments. As these developments take place, more and more working personnel, including supervisory and managerial staff, would be entering the area.
- Most of the mines do not assist staff with transport. They travel on their own steam either by taxi or private vehicles, although many workers stay within a walking/bicycle distance from the mine.
- Most of the mines have no bus or taxi facilities and services with the exception of Samancor that provides transport free of charge to their staff, using 24 buses owned and operated by Sekhukhuneland Express.
- Some mines provide transport exclusively on mine property to the various shafts.

2.4 DEVELOPMENT SITES

The positioning of the mines where public transfer facilities can be considered are indicated on Figure 2:

- Node 1: Lebowa Platinum Mine at Atok
- Node 2: Twickenham Mine
- Node 3: Morula Mine
- Node 4: Dilokong Mine
- Node 5: Maandagshoek Mine
- Node 6: Steelpoort Smelter
- Node 7: Polokwane Smelter

Visual material indicating the potential development sites at the entrances to the mines where the transfer facilities can be developed are shown in Annexure 1.

3. DEVELOPMENT OF STANDARDS AND REQUIREMENTS

3.1 CATEGORIES OF FACILITIES

Three different categories of facilities are suggested as alternatives for each development site:

- CATEGORY A TRANSFER FACILITY: Major multi-modal facility
- CATEGORY B TRANSFER FACILITY: Limited transfer facility
- CATEGORY C TRANSFER FACILITY: Lay bye (drop-off, pick-up).

3.2 FACILITY STANDARDS

Standards for the development of the transfer facilities are shown in Diagram 1.

Standards are provided for roads/pavements/parking, buildings and structures, bulk infrastructure general facilities and amenities, and the difference in the standard required for the three categories of facilities indicated.

The standards have been developed in consultation with the Department of Transport for Limpopo Province

3.3 TYPICAL FACILITY LAYOUTS

Typical layouts are prepared taking cognizance of the following guideline documents for the design of bus and taxi termini:

- Guidelines for the Design of Taxi Facilities (DOT, 1990)
- Bus Terminals and Bus Stations, Planning and Design Guidelines (DOT, 1986)

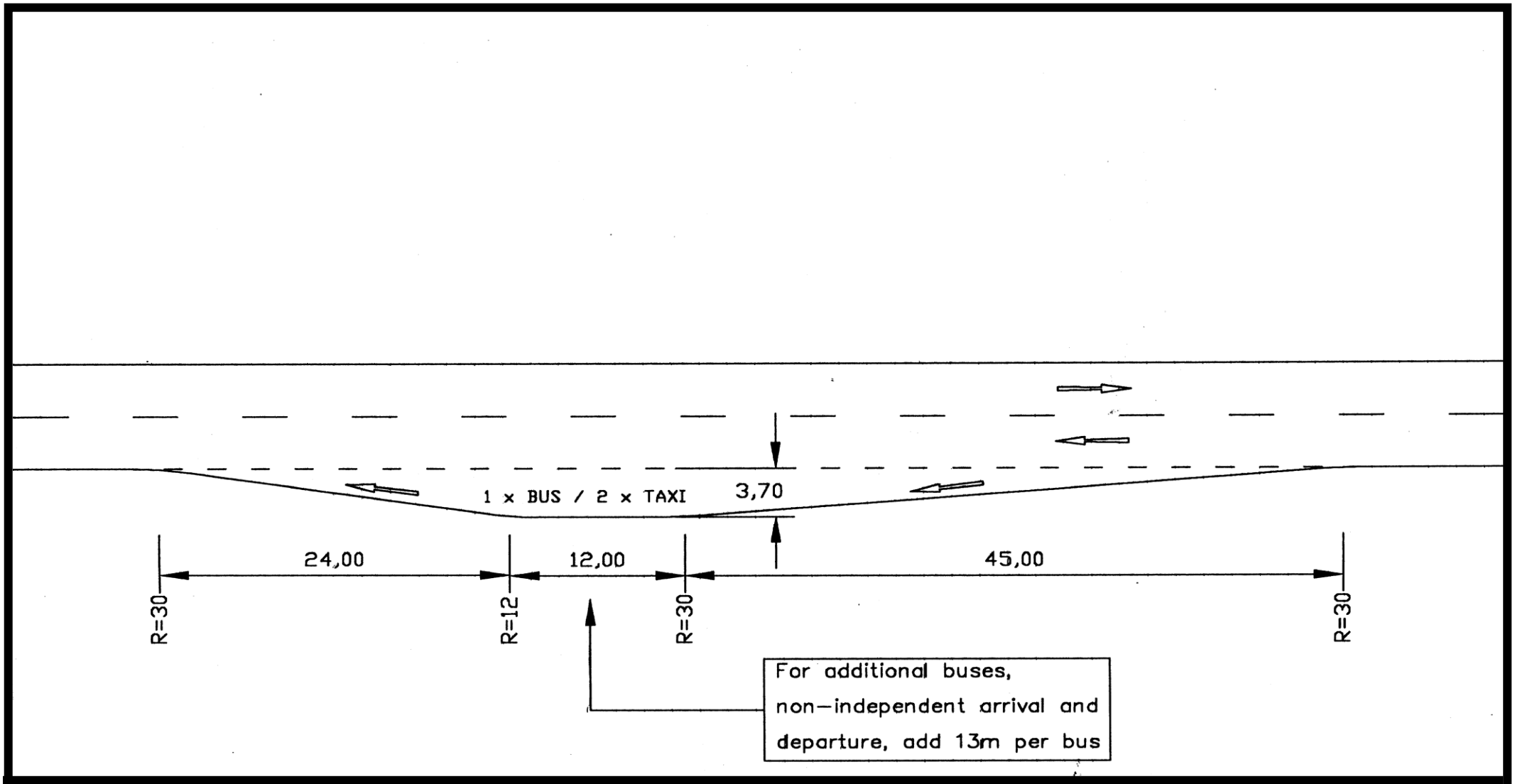
The final layouts of the respective facilities will however be determined by the demand at each specific location.

However, the following typical layouts are provided as **Figures 3.1** to **3.4**:

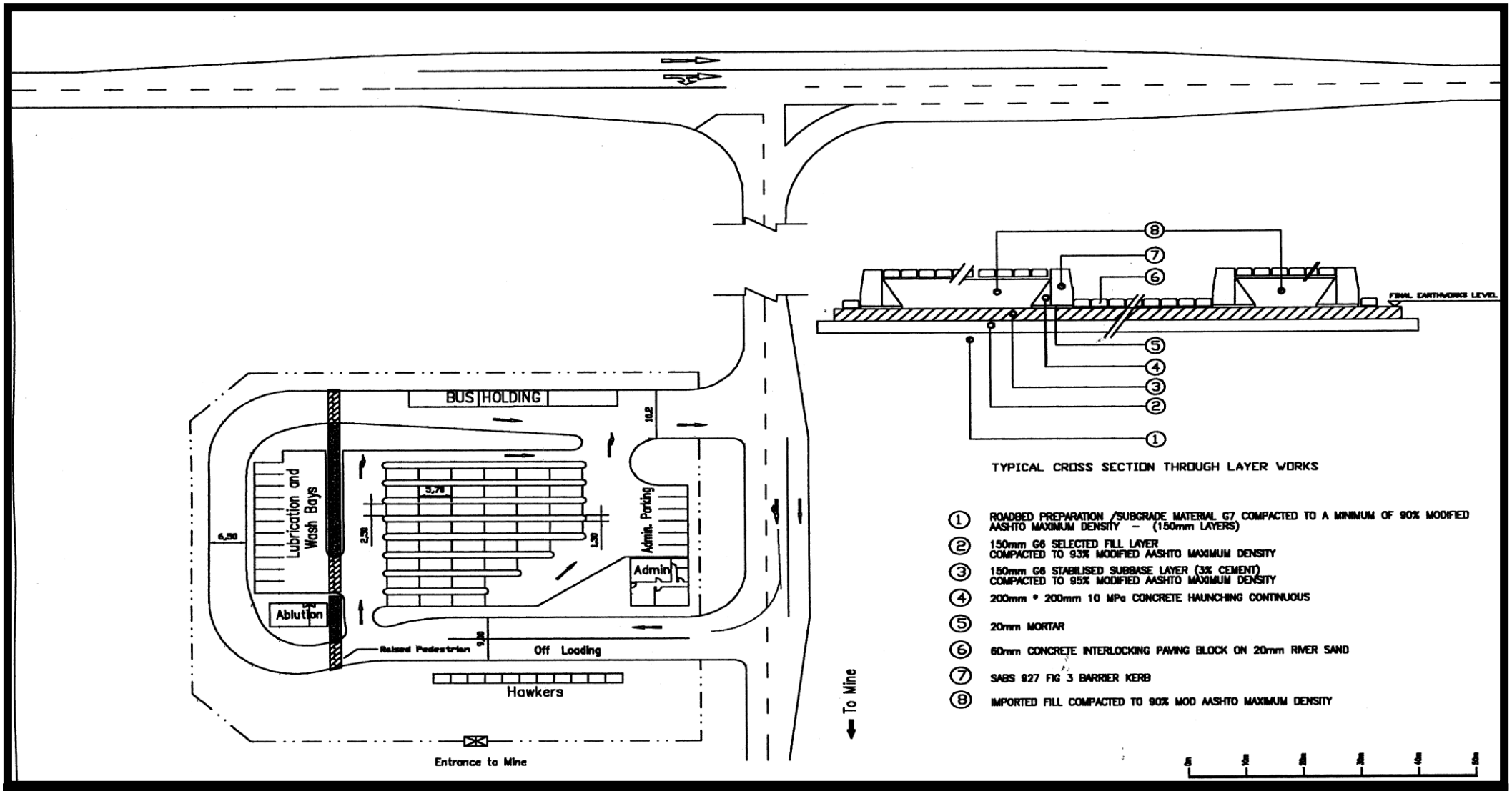
- **Figures 3.1**: Category C facility - recessed bay for parallel berth for use by taxis and buses.
- **Figures 3.2**: Category B limited terminal facility.
- **Figures 3.3 and 3.4**: Terminal facilities for predominant use by buses and taxis respectively.

The above figures are provided in large scale at the back of the report.

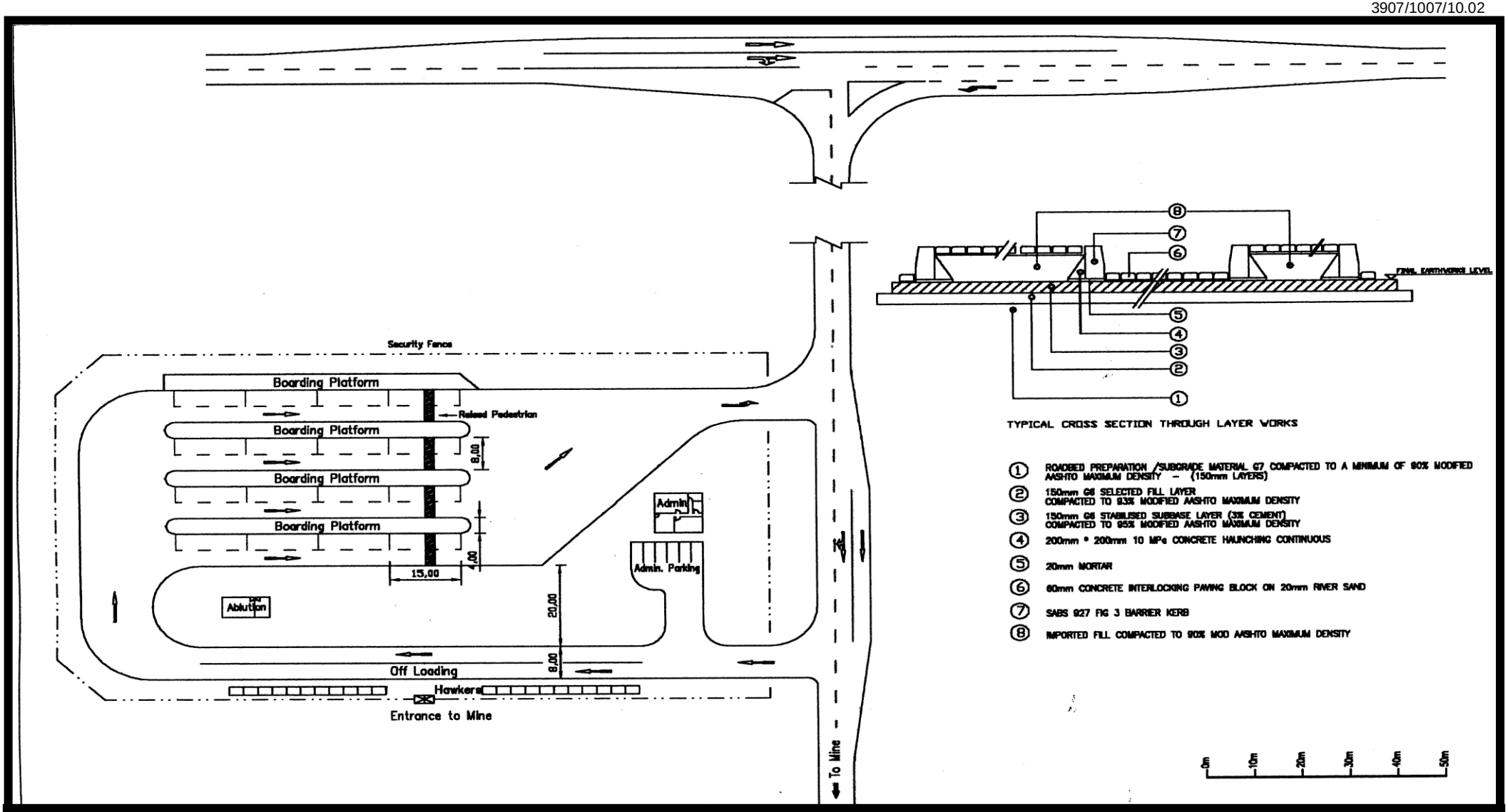
LIMPOPO PROVINCE: DESIGN STANDARD FOR PUBLIC TRANSPORT TRANSFER FACILITIES			DIAGRAM 1
FACILITY CATEGORY	**A: MAJOR MULTIMODAL FACILITY**	**B: LIMITED TRANSFER FACILITY**	**C: LAY BYE (Drop off, Pick-Up)**
POSITIONING OF FACILITY			
ROADS/PAVEMENTS/PARKING			
Road Ways Surfacing	Paving or tar	Tar	Tar
General Parking	Small number for private vehicles	No	No
Passenger Pavements	Paving bricks	Concrete	Concrete
Passenger Areas	Paving brick or concrete	Concrete	Concrete
BUILDINGS AND STRUCTURES			
Ablution/Toilets	Yes	Yes	Yes, where appropriate
Offices	Yes	One only	No
Information, Ticketing	Yes	Yes	No
Conference Room	It may be necessary, but not priority	No	No
Passenger Shelters	Yes	Yes	Yes
Rest Areas	Yes	No	No
Covered Loading Bays	Yes	Yes	No
Hawker Stall	Yes	Yes	Yes, where appropriate
Formal Shops	Limited, but necessary for funding assistance	Maybe one or two	No
Fences	Depending on environment	Yes	Yes, where appropriate
Wash bays	Yes	Yes	No
BULK INFRASTRUCTURE			
Electricity	Yes	Yes	Yes, where appropriate
Water Supply	Yes	Yes	Yes, where appropriate
Sewage	Yes	Yes	Yes, where appropriate
Storm Water Drainage	Yes	Yes	Yes
Entrance And Exit Traffic Control	Depending on siting	No	No
Speed Measures	Yes	No	No
Traffic Signs	Yes	Yes	Yes
Rank Access Control	Yes	Yes	No
GENERAL PASSENGER FACILITIES & AMENITIES			
Seating: Passengers	Yes	Yes	Yes
Water Taps (Outside)	Yes	Yes	Yes, where appropriate
Refuse Bins	Yes	Yes	Yes
Lights	Yes	Yes	Yes
Public Telephones	Yes	Yes	Yes
Information Systems	Yes	Yes	No
Signage	Yes	Yes	Yes
Fire Protection Equip.	Yes	Yes	Yes, where appropriate
First Aid	Yes	No	No
Advertising Boards	Yes, funding source	Yes, funding source	Yes, funding source
Compatibility: Handicapped	Yes	Yes	Limited
Public Ann. System	Yes	No	No



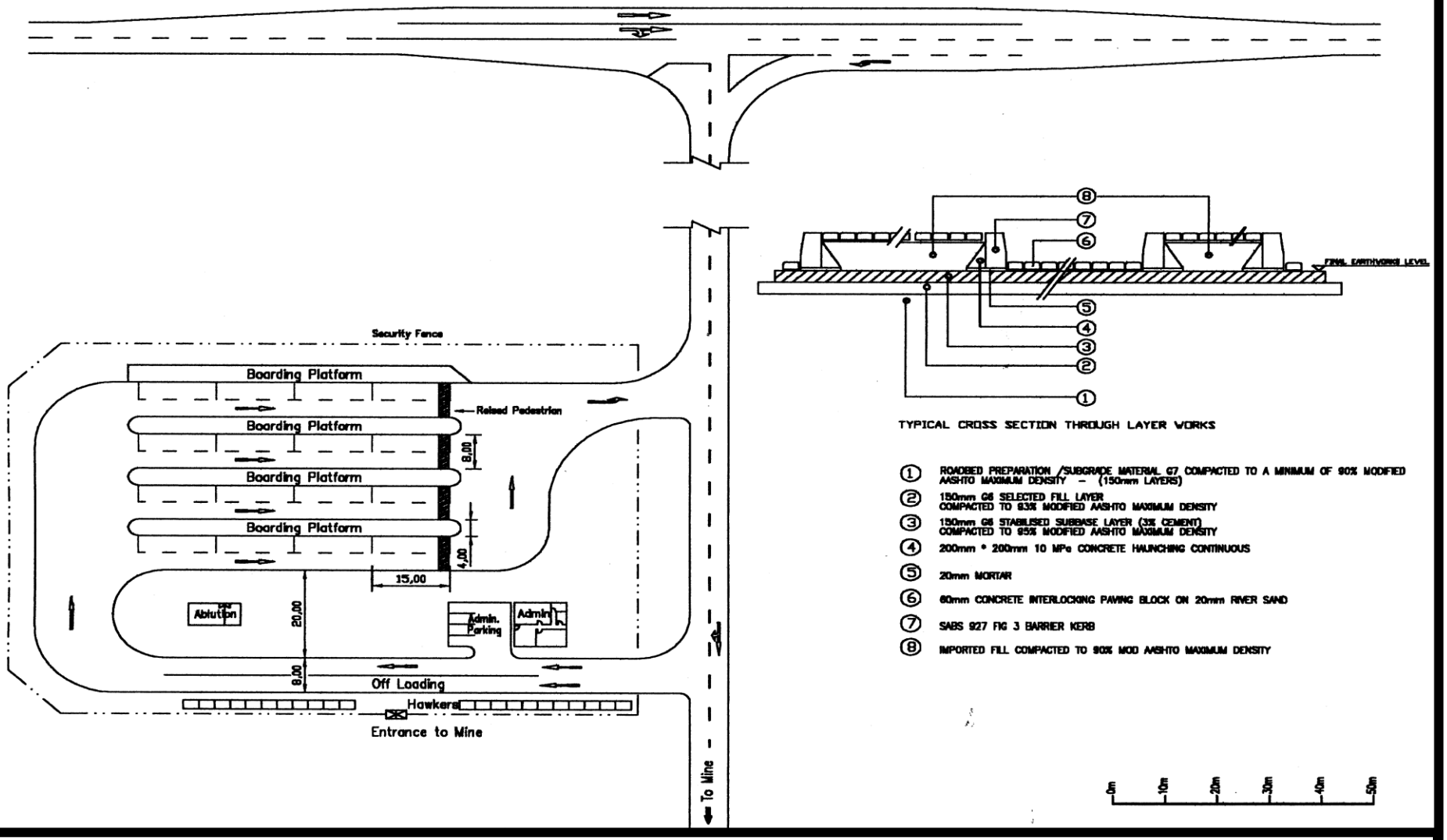
RECESSED BAY FOR PARALLEL BERTH
FIGURE 3.1



PROPOSED TAXI LAYOUT
FIGURE 3.2



PROPOSED BUS TERMINAL LAYOUT 1
FIGURE 3.3



PROPOSED BUS TERMINAL LAYOUT 2
FIGURE 3.4

3.4 TECHNICAL REQUIREMENTS

3.4.1. Introduction

The proposed transport terminal facilities for the Limpopo Province need to be constructed such that the facilities will be practical, safe and functional. The combination of taxis and buses calls for a diverse set of design considerations, which need to be integrated into one multi-modal facility.

The mentioned guideline documents shall thus be used as a basis for the design of the facilities. The essence of the guideline documents will however be highlighted in this document to provide a broad indication of what is required.

3.4.2. Vehicle Characteristics

Dimensions

Design vehicle dimensions are available for taxis and buses from the respective guideline documents.

It must be noted that the maximum width given for a taxi in the guidelines does not include the size of side-view mirrors that can be up to 300 mm per mirror depending on the type used. Further, the addition of roof racks and baggage on top of a taxi can increase the height of the vehicle significantly. This should be anticipated for especially long distance travelling.

The design dimensions for taxis and buses, as obtained from the guidelines, are summarized below:

Table 1: Design Dimensions for Taxis and Buses

Dimension	Taxis	Buses
Length	4.625 m	12,0 m
Width	1.845 m	2,6 m
Wheelbase	2.495 m	6,0 m
Front overhang	1.005 m	2,5 m
Rear overhang	1.125 m	3,5 m

Turning characteristics

The typical taxi is shorter than the design vehicle but slightly wider. However, one should note the differences in the front overhang and wheelbase dimensions.

It is thus recommended that the South African design vehicle be used for design purposes of taxi facilities with allowance for a 255 mm longer front overhang and consideration of the size of side-view mirrors. The 11,0 m kerb-to-kerb and 12,0 m wall-to-wall turning circles of the typical taxi fall within the range of the South African design vehicle.

The minimum turning radii for buses at terminal maneuver speed is given in the design guideline as 18.0m.

Long-distance taxi trailers

Passengers travelling with long-distance taxis usually have more luggage than on commuter trips. Storage space in a taxi is very limited and in the 16-seater vehicles, nothing more than hand luggage can be stored inside the vehicle.

Trailers are very popular to accommodate additional luggage and it is essential to include their usage in the design of long-distance taxi facilities. The commercially available trailers vary in capacity and size. An average typical trailer is 3,0 m long and 1,6 m wide, and should be accommodated in design.

3.4.3. Site Layout and Geometric Requirements

Layout Principles

The following basic principles apply to all types of public transport facilities and should be taken into account in the layout when designing the facility:

- Passengers board and alight from taxis and buses on the left hand side of the vehicle.
- One-way movements within a facility are generally safer and easier controlled than two-way movements.
- All vehicle movements should be in the forward direction of travel. The only exception should be the holding area where reversing in or out of standard parking bays may be considered.
- Passengers should have clearly defined queuing areas for boarding. Walkways should preferably be raised by kerbs and clearly separated from vehicle movements.
- A clockwise or anti-clockwise direction for circulation should be considered depending on the number of access points to the road system, the main direction of approach and turning movements of the taxis and buses as well as the volumes of other street traffic.

Terminal Layout

A typical layout for a recessed bay for taxis or buses is shown on **Figure 3.1**, while typical layouts for taxi and bus termini are shown on **Figures 3.2 to 3.4**. The layouts for taxis are based on the following design considerations:

- A separate off-loading area should be provided.
- The loading area should preferably consist of parallel loading lanes separated by passenger loading islands.
- Provision should be made for holding of vehicles within loading lanes.
- In general through lanes are not required in a terminal.
- Loading lanes need not have the same length.
- Taxis should form queues in loading lanes and the front of the queue should be as close as possible to the passenger demand or alternatively to the exit point of the terminal.
- Pedestrian/vehicle conflicts should be minimized.
- Pedestrian islands and paths should be located in accordance with the natural flow of pedestrians that normally is the shortest path.
- Provision should be made for physically disabled passengers by means of ramps to raised loading and pedestrian islands.

For buses, loading berth layouts can be classified as either drive-through or reversing. Drive-through layouts are generally preferred to reversing layouts for high frequency urban services. Reversing layouts may be appropriate sometimes for lower frequency services such as those associated with inter-city or long distance bus services.

For the convenience of the passengers and the operators, the natural pedestrian movement should be taken into account at the outset of designing a layout.

Geometric Requirements

Geometric guidelines for design of taxi facilities are provided in the mentioned guideline document. The essence of the geometric requirements is summarized as follows:

***a) Loading area*:**

The loading area consists of the loading lanes, loading islands and loading bays. Loading lanes should not be less than 2,2 m and not more than 2,8m wide. A 2,2 m wide lane allows for the movement of taxis with 0,2m clearance on each side.

Lanes wider than 2,8m are not space efficient and could result in taxis trying to form two queues instead of one, or trying to overtake each other.

Loading islands should have a minimum width of 1,0m. This allows for a single passenger queue catering for 0,7 m required for boy dimensions and a clearance of 0,15 m on each side. Painted loading islands should not exceed 1,8 m in width since this will increase the possibility of drivers using them as loading lanes. The total width of any loading lane and painted island should not exceed 4,0 m.

The pedestrian island separating the loading area from the access/circulation lane should be at least 2,0 m wide, thus allowing for two pedestrians walking next to each other and a buffer between the pedestrian and the kerb edge on the side of the circulation lane of 400 mm. A non-mountable kerb to enforce vehicle movement around it and increase safety must raise this island. Loading bays do not need to be paint marked but an average length of 5,7 m per loading bay is required.

***b) Off-loading area*:**

The off-loading area consists of the off-loading bays, usually parallel to the kerb, and should have the same dimensions as the loading bays. The off-loading bays should allow for non-independent arrivals and departures and should be clearly marked. Ideally the off-loading area should be separate from the loading area.

***c) Holding area*:**

The holding area consists of the circulation aisle and the holding bays. The holding area functions as a parking area and therefore the design parameters given in the Parking Standards should be used. Aisle width depends on the circulation pattern and the angle of the parking bays. A separate holding area in taxi terminals should be provided to accommodate secondary activities.

***d) Circulation and access lanes*:**

Circulation and access lanes should be designed in such a way that all taxi movements are feasible in a forward direction. Special attention should be given to turning circles according to the design dimensions. A 5,5 m turning radius is the absolute minimum kerb-to-kerb radius of a taxi at crawl speed.

Taking into account different driving skills this could result in a driver not being able to turn in one maneuver. A 6,2 m turning radius provides an appropriate minimum standard. The width of one-way circulation lanes should not exceed 4,0 m in order to discourage stopping of taxis in this lane.

The geometric requirements for bus terminals are described in detail in the guideline document. A variety of loading berth designs has evolved from attempts to make the best use of the size and shape of land available and to best facilitate the maneuvering of buses into and out of the berths.

Four basic designs relating to different bus parking angles are:

- Parallel
- Shallow saw tooth
- Acute saw tooth (45 to 60 degrees)
- End on (90 degrees)

The most prominent layouts, the recessed on-street bay and a typical bus terminal with parallel berths, are shown on **Figures 3.1, 3.3 and 3.4**.

3.4.4. Considerations for Long-distance Operation

Long-distance operations are characterized by the long passenger waiting and loading times, and by the large amount of personal luggage carried. These differences are reflected in the spatial needs of the operators and passengers, which affect the layout, and geometric design parameters of long-distance taxi and bus facilities.

Special considerations for long distance taxi facilities are provided in the guideline document, and are briefly discussed below:

The main difference between commuter and long-distance taxi facilities is in the loading area. The pedestrian island should have a minimum width of 3,0 m and preferably be raised by kerb. This allows 1,4 m width for a single-line queue of passengers with their luggage and 1,6 m width for two-way pedestrian flow. The loading lane plus aisle width should be 5,0 m wide in order to allow for independent taxi departures. The recommended dimensions for loading berth are incomplete and should be provided for each destination at the front of the queue.

As mentioned, long-distance taxis sometimes make use of trailers in order to store luggage. The frequency of trailer usage as well as their dimensions varies significantly. As a result of these variations the dimensions of berths cannot be standardized to accommodate all possible vehicle-trailer combinations. The degree of trailer usage and their dimensions should be established in each case and if necessary adjustments to the previously developed standards should be made.

3.4.5. Ancillary Infrastructure

The provision of ancillary infrastructure (e.g. ablution facilities, seating, shelters, waste bins, public phones, shops and informal trading areas) are important factors to consider, especially at long distance facilities where people have to be accommodated on the premises for longer periods than at commuter facilities. The area occupied by such facilities should however not dominate the use of land.

a) Ablution Facilities

The number of toilets required depends on the location of the facility and the surrounding land uses. Assuming that 40 % of 1 000 peak hour passengers are present in the peak 15 minute period and 10 % of these use a toilet for an average time of 2 minutes per person, toilet-time requirements would be 80 minutes over the 15 minute period. Thus 5,33 toilets per 1 000 peak hour passengers would be required.

A male/female ratio of 2 toilets for male and 3 toilets for female could be applied. The size of a single toilet can vary from 1 m^2 for portable ones to 2 m^2 for permanently built ablution blocks.

Security at toilet facilities has always been a problem. Toilets must be well lit and ventilated and must not provide concealment for robbers. Discussions with taxi users showed that privacy is very important and therefore semi-open toilet facilities are not acceptable. The design should be a compromise between the provision of privacy and enhanced security.

b) Seats

The width of the loading island in long-distance taxi facilities allows for the installation of a space saver type of seat. This type of seat consists of rails arranged in a way to provide for resting of the body in an almost standing position or for temporary seating. This seating arrangement, which was first implemented at the Golden Acres bus terminus in Cape Town, is cheap to construct, and cannot be easily damaged. It can be painted in bright colors, thus enhancing the appearance of the taxi facility.

c) Shelters

Shelters at long-distance taxi facilities should be provided at the loading area and cover each individual loading island. A minimum vertical clearance of 3,0m is recommended. Such a height would allow for a taxi with roof racks and luggage loaded on the roof. A minimum overhang of 1,0 m is recommended, to offer protection from rain falling at an angle.

Other areas that need protection from weather are the seating, social area, off-loading area and the main pedestrian walkways. Alternatively a shelter covering the entire area of the facility can be provided.

The deciding factor will be the cost, and the extent of shelter provided will therefore be dependent on the funds available. In the case of fully covering the facility the height clearance should be increased sufficiently for aesthetic and ventilation purposes.

Shelters for buses have to be offset at least 0,5 m from the edge of the kerb of the bus aisles, to prevent buses from striking the shelter. The height of the shelter should be at least 2,8 m to prevent vandalism resulting from high-spirited passengers jumping up and hanging from the edge of the shelter roof.

Designing the shelter to overhang part of the bus aisles can provide improved coverage. In this case the height must be increased to give sufficient clearance to the buses.

A height clearance of 3,7 m is necessary for single decker buses. If there is a likelihood of double-decker buses being used then the height clearance should be increased to 5 m for standard double-deckers and to about 6 m for trolley buses, depending on the height of the catenaries.

d) Lighting

Adequate lighting is essential for facilities that are used at night. This is particularly true in winter when operations start at 5h30 – 6h00 in the morning and stop after 18h00 in the evening. Lighting increases security and reduces the incidence of crime. Special consideration should be given when the facility is fully or partly covered by shelters so that all places are well lit. Lights must be placed out of reach of vandals and must be economic to operate and easy to maintain.

e) Rest area for drivers

The need for a rest area for drivers is apparent at long-distance taxi and bus facilities. Drivers often arrive at a facility at a late hour and after a long trip and spend the night waiting before starting their return trip in the morning. A rest area would give the drivers the opportunity to rest and start their new trip refreshed, thus increasing safety on the road.

f) Commercial activities

The area for the informal sector depends on the extent of informal activities that again depend on the local circumstances prevailing in different parts of the country. An area of approximately 5 % of the total area of the facility would intuitively seem adequate for the informal sector but it also depends on the provision of built-in counters, seats and shelters.

The provision of formal commercial activities within a taxi facility is a matter related to management policy and as such falls out of the scope of this report.

The benefits of providing shops, restaurants and petrol facilities are an added convenience both for passengers and operators as well as, income from renting of shops and the attractiveness of the facility. On the other hand, commercial activities require additional space and could generate other traffic that interferes with the traffic flow within a facility.

3.5 ESTIMATED DEVELOPMENT COSTS

The financial implications for each of the respective projects depend largely on the extent of the demand for public transport services at each specific location. The cost will further be influenced by the availability of land that may influence the site layout.

General costs are however estimated to the extent of each of the typical terminal layouts as shown on **Figures 3.1 to 3.4**:

Table 3.2: Estimated Costs for Taxi and Bus Facilities (Excludes VAT)

Facility	Estimated Cost
Recessed bay for parallel berth (**Figure 3.1**) for buses and taxis	**R 46 000 (+ R12 720/additional bay)**
Terminal facilities for predominant use by taxis (**Figure 3.2**).	**R 2 225 000**
Terminal facilities for predominant use by buses with short turn lanes from major road (**Figure 3.3**)	**R 4 250 000**
Terminal facilities for predominant use by buses – compact configuration, no short turn lanes from major road (**Figure 3.4**)	**R 3 225 000**

Please note that the cost estimate includes preparation of the area, paved areas, all road works, fencing, buildings, hawker stalls, passenger shelters and lighting and 10% contingencies but does not include professional fees, provision of services (electrical, water and sewer).

The total cost for the each respective project can only be estimated once the site layout has been finalized in consideration of the extent of activity expected. The abovementioned cost estimates can however be used as an initial broad indication of the financial extent of each project.

4. SPECIFICATIONS: DILOKONG CORRIDOR SITE DEVELOPMENTS.

4.1 LEBOWA PLATINUM MINE (ATOK) (Contact Person: Stefan Crafford: 015 620 0058)

4.1.1 Location

See Node Nu. 1 on the attached map and also photos LMP 1 – 17 in Annexure 1. The mine is situated south of the R37 provincial road between Polokwane and Burgersfort about 63 kms west from the turn-off to Steelpoort (referred to as the Riba Cross) and about 6 kms from a turn-off (not numbered Atok turn-off) from the R37.

4.1.2 Visual Material

Refer to Annexure 1 for visual material on the mine and adjacent areas.

- LMP Photo 1: A piece of land to the entrance of the mine (south of service road) that could be used for transfer facilities.
- LMP Photos 2-4: A piece of land to the entrance of the mine (north of service road) that could be used for transfer facilities (recommended).
- LMP Photo 5: The current loading area next to the hostel where mine buses load workers for transport to the shafts.
- LMP Photo 6: The “works” site where the buses and other equipment are currently accommodated.
- LMP Photo 7: The T-junction of the R37 provincial road with the Lebowa Platinum Mine service road leading to the mine property via the local ATOK community areas.
- LMP Photo 8-17: Photos of all directions around the T-junction indicating some informal trading, houses, taxis at loading points and some formal commercial developments close to the T-junction.

4.1.3 Development Status of Mine

The Lebowa mine at Atok is one of the first and older mines along the corridor. It is well established with all mine infrastructure developments completed but with vast expansions that are scheduled to double the mine capacity within the next year or two. Its expected economic life is therefore poised to go well into the future estimated at 50 years.

Apart from the mine being situated adjacent to the Atok local community, some limited other private sector support services and trading developments have developed adjacent to the mine property. See photos LMP 8, 11, 12, 16 and 17. The Atok area, including the local other and mine commercial developments and support services, indicates a first stage of an independent local economy that would require normal infrastructure developments to serve the mine employees and the local community.

A main service road (paved) is available, starting at the T-junction (see photo LMP 13) with the provincial road serving all residential developments and commercial facilities situated around the service road, with the mine property at the end of this service road. All collector roads leading to this main service road are gravel roads.

All normal bulk services are available as a result of the mine developments but not necessarily provided to all the residential areas.

4.1.4 Number of Employees

It is estimated that about 4 000 people will be employed (permanent and contract basis) once the new expansions have been completed, which could double in the next few years. Management reports that about 3200 people are employed currently.

4.1.5 Current Public Transport Practices

The mine provides buses to transport employees from the hostel that is located on the mine property to the various shafts on the mine. The mine also transports children of employees that are resident on the mine property to schools in Polokwane.

Most workers originate from a mine hostel or an adjacent housing development for management staff or from the local villages close to the mine. These employees go to work by foot, bicycle or own transport and are then transported by the mine buses to the various shafts.

Some employees also originate from areas further away from the mine and the local Atok area but they are in the minority. There is no public transport provided to these employees and they arrange their own transport of which some arrive by private vehicles and some by taxis. Between 800 and 900 employees can be accommodated in the hostel.

4.1.6 Estimated Number of Public Transport Users

Based on the reported number of employees, it is estimated that a minimum of 80% arrives on own accord (by foot, bicycle and private transport) and a maximum of 20% by bus or taxi, i.e. about 800 workers.

It is not expected that the demand for external public transport services will grow to more than 1 000 daily passengers. However, the demand for public transport by the local Atok community to destinations other than the mine is evident, based on the visual material and other observations. This demand is also expected to grow and therefore services and facilities from the T-junction at the provincial road are required.

4.1.7 Current Public Transfer Facilities

Apart from an informal loading area adjacent to the hostel and a yard where buses are parked (photos LMP 5-6) no facilities are provided for public transport services. Taxis currently load passengers at the T-junction (LMP 9, 14) next to the provincial road under unsafe circumstances.

4.1.8 Requirements for Transfer Facility Development

The above estimated demand calls for transfer facilities both at the mine entrance and at the T-junction with the R37 that can accommodate a combined maximum of about 70 taxis or about 15 buses spread over the day, mainly two peak periods when shifts start and end.

The estimated peak hour requirement is about 25% of the total requirement.

(i) At the R37 T-junction.

A Category B transfer facility is required at the T-junction with the provincial road. It should accommodate both taxis and buses, with covered areas and ablution facilities to hold between 15 and 20 taxis and 4 buses parked.

This facility will serve mainly the local ATOK community and to transfer passengers from the T-junction to the mine areas, depending on the taxi operational practices.

This transfer facility can be located at either the north or southern side of the T-junction although the northern side is currently preferred by the taxis (see photo LMP 9), as most of the commercial and some of the residential developments are situated on the northern side of the provincial road. Most southern developments are residential.

It is not necessarily the safest position in view of the direct movements of the taxis into the R37. Linkage with the taxis from the mine service road also poses a traffic hazard, as these taxis/buses would have to cross the R37 to the taxi holding area.

It is therefore suggested that:

- The site on the southwestern corner of the T-junction is reserved for a Category B transfer facility that could eventually develop into a Category A facility as the demand grows.
- Entrance to the facility should be from the Atok service road, not the R37.
- Informal hawker stalls are integrated with the transfer facility.
- Provision should also be made for safe pedestrian crossings at this point.
- This transfer facility should also serve as a holding and dispatching area for the trips to the mines.
- The possibility to establish a fuel station adjacent to this point could also be promising in time.

This node will become stronger as the mining developments and the local commercial activities of the ATOK community increases.

(ii) At the main entrance to the mine

A transfer facility should also be provided near the entrance to the mine. The exact positioning of the facilities on the mine property must be negotiated and agreed with the mine officials, as it is not public property.

However, it is suggested that the facility should preferably be provided at the northern side of the service road's T-junction to the entrance to the works site as indicated on photos LMP 2, 3 and 4.

It is recommended that:

- A Category C load facility (lye-bye type) be provided
- The lay bye should accommodate at least 6 taxis or 2 buses
- Limited ablutions and lightning should be provided
- It should serve as a load and off-load point only.
- The transfer facility at the T-junction should serve as the holding area and from where taxis or buses will be dispatched at certain times to serve the mine employees for destinations away from the local Atok area.
- An additional lay-bye (2 taxis, 1 bus, only with a limited shelter) might be justified further down the same entrance road adjacent to the hostel, opposite the current loading area that is reserved for mine buses only.

4.1.9 Potential for Private Sector Involvement

The possibility to develop a transfer facility at the T-junction with the provincial road by means of private sector capital is promising provided government owned land adjacent to the T-junction could be provided and the rights for a fuel station could be granted. The developer should then undertake to provide the transfer facilities. Contact should be made with interested oil companies.

A part of the land should also be reserved provisionally for a possible truck-inn facility in the future, although the justification of such a facility is still not clear.

The funding of the facilities on the mine property by means of the mine owners is also possible although it could be policy of the mine not to become involved, as it may well be. Nevertheless, some obligation from the mine owners is worth exploring.

4.1.10 Priorities and Programming

In view of the fact that this mine is one of the older and more established mines and that the demand for facilities already exists, a high priority for immediate development of this node is justified.

It is therefore recommended that in terms of:

(i) Facilities at the T-junction with the provincial road:

- Arrangements should commence immediately to reserve the land, to authorize the specified land uses and to negotiate with fuel companies.
- Detailed design should follow pending the outcome of the agreements reached and should be cognizance of the requirements stated in paragraph 4.1.8.
- Budget to initiate the implementation program and to fund a portion of the capital should be placed on the provincial budget.

(ii) Facilities at the entrance to the mine:

- Negotiations with the mine should commence immediately on the positioning of the specified facilities and to assist with the funding of the facilities.
- Detailed design should follow pending the outcome of the agreements reached and should be cognizance of the requirements stated in paragraph 4.1.8.
- Budget to initiate the implementation program and to fund all or part of the capital should be placed on the provincial budget.

4.2 TWICKENHAM PLATINUM MINE **(Contact Person: Mrs. Stasha De Costa: 0823373608)**

4.2.1 Location

See Node Nu. 2 on the attached map and also photos TPM 1- 4 in Annexure 1.

The mine is situated 7 kms south of the R37 provincial road between Polokwane and Burgersfort, at the end of a turn-off (not numbered Twickenham turn-off) from the R37 about 32 kms west from the Riba Cross turn-off to Steelpoort. It is about 90km to Polokwane.

The mine property starts about 1,5km from the R37 main road and this is where mine offices will be located but the shafts will be 7 kms further down the service road.

4.2.2 Visual Material

Refer to Annexure 1 for visual material on the mine and adjacent areas.

- TPM Photo 1: The sign board at the T-junction with the R37 indicating the construction site of the mine and other infrastructure developments.

- TPM Photo 2: The T-junction with the R37 provincial road.

- TPM Photo 3: The service road from the T-junction towards the mine construction site.

- TPM Photo 4: A hawker stall on the southwestern side of the T-junction where a transfer facility can be accommodated.

4.2.3 Development Status of Mine

The Twickenham Platinum Mine is an Anglo Plats development that is still under construction and not in operation yet. It is awaiting the mining license from government and construction is expected to be completion in the next 2 years.

The visual material, particularly photo TPM 1, illustrates that the entire development process is in the very early stages. Very little infrastructure developments have been completed to date. The service road that leads to the mine site is still a gravel road as is shown in photo TMP 3.

Apart from the current construction workers about 189 future mining employees are undergoing training in Randfontein for the next 2 years.

The estimated economic life is 50 years.

4.2.4 Number of Employees

Once the mine is operational the expected workforce is about 2000 - 4000 workers.

4.2.5 Current Public Transport Practices

Apart from temporary arrangements to transport the workers to the construction site no other public transport arrangements have been made to date. Such arrangements would be premature at this stage.

4.2.6 Estimated Number of Public Transport Users

In contrast to the Lebowa Mine at Atok where the majority of the workers come from the surrounding villages that can go to work on own accord by foot or bicycle, this mine is situated further away from the villages and public transport by means of either mine contracts or by own arrangement would be more prominent.

Based on the estimated number of employees, it is expected that a maximum of 20% will arrive by foot, bicycle or private transport and 80% by bus or taxi, i.e. about 1 200 workers representing about 80 taxis or 20 buses.

4.2.7 Current Public Transfer Facilities

The mine is under construction.

4.2.8 Requirements for Transfer Facility Development

It is recommended that the same strategy as suggested for the Lebowa mine be followed with some difference indicated below. A Category A or B transfer facility in combination with a Category C facility would have to be provided at two locations namely the entrance to the mine itself where workers are loaded and off-loaded, with the second facility at the T junction with the R37.

The distance between the R37 and the position where workers are off-loaded at the mine justifies two facilities, with the one facility as the holding and main dispatch point, linking with the local community as well.

The differences in specifications between the Lebowa mine and the Twickenham mine are:

- Firstly the fact that the latter is only at its very initial stages of development and no real demand for commuter services for the mine exists at this stage;
- Secondly the size of the local community residing in the adjacent villages around the Twickenham mine area is very small and the demand for public transport at this stage is much less.

Therefore it is not clear at this stage where to place the two categories of facilities. It is possible that the larger facility would have to be placed at the mine and the lay-bye facility at the R37 junction. The extent of the local demand does not justify a full-scale category A or B facility at this stage but the circumstances could change.

It is expected the capacity of the main transfer facility should accommodate 20 taxis or 5 buses.

More finality in this respect and the extent of the requirement would have to be obtained once the mine construction is completed and the arrangements of the mine itself are known. It is also essential to monitor developments in the area on a continual basis.

It is nevertheless suggested that from an early stage all-new mine developments should be required to provide a minimum transfer facility that would conform to standards laid down by government.

4.2.9 Potential for Private Sector Involvement

The potential for private sector involvement is the same as for the Lebowa developments except that the justification for a fuel station at the R37 junction is much less and the spacing between the Lebowa junction and the Twickenham junction is such that a second fuel station close to the other could be problematic for a limited demand.

4.2.10 Priorities and Programming

In view of the fact that this mine is still in the construction phase and that the extent of other local demand is also low, a low priority for early development of this node is allocated.

It is therefore recommended that in terms of:

(i) Facilities at the T-junction with the provincial road:

- Arrangements should commence immediately to reserve the land on the southwestern side of the R37 junction to provide for either a Category C or a Category B facility and to authorize the specified land uses and to negotiate with oil companies.
- Development of the facilities should be scheduled not within 24 months, after which the category of development and the timing should be reassessed.
- Detailed design should follow the above, pending the outcome of the agreements reached.
- Budget to initiate the implementation program and to fund a portion of the capital should be placed on the provincial budget of 2004.

(ii) Facilities at the entrance to the mine:

- Negotiations with the mine should commence immediately on the positioning of the facilities, the category or type of facility and to assist with the funding of the facilities.

- Detailed design should follow pending the outcome of the agreements reached.
- Budget to initiate the implementation program and to fund all or part of the capital should be placed on the 2004 provincial budget.

4.3 MARULA PLATINUM MINE (Contact Person: Ivan Manini: 013 214 7405)

4.3.1 Location

See Node Nu. 3 on the attached map and also photos MPM 1- 9 in Annexure 1.

The main gate of the mining area is situated at the end of a mine service road about 5 kms south of the R37 provincial road between Polokwane and Burgersfort. The turn-off to this service road is about 24 kms west from the Riba Cross-junction. From the main gate the offices are another 2kms further.

4.3.2 Visual Material

Refer to Annexure 1 for visual material on the mine and adjacent areas.

MPM Photo 1: The T-junction of R37 with the service road leading towards Marula mine.
MPM Photo 2: The empty site on the southeastern side of the junction with the hospital in the background.
MPM Photo 3: The site on the southwestern side of the junction, with housing developments in the background.
MPM Photo 4: Another closer picture of the site on the southeastern side.
MPM Photo 5: The northern side of the junction.
MPM Photo 6-9: Pictures of Marula Mine under construction and the service road leading to the site.

4.3.3 Development Status of Mine

The Marula Platinum Mine is also still under development and not in operation yet. Construction is expected to be completed in the next 2 years. Refer to photos MPM 6 – 8.

Some limited infrastructure developments have been completed, including the service road that has been paved (photo MPM 9). Apart from that and some bulk services for the mine construction, no other developments have been done.

The estimated economic life is 50 years.

The development of the local community adjacent to the mine property is well advanced and at least on the same level as Atok if not more. A hospital and other housing developments are situated close to the R37 (see photos MPM 2 and 3).

4.3.4 Number of Employees

Expected workforce is about 2 000 workers by the year 2008. Currently 1 200 workers are employed at this stage. There are about 500 contract workers, although they fluctuate in number. They will finish and go by about June 2004.

4.3.5 Current Public Transport Practices

Apart from temporary arrangements to transport the workers to the construction site no arrangements are in place yet.

Taxi and bus services are serving the local community to and from the hospital and the surrounding settlements in and around Mecklenburg that is situated a few kilometers from the hospital and mine property.

4.3.6 Estimated Number of Public Transport Users

Based on the estimated number of employees, it is expected that 20% will arrive by foot and private transport and 80% by bus or taxi, i.e. about 1 200 workers representing about 80 taxis or 20 buses.

The extent of the local demand cannot be underestimated and could be as high as, or more than the future demand for the mineworkers, given the location of the hospital and other commercial activities in the area.

4.3.7 Requirements for Transfer Facility Development

The same strategy as suggested for the Lebowa the Atok local community and mine also recommended for the Marula mine and surrounding local areas, but perhaps with more extensive and decentralized facilities at the mining shafts.

A transfer facility of most likely Category A, or at least Category B to start with, should be provided near the T-junction with the R37. The position should be such that it would integrate with the hospital and as such the southeastern corner of the T-junction is preferred, lower down to the hospital.

Lay-bye facilities should be provided at about 4 entrances to the various shafts down the service road. These facilities should be smaller in capacity to accommodate 2 taxis or 1 bus at a time. These proposals should however be negotiated with the mine owners.

Two types of facilities are required for the Marula Platinum Mine and the local community:

(i) At the R37 T-junction.

A Category B transfer facility is required at the T-junction with the provincial road. It should accommodate both taxis and buses, with covered areas and ablution facilities to hold between 15 and 20 taxis and 3 buses parked.

This facility will serve mainly the local community and to transfer passengers from the T-junction to the mine areas, depending on the taxi operational practices.

This transfer facility can be located at the southern eastern side of the T-junction.

It is therefore suggested that:

- The site on the southeastern corner of the T-junction be reserved for a Category A or B transfer facility.
- Photos MPM 2,4 and 6
- Informal hawker stalls be integrated with the transfer facility.
- This transfer facility should also serve as a holding and dispatching area for trips to the mines.
- The possibility to establish a fuel station adjacent to this point could also be promising in time.

4.3.8 Potential for Private Sector Involvement

The potential for private sector involvement is similar to that of the Atok/Lebowa node and perhaps even more promising in view of the strong presence of the hospital and high level of local community

development. A fuel station development, as part of the transfer facility is also promising, given the existing local demand together with the R37 through traffic.

4.3.9 Priorities and Programming

Given the increase in activities once the mine is in full production and the fact that the local community and social services in the area are well developed and that the demand for facilities already exists which will grow further when the mine opens, a high priority for immediate development of this node at the R37 is justified, with supporting facilities at the entrances to the various mining shafts at a later stage within a year or two.

It is therefore recommended that in terms of:

(i) Facilities at the T-junction with R37 provincial road:

- Arrangements should commence immediately to reserve the land, to authorize the specified land uses and to negotiate with oil companies.
- Detailed design should follow pending the outcome of the agreements reached
- Budget to initiate the implementation program and to fund a portion of the capital is placed on the provincial budget.

(ii) Facilities at the entrance to the various mining shafts:

- Negotiations with the mine should commence immediately on the positioning of the specified facilities and to assist with the funding of the facilities.
- Detailed design should follow for individual lay-byes, pending the outcome of the agreements reached, and the requirements stated in paragraph 4.3.7.
- Budget to initiate the implementation program and to fund all or part of the capital should be placed on the provincial budget for 2003.

4.4 DILOKONG CHROME MINE

4.4.1 Location

See Node Nu. 4 on the attached map and photos DCM 1 - 3.

The main gate to the mining area is situated at the end of a mine service road about 2 kms southwest of the R37 provincial road between Polokwane and Burgersfort. The turn-off to this service road is about 10 kms west from the Riba Cross-junction.

4.4.2 Visual Material

Refer to Annexure 1 for visual material on the mine and adjacent areas.

Photo 1 and 2: The entrance to the Dilokong mine.
Photo 2: An open site north of the entrance to the mine where a facility can be developed.

4.4.3 Development Status of Mine

The Dilokong mine is one of the older mines along the corridor. It is small but well established and with all infrastructure developments completed.

Some expansion is possible as initially 3 phases of development were planned but further expansions would depend on the international and local chrome market circumstances.

Its expected economic life is limited to 50 years. Management believes that with expansion it could increase to 150 years. Most workers originate from the surrounding villages.

4.4.4 Number of Employees

About 500 workers are employed at the mine and management expects staff to increase to 650 later.

4.4.5 Current Public Transport Practices

The mine makes no transport arrangements officially and workers use either foot or in limited numbers come by private transport and a few by taxi. Most of the workers live locally. There is also accommodation on site, about 16 houses. There are also single quarters for 30 employees. Some employees, mainly managers, live in Burgersfort.

4.4.6 Estimated Number of Public Transport Users

Based on the number of employees, it is estimated that 20% arrives by foot and private transport and 80% by bus or taxi, i.e. about 480 workers representing about 32 taxis or 8 buses.

4.4.7 Current Public Transfer Facilities

None, a part from an open site at the main entrance that is reserved for private vehicles and taxis.

4.4.8 Requirements for Transfer Facility Development

In contrast with the requirements at the other mines, limited facilities are required for the Dilokong mine:

- At the mine entrance itself on the north-western side of the entrance, a Category C facility should be provided that can accommodate a maximum number of 4-5 taxis at a time.

- At the T-junction with the R37 provincial road another lay-bye facility could be justified but its need should first be confirmed with the CPTR survey results.

4.4.9 Potential for Private Sector Involvement

Management is prepared to consider making a contribution towards public transport facilities around the mine.

4.4.10 Priorities and Programming

The mine is already in operation for some time and the demand for a better facility at the mine is also there for some time.

In terms of facilities at the entrance to the mine it is recommended that:

- Negotiations with the mine commence immediately on the positioning of the facilities, the category or type of facility and to assist with the funding of the facilities.

- Detailed design should follow, pending the outcome of the agreements reached, taking into consideration the requirements in paragraph 4.4.8.

- Budget to initiate the implementation program and to fund all or part of the capital should be placed on the 2003 provincial budget.

In terms of facilities at the T-junction with R37 it is recommended that:

- No facilities are provided unless the results of the CPTR surveys prove that a meaningful demand exists.

4.5 MAANDAGSHOEK (MODIKWA) PLATINUM MINE
(Contact Person: Nigros Nonyane: 013 2302035)

4.5.1 Location

See Node Nu. 6 on the attached map.

The main gate of the mining area is situated at the end of a mine service road about 5 kms south of the R37 provincial road between Polokwane and Burgersfort. The turn-off to this service road is about 3 kms west from the Riba Cross-junction.

4.5.2 Visual Material

Refer to Annexure 1 for visual material on the mine and adjacent areas.

Photo 1: The main service road that leads to Maandagshoek Platinum Mine
Photo 2: The entrance to the mine area.

4.5.3 Development Status of Mine

The Modikwa/Maandagshoek mine is also one of the older and established mines along the corridor. Further expansions are planned for the next 3 years that could double the output. Its expected economic life is limited to 40 years. Most workers originate from the surrounding villages.

4.5.4 Number of Employees

1 300 workers are employed currently, of whom 60% are permanent, and which is expected to grow to 2 400 workers in 3 years.

4.5.5 Current Public Transport Practices

Workers are employed on a total package system and therefore the transport arrangements and costs are the employees' responsibility. The mine prefers not to become involved with the transport needs. However, the unions have approached the management re transport arrangements and management will engage them in discussions.

Most employees make use of taxis that drop them off at the main security gate whilst some are allowed to proceed further to other shafts in the mine area.

4.5.6 Estimated Number of Public Transport Users

Based on the number of employees, it is estimated that 20% arrive on foot and private transport and 80% by bus or taxi, i.e. about 1 000 workers representing about 15 buses or 70 taxis, which will grow to about 1 900 commuters, 130 taxis and 30 buses in 3 years time.

4.5.7 Current Public Transfer Facilities

No formal facilities exist but an area next to the main gate is reserved for use by taxis.

4.5.8 Requirements for Transfer Facility Development

A Category A transfer facility that can accommodate 30 taxis or about 8 buses at a time is required adjacent to - or as close as possible to the main gate, with some lay-bye facilities at the other shafts, with no holding facilities.

The available space for such a facility at the entrance to the main gate is limited (see Photo MCM 2) and therefore the facility should be provided at a suitable place as close to the main entrance as possible. The position must be negotiated with the mine management as continual expansions and developments are evident and the mine management must identify a suitable position.

All operations that enter the mine towards the shafts should be controlled from the main transfer facility. The facility should also be provided with an office building to control vehicles that are to be dispatched to other shafts.

Permanent facilities for hawkers and a tuck shop are required, with ablution facilities.

4.5.9 Potential for Private Sector Involvement

The only possible involvement from private sector would be the mine owners.

4.5.10 Priorities and Programming

It is therefore recommended that in terms of:

(i) Facilities at the T-junction with R37 provincial road:

- A Category C lay-bye facility is provided at the T-junction with the R37, subject to confirmation with the results of the CPTR results.
- A detailed design should follow pending the above confirmation.

(ii) Facilities at the entrance to the mine and at the drop off points along within the mining area:

- Negotiations with the mine should commence immediately on the positioning of the main transfer facility at the entrance area and within the mine area and to assist with the funding of the facilities.
- A detailed design should follow pending the outcome of the agreements reached taking into account the requirements in paragraph
- Budget to initiate the implementation program and to fund all or part of the capital should be placed on the provincial budget for 2003.

5. SUMMARIZED BUSINESS PLAN

The business plan is summarized in Diagram 2 below.

BUSINESS PLAN: DEVELOPMENT OF PUBLIC TRANSPORT TRANSFER FACILITIES AT ON THE DILOKONG CORRIDOR DIAGRAM 2						
	REQUIRED FACILITY	**CAPACITY**	**PRIORITY**	**ACTIONS**	**BUDGET YEAR**	**COST R m.**
	LEBOWA PLATINUM MINE					
1.	**At R37 T-junction:** Category B transfer facility located at the southwestern corner of the T-junction, to develop eventually into Category A facility as the demand grows. Informal hawker stalls to be integrated with the transfer facility. Pedestrian crossings. The possibility to establish a fuel station adjacent to this point could also be promising in time.	Accommodation for both taxis and buses, with covered areas and ablution facilities to hold between 15 and 20 taxis and 4 buses parked.	High	Reserve the land, authorize the specified land uses and negotiate with fuel companies. Detailed design should follow pending the outcome of the agreements reached. See paragraph 4.1.8. Budget to initiate the implementation program and to fund a portion of the capital should be placed on the provincial budget immediately.	2003/2004	**R2.450**
2.	**At the Mine Entrance:** A Category C load facility (lye-bye type) should be provided to serve as a load and off-load point only. An additional lay-bye might be justified further down the same entrance road adjacent to the hostel, opposite the current loading area that is reserved for mine buses only.	Accommodation to hold 5 taxis and 2 buses parked.	High	Negotiations with the mine on the positioning of the specified facilities and to assist with the funding of the facilities. Detailed design should follow pending the outcome of the agreements reached. Budget to initiate the implementation program and to fund all or part of the capital should is placed on the provincial budget.	2003/2004	**R0.050**

	TWICKENHAM PLATINUM MINE					
3.	**At the T-junction with R37:** Category A transfer facility on the southwestern side of the R37 junction.	To accommodate about 20 taxis or 5 buses.	Low	Reserve the land and authorize the specified land uses and to negotiate with fuel companies. Detailed design should follow the above and pending the outcome of the agreements reached. Budget to initiate the implementation program and to fund a portion of the capital should be placed on the provincial budget of 2004.	2004/05: Development of the facilities should be scheduled not within the 24 months.	**R4.400**
4.	**At the Mine Entrance:** Category C load facility (lye-bye type) with a position to be determined after completion of mine construction.	Accommodation for 8 taxis and 2 buses parked.	Low	Negotiations with the mine management on the positioning of the facilities, the category or type of facility and to assist with the funding of the facilities. Detailed design should follow pending the outcome of the agreements reached. Budget to initiate the implementation program and to fund all or part of the capital should is placed on the 2004 provincial budget.	2004/05: Review need.	**R0.100**

	MARULA PLATINUM MINE					
5.	**At the R37 T-junction:** Category A transfer facility located at the southeastern corner of the T-junction, lower down to the hospital. Informal hawker stalls, integrated with the transfer facility. Fuel station adjacent to this point.	Accommodation for both taxis and buses, with covered areas and ablution facilities to hold between 15 and 20 taxis and 3 buses parked.	High	Reserve the site for a transfer facility and authorize the specified land uses and to negotiate with fuel companies. Detailed design should follow pending the outcome of the agreements reached. See paragraph 4.3.7 Budget to initiate the implementation program and to fund a portion of the capital is placed on the provincial budget.	2003/2004	**R4.500**
6.	**Within the mining area:** Lay-bye facilities should be provided at about 4 entrances to the various shafts down the service road.	Accommodate 2 taxis and 1 bus at a time.	High	Negotiations with the mine management on the positioning of the facilities and to assist with the funding. Detailed design should follow for individual lay-byes, pending the outcome of the agreements reached. Budget to initiate the implementation program and to fund all or part of the capital should is placed on the provincial budget for 2003.	2003/2004	**R0.200**

	DILOKONG CHROME MINE					
7.	**At the mine entrance:** At the mine entrance itself on the north-western side of the entrance, a Category C facility should be provided	Accommodation for a Maximum number of 4-5 taxis at a time.	Medium to high	Negotiate with management on the positioning of the facilities, the category or type of facility and to assist with the funding of the facilities. Detailed design to follow pending the outcome of the agreements. See par 4.4.8	2003/04.	**R0.050**
8.	**At the R37 T-junction:** Category C lay-bye facility could be justified but its need should first be confirmed with the CPTR survey results.	To be determined in future when demand is proven.	Low	Confirm need through the CPTR survey results	No facilities to be provided until CPTR surveys indicate meaningful demand.	**R0.050**
	MAANDAGSHOEK CHROME MINE					
9.	**At the mine entrance:** Category A transfer facility adjacent to - or as close as possible to the main gate Some lay-bye facilities at the other shafts, with no holding facilities, with an office building to control vehicles that are to be dispatched to other shafts. Permanent facilities for hawkers and a tuck shop are required, with ablution facilities.	Accommodation for 30 taxis or about 8 buses at a time is required	High	Negotiated with the mine management on position of facilities and to assist with the funding of the facilities. Detailed design should follow pending the outcome of the agreements reached. See par 4.5.8 Budget to initiate the implementation program and to fund all or part of the capital should is placed on the provincial budget for 2003.	2003/04	**R2.400** **R0.150**
10	**Facilities at the R37 T-junction:** A Category C lay-bye facility should be provided at the T-junction with the R37, subject to confirmation with the results of the CPTR results.	Maximum number of 4-5 taxis at a time, or 1 bus.	Low	Confirm the need with the results of the CPTR surveys. Detailed design should follow pending the above confirmation. See par 4.5.8	2004/05	**R0.050**

6. FINANCIAL IMPLICATIONS

Based on the estimated construction costs indicated in Diagram 2, the estimated capital cost requirements for the construction and implementation management of the public transport transfer facilities at the mines and adjacent local areas along the Dilokong Corridor are:

FINANCIAL YEAR	CAPITAL COST	PROJECT MANAGEMENT	TOTAL
2003/04	R 9.850m	R 0.900m	R 10.750m
2004/05	R 4.550m	R 0.400m	R 4.950m
TOTAL	**R 14.450M**	**R 1.300M**	**R 15.700M**

7. RECOMMENDATIONS

It is recommended that:

(i) The technical recommendations for each of the facilities are distributed for comments to relevant role players and that the specifications are finalized accordingly.

(ii) The final recommendations are submitted to Limpopo Provincial Government for consideration.

(iii) An implementation budget is provided over the next two financial years for a total amount of R15.7 million, subject to negotiations with mine and oil companies for contributions to the total capital requirements.

(iv) An implementation process is initiated.

ANNEXURE 1
VISUAL MATERIAL OF THE POTENTIAL DEVELOPMENT SITES

1. LEBOWA PLATINUM MINE (ATOK)

- LMP Photo 1: A piece of land to the entrance of the mine (south of service road) that could be used for transfer facilities.
- LMP Photos 2-4: A piece of land to the entrance of the mine (north of service road) that could be used for transfer facilities (recommended).
- LMP Photo 5: The current loading area next to the hostel where mine buses load workers for transport to the shafts.
- LMP Photo 6: The "works" site where the buses and other equipment are currently accommodated.
- LMP Photo 7: The T-junction of the R37 provincial road with the Lebowa Platinum Mine service road leading to the mine property via the local ATOK community areas.
- LMP Photo 8-17: Photos of all directions around the T-junction indicating some informal trading, houses, taxis at loading points and some formal commercial developments close to the T-junction.

2. TWICKENHAM MINE

- TPM Photo 1: The sign board at the T-junction with the R37 indicating the construction site of the mine and other infrastructure developments.
- TPM Photo 2: The T-junction with the R37 provincial road.
- TPM Photo 3: The service road from the T-junction towards the mine construction site.
- TPM Photo 4: A hawker stall on the southwestern side of the T-junction where a transfer facility can be accommodated.

3. MARULA MINE

- MPM Photo 1: The T-junction of R37 with the service road leading towards Marula mine.
- MPM Photo 2: The empty site on the southeastern side of the junction with the hospital in the background.
- MPM Photo 3: The site on the southwestern side of the junction, with housing developments in the background
- MPM Photo 4: Another closer picture of the site on the southeastern side.
- MPM Photo 5: The northern side of the junction.
- MPM Photo 6-9: Pictures of Marula Mine under construction and the service road leading to the site.

4. DILOKONG MINE

- Photo 1 and 2: The entrance to the Dilokong mine.
- Photo 2: An open site north of the entrance to the mine where a facility can be developed.

5. MAANDAGSHOEK MINE

- Photo 1: The main service road that leads to Maandagshoek Chrome Mine
- Photo 2: The entrance to the mine area.

LEBOWA PLATINUM MINE

LPM PHOTO 1

LPM PHOTO 2

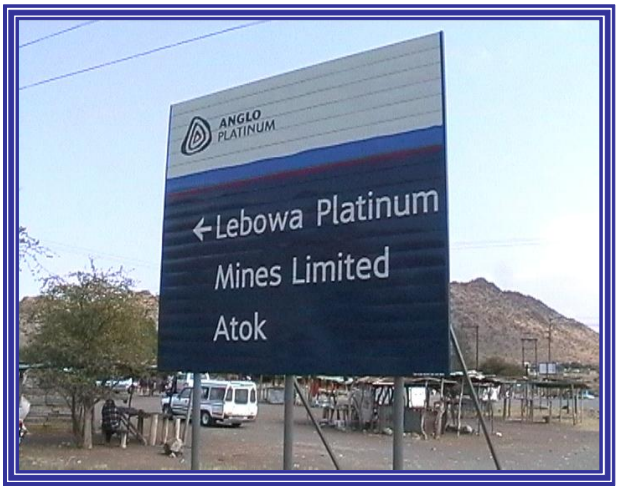
LPM PHOTO 3

LPM PHOTO 4

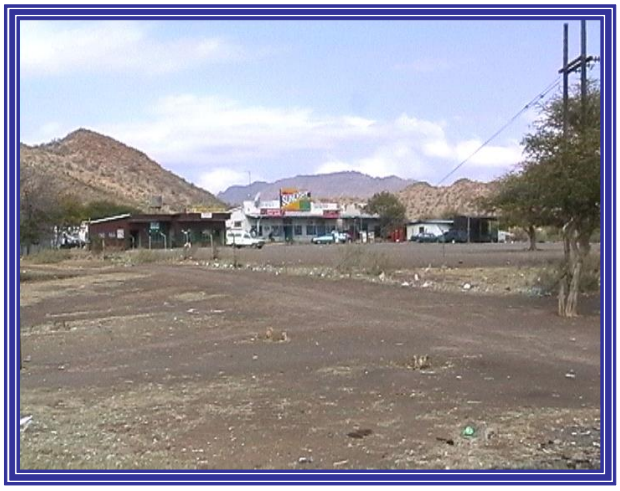
LPM PHOTO 5

LPM PHOTO 6

LPM PHOTO 7



LPM PHOTO 8



LPM PHOTO 9

LPM PHOTO 10

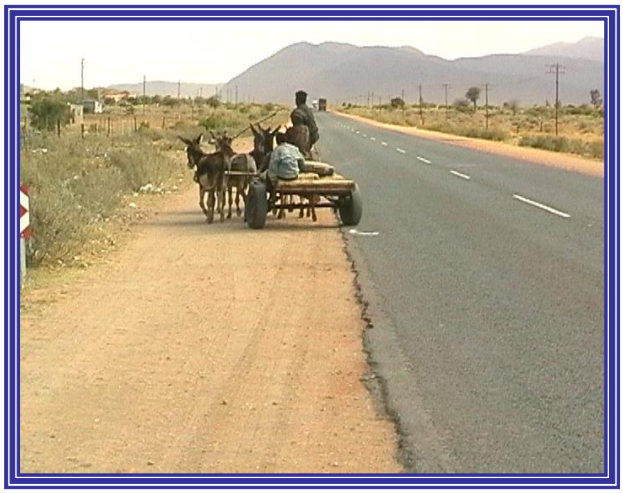
LPM PHOTO 11

LPM PHOTO 12

LPM PHOTO 13

LPM PHOTO 14

LPM PHOTO 15



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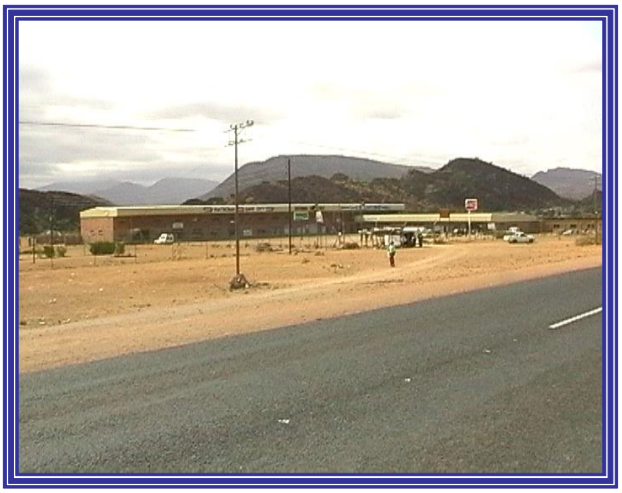
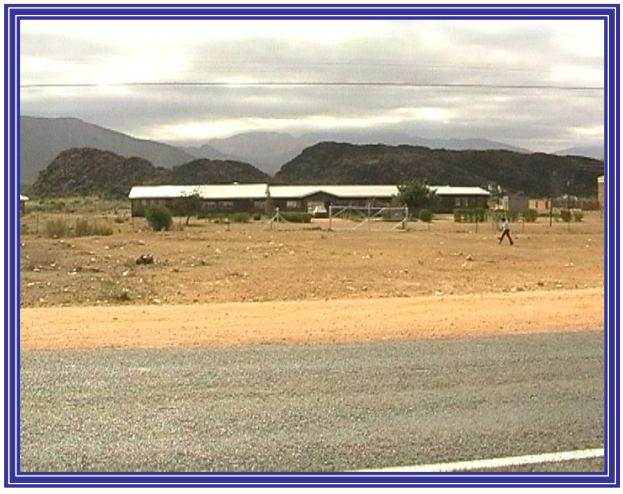


LPM PHOTO 17



TWICKENHAM PLATINUM MINE

TPM PHOTO 1

TPM PHOTO 2

TPM PHOTO 3

TPM PHOTO 4

MARULA PLATINUM MINE

MPM PHOTO 1

MPM PHOTO 2

MPM PHOTO 3

MPM PHOTO 4

MPM PHOTO 5

MPM PHOTO 6

MPM PHOTO 7

MPM PHOTO 8

MPM PHOTO 9

DILOKONG CHROME MINE

DCM PHOTO 1

DCM PHOTO 2

DCM PHOTO 3

MAANDAGSHOEK CHROME MINE

MCM PHOTO 1

MCM PHOTO 2