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SHOVA KALULA ("RIDE EASY"), BUT WHERE TO RIDE? A CASE FOR IMPROVED RURAL MOBILITY

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ABSTRACT

The National Household Travel Survey 2003 showed that 90,6 percent of the 7,5 million learners and students in rural areas walked to schools and educational centres. More than half of the workforce (52,5%) in rural areas also indicated that they were walking to their places of work. The potential of low-cost mobility enhancement in rural areas through bicycle transport provides an alternative mode of travel to scholars and learners who have to walk long distances to schools and other educational centers. At present, the Shova Kalula National Bicycle Programme is mainly targeted at school students in peri-urban and rural communities, who walk long distances to school. The programme was implemented at 11 demonstration sites countrywide. However, the lack of bicycle infrastructure in these villages is contributing to a multitude of safety and security problems. Children have to travel on the existing gravel roads because of a lack of separate bicycle ways. The lack of bicycle lockers at schools causes a security problem, mainly theft, which discourages the use of bicycles. Many of the villages in the deep rural areas of South Africa are experiencing a backlog in the provision of housing, educational facilities, sanitation, potable water, paved roads and other essential services. In view of these needs, the provision of bicycle infrastructure will have to compete with these needs for the limited available resources. The paper illustrates how the provision and maintenance of bicycle infrastructure through labour-based methods could be a catalyst in reducing poverty by creating jobs in communities, therefore enhancing skills development, alleviating poverty and at the same time also promote child safety and increased security. The role of the district municipalities is high lighted to take the lead in this process. At present, there are no comprehensive set of guidelines for the design, construction and maintenance of bicycle infrastructure in rural areas. The paper gives a broad overview of the aspects that should be considered in the design, construction and maintenance of gravel bicycle ways. The learning to be obtained through a number of experimental designs in rural villages could be used to compile relevant guidelines and technical standards.

SHOVA KALULA ("RIDE EASY"), BUT WHERE TO RIDE? A CASE FOR IMPROVED RURAL MOBILITY

1 BACKGROUND

In 2003, the Department of Transport conducted a National Household Travel Survey (NHTS 2003). The study was undertaken because the Department of Transport and planning authorities throughout the country were experiencing difficulties in obtaining information to assist them in fulfilling their research, planning and policy development needs. The NHTS provides detailed information on various topics such as households, persons in households, consumer perceptions of current public transport services, trip making to educational centres, trips to work, and so on. One of the important findings of the NHTS is that a significant larger proportion of the rural population, compared to urban and metropolitan populations, on a daily basis is walking to their places of work, to educational institutions and to other destinations.

Table 1 provides details about the main modes of travel for the work force in South Africa. It showed (NHTS 2003: 113) that 2 259 million or 23,2 percent of the RSA workforce indicated that they walk to their working places. This figure when differentiated by settlement type highlights the problem in rural areas. In rural areas, more than half of the workforce (52,5%) indicated that they are walking to their places of work.

Table 1: Main Modes Of Travel For Workers In South Africa

Settlement type	Number travelling	Main mode to work (% of work trips within settlement type)					
		Train	Bus	Taxi	Car	Walk	Other
Metropolitan	4 664 000	11.3	8.7	29.1	39.4	8.9	2.7
Urban	3 098 000	1.7	6.4	26.8	34.1	24.0	7.1
Rural	2 195 000	0.5	11.6	14.5	12.1	52.5	8.6
RSA	**9 957 000**	**5.9**	**8.6**	**25.2**	**31.7**	**23.2**	**5.4**

Table 2 gives the main mode of travelling to educational centres by settlement type. The National Household Travel Survey (NHTS 2003: 93) showed that 90,6 per cent of the 7,5 million learners and students in rural areas walk to educational centres. Figures for urban or metropolitan learners and scholars are 70,8 and 56,9 per cent respectively.

Table 2: Main Modes Of Travel To Educational Centres in South Africa

Settlement type	Number travelling	Usual main mode (% of trips within settlement type)					
		Train	Bus	Taxi	Car	Walk	Other
Metropolitan	4 448 000	2.8	6.3	15.6	16.8	56.9	1.6
Urban	3 823 000	0.4	4.2	11.8	10.4	70.8	2.4
Rural	7 470 000	0.1	2.0	3.7	1.8	90.6	1.7
RSA	15741000	0.9	3.8	9.0	8.1	76.3	1.9

The affordability issue also influences the travel patterns in rural areas. Altogether 40 per cent of the rural population indicated that they couldn't afford to use taxis compared to only 14 percent of the metropolitan population and 23 percent of the urban population.

The Rural Transport Strategy for South Africa (Department of Transport, 2002) states that the plight of rural people has been highlighted by numerous policy studies. Whereas 50 percent of the population of South Africa is rural, the rural areas contain 72 percent of those members of the total population who are poor. Compared to their urban counterparts, rural people also have vastly inferior access to basic social services and the economic mainstream. Given this context, the delivery of rural transport infrastructure and services can be a significant catalyst for sustainable economic development, improved social access and poverty alleviation in

South Africa's rural areas. The provision of non-motorised transport opportunities such as the Shova Kalula National Bicycle Programme, aimed at improving the mobility the rural population can also be regarded as an important catalyst in this development process.

The Expert Group on Low Cost Mobility in African Cities (IHE 2000: 91) accentuates the poverty reduction implications of low-cost mobility. They state that low-cost mobility improvement proposals need to be addressed as part of upgrading or poverty reduction and environmental management initiatives in low-income communities in order to have a meaningful impact. Furthermore, they argue that until a coherent framework for poverty reduction also includes low-cost mobility solutions, there will be little progress in mitigating the impacts of ineffective mobility for the poor. The same arguments as mentioned for the urban poor above, are relevant for the poorer rural communities.

The introduction of the Shova Kakula National Bicycle Programme should be seen against this background. The White Paper on National Transport Policy of 1996, Moving South Africa (Department of Transport 1998) – *Towards a Transport Strategy for 2020*, and several ministerial speeches all reiterated the need to explore the potential of low-cost mobility enhancement through bicycle transport.

2 OBJECTIVES OF PAPER

The objectives of the paper are fourfold:

- Firstly, it motivates the need for safe bicycle infrastructure in rural areas as a measure to enhance low cost mobility.
- Secondly, it shows how the provision of low cost mobility infrastructure could be reconciled with other basic community needs.
- Thirdly, it shows how benefits could be accrued by merging the provision of bicycle infrastructure with other government imperatives such as poverty alleviation, job creation and the Expanded Public Works Programme (EPWP).
- Fourthly, it illustrates how this kind of labour-based project could serve as a model for other communities with similar low cost mobility infrastructure needs.

3 THE SHOVA KALULA NATIONAL BICYCLE PROGRAMME

3.1 Objectives

Mashiri, et.al. (Department of Transport 2001) stated that the Shova Kalula National Bicycle Programme of the Department of Transport was a ministerial initiative targeting rural and underdeveloped peri-urban areas. They pointed out that the transportation burden faced by developing communities on a daily basis is real and substantial. The National Household Travel Survey of 2003 has since substantiated these facts.

One of the main objectives of the Shova Kalula National Bicycle Programme was to provide bicycles to the estimated 350 000 secondary and 445 000 primary school students, especially to those in the most disadvantaged rural and urban settings that have to walk long distances to school. The NHTS, 2003 showed that in total about 12 million scholars are walking to school on a daily basis. It will make good sense if the Shova Kalula programme could be extended to other communities where scholars walk long distances to school.

At a later stage the Department of Transport hopes to focus on the many thousands of urban and rural workers who currently have to walk long distances to get to work.

3.2 The demonstration programme

Since 2000, demonstration projects have been introduced countrywide I a number of rural and peri-urban communities as listed in Table 3.

Table 3: Shova Kalula demonstration projects

Name of demonstration area	Province
Witpoort,	Limpopo Province
Bakenberg	Limpopo Province
Mokwakwaila	Limpopo Province
Dzanani	Limpopo Province
Mzinti	Mpumalanga
Vaal Reefs Mine	North West
Themba	Gauteng
Hammanskraal	Gauteng
Theunissen	Free State
Edenburg	Free State
Khayalitsha	Western Cape

Some of the national aims of introducing the programme were:

- The provision of affordable bicycles to scholars in the respective communities
- The development of micro-businesses to support bicycle transport
- The training of interns in the bicycle transport business
- The promotion of safer bicycle transport through improvement in road safety education and training, traffic calming and infrastructure upgrade projects
- The developing of mobile bicycle transport clinics or shops, and so on.

In 2001, Mashiri et.al. (Department of Transport 2001) conducted an assessment of the Shova Kalula programme on behalf of the Department of Transport. Some of the major conclusions drawn from the assessment were:

- The project had a positive impact on the intended beneficiaries and communities at large
- The bicycle shops generated a spirit of entrepreneurship among shop owners
- There is a demand for more bicycles in the visited communities
- Safety is of concern to communities, but nothing has been initiated in the communities to address it
- The project has achieved its objectives. However, the undersupply of bicycles and spares and other issues threatened its existence.

4 THE NEED FOR SAFE BICYCLE INFRASTRUCTURE IN RURAL AREAS

4.1 Introduction

Ribbens and Makhado (CSIR 2004) conducted a survey in Bakenberg on behalf of the South Africa Netherlands Transport Forum (SANTF) to familiarise the forum with the conditions in a typical village where the Shova Kalula National Bicycle Programme has been implemented. As stated above, the rural villages where the programme has been introduced, e.g. Bakenberg, Witpoort, and others, showed an overwhelming support for the

programme. The demand for bicycles completely overshadowed the supply. These and other surrounding villages have a large proportion of young people that could benefit by having bicycles to travel to school. Ribbens and Makhado (CSIR 2004), however, found that in Bakenberg (as well as in the other rural demonstration areas) there was a lack of safe travelling space for scholars. No bicycle infrastructure in the form of bicycle ways or secure storage facilities exists for bicycle users and scholars. This situation results in a number of undesirable road safety and security concerns that are counterproductive to the deployment of the bicycle programme such as unsafe road travelling conditions for scholars and the lack of secure bicycle lockers at schools. In addition, no proper guidelines and standards exist for the provision of bicycle ways in rural areas and villages.

Firstly, *the issue of unsafe road travelling conditions for scholars*. Children have to travel on the existing gravel roads because of a lack of separate bicycle ways. Alternatively, they use the undeveloped alleys or dirt tracks in the villages to get to schools and other destinations. The roads running through many of the rural villages are still gravel, which is completely unsuitable for use by cyclists. Vehicular traffic flings loose sand and stones to the sides of the road, which make the road edges and shoulders impassable for cyclists. Bicycles with narrow tyres are difficult to handle under these circumstances. Furthermore, the dust problem on these roads caused by vehicular traffic, especially buses, minibus taxis and lorries, obscures cyclists to other vehicular when they travel on the road. The crossing of these gravel roads under dusty conditions is another safety problem confronting these scholars.

Secondly, *the lack of secure bicycle lockers at schools and elsewhere at community centres* lead to a security problem discouraging the use of bicycles. Various bicycle thefts were reported at schools and elsewhere. Consequently, school principals discourage children to bring bicycles to schools, which of course is defeating the principle of increased mobility.

Thirdly, at the moment *no comprehensive guidelines exist in South Africa for the provision of bicycle ways in rural areas and villages*. The Pedestrian and Bicycle Facility Guidelines Manual (Department of Transport, 2003), the current guidelines manual used for the provision of bicycle and pedestrian facilities in South Africa, needs to be expanded to cover the infrastructure needs of the rural cyclist. This is especially true for Chapters E.3 and E4 of the Manual dealing with rural and disadvantaged areas. Many traffic accidents involving pedestrians and cyclists occur in rural and disadvantaged areas. There are, however, not many directives available for addressing this problem, and innovative and new guidelines need to be developed for rural areas.

4.2 Bicycle infrastructure vis-à-vis other community needs

Many of the villages in the deep rural areas of South Africa are characterised by a backlog in the provision of housing, educational facilities, sanitation, potable water supplies, paved road linkages to bigger towns or service centres, internal paved road networks in villages, and similar needs. In view of these pressing needs in the villages, the provision of paved bicycle ways would not necessarily be supported by the communities and will most probably be low on the community's priority list of needs.

The question arises, however, why not balance the need for bicycle infrastructure through creating jobs in communities and enhancing skills development, therefore alleviating poverty and at the same time also promote child safety and increased security?

This concept is feasible though the introduction of a labour based bicycle way construction programme through the Expanded Public Works Programme (EPWP). The district municipalities as transport authorities in terms of the National Land Transport Transition

Act, 2000, ought to take the lead in this initiative to provide bicycle infrastructure in those local municipalities under its jurisdiction where the need arises.

5 OPTIONS TO INCREASE MOBILITY IN RURAL AREAS BY PROVIDING SAFE AND SECURE BICYCLE INFRASTRUCTURE

5.1 Introduction

One of the national aims of the Shova Kalula National Bicycle Programme is the promotion of safer bicycle transport through improvement in road safety education and training, traffic calming and infrastructure upgrade projects. Bicycle infrastructure is urgently required in rural villages to sustain the mobility efforts initiated by the Shova Kalula National Bicycle Programme. The infrastructure that is needed as a priority includes bicycle ways and secure storage facilities for bicycles at schools.

The provision of off-road bicycle networks in rural villages is a matter that needs to be considered seriously. The layout of most of the rural villages in South Africa is based on a grid pattern with reserves (alleys) between the properties. Only few of these reserves in many villages are normally developed to accommodate vehicular traffic to schools, shops, hospitals, clinics and tribal offices. The rest of the reserves are undeveloped and mainly used by pedestrians and cyclists. The horizontal separation of bicycle and pedestrians from other road traffic in these rural villages by using these reserves seems to be a feasible solution. Some of the undeveloped reserves could be developed into bicycle ways. A problem experienced with these undeveloped reserves is that during inclement weather conditions it very often becomes impassable for pedestrians and cyclists. The upgrading of these reserves with compacted and well-drained surfaces will enhance cyclist and pedestrian movements to schools, shops, hospitals, clinics, tribal offices and other public places.

Furthermore, the provision of secure bicycle storage facilities at schools, shops and hospitals is considered as an important measure to encourage the use of bicycles in communities. Initially, more than 1 100 bicycles were sold at the Bakenberg bicycle shop and many children used them to travel to school. However, a survey conducted in January 2004 by Ribbens and Makhado (CSIR 2004) during school hours at all the major schools in Bakenberg, showed that very scholars in fact were still using their bicycles to travel to school. One of the contributing factors for this discontinued use of bicycles is the security issue. Because of a lack of secure storage facilities at schools many scholars are reluctant to travel with their bicycles to schools.

5.2 Bicycle infrastructure as a catalyst in reducing rural poverty

5.2.1 Introduction

The benefits to be gained through the provision of bicycle infrastructure for example the construction of gravel bicycle ways and secure bicycle storage facilities are the following:

- The creation of new and sustainable jobs in communities.
- The enhancement of skills development and alleviating poverty.
- Community and local economic development.
- The improvement of child safety and security.

5.2.2 Creating jobs in communities

The construction of gravel bicycle ways by the local community members according to an approved master plan and prescribed specifications through the Expanded Public Works

Programme (EPWP) will create job opportunities in these communities. As stated earlier, district municipalities should take the lead in initiating these projects. The maintenance of bicycle ways could also be contracted out to community members. Furthermore, the erection of secure bicycle storage facilities at schools and other community centres could also be sourced out to the community. Road signs must be provided and maintained where these bicycle ways crosses public roads.

5.2.3 Enhancing skills development and alleviating poverty

A skills enhancement programme to construct these gravel bicycle ways and provide secure storage facilities at schools under the supervision of a mentor in terms of the EPWP has great potential in transferring skills to unskilled and semiskilled workers. This will create jobs and therefore allow workers to earn a constant income. These skills could later also be used to construct other community infrastructure such as footpaths, roads, dams, earth works, and so on.

5.2.4 Community and local economic development

Local Economic Development (LED) is an approach towards economic development, which allows and encourages local people to work together to achieve sustainable economic growth and development thereby bringing economic benefits and improved quality of life for all residents in a local municipal area. The construction and maintenance of bicycle infrastructure in rural communities could provide an opportunity through which community members could be mobilised.

5.2.5 Improving child safety and security

The provision of a gravel network of bicycle ways in communities linking schools and other major land uses will provide scholars with safe places to ride. Safe storage facilities at these land uses, will reduce the risk of bicycle theft and also encourage the use of bicycles again. Bicycle ways will ensure that children only will have to cross the major gravel roads at a few crossing points. Special measures can be introduced at these crossing points to reduce the speed of vehicles and dust generation such as road signs, gravel road humps, etc,

6 ASPECTS TO BE CONSIDERED IN THE PROVISION OF BICYCLE WAYS IN RURAL AREAS

6.1 Introduction

At the moment the concept of gravel bicycle ways is not backed up by technical standards. Various technologies, however, are available on the construction of gravel roads that could be used as a basis for the developing of standards for the construction of gravel bicycle ways. Examples are:

- The best practices guidelines of the Construction Industry Development Board (CIDB 2004) cover a variety of labour-based technologies that could be used including methods for constructing unsealed roads.
- The structural design, construction and maintenance of unpaved roads commissioned by the Committee of State Road Authorities (CSRA TRH 20:1990)

The purpose of this discussion is to provide a broad overview of the aspects that need to be considered during the provision of gravel bicycle ways. The technical specifications for the design, construction and maintenance for gravel bicycle ways could be developed based on the learning to be obtained from experimental designs of bicycle ways in rural villages.

Three broad categories of activities are relevant to the provision of bicycle ways. These are:

- Design of bicycle ways.
- Construction techniques.
- Maintenance of bicycle ways.

6.2 Design of bicycle ways

Three aspects need to be considered during the design of bicycle ways. These are: geometric design, material selection and thickness design.

6.2.1 Geometric design criteria

The design criteria for bicycle ways are available in the Pedestrian and Bicycle Facility Manual (Department of Transport 2003). Figure 1 illustrates essential and comfortable manoeuvring space. Taking into account that pedestrians, and two-way bicycle traffic will use the facility, a minimum width of 3 m should be considered (see Table 5). However, the points where these bicycle ways intersects roads will have to be properly blocked off by means of bollards or boulders so that minibus taxis and other vehicles are prevented from using them as roadways.

Figure 1: Essential sand comfortable manoeuvring space for cyclists

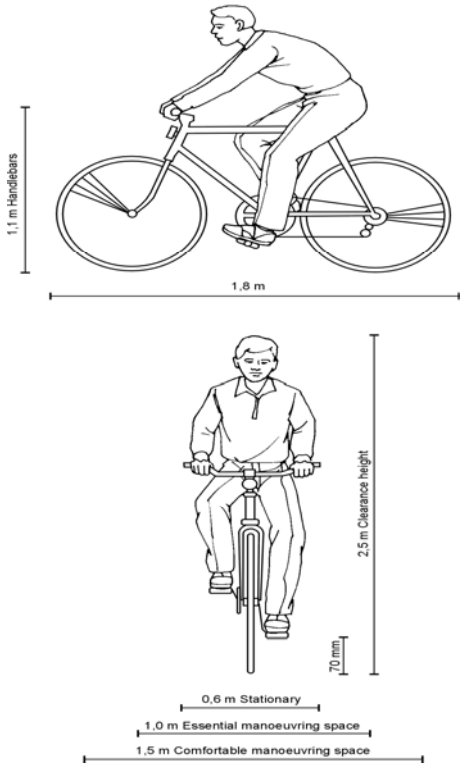


Table 4: Recommended minimum bicycle road widths (two-way)

Desirable minimum	3,5m
Acceptable minimum	3,0m
Absolute minimum	2,5 m
Horizontal clearance	0,5 m

6.2.2 Material selection.

Bicycles have narrow tyres inflated to high pressures. A smooth surface is therefore desirable for bicycles to be used effectively, comfortably and safely, especially on gravel surfaces. Of particular concern are potholes or loose gravel, which could induce skidding.

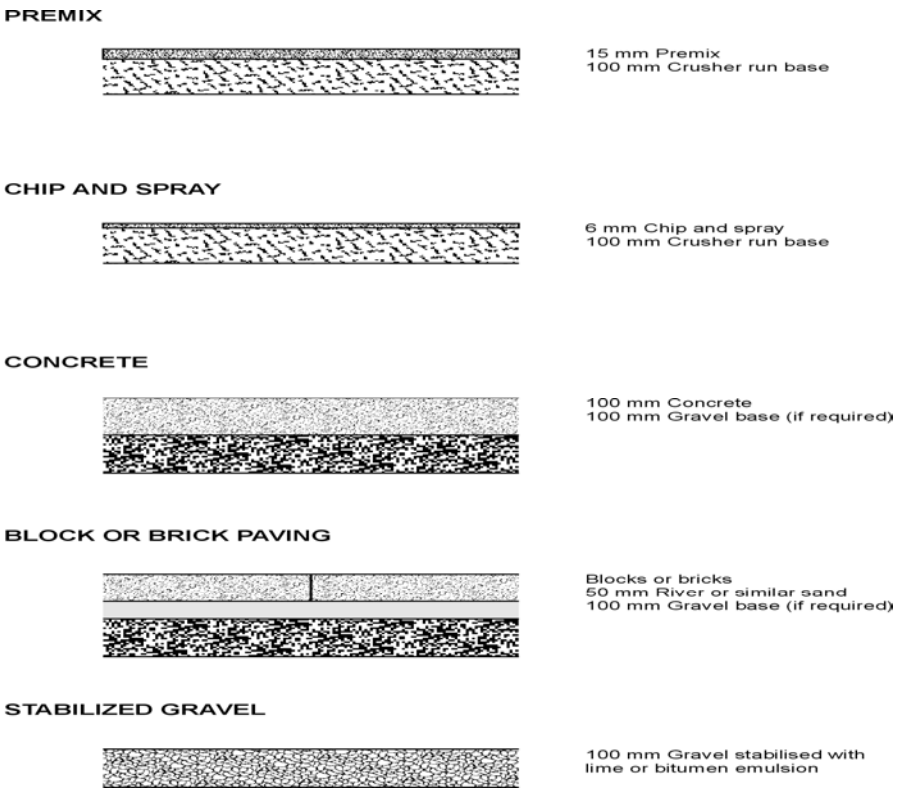
Various materials are available that could be used for the construction of bicycle ways such as a premixed asphalt, a 6 mm chip-and-spray seal, a slurry seal, concrete or interlocking concrete blocks or bricks or a dense graded surface of stabilised soil or gravel. The latter two options would most probably be more suitable for rural villages. In areas where bicycle traffic will be high, interlocking concrete blocks could be considered and where volumes are less, gravel bicycle ways should be provided.

When interlocking concrete blocks are provided, the establishment of a suitable foundation for a bicycle path is essential. It is not necessary to provide a heavy foundation for bicycle roads, but it is particularly important to remove all vegetation, topsoil and other soils, which are considered unsuitable over the width of the path. Tree roots can badly damage the surface of a bicycle road. Due to condensation forming on the underside of the pavement, a climate arises which is conducive to root growth. Various methods can be used to prevent such root growth, but the preferred method is to only allow species of trees whose roots will not damage the bicycle road.

6.2.3 Thickness design of the bicycle ways

The thickness design of materials that could be used for the different layers of bicycle ways are illustrated in Figure 2. In certain high volume areas of the bicycle network, paving blocks are recommended. The less trafficked parts of the bicycle ways could be constructed of suitable gravel, 100 mm thick and stabilised with lime or a bitumen emulsion.

Figure 2: Thickness design and materials that may be used for the construction of bicycle paths



6.3 Construction of bicycle ways

Four aspects need to be considered during the construction of bicycle ways. These are sub grade preparation, wearing course construction, compaction and drainage.

6.3.1 Sub grade preparation

All vegetation should be removed and the techniques used for sub grade preparation for unpaved road should be applied.

6.3.2 Wearing course construction

The wearing course should be smooth and no sharp object such as stones should be protruding from the road surface to prevent punctures.

6.3.3 Compaction

Good compaction of the bicycle way is essential to ensure tightly bound gravel with optimum particle interlock, minimum permeability and porosity and increased strength. Compaction techniques used for gravel roads could be used.

6.3.4 Drainage

Unpaved bicycle ways are totally exposed to the elements and rainfall that could result in significant maintenance problems. The wearing course should have an adequate cross fall which removes water rapidly from the bicycle way surface into side drains without causing scouring.

6.4 Maintenance of bicycle ways

Two aspects need to be considered during the maintenance of bicycle ways. These are drainage maintenance and surface maintenance.

6.4.1 Drainage maintenance

Drainage problems caused by prolonged periods of rain or high intensity thunderstorms could have a significant effect on the surface of bicycle ways. A cross fall of about 4 to 5 per cent should be provided to allow adequate run-off without erosion. Side drains should be used where the natural dispersion of surface water is disrupted, because concentration of water is the root caused of erosion.

6.4.2 Surface maintenance

The maintenance of the surface of the bicycle ways is the major cost factor in the maintenance programme. For labour intensive maintenance, devices such as “camber boards” could be used to ensure that the overall standard of the maintenance is acceptable.

7 BAKENBERG: A BICYCLE INFRASTRUCTURE DEMONSTRATION PROJECT

7.1 Community profile

The rural village of Bakenberg is located in the Mogalakwena District Municipality in the Limpopo Province. The village is situated about 50 km north west of Mokopane (formerly

known as Potgietersrus). Currently, the village is connected to Mokopane by means of gravel roads only. The nearest paved road to Bakenberg ends at Mapela, about 10 km away. Future planning makes provision for the extension of the tarred road to Bakenberg and beyond.

Community facilities at Bakenberg comprise of a preschool centre, four primary schools, three secondary schools, the George Maseba Hospital just outside Bakenberg, a number of shops and retail outlets. It also houses the tribal office and a Shova Kalula bicycle shop. Bakenberg also services a number of other smaller rural villages such as Masipha, Manokaneng, Sepharane, Ditlotswane, Rooiwal, Malokong, Van Wykspan, Pudiakgopa, Swartkop, Matebeleng, Kgopeng, Mabula and Kaditshwene. Children from some of these villages also attend school at Bakenberg.

The Bakenberg Taxi Association operates two taxi ranks in the area, namely at the shops in Bakenberg and at the George Maseba Hospital. Bus companies also operate between Bakenberg and Mokopane and to mines in the vicinity.

Initially about 1 100 bicycles were sold to scholars under the agreement with AfriBike. Since then another 500 bicycles were sold to scholars.

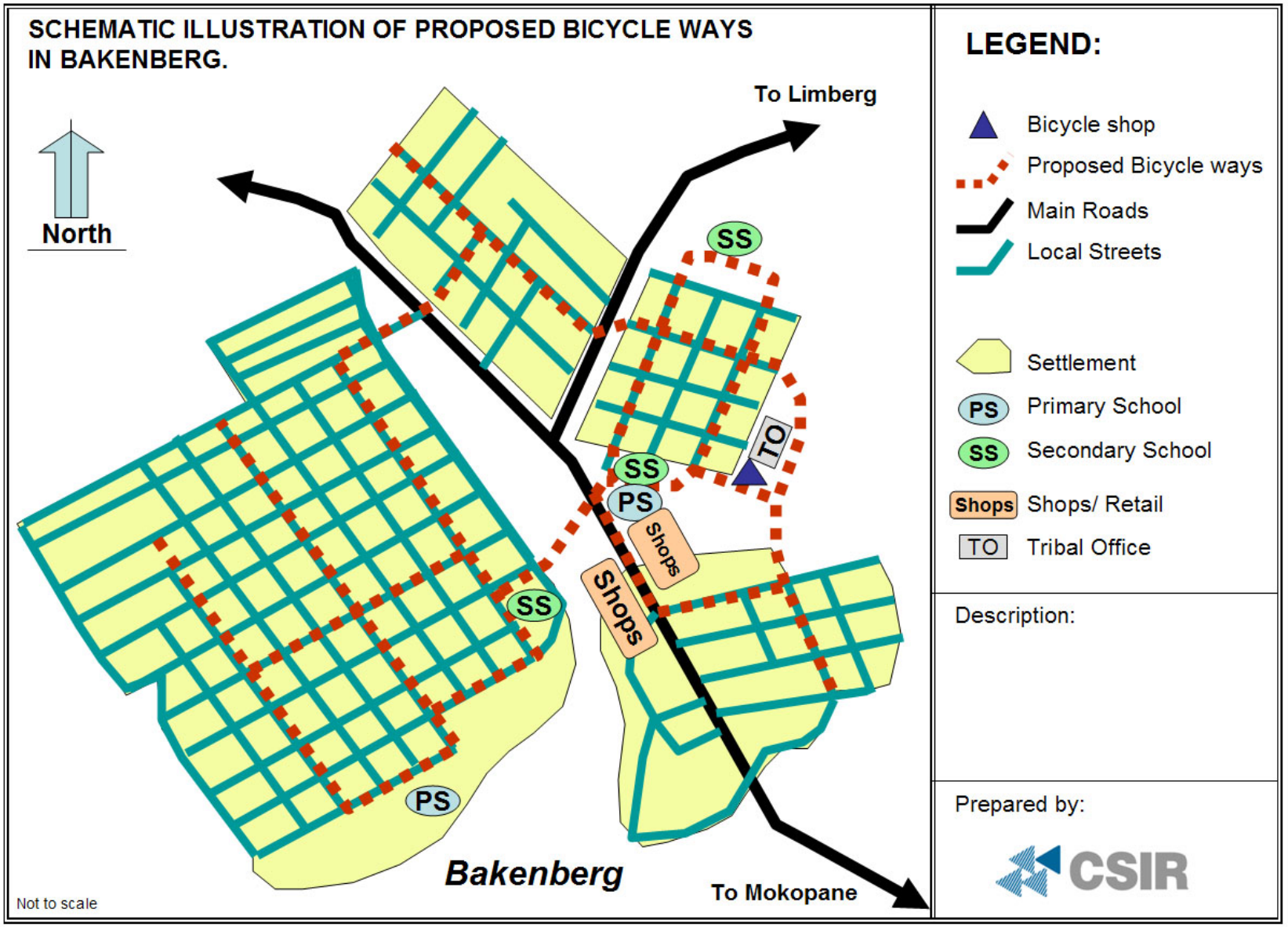
7.2 Proposed bicycle way network

Figure 3 gives a schematic layout of the proposed bicycle network in Bakenberg. The village covers an area of about five square kilometres and the total envisaged length of bicycle ways required in Bakenberg could be about eighth kilometres. The dotted lines in the figure indicate the proposed location of the gravel bicycle network. At this stage it should be considered as a schematic layout to illustrate the principle. A more detailed analysis will determine the actual routes based on demand in relation to land uses.

As shown in Figure 3, the main gravel road leading through the centre of Bakenberg, forms a T-Junction with the gravel road leading to Limburg. Bakenberg is divided into three sectors by the main gravel roads with the main part on the western side of the main road. Most of the businesses are located on both sides of the main road and together with the three high schools and a primary school form a prominent east to west movement axle. A number of the undeveloped reserves could be used to develop a gravel bicycle network to link all the schools and other major land uses in Bakenberg. The east to west axle will be the most heavily used part of the bicycle network and interlocking concrete paving blocks could be considered. The rest of the bicycle ways could be constructed of gravel stabilised with lime or bitumen emulsion.

Once the bicycle network in Bakenberg has been developed, linkages with the other villages in the area should be considered as a second phase, especially to those villages from where school children commute daily to Bakenberg.

Figure 3: Schematic illustration of proposed bicycle ways in Bakenberg


SCHEMATIC ILLUSTRATION OF PROPOSED BICYCLE WAYS IN BAKENBERG.
To Limberg
North
SS
TO
SS
PS
Shops
Shops
SS
PS
Bakenberg
To Mokopane
Not to scale
LEGEND:
Bicycle shop
Proposed Bicycle ways
Main Roads
Local Streets
Settlement
PS Primary School
SS Secondary School
Shops Shops/ Retail
TO Tribal Office
Description:
Prepared by:
CSIR

8 CONCLUSIONS

The main conclusions based on this paper are:

- The National Household Travel Survey, 2003 showed that showed that 90,6 percent of the 7,5 million learners and students in rural areas walk to schools and educational centres. The potential of low-cost mobility enhancement through bicycle transport should be encouraged an alternative mode of travel to scholars and learners who have to walk long distances to schools and other educational centers.

- The Shova Kalula National Bicycle Programme should be extended to communities where no alternative modes of travel are available.

- The assessment of the Shova Kalula National Bicycle Programme pointed towards the lack of bicycle infrastructure in rural areas. This includes a lack of separate bicycle ways and bicycle lockers at schools and other public places.

- The provision of bicycle infrastructure could be a catalyst in reducing poverty through creating jobs in communities and enhancing skills development, therefore alleviating poverty and at the same time also promoting child safety and increased security.

- The district municipalities in collaboration with the provinces should take the lead in providing the much needed bicycle infrastructure in rural communities.

- Currently, there are no comprehensive set of guidelines for the design, construction and maintenance of bicycle infrastructure in rural areas. The learning to be obtained through a number of experimental designs could be used to compile relevant guidelines.

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