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GENERAL NOTICE

NOTICE 198 OF 1999

SOUTH AFRICAN TELECOMMUNICATIONS REGULATORY AUTHORITY



**NOTICE IN TERMS OF SECTION 89 OF THE TELECOMMUNICATIONS ACT 103, 1996
INVITING WRITTEN REPRESENTATIONS ON THE DEVELOPMENT OF THE
NATIONAL NUMBERING PLAN TO BE ESTABLISHED BY SATRA**

1. Pursuant to Section 89 of the Telecommunications Act, the South African Telecommunications Regulatory Authority ("the Authority") hereby provides notice

and invites comment on "A Discussion Paper on the Future Of Telecommunications Numbering in South Africa" (including draft Numbering Plan).

2. Interested persons are hereby invited to submit written representations, including an electronic version of representations in Microsoft Word 6.0 or higher, of their views on "A Discussion Paper on the Future Of Telecommunications Numbering in South Africa", by no later than **16h00 on Friday, 14 May 1999**.
3. Persons making representations are further invited to indicate whether they are requesting an opportunity to make oral representations (and the estimated duration therefor, which duration shall not exceed one hour).
4. Furthermore, persons submitting representations to the Authority after Friday, 7 May 1999, are requested to submit twelve (12) copies of such submissions.
5. Written representations may be posted or hand delivered for the attention of Mr. Roger Nicol at Telecommunications Licensing Division, SATRA

Private Bag X1, Marlboro, 2063; OR
Block B, Pin Mill Farm, 164 Katherine Street, Sandton, Gauteng Province.

Any enquiries in this regard can be forwarded to Mr. Roger Nicol -
Tel. (+27 11) 321 8200
Fax (+27 11) 321 8550
E-mail: NICOR@satra.gov.za

6. Oral representations will be heard from Monday, 31 May 1999 at SATRA, Block B, Pin Mill Farm, 164 Katherine Street, Sandton, Gauteng Province.
7. The times of the oral hearings will be made known to such persons (i.e. those who requested an opportunity to make oral hearings) by means of a telephone call, telefax, or e-mail by no later than Wednesday, 19 May 1999.
8. All persons attending and/or making oral representations will do so at their own cost.
9. All written representations and documents submitted to the Authority pursuant to this notice shall be made available for inspection by interested persons from Monday, 31 May 1999 to Friday, 4 June 1999, during the business hours of the Authority, from 08h30 to 16h00, and copies of such representations and documents will be obtainable on payment of a fee.
10. At the request of any person who submits a written representation or document pursuant to this notice, the Authority may determine whether such representation or document, or a portion thereof, relates to the financial capacity or business plan of any person, or to any matter reasonably justifying confidentiality, in which event such representation or document shall not be made available for inspection by members of the public. If the request for non-disclosure to the public is refused,

the person making the request will be allowed to withdraw the representation or document in question.

11. With respect to the documentation determined not to be open to public inspection as aforementioned in paragraph 10 above, the Authority may direct that the public or any member or category thereof, shall not be present during the oral submission relating to such documentation, provided that those present shall be notified of this intention, allowed to object thereto and after such objections had been considered by the Authority.

THE "DISCUSSION DOCUMENT"

12. Representations may address any relevant issue, whether or not such issue has been raised in the Discussion Document. Furthermore, it is not a prerequisite that representations should address any or all the issues raised in the Discussion Document.
13. The findings, recommendations and conclusions by the Authority following the public comment, will be published in the Government Gazette in accordance with Sections 27 of the Telecommunications Act.

**H.N.L. MAEPA, Pr. Eng. P.E.
CHAIRPERSON SATRA**

SOUTH AFRICAN TELECOMMUNICATIONS REGULATORY AUTHORITY

TELECOMMUNICATIONS NUMBERING INTO THE TWENTY-FIRST CENTURY

**A CONSULTATIVE DOCUMENT ON THE DEVELOPMENT OF THE
NATIONAL NUMBERING PLAN**

"A DISCUSSION PAPER ON THE FUTURE OF TELECOMMUNICATIONS NUMBERING IN SOUTH AFRICA"

ISSUED BY SATRA IN CONNECTION WITH

A PUBLIC ENQUIRY INTO

**THE DEVELOPMENT OF THE NATIONAL NUMBERING PLAN TO BE
ESTABLISHED BY SATRA, PURSUANT TO SECTION 89 OF THE
TELECOMMUNICATIONS ACT.**

FEBRUARY 1999

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1 Introduction

All telecommunications services require numbers whether it is a standard telephone, mobile, facsimile, pager, toll free or any other type of telecommunications service.

The telecommunications industry in South Africa is undergoing major reform, which will result in new competitors entering the market, offering a range of new and innovative services to consumers.

The way in which telecommunications services are numbered has a direct influence upon the effectiveness of competition in the industry and the provision of telecommunications services to consumers.

The existing numbering plan has generally served South Africa well. However with the introduction of competition, new and innovative services and overall growth in the use of telecommunications services, it is necessary to develop a new plan which will accommodate the telecommunications needs of South Africans well into the next century.

Up until the time of the establishment of the South African Telecommunications Act 1996, Telkom managed the national numbering plan for South Africa. The Telecommunications Act confers this responsibility on the South African Telecommunications Regulatory Authority, SATRA, and requires that it develop a numbering plan for use in respect of telecommunications services.

SATRA is now commencing that task.

2 Purpose of this Discussion Paper

The purpose of this paper is to:

- inform the public of the issues impacting on the numbering of telecommunications services;
- explain why changes will be necessary to existing telecommunications numbers, and;
- present options for a new plan, and to encourage all interested parties to submit comments on these options and the proposals detailed in this paper.

This paper does not cover:

- numbering for data networks (including the internet), or;
- implementation issues for a new numbering plan (other than in general terms).

3 The Role of SATRA

The South African Telecommunications Regulatory Authority, SATRA was established by the Government in 1996 to regulate the industry and to oversee, among other regulatory duties, the introduction of competition in the South African telecommunications industry.

SATRA's role is defined under the Telecommunications Act 103, 1996.

One of SATRA's responsibilities is to develop a numbering plan for telecommunications services. Specifically, section 89 of the Act states:

"Numbering Plans

89. (1) The Authority shall prescribe a numbering plan for use in respect of telecommunications services.

(2) A numbering plan shall consist of a scheme of identification so as to ensure that telecommunication is correctly and efficiently directed to the point of reception for which it was intended.

(3) In preparing a numbering plan the Authority shall take account of existing numbering plans and schemes."

In giving SATRA responsibility for the numbering plan, the Government is sending a clear message to the industry that the development, implementation and ongoing management and administration of the plan must be done by an independent body.

There are several reasons for this. Firstly, numbers for telecommunications services is a scarce national resource because it has a finite capacity. Secondly, numbering is being increasingly viewed as a key competitive issue. For example, a provider of telecommunications services could gain an unfair competitive advantage over its competitors should it have a greater range of numbers to choose from to allocate to customers, or have exclusive access to numbers which are most sought after by customers.

Therefore it is critical that the allocation of numbers is equitable. The only way to ensure this is to have it managed by an independent body.

4 Background

The South African Government is implementing major reform of the telecommunications industry. The primary objective of this reform is to promote the provision of affordable telecommunications services to all South Africans through increased competition in the supply of these services.

4.1 The existing regulatory regime:

- ◆ A fixed network monopoly with Telkom licensed to provide a full range of domestic and international services. This exclusivity expires in 2002 with a possible extension to 2003;
- ◆ A cellular duopoly with MTN and Vodacom licensed to supply mobile based services;
- ◆ Unrestricted competition in the supply and operation of private networks (currently 2 major players - ESKOM and Transtel);
- ◆ Resale is prohibited;
- ◆ Unrestricted competition in the supply of value added network (VAN) services, subject to being licensed, and;
- ◆ Unrestricted competition in the supply of customer premises equipment (CPE), which includes inter alia, telephone sets, PABXs and cellular phones.

4.2 The future regulatory regime:

- ◆ A second, and possibly third, fixed line operator will be licensed shortly to provide service in 2002 or 2003;
- ◆ Two additional mobile licences will be awarded in 1999, and;
- ◆ Resale may be permitted.

4.3 The impact of deregulation on telecommunications numbering

This additional competition will place greater demand on numbers for telecommunications services because:

- it will stimulate growth in the use of telecommunications services generally, placing greater demand on numbering capacity;
- new competitors will require their own blocks of numbers, and;
- it will promote the introduction of new and innovative telecommunications services, which will require new number ranges.

4.4 Experience in other countries

Implementing a new numbering plan is not unique to South Africa. Over the last 10 years the United States, United Kingdom, Hong Kong, Japan, France, Australia, Sweden and New Zealand have all undertaken reviews of their numbering plans. Many found that their existing plans would not provide sufficient capacity for the future and that they would literally run out of numbers if a new plan were not developed.

The fact that developed countries such as these (all of which have moved to increased industry competition) saw the necessity to have a well developed numbering plan for telecommunications services, is evidence that it is critical for South Africa to ensure that it has a plan which will provide for the provision of telecommunications services for at least the next 30 years.

5 Why the need for change

The three main reasons why the existing numbering scheme in South Africa needs to change are:

- potential number run-out in some areas due to normal growth in demand for telecommunications services;
- increased competition in the provision of telecommunications services; and
- developments in telecommunications services.

5.1 Potential Number Run-out

The current numbering plan for PSTN services provides a theoretical capacity of 10 million numbers for the Gauteng Central area, (the "011" area). However, because "0" and "1" are not used for directory numbers, only 8 million numbers are theoretically available. At first glance this would appear to be more than enough numbers for the population of this area, which is about 7.3 million.

However, due to the geographical nature of PSTN numbers, effective numbering capacity can be exhausted at very low levels of utilisation (utilisation rate is the percentage of telephone numbers in use against the total number available). In some countries numbering capacity has been exhausted at only 5% utilisation.

Analysis shows that based on the existing utilisation rates and demand forecast in the Gauteng Central area, PSTN numbers will be exhausted around 2004. Therefore changes to the current numbering plan for this area will be necessary in order to provide sufficient capacity well into the next century. Several options for increasing number capacity are presented in section 8.1.

The remainder of South Africa should have sufficient number capacity for PSTN services for at least the next 30 years.

5.2 Increased Competition

In 1996 the Government introduced new legislation which opens up the telecommunications industry to increased competition. Within the next few years a new fixed network operator will be licensed to compete with Telkom and new mobile licences will be awarded. In the longer term more competition is likely.

With the prospect of many players competing in the industry, SATRA, as administrator of the numbering plan, is about to face massive demand for numbers. The current plan will be unable to meet that demand.

5.3 Developments in Telecommunications Services

At one time it was never contemplated that mobile phones, pagers, facsimile and other telecommunications services other than the "plain old telephone" would be in use today.

However, these services are now considered almost commonplace and demand is growing rapidly. In only 4 years the total number of digital mobile services in South Africa has grown to over 2 million.

In the days when the plain old telephone was the only service people used, the requirements for numbers was straightforward. However as new services were introduced greater demand was placed upon the numbering plan. Fortunately the existing numbering plan has been able to accommodate these developments.

However with continuing developments in technology, new and innovative services will be on offer to customers. These will include:

□ Universal Personal Telecommunications Services (UPT)

UPT services will enable a customer to have only one number for all services, so that wherever the location, the customer can be reached on that one number. This will provide total personal mobility. The number is allocated to a customer rather than a service.

□ Global Mobile Personal Communications Services (GMPCS)

GMPCS will provide world wide mobile service based upon sophisticated satellite technology. It will provide global voice and data access, so wherever the customer may be in the world access will be available. Handsets will be dual mode so that when a customer is within cellular network coverage the call will be connected through that network, but when that customer moves outside of cellular coverage the call will be routed via the GMPCS network.

□ Premium Services

These services use short memorable numbers and provide sophisticated features. For example, South African Airways (SAA) may have the number 13 13 13. A customer can call this number anywhere within South Africa and be connected to the nearest SAA office.

□ Information Services

These will provide recorded and live information for a range of services such as legal advice, dating services, horoscope readings, investment advice, news and sport.

□ Broadband Services

Broadband services provide voice, video, teleconferencing, internet and high speed data. These services are being offered now and are continually being enhanced to provide greater amounts of capacity at higher speeds.

These new services, as well as emerging and future technologies, will place greater demand on numbering and a new plan is needed to accommodate them.

6 Approach to Developing a New Numbering Plan

In developing the new numbering plan SATRA will have regard to:

- requirements of the telecommunications industry;
- customer and service provider requirements;
- the need for numbering neutrality;
- The Numbering Advisory Committee;
- SATRA's numbering principles;
- SATRA's statutory obligations; and
- international standards.

6.1 Requirements of the telecommunications industry

Adequate number capacity within the plan will be critical to service growth, innovation and competition. Adequate capacity also ensures that changes to numbers are kept to a minimum.

Any constraint on capacity could stifle growth and deter competition. This will limit the economic benefits achievable through deregulating the market.

Number allocation to service providers must be fair. The market must be left to determine the success or failure of commercial ventures.

6.2 Requirements of Customers

Whilst no specific surveys have yet been conducted on the views of South African consumers in relation to telephone numbers, it is likely that customer requirements **may** include:

- ☐ that, in the case of PSTN services, the telephone number indicates the area/location being called;
- ☐ that the prefix of the number indicates the type of call (e.g. 083 is a mobile call);
- ☐ that the number gives an indication of the cost of the call;
- ☐ that as far as possible numbers should be of standard length and similar format; and,
- ☐ the ability to retain a number when relocating or changing service provider (ie. number portability)

6.3 Requirements of Service Providers

The views of industry have not yet been specifically sought, however some likely requirements **may** include:

- ☐ an adequate supply of numbers;
- ☐ minimal digit analysis for the purposes of simplifying call routing;
- ☐ minimising the cost to implement a new plan; and
- ☐ freedom to manage numbers within number blocks allocated to them.

6.4 The importance of neutrality

SATRA believes that it is important for numbering to be independent of service providers. That is, the number plan should not be designed primarily to convey service provider branding. For example, the leading digits of a number will primarily indicate the broad service type rather than identifying the service provider.

To do otherwise would, amongst other things, result in inefficient use of numbering capacity and restrict the opportunity for competitor number portability.

6.5 The Numbering Advisory Committee

To assist in the development of the new numbering plan, SATRA has established a Numbering Advisory Committee (NAC) to provide advice to SATRA on numbering matters. The NAC consists of representatives from industry including fixed, mobile and private network operators. There are also members representing consumer, disabled and business interests. A list of committee members and the terms of reference for the committee is included at the Appendix.

6.6 Numbering Principles

SATRA, in consultation with the Numbering Advisory Committee, has developed a set of numbering principles to guide the development of the numbering plan. The principles are:

- ☐ The availability and supply of telecommunications numbers should promote the provision of universal service and equitable access.
- ☐ Every customer should have convenient and transparent access to all other domestic and international customers irrespective of the carrier to which they are physically connected.
- ☐ The frequency of changes to telecommunications numbers should be kept to a minimum.
- ☐ Where change to telecommunications numbers is required, disruption and inconvenience to customers should be kept to a minimum.
- ☐ The availability of telecommunications codes and numbers should promote the supply of telecommunications services in South Africa.
- ☐ The allocation of telecommunications numbers by SATRA to carriers, service providers and customers should be fair, reasonable and equitable.

- ❑ Telecommunications codes and numbers should be allocated and used as efficiently as practicable taking into account the interests of consumers and the need to promote the supply of innovative telecommunications services.
- ❑ The numbering plan should comply with international standards wherever possible.

6.7 SATRA's Statutory Obligations

Under the Telecommunications Act 103 of 1996, SATRA must prepare a numbering plan and in doing so must have regard to the existing plan.

6.8 International Standards

SATRA needs to take account of international standards for numbering. These include:

- ❑ "0" to be reserved for trunk access, and
- ❑ "00" to be reserved for international access.

7 *Stages in the development of the National Numbering Plan*

7.1 Development stages

SATRA has decided that the plan will be developed in the following stages:

Stage 1 Review of Existing Plan

Revise the existing numbering plan and develop the principles by which the new numbering plan should be developed. Identify key issues and recommend possible solutions and/or further action.

This stage has been completed

Stage 2 Discussion Paper and Draft Plan

Produce a paper for public comment, which focuses discussion on the key issues and presents a draft plan. SATRA will accept submissions from all interested parties.

This is the current stage**Stage 3****Public Consultation**

Analysis by SATRA of submissions and comments received from Stage 2. Meetings held with key submitters. During this stage SATRA will also convene a public consultative session where SATRA will present the issues and draft plan.

Stage 4**Overview of Public Debate**

SATRA will produce a summary report of submissions and comments received to date. SATRA will receive public comment on the issues raised by submitters.

Stage 5**Final Plan**

SATRA will prepare and release the final national numbering plan.

7.2 Public consultation

In undertaking the development of the new numbering plan, SATRA is committed to open public debate and consultation. The quality of any new plan will be directly dependent upon the input and cooperation of the telecommunications industry and the public. Whilst SATRA has its own views on the issues surrounding a new numbering plan, it does not presume to have all the answers. It is relying on industry to provide objective and informed comment on the issues, and on the opinion of consumers, to ensure that South Africa has a well developed and successfully implemented numbering plan.

Where possible, SATRA in consultation with the Numbering Advisory Committee, has presented options for each issue in this discussion paper.

7.3 Progress to date

Stage 1 has been completed, resulting in the following:

- ❑ SATRA has reviewed the existing numbering plan and has concluded that it will not meet future needs and that a new plan will need to be developed.
- ❑ SATRA has developed a set of "numbering principles" which will be used as the criteria for the development of the new plan. These are listed under the section 6.
- ❑ SATRA has established a "Numbering Advisory Committee" to advise it on numbering related matters. This is discussed under section 6.

Stage 2 is the current stage of which this discussion paper is part.

8 Key Issues and Options for a New Plan

8.1 Public Switched Telephone Network (PSTN) services

8.1.1 Discussion

8.1.1.1 Capacity to meet growth

Most numbering systems exhaust effective numbering capacity at low rates of utilisation (utilisation rate is the percentage of telephone numbers in use against the total number available). This is because of a) the geographical nature of PSTN numbering, b) the population distribution and c) in some cases switching limitations. For example the United Kingdom began developing a new numbering plan when it reached a utilisation rate of 5%. North America (including the USA, Canada, Mexico and most of the Caribbean), with a less geographically based system, started to run out of numbers when it reached 25% utilisation. Australia developed its new plan when it reached 13% utilisation.

Take Gauteng Central as an example, which has a 7-digit number length behind the "011" prefix. The theoretical capacity within the "011" area is 10 million numbers. However because "0" and "1" are not used for directory numbers, only 8 million numbers are available. ***Based upon current and planned utilisation rates for the multi exchange area of Gauteng Central which is 24%, this area will begin to run out of numbers at around 2004.***

Consistent with the numbering principles, it is important that the numbering plan provides sufficient capacity for geographic based services for at least the next 30 years without the need for major change to the plan over that period.

The advent of advanced switching technologies such as ATM (Asynchronous Transfer Mode), may improve utilisation rates. ***There is an international forum considering the impact of ATM addressing and the ITU is also doing some work in this area. However it appears that only limited progress has been made and there are no specific recommendations formulated at this stage.***

8.1.1.2 Capacity for new Competitors

It is absolutely critical that there is sufficient numbering capacity for new competitors.

If number portability is not available then each fixed line carrier will need to be allocated separate blocks of numbers from which they can then allocate numbers to their respective customers.

Current plans envisage one additional fixed network carrier. The demand for fixed network numbers could be significant if the second licensee has immediate access to a potentially large customer base.

Further, it is highly likely that in the longer term there may be no restriction on the number of carriers licensed. There will be an even greater demand for numbers if in the future, more carriers are licensed and resale is permitted.

If however number portability is provided, then this will greatly reduce the demand on numbers because carriers will be able to share numbers (that is, within common number range blocks) rather than needing separate dedicated blocks of numbers.

8.1.1.3 Capacity for replacement of manual services

Some areas in South Africa remain connected to manual exchanges requiring operator intervention for making and receiving calls. There are over 120 manual exchanges still in existence. It is understood that by end 1999 all exchanges will be automatic and digital.

8.1.1.4 Number Structure and format

Experience shows that customers consider many characteristics of telephone numbers to be important. These include, being able to identify the geographical location of the number and what charging will apply if they use the service. Also important to customers is that numbers are of a standard length, similar format and have the same dialling procedures.

Because number format and number capacity are largely interdependent, options for standardising the PSTN number format are discussed together with options for increasing numbering capacity.

8.1.2 Assessment of Existing Plan

8.1.2.1 Capacity to meet Growth

A review of the current numbering capacity in the PSTN was recently conducted by SATRA in order to determine whether there will be sufficient PSTN number capacity to meet forecast growth up to 2050. The figures are based upon current utilisation rates for each area (eg. Gauteng Central, Pretoria, North East etc.) matched against forecasted growth in services. It is important to remember that utilisation rates are generally fixed because they are directly related to how the network is designed and how exchanges and switching nodes are dimensioned and geographically deployed. This is the main reason why utilisation rates differ between areas, regions and countries.

These figures indicate that in all areas except Gauteng Central, there will be sufficient PSTN number capacity up to 2050 without the need to change numbers or number structure over that period.

In the case of Gauteng Central ("011" prefix), the planned utilisation rate is 24%. At this utilisation rate, there will be insufficient numbers to meet Telkom's forecast growth beyond 2004. Therefore changes to the way PSTN services are numbered will be necessary, at least for Gauteng Central.

8.1.2.2 Capacity for New Competitors

Whilst determining whether there will be sufficient capacity to meet growth in customer demand is reasonably quantifiable, it is more difficult to determine whether there will be sufficient capacity for new fixed line competitors. This depends on several factors such as whether local number portability between competing carriers will be available by the time new carriers enter the market. If "competitor" number portability is available then there should be little impact on number capacity other than that as a result of growth in demand (as discussed under the section above, "Capacity to meet Growth").

Licence conditions for new carriers and their commercial objectives will also impact upon demand for numbers. For example whether new licensees will offer local services immediately as opposed to offering long distance services only initially.

If new competitors are either required by licence or, take their own commercial decision to offer local services, and number portability is unavailable, then those competitors will have to be allocated separate dedicated blocks of numbers. How many and what size number blocks those competitors will require, will depend upon licence obligations and the business plans of those competitors.

The extent to which the new competitor will take market share of growth in demand for PSTN services will also impact number demand and utilisation.

Notwithstanding the above, a broad assessment can be made of the likely impact of competition on PSTN number capacity given a worst case scenario. Should the second fixed line carrier require substantial number capacity, then based upon projected figures for forecasted growth and utilisation, it is likely that the area where numbering capacity may become an issue will be in Gauteng Central. This will be in addition to the capacity issue due to growth in demand. Other areas have utilisation rates that indicate substantial remaining number capacity and therefore should be able to accommodate the need to allocate dedicated number blocks to competitors.

8.1.2.3 Capacity for replacement of Manual Services

This is primarily a network infrastructure issue. However the numbering plan must anticipate the replacement of the '0020' code, which is currently used for access to the manual operator, and provide sufficient capacity for manual switched services to move to a number range for exchange switched services.

Based upon forecast growth and utilisation rates, there should be more than sufficient number capacity for these services and therefore no specific change to the numbering plan should be necessary.

8.1.2.4 Number Structure and format

Currently South Africa has a standard length full national number, (FNN) of 10 digits. This is made up of a mix of different length area codes and telephone numbers. It was structured this way primarily because of population densities and distribution.

Given that the numbering plan is now being reviewed, it is worthwhile addressing the issue of the different lengths in area codes and service numbers with a view to adopting a standard format. That is, a uniform length area code and directory number for all of South Africa.

8.1.3 Options

A range of options for increasing numbering capacity to meet future demand, primarily for Gauteng Central, are presented below. An initial assessment of the impact and implications of each is also included.

Option A: Split the existing area code for Gauteng Central (ie "011") into 2 area codes, "011" and "019".

The area code "019" is spare and if implemented would increase the total available numbers within Gauteng Central to 16 million. Based on Telkom's forecast growth, this would provide sufficient capacity until 2030. However, should growth exceed Telkom's estimates then capacity limitations may be reached sooner than 2030.

This option would mean that some existing Gauteng Central customers may have to incur a change to a "019" area code. It will also mean that customers within Gauteng Central will need to dial ten digits on those occasions when calling other customers within the same area but who are within the other area code.

Area code size and boundaries would need to be determined along with which numbers would need to change and when.

Standardising the PSTN number format on (0NN) ABC XXXX could be implemented with this option. The other option is to retain the existing arrangement of a mix of area code and directory number lengths.

Option B: Split the existing area code for Gauteng Central (ie "011") into 3 area codes, "010", "011" and "019".

This option would provide sufficient number capacity up to 2050, based on Telkom's existing demand forecasts. However if growth exceeds Telkom's forecasts then capacity limitations may be reached earlier than 2050.

The 2 new area codes could either be introduced simultaneously, or in stages. By implementing both new area codes simultaneously would mean having to make one change only. By staging the introduction of the two new codes (that is, only introducing the second new code when needed) would mean two changes. A balance needs to be reached between the number of times changes are made and the impact of those changes.

As with option A, some customers will need to change area code and in some cases customers within Gauteng Central will have to dial the full ten digit number to access other customers within the same area.

Area code size and boundaries would need to be determined along with which numbers would need to change and when.

Standardising the PSTN number format on (0NN) ABC XXXX could be implemented with this option. The other option is to retain the existing arrangement of a mix of area code and directory number lengths.

Option C: In Gauteng Central area, increase the local directory number length from 7 digits (as used presently) to 8 digits, retaining the "011" area code. The full national number would become 011 YABC XXXX, where Y would be a new digit added to the front of all existing numbers. Y=2 to 9.

This would increase number capacity from 8 million to 64 million and therefore provide sufficient capacity well beyond 2030. The existing "011" area code would be retained and there would be no need to introduce new area codes. However, every number within Gauteng Central would need to change to add one new digit to the front of the existing number.

Under this option Gauteng Central would have an 8 digit directory number while all other parts of South Africa would use a 7 digit directory number.

If the PSTN number format was to be standardised under this option, all directory numbers would have to be increased to 8 digits in length. This would cause significant inconvenience to those customers outside of Gauteng Central because this would mean every number in South Africa would have to change even though many areas may not face capacity problems. This would however provide abundant numbering capacity and therefore accommodate dramatic demand in growth and numbers of competing carriers.

Option D: In Gauteng Central area, increase the local directory number length from 7 digits (as used presently) to 8 digits, retaining the "011" area code. The full national number would become 011 ABCY XXXX, where Y would be a new digit added after the existing "C" digit to all existing numbers. Y=1 to 0.

This option would increase the theoretical numbering capacity to 80 million and therefore provide for even greater demand than what would be accommodated in option C.

However the same degree of inconvenience to customers, if not greater, would be incurred as discussed under option C, because a new digit would have to be added in the middle of all existing directory numbers.

The same issues on standardising the PSTN number format apply as in option C.

Option E: That the numbering scheme be closed to 10 digits or 11 digits on a national basis. That is, no 7 digit or 8 digit dialling would be permitted.

This option may overcome confusion that could arise as a result of splitting area codes to increase number capacity.

When area codes are split, particularly in relatively small geographic areas, customer confusion can result. In the case of Gauteng Central it would mean that some would be on a different area code. Therefore, whereas before the split they could be accessed by the directory number only, after the split the full national number (ie area code + directory number) would have to be dialled. This could result in Gauteng Central customers not knowing when they have to dial the directory number only or the full national number to access other customers in Gauteng Central.

Mandating that the full national number always be dialled (ie "closing" the number scheme) would overcome this confusion.

The obvious drawback with this option is that customers are forced to dial long number sequences, when often it may be unnecessary.

SATRA strongly encourages comment and input on this important issue

8.2 Cellular and Paging Services

8.2.1 Discussion

There are presently 2 operators licensed to provide mobile services. There are plans to issue two additional licences with the possibility of more at a later date.

There must be sufficient numbering capacity to allocate blocks of numbers to these new competitors in a way, which affords them the opportunity to compete on equal terms with the current operators.

8.2.2 Assessment of Existing Plan

The current plan accommodates mobile and paging services in the "08X" range. Specifically it reserves "081" for analogue cellular and "082", "083", "084" and "085" for digital cellular. Presently Vodacom occupies the "082" range and MTN occupies the "083" range. The ranges "084" and "085" are vacant.

Paging services are located in the "08X" range, that is "0880".

Other services operating in the "08X" range are toll free services - "080", VPN, Centrex, televoting and credit card calling - "086", and maxinet (mass calling) service - "089".

Also, because there is no number range currently available for competitor special services such as operator assistance, information services and fax mail, cellular operators have to use cellular numbers to provide customers access to these services. This significantly reduces the available quantity of numbers for allocation to customers.

Locating special services in the mobile range is inconsistent with the numbering principles and they should be allocated a separate dedicated range. This would free up additional capacity for cellular services. It is proposed to use the "1X" range for special services (refer section 8.3)

8.2.3 Options

In presenting these options it is important to take account of the unprecedented growth in mobile services around the world, the rapid developments in mobile service technology and the history of dramatic underestimation of mobile service growth.

Option A: To allocate the entire "08X" range for cellular, excluding "080", "086" and "089". Reserve "081" for GMPCS. Retain "088X" services including "0880" for caller pays paging.

This option would provide for a total of 50 million services for cellular with each operator having its own dedicated "08X" range of 10 million numbers.

This option will provide for a total of 5 cellular operators.

All mobile services would be in a common range (ie "08") and customers could readily identify a mobile service by the prefix, although there would still be a mix of service types in the one range (ie various Telkom services mixed with mobile services). That is, the range would not be dedicated to one service type only.

There would be no disruption to existing services or customers. Telkom would retain the use of the "080", "086" and "089" ranges. Vodacom and MTN would retain the use of "082" and "083" ranges respectively.

This option would mean no change to paging services. It is expected that should demand for paging services exhaust capacity in the "0880" range then other blocks in the "088X" range could be allocated.

Option B: To allocate the entire "08X" range to cellular. To allocate "081" for GMPCS and retain "0880" for paging.

Existing Telkom services in the "086", "080" range would migrate to the new "18" range. Existing Telkom services in the "089" range would migrate to the new "11" range. All "088X" services (except paging) would migrate to the new "19" range.

Note: The migration of these services to the appropriate "1X" range would still retain the normal 10-digit national number length.

This option will allow for a total of 8 mobile operators each having a dedicated "08X" range of 10 million numbers. A total of 80 million services could be provided for. This would avoid the need to locate new operators and services in a different range (ie other than the "08" range) should demand exceed that which option A could accommodate.

All mobile services would be in a common dedicated range with no other services included. Customers could readily identify a mobile service by the prefix "08".

This option would mean no change to paging services. It is expected that should demand for paging services exhaust capacity in the "0880" range then other blocks in the "088X" range could be allocated.

There would also be no change to existing Vodacom and MTN service numbers.

Under this option Telkom would have to move existing services out of the "080", "086" and "089" ranges. This would result in costs to Telkom and inconvenience to customers currently using services in these ranges. If this option was adopted, services in these ranges would be moved to new ranges as follows:

- a) Telkom's toll free services in the "080" range and intelligent network based services in the "086" would move to the new "18" range which is proposed for all intelligent network based services.

Given that the "080" and "086" ranges would not be taken up by mobile services for several years, the transfer of services in these ranges could be done over a long period, to minimise customer inconvenience. Therefore a 3 year period is suggested for this migration. At the end of this period all existing "080" and "086" services would be moved to the "18" range.

Note: Locating free call services in the "1800" range would bring South Africa into line with many other major countries.

- b) Telkom's "089" services would migrate to the new "11" range which is proposed for all community services and mass dialling services.

As similar migration plan would be adopted for "089" services as for "080" and "086" services.

Option C: To allocate the entire "08X" range to cellular, excluding "080". Reserve "081" for GMPCS and retain "0880" for paging.

Free call "080" should be retained as part of the "08" range, to avoid disruption of corporate clients. The "1800" range should be reserved for free call and share call type services and allocated once the existing "080" range is exhausted.

Telkom would have to migrate "086" and "089" services onto new ranges as per option B.

However, this option would mean no disruption to existing "080" customers and no cost to Telkom to migrate these customers onto new ranges as in option B. Over time, with attrition, the "080" range would become free and could then be used for new cellular growth.

This option would provide for 70 million to 80 million numbers and up to 7 to 8 competitors each having 10 million numbers.

Option D: That the entire "07" range be reserved for mobile, and personal number services.

That "072" be allocated to Vodacom, "073" be allocated to MTN, etc.

That "0770" be reserved for GMPCS.

That the "08" range be used for current and future inbound call services, voice networking services, information services and paging services.

Option E: That the entire "07" range be reserved for cellular, including GMPCS. That "078X" and "079X" be the initial allocation. The existing "0880" range would be retained for paging.

The "07" range is currently vacant and would provide a theoretical total of 1 billion numbers. The "078X" and "079X" ranges would provide a total of 200 million numbers.

Under this option the following ranges would be allocated:

0770	GMPCS (reserved)
0780	Vodacom (reserved)
0781	Vodacom (reserved)
0782	Vodacom (current services)

0783	MTN (current services)
0784	MTN (reserved)
0785	MTN (reserved)
<hr/>	
0786	3 rd operator
0787	"
0788	"
<hr/>	
0789	4 th operator
0790	"
0791	"
<hr/>	
0792 to 0799	Reserved for future use
<hr/>	

This option would mean that all existing cellular customers would incur a number change by having to insert the digit "7" between the first and second digits of the existing number.

Under this option the "081", "082" and "083" ranges would become vacant. This would create the option of reserving the entire "08" range for "intelligent network based services" such as inbound call services (e.g. free call), VPN, centrex. The exception would be the "0880" range which would be retained for paging.

This option would see Telkom's "080", "086" and "089" services remain in these ranges.

This option would increase the total number of digits dialled, for all cellular calls, from 10-digits to 11-digits. (e.g. 083-326-6789 will become 0783-326-6789)

SATRA strongly encourages comment and input on this important issue
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8.3 Provision for New Services

8.3.1 Discussion

New and innovative telecommunications services are being offered. For example GMPCS, information services, universal personal telecommunications (UPT) services, premium services and others. Some of these are described at section 5. They are generally referred to

as "special services" or "non geographic services" because the service does not give an indication of the geographic location. Users will demand these services and the numbering plan must provide numbers for them.

Some other services which may be unfamiliar to some people are:

Community Information Services

These are services which are provided in the community interest such as time, weather, emergency services etc.

Mass Dialling

Carriers need to protect customers on their network from "avalanche" traffic that enters their network in high volume over very short periods of time. An example is when a radio station runs a "phone in" competition. Allocating dedicated codes for these services allow carriers to manage that traffic and ensure that it does not disrupt normal service.

Premium Services

These services use short memorable numbers and provide sophisticated features. For example South African Airways (SAA) may have the number 13 13 13. A customer can call this number anywhere within South Africa and be connected to the nearest SAA office.

Information Services

These will provide recorded and live information for a range of services such as legal advice, dating services, horoscope readings, investment advice, news and sport.

Intelligent Network Services

These are services which derive their special features from intelligence in the network, such as, free call ("0800"), virtual private networks, credit card services etc.

8.3.2 Assessment of Existing Plan

The existing plan will provide for some new services. However there are some services for which there is no specific allocation such as premium services and information services.

Also, there is no available capacity allocated for competitors services within existing ranges.

An important characteristic of any plan is to group like services in the same number range, primarily so customers can readily identify the type of service. Experience shows that customers want to be able to identify the type of service through the number format or prefix. Taking current examples, "0800" is free call and "102" is operator assisted.

8.3.3 Options

There are few options available to accommodate new services. Fundamentally a new range has to be found and one that is either completely vacant or mostly vacant.

Option A: Reserve the entire "1X" range for new and "special" services. Telkom's existing customers in the "10" range would migrate to the new appropriate "1X" range.

The "11" to "19" range is available for use now. Number blocks in this range can be allocated for new services and accommodate new competitors' services. The draft plan proposes a structure within the "1X" range for the allocation of service types.

Telkom currently uses most of the "10" range for a mix of services including, operator assistance, community services such as time and weather, and emergency services. This is not in keeping with grouping like services in common ranges. Under this option these services would have to relocate to the appropriate "1X" range allocated for the particular service type.

However, services in the "10" range have been established since the 1960s.

To require Telkom to move these services into the respective new ranges as proposed in the draft plan may be unrealistic because of the substantial inconvenience to existing customers. Also, there is wide range of services in this range and to move them would incur a substantial cost on Telkom.

To bring South Africa in line with many other countries it is proposed to locate free call services in the 1800 range. Existing free call services (ie "0800") can be either migrated to this new range, or, existing services can remain in the "0800" range with all new services located in the "1800" range.

Option B: Reserve the entire "1X" range for new and "special" services, except the "10" range which would continue to be used exclusively by Telkom for its existing and new customers.

This option would mean that like services would not be located in like ranges because while new competitors would be using the appropriate "1X" range, Telkom would continue to locate all its special services together in the "10" range. This would be confusing to customers as it would be difficult to identify service type by the number prefix.

To bring South Africa in line with many other countries it is proposed to locate free call services in the 1800 range. Existing free call services (ie "0800") can be either migrated to this new range, or, existing services can remain in the "0800" range with all new services located in the "1800" range.

Option C: Reserve the entire "1X" range for new and "special" services, except Telkom would retain the "10" range to service existing customers only. All new customers would be allocated numbers in the new "1X" ranges.

Under this option Telkom could continue to service existing customers in the "10" range, however it would have to locate all new customers in the new ranges as proposed in the plan. This would ensure that over time with natural attrition, that all services would eventually be located in the appropriate range.

To bring South Africa in line with many other countries it is proposed to locate free call services in the 1800 range. Existing free call services (ie "0800") can be either migrated to this new range, or, existing services can remain in the "0800" range with all new services located in the "1800" range.

8.4 Provision for New Competitors

8.4.1 Capacity

The need to have sufficient numbering capacity for new competitors is covered in section 8.1.

8.4.2 Preselection and Carrier Access Codes

Preselection allows for the automatic selection of one of several alternative carriers for all normally dialled calls, by the customer nominating that carrier in advance. Preselection is only necessary where the carrier does not have its own local network infrastructure in place and therefore must rely on the use of Telkom's local network to gain access to customers.

If the second fixed line carrier does not have a local network in place, preselection will be necessary for it to compete effectively with Telkom. This may be the case if the second carrier chooses to roll out a long distance network first and delay building a local access network.

Preselection must be enabled within Telkom's network.

If for some reason preselection is not provided, then a "carrier access code" will need to be made available in the interim until preselection is available. This would need to be accommodated in the plan. There are several options for this access code, but in principle it should be as short as possible.

This is important because although short codes absorb significant capacity, it must be convenient for customers to gain access to the new carrier. A long access code will deter customers from using the second carrier.

8.4.3 Preselection Override Codes

Preselection override codes allow a customer to gain access to a fixed line carrier (on a call-by-call basis) other than the one they are preselected to. If preselection is implemented, then provision for these codes will need to be made in the numbering plan.

8.4.4 Service Provider Access Codes

If resale is permitted in the future, then "service provider access" codes will need to be provided and allowed for in the plan.

Resellers do not use their own infrastructure but instead lease capacity from licensed carriers and then resell that to customers with the reseller providing its own value-added features. Therefore resellers need some way for customers to gain access to their services. This is why each service provider will require a separate and dedicated code, so that customers can gain access to the service provider via a carriers' network.

Service provider access codes and preselection override codes are usually short, about 4 digits in length. This is designed primarily to make it convenient for users to choose between competitors. If codes were too long then users would be disinclined to use another competitors' network and services.

8.4.5 Assessment of Existing Plan

It is understood that preselection for new fixed line carriers will be a requirement under the new regulatory structure and therefore there will be no need for "carrier access codes" and no need to provide for them in the new plan.

However, there is no specific provision in the current plan for:

- preselection override codes and;
- service provider access codes.

Because these are a form of special service they should be allocated numbers in the "special service" number range.

If future policy dictates that service providers should also have the right to be preselected, then there will be no need for service provider access codes. However it is expected that service providers will not be awarded that right, at least initially, and that access codes will be necessary.

Options

There are few if any options available to provide for preselection override codes and service provider access codes. A spare range must be found, and one which can accommodate short numbers (ie where number capacity can be comprised).

The only viable option available is to use numbers in the "1X" range. Which particular range is fairly arbitrary, however "14" is suggested here.

8.5 International Standards

8.5.1 Discussion

The international standards setting body, the ITU-T, prescribes certain standards for international numbering.

In particular that:

"0" be reserved for trunk access; and

"00" be reserved for international access.

The ITU-T recommends that when a country is reviewing its numbering plan, conformity to these recommendations should be implemented.

The standards also recommend that UPT services be allocated a separate dedicated range. That is for example, they should not be located in the same range as mobile services.

8.5.2 Assessment of Existing Plan

The existing plan complies with the trunk access prefix, but does not comply with the international access prefix. South Africa presently uses "09" as its international access code.

Manual operator services currently occupy the "00" range. However when Telkom replaces the remaining manual exchanges this service will be made redundant and the number range will be freed.

This will allow for the international access code to be prefixed by "00" and comply with international standards.

New international access services can be expected to be offered to customers, such as, international facsimile services which provide high quality facsimile transmission to overseas destinations, international credit card charge calls and bulk IDD (where blocks of time can be purchased by customers).

It is important that the plan provides for these services which will require dedicated "00X...." codes.

8.5.3 Options

The ITU-T specification E.164 requires that the IDD code be preceded by "00". That does not mean that the IDD code must be "00" although that is an option. The code can be any length provided it is preceded by "00".

Option A: To adopt "00" as the international direct dial (IDD) access code.

This option would mean customers would only need to dial 2 digits to gain IDD access.

The recovered "09" range will be reserved for growth in the PSTN, and is consistent with the standard of using the prefix "0" for trunk access.

It is also proposed that "double trunking" be provided on this service for a period of 6 to 12 months after "00" is introduced. This would allow customers to use either "00" or "09" for international access for the first 6 months, thereby giving customers time to become used to the change to "00". After this transition period only "00" would be available for international access.

However this option would not provide for new IDD access services because all the "00X..." range would be taken by the one "00" code.

Option B: To reserve the entire "00X" range for international access services. Also, within this range that "009" be allocated as the new IDD access code.

The recovered "09" range will be reserved for growth in the PSTN, and is consistent with the standard of using the prefix "0" for trunk access.

It is also proposed that "double trunking" be provided on this service for a period of 6 to 12 months after "009" is introduced.

This would allow customers to use either "009" or "09" for international access for the first 6 months, thereby giving customers time to become used to the change to "009". After this transition period only "009" would be available for international access.

This option would allow for 9 new international access services. Dedicated codes would be allocated within the "00X" range.

Option C: To reserve the entire "00XX" range for international access services. That initially the "001X" range is used. Within this range, "009" would be reserved for the new IDD access code.

Under this option all international access codes would be 4 digits, except the IDD access code which would be a 3 digit code. All other international access services would be allocated from "001X" to "008X".

This would allow for 80 new international access services.

8.6 National Emergency Service Codes

8.6.1 Discussion

The national emergency service number for South Africa is "107".

Cellular customers can also dial "112" to access emergency services. The use of "112" is a mandatory international standard for GSM networks and therefore must be provided by all GSM cellular operators.

Now that South Africa is reviewing its' numbering plan, it may be opportune to reconsider whether "107" is the best number for national emergency services.

In most administrations access to emergency services is via a standard 3 digit number which is easy to remember and can be accessed nationally, such as "911" in the USA, "000" in Australia and "112" for GSM mobile.

In considering this issue, it should be noted that:

- there is no international standard for emergency service numbers, other than that prescribed for GSM cellular (ie "112").
- the quality and reliability of the emergency service should in no way be related to, or dependant upon the number allocated to access it.
- the National Emergency Committee is reviewing the national emergency service code

8.6.2 Assessment of Existing Plan

The current plan accommodates all present emergency services. This includes "non national" emergency service codes such as "10111" (police).

8.6.3 Options

Subject to the activities of the National Emergency Committee, consideration should be given to several options for the national emergency service number:

Option A: Retain "107" as the national emergency service number.

This option requires no change.

It is not however an internationally recognised number.

Option B: Adopt "112" as the national emergency service number.

This number is already in use by GSM cellular networks and is recognised on a broad international scale as a standard.

It would mean that customers would need to be re-educated to use a new number.

Option C: That other numbers such as "000" or "911" be considered as the national emergency service number.

The code "911" is used in the U.S.A and is widely recognised for that reason.

Using "911" would require existing PSTN customers using the "911" prefix to be relocated, thereby causing some inconvenience. It is understood that there is only a small number of customers on this prefix.

The code "000" is presently unused and could be adopted immediately. However using this code may result in confusion with the transition from the "09" IDD code to the new "00" or "00X" code.

9 Draft Numbering Plan

The draft numbering plan has been prepared based upon the discussion of the issues, arguments and proposals in the previous sections.

It recommends an overall structure for a future plan. Where appropriate it includes recommendations on number "sub groups" and service groupings. However it does not propose to describe number range details to the lowest possible level.

The plan is divided into three main sections. International service codes, non geographic service codes and geographic service codes. Bolded type indicates recommended allocation. Non-bolded type shows indicative/alternate ranges only.

9.1 International service codes

Range**Service****001X to 008X****Reserved for future international access services.**

(a 4 digit code is recommended to provide for sufficient capacity)

001X**Initial range allocated for IDD services****009****International Direct Dial Access Code**

9.2 Non-Geographic Codes

Range	Service
10	Existing Telkom Services
	eg. directory assistance operator services community services (time, weather) current national emergency service (107)
	Telkom will retain this range, however all new services must be located in the appropriate new range.
11	Community Services and Mass Dialling
	e.g. 1100 dial before you dig 112 GSM emergency service 113X Time, Weather 114X radio competitions 115X lottery results
12	Operator Services
	e.g. difficulties and faults directory assistance domestic and overseas manual assistance international telegram enquiries ships at sea payphone connected calls wake up reminder charging/pricing
	Possible groupings:
	122X manual assist 123X directory assist 124X faults/service difficulties 125X internal network codes (customer barred)

Range**Service****13****Premium Services**

Services which may attract a premium charge.

e.g. short code numbers – 13 XX XX

This range may contain groups of different length numbers.

eg. 13 1X XX to 13 3X XX (6 digits)
13 4XX XXX to 13 6XX XXX (8 digits)

14**Service provider access and preselection override codes**

141X to 146X for service providers
(capacity for 60 service providers)

147X to 149X for preselection override
(capacity for 30 carriers)

15**Universal Personal Telecommunications (UPT)****16****Reserved for future growth****17****Reserved for future growth****18****Special Network Services****1800****Toll free**

Other services in this range would include:
virtual private networks
credit card services
network wide PABX type services

Range	Service
19	Information Services
1900	Initial allocation (capacity for 1million services) further ranges can be released when needed e.g. 1901, 1902 etc
08	Mobile Services
080	reserved for future growth after existing Telkom toll free services cease use of this range
081	reserved for GMPCS after analogue closure
082	Vodacom
083	MTN
084	reserved for 3 rd operator
085	reserved for 4 th operator
086	reserved for future growth after existing 086 Telkom services migrate to new ranges
087	reserved for future growth
088	paging
089	future growth after Telkom maxinet service migrates to the "11" range

9.3 Geographic Services

Range**Service****01 to 05****Public Switched Telephone Network Service**

01 Gauteng, Northern Province and
Mpumalanga

*Gauteng Central to be split into 3 area
codes, "010", "011" and "019"*

02 Western Cape

03 Eastern (KwaZulu – Natal)

04 Southern Eastern Cape

05 Central (Free State and Northern Cape)

06 to 07**Reserved for PSTN growth**

*(possibility of using the "07" prefix as the new
range for cellular)*

09**Reserved for PSTN growth**

(after migration to the new IDD code "009")

10 Impact of Change

10.1 Human Impact

Change in telecommunications numbering impacts people in three ways. These are:

- ❑ difficulty in comprehending a new numbering scheme;
- ❑ difficulty in remembering changed or longer telephone numbers; and
- ❑ difficulty in dialling longer or changed telephone numbers.

SATRA believes it is important that in developing a new numbering plan, consideration is given to the way in which change affects different members of the community so that disruption and inconvenience is kept to a minimum.

10.1.1 General impact

The change proposed to the structure of PSTN numbering in particular, will mean that telephone customers will need to learn the form in which a new digit or digits will be added to the number.

A large portion of customers rely on their memory for storing and recalling phone numbers. For these people change will have a substantial effect. However experience in other countries where there have been changes, shows that over a relatively short time period, people do adapt quite readily and become accustomed to new numbering.

Also, the use of number memory facilities on modern equipment means that for those customers the impact of changes to numbers is less significant.

Uniformity in the way numbers are presented is important to people so they can readily recall numbers. What is important here is that whatever the change, numbers are presented in one uniform format, particularly for telephone directories.

10.1.2 Older people and physically or intellectually disabled

Change to numbers has a more significant impact on this group of people. Often people in this group have difficulty in dialling numbers quickly enough within the maximum time permitted by the network, and the call is disconnected. Making numbers longer can exacerbate this problem. It is therefore important that the issue of post dialling delay be considered in the event of number changes.

Summary

SATRA is aware that special consideration will need to be given to the needs of older people and those with disabilities in designing its public information campaign for the new plan. SATRA will consult closely with the community and representative groups on how best to manage the change process.

10.2 The Cost of Change

The cost to implement a new numbering plan will have to be borne by carriers, service providers, residential and business customers. Some studies indicate that the main cost is incurred by customers. Costs are extremely difficult to estimate, however experience shows that forward planning significantly reduces costs incurred.

South Africa is in a relatively fortunate position in that it is reviewing its numbering plan well in advance, thereby having time to plan ahead and minimise inconvenience, disruption and costs to customers.

10.2.1 Cost to Business Customers

Costs to business customers are difficult to assess because of the different nature and size of businesses.

However, potential disruption and financial costs to businesses due to number changes, include:

- ☐ Reprinting stationary
- ☐ Advertising and marketing
- ☐ Informing customers of number changes
- ☐ Reprogramming of telecommunications equipment eg. PABXs, and
- ☐ Potential loss of business

However with adequate forewarning of planned number changes, businesses will be able to reduce, if not eliminate, these costs.

10.2.2 Costs to Residential Customers

The 2 main areas of costs to residential customers are:

- ☐ Informing people

These are costs incurred by those people wishing to contact others to inform them of their new number.

This cost can be almost completely eliminated because in most cases this information is usually conveyed through the course of normal conversation. This will be assisted by double trunking and recorded voice announcements.

□ Customer inconvenience

Less easily quantifiable are the costs involved in learning new dialling procedures and the inconvenience resulting from number changes.

However experience elsewhere indicates that dialling different or extra digits does not pose a problem for most customers. This is generally because of push button phone equipment, and the provision of memory capacity, abbreviated and speed dialling facilities.

10.2.3 Costs to Carriers

The main costs to carriers are:

- Cost to publicise number changes to customers;
- Cost of implementing changes required in the network, and;
- The cost of misdialled calls during the transition phase from the old plan to the new plan.

These costs will fall mostly on the incumbent because it is the main network provider.

Network costs are unavoidable, however they can be minimised with forward planning and when the changes are incorporated into other network modernisation and upgrade activities.

Costs associated with misdialling will be incurred because carriers will need to trap the misdialled call and advise the caller of the correct dialling procedure. This will occur mostly during the transition from the old plan to the new plan.

Costs to inform customers of number changes are largely unavoidable.

11 Numbering Administration

Numbering administration is associated with the management of the numbering plan. It refers to a range of management policies and processes necessary to ensure that the numbering plan is administered effectively and fairly.

Numbering administration can cover issues such as:

- number allocation - how will numbers be allocated, who to and on what basis;
- number portability - the ability for customers to retain their number when changing location and/or service provider;
- charging for numbers - whether charges should be levied on operators and customers for using numbers;
- rights of use - what rights, if any attach to the allocation and use of numbers, and;
- trading in numbers - whether operators and customers can buy and sell numbers.

Numbering administration is an entire project in itself and although it is not part of the numbering plan as such, it is a critical element in the overall operation of the plan. For that reason the issues of administration responsibility, number portability, number allocation and charging for numbers is discussed in this paper with the aim of raising awareness of the issues involved and to stimulate thinking and debate on some of the more important aspects associated with them.

11.1 Responsibility for Number Administration

It is generally accepted world wide that the number administration function must be performed by an independent body and that it be either a government entity, or a duly authorised agent of the government. The reason for this is to ensure that the management of numbering resources is fair and reasonable. In most countries the Telecommunications Regulatory Authority, TRA (generic term) is given responsibility for this function.

In general terms the TRA is responsible for ensuring non discriminatory access to numbering resources. In terms of number allocation for example, it is responsible for the assignment of numbers to market parties, the surveillance of usage and the withdrawal of assigned numbers where necessary.

Numbering administration comprises the establishment of policies and the administration of those policies. These two roles are undertaken differently in different countries.

For example in some countries the ministry establishes the policies and the management of them is undertaken by the TRA. In other countries both functions are undertaken by the TRA.

The following are examples of how some countries handle numbering administration:

In the U.S.A numbering administration for most types of numbers is undertaken by the North American Numbering Plan Administrator (NANPA). The NANPA works under the policy guidance of the North American Numbering Advisory Council which is itself an advisory committee to the FCC. The rules for allocation of numbers are developed and maintained by the Industry Numbering Committee, which probably has a similar role to the Numbering Advisory Committee (NAC), recently established by SATRA. Toll free

numbers in the U.S.A are administered by Database Service Management Incorporated which is an outsourced operation.

In Hong Kong and the United Kingdom numbering administration is undertaken by their respective TRAs, OFTA and OFTEL. OFTEL recently released a discussion paper which canvassed the concept of separating the policy and administration issues and outsourcing the latter.

In Germany numbering administration is undertaken by the German Regulatory Authority for Telecommunications and Posts which is a government body.

In Denmark numbering administration is the responsibility of the National Telecommunications Agency which is a government body.

In Australia numbering administration is undertaken by the Australian Communications Authority which is a government body.

11.2 Number Portability

Number portability is a major issue in itself and SATRA has plans to initiate a public inquiry on it. Therefore it is discussed here in general terms.

There are various forms of number portability and it is important for these to be understood because each has significant competitive and customer implications. Number portability can also effect number capacity.

There are two main types of number portability.

a) Competitor Number Portability

Competitor portability, enables the customer to keep the same number when changing carrier or service provider. Competitor portability promotes competition. Without competitor portability customers have to change their number if they wish to move to another service provider. Services for which competitor portability may be considered desirable are for example PSTN, mobile and toll free services.

b) Geographic number portability

Geographic number portability applies to PSTN services, and allows a customer to retain the same telephone number when relocating premises. Geographic number portability breaks down the significance of the geographic information contained within the number (refer section 6.2). As a result consumers would not be able to identify the location of a particular service from the number.

It is generally accepted that the technical implementation of number portability requires that carriers' have intelligent networks (IN) implemented. Some forms of number portability can be achieved without IN (e.g. using network call forwarding) however it is more difficult

and can require complex network routing. It is understood that by the year 2000 all of Telkom's network will be IN. This will be timely because it will coincide with the planned introduction of the second PSTN carrier. Therefore there appears to be no technical impediment to implementing number portability at that time between the two fixed network operators.

However, the technical feasibility of number portability is only one aspect of the issue. As important if not more, are the policy, management and administrative issues. Such as, who is responsible for maintaining the database of numbers and what are the costs involved in implementing portability and who should pay.

Consistent with the principles, competitor number portability must be reciprocal. That is, it must apply to all carriers.

Number portability can impact upon numbering capacity and utilisation. If portability is provided then numbering utilisation may be improved because it can reduce the need to allocate each carrier its own number blocks. That is, competitors can share numbers within the same number blocks. Conversely, without portability, each carrier needs to be allocated its own dedicated number blocks from which they can allocate numbers to their respective customers. This can result in significant inefficiencies for number utilisation.

The extent to which number portability affects numbering capacity is almost impossible to estimate because it depends on several external variables such as operators' business plans and licence conditions (eg network roll out obligations). Number portability is more important to the issue of competition, because without it competition is restricted.

SATRA welcomes any comment on this issue as part of this discussion paper. However SATRA intends to initiate a separate public inquiry into the feasibility of number portability. The scope of this inquiry will include, types of services, technical feasibility, consumer interests, implementation costs and timing and administration issues.

11.3 Number Allocation

The number allocation role can be broken down into specific procedures. These procedures need to be considered in establishing the number allocation function. The following is an outline of the types of procedures that may be required. It is indicative only and is by no means a definitive list.

11.3.1 Allocation principles

Specifies by what principles numbers will be allocated. Some principles may include the need for fairness, responsiveness, compliance and consistency.

Applications and eligibility

Specifies who will be eligible to apply for numbers.

Specifies what information must be supplied by the applicant.

Primary assignment (assignment to a service provider or carrier)

Specifies what size number blocks will be allocated.

Requires that the application provides sufficient justification for the allocation.

Requires that the proposed use of the number/number blocks is compliant with the numbering plan.

Specifies who receives priority if there are applications for the same number blocks.

Timing for processing applications

Includes procedures for informing applicants of progress and receipt of application.

Specifies under what conditions applications may be refused.

Usage conditions

Specifies what rights of use attach to the allocation.

Specifies the legitimate purpose of use.

Specifies a time limit on when number/numbers must be put into use.

Specifies under what circumstances can the number/numbers be recovered.

Conditions for secondary and tertiary assignment

Specifies conditions, if any, placed upon secondary and tertiary assignment by the primary operator.

Transparency and Public Information

Specifies what information on number allocations should be made available to the public. A balance between preserving competitor confidentiality and the public interest must be determined.

11.4 Charging for numbers

Recognising the value attaching to certain numbers and the scarcity of the numbering resource, many countries have established regimes for charging carriers and service providers for numbers. This is particularly the case with premium numbers or what are commonly known as "gold" numbers. These types of numbers usually have special characteristics such as being short in length and/or easy to remember.

There are various ways in which charges can be levied for numbers including an initial allocation charge and an ongoing annual charge. However in many countries the

government sets a total revenue target and a charging formula is calculated in order to achieve that target.

In Australia annual charges are levied and are based upon the quantity of total numbering resources a number occupies. This essentially means that the charge is based upon the number length. The following formula is used to calculate the charge:

$$A = A_s \times M^{(L_s - L)}$$

where

A = amount of charge on given number

A_s = amount of charge on standard (10-digit) number

M = number length multiplier = 10

L = length of given number

L_s = length of standard (10-digit) number

This results in higher charges for numbers shorter than the standard 10 digit number and lower charges for numbers longer than the standard 10 digit number.

There is a cap on the maximum amount that can be charged on any individual number.

Some numbers are exempt from charges such as those used in the supply of standard telephone services.

In Finland charges are based upon the type of service which is provided by the number together with number length. Service types include:

- standard subscriber number
- operator prefixes including 3, 4 and 5 digit trunk and international prefixes
- data network identification codes (DNICs)

In Switzerland OFCOM divides numbers into 2 classes and applies application and annual charges. Class 1 numbers are those numbers with end users such as PSTN numbers. They are allocated in blocks of 10,000 and are charged accordingly. Class 2 numbers are service identification numbers and short numbers. These are allocated in blocks of 1000 and are charged at a premium.

Application charges take account of how much time is required by OFCOM to allocate the number and any other administration costs.

In Denmark a similar regime is used as in Australia.

In most countries the charging formula is established by the relevant government department or ministry. Usually it is then the responsibility of the TRA to administer the arrangements.

APPENDIX 1**Numbering Advisory Committee (NAC) Membership**

Mr. Nape Maepa (Chairperson)	SATRA
Ms. Noluthando Gosa (Alternate Chairperson)	SATRA
Mr. Roger Nicol	SATRA
Mr. Sidney Arnold	MTN
Ms. Tanya Lacob	MTN
Mr. Gary Robinson	Vodacom
Mr. Amish Chana	Vodacom
Mr. Brian Blackadder	Telkom
Mr. Jack Tlokana	Telkom
Mr. Renier Joubert	Eskom
Mr. Ray Webber	NTUG/SAVA/SATMA
Mr. Anthony Brooks	ISPA
Mr. Zolisa Masiza	Transtel
Mr. Denis Hasenjager	Consumer Protection Committee
Mr. Daan van Niekerk	Special Advisory Committee
Mr. Monty Morris	Department of Communications
Mr. Sudheer Sukumaran	Department of Communications
Mr. Kerry Stephenson	SACSPA

APPENDIX 2

NAC – Terms of Reference

The Numbering Advisory Committee (NAC) shall provide a forum for the exchange of views on numbering issues and will advise SATRA on a range of matters including, *inter alia*, the following:

Development of a Numbering Plan that will meet the Telecommunications sector's requirements into the 21st century.

Implementation of a proposed new or revised Numbering Plan.

Industry and consumer views on numbering matters.

Public awareness and information on numbering.

Key principles proposed by SATRA, by which a new or revised Numbering Plan should be developed.

Key issues and recommend possible solutions and/or further action.

Input to a paper for public comment, which focuses on the key issues and presents a Draft Numbering Plan.

The evaluation of submissions to the paper from all interested parties.

Administration of the Numbering resource, for example:

Allocation of codes and numbers

Charging (for numbers)

Portability

Rights of usage/ownership

In order to fulfil the obligations of the terms of reference and to focus on certain key issues, it may be necessary for the NAC to work in sub-teams or working groups which will report back to the main committee.

RECYCLE HERGEBRUIK



Department of Environment Affairs
Departement van Omgewingsake



Keep South Africa Clean



Throw trash where it belongs

Save a drop — and save a million

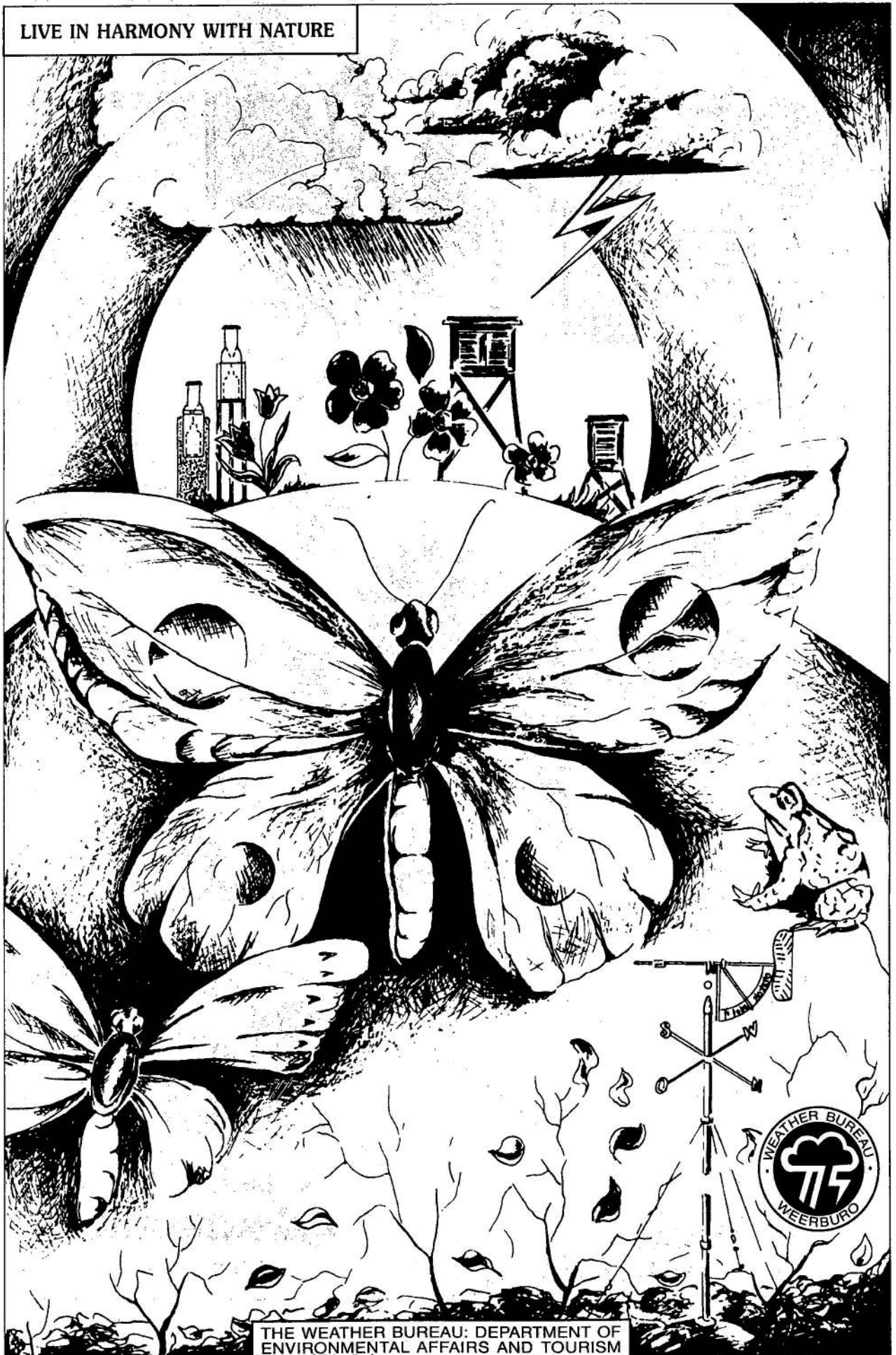
Water conservation is very important to the community and industry to ensure their survival. So save water!



Spaar 'n druppel — en vul die dam

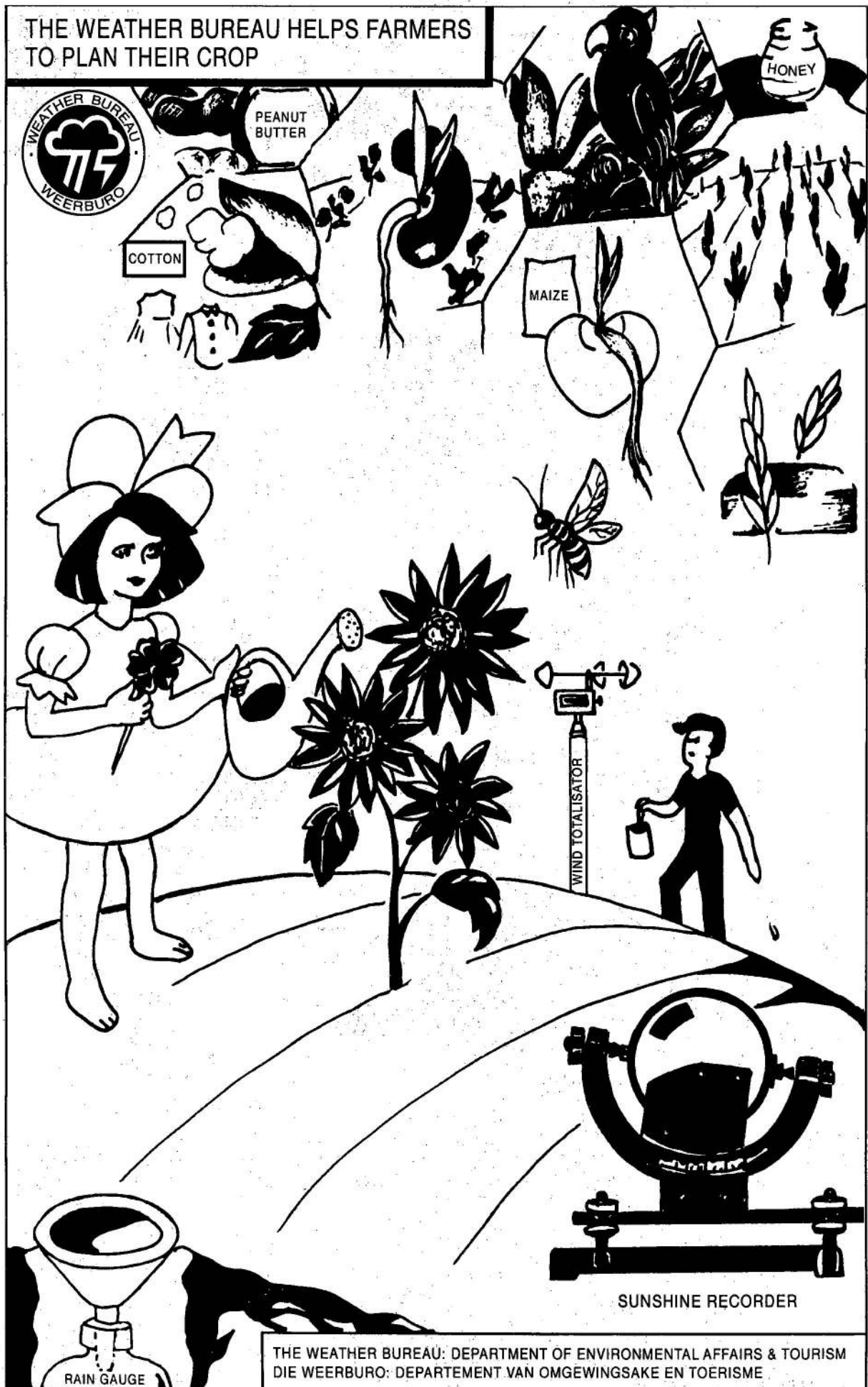
Indien almal van ons besparingsbewus optree, besnoei ons nie slegs uitgawes nie maar wen ook ten opsigte van ons kosbare water- en elektrisiteitsvoorraad

LIVE IN HARMONY WITH NATURE



THE WEATHER BUREAU: DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM

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THE WEATHER BUREAU: DEPARTMENT OF ENVIRONMENTAL AFFAIRS & TOURISM
DIE WEERBURU: DEPARTEMENT VAN OMGEWINGSAKE EN TOERISME

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