

## 7.1 Need for Information Management

**D**uring the initial stages of the Community Access Roads Need Study it became apparent that a large amount of information would need to be collected in the field and recorded as the base data, from which the need for new roads could be determined. In order for the Department and the Rural Road Transport Forums to have easy access to this information, a computer database system was developed whereby enquiries for various types of information could be extracted from the base data.

As the study progressed it was found necessary to present the original base data in different ways and it was considered essential that a flexible approach should be adopted. This will allow for changes and new requirements to be handled in the future, particularly as the Department's staff and the Transport Forums become experienced with the techniques and opportunities which are possible. In this way the database structure and content will be a dynamic resource which can be both updated and extended, such that it remains relevant to the needs of the users, on an ongoing basis.

### 7.1.1 Provincial Level

Typical requirements by the Department will be for Management reports, budget applications, motivation reports, forward planning and project planning.

- Budget Applications

The Department of Transport makes annual applications to Treasury for the funding of its operations. Generally the amount of funding provided is determined in accordance with established norms and principles. When additional funds are required, say for construction of Local Access Roads, special motivations will have to be given as to why these funds are required. Hence one of the most valuable uses of the CARNS database will thus be to provide information required for priority needs and the costing of annual programmes which are needed for budget applications.

**Such information could include:**

- **the total length of road required in the Province,**
- **lengths of roads in each district or region,**
- **the number of people affected and**
- **benefits to the Province by providing access to areas with economic potential.**

### **7.1.2 Forward Planning**

The Department needs to undertake forward planning, together with the Transport Forums, in preparation for the construction of new Local Access roads. The planning may include surveying, drainage and alignment calculations, drawings and specifications for the project. The Department also has to ensure that sufficient funding is available for both planning and construction.

- **Strategic Planning**

The database will be used to identify potential projects for forward planning several years in advance of construction. It is unlikely that enough funding will be available in any one year for the Department to complete all the projects that it would like to address. It therefore plans ahead and develops strategic plans identifying when particular projects are likely to go ahead, how much they are going to cost, who is going to plan them and what method is going to be used to construct them.

This project identification process includes assessing population, development potential and apparent need in the district as a whole. The available funding will be allocated to each Magisterial Districts, as indicated in Chapter 6, and the Transport Forums will then apply other parameters, also extracted from the database, to prioritise projects in order of importance or need.

### **7.1.3 Regional and Transport Forum Level**

The Department and the Transport Forums will require detailed information to help them determine their funding requirements for the year, and to provide motivation for their applications to the Provincial Government. They will also have to plan and prioritise their proposed projects to meet the allocated funding.

During debate among themselves, the Transport Forum's list of potential projects for the year will emerge. To assist with this decision making process, the Transport Forum will require management tools which will assist them with the reorganisation of their project priorities to determine:

- which projects will be done first,
- when they will be done,
- methods of construction to be employed
- financial and progress controls to be used.

## 7.2 Investigation of Computer Systems

**T**here are numerous computer database programmes available, each of which has its own method of operation and abilities. These were investigated, but it became apparent that there would be many benefits of using a database programme which is already used by the Regional Offices and the Head Office of the Department.

### 7.2.1 Compatibility Requirements

The Department uses ORACLE, a high level database programme capable of storing large amounts of information and producing reports of any nature, as may be required by the user. It is, however, the Department's present policy that only information relating to Proclaimed roads be stored in the Oracle core database. Information such as traffic counts, accident statistics, start and end node descriptions, road furniture inventory and so on is kept in the Oracle core data. Local roads, such as are the subject of this Report, are not Proclaimed and it is thus recommended that the Local Roads data be stored in a separate "stand alone" database.

The computer system required to control the Local Roads database should be able to produce the necessary information in a format compatible with the other programmes used by the Department and produce reports required by the various parties. Regional Office computers should be able to read data produced by the Department's Head Office and vice versa.

It is also necessary that the information collected by the Consultants during the study should be available to all role players. Using the same programme throughout the Department will reduce the operators' learning time as many

of them already know the programme. The transferring of files between users will also be less disruptive as the translating of files between different programmes will not be required.

### 7.2.2 User Requirements

To ensure that the system works and is a "living" system, it is important that a readily available, widely used, commercial programme be used. A tailored, unique programme will not be in the interests of capacity building as users will be limited in the use of the programme to matters relating only to this database. A commercially available programme will provide the user with a saleable skill once he has mastered the programme as well as provide a flexibility within the system to adjust Field names, add additional Fields and change the reporting structure to suit the changes in both reporting and input requirements that will develop as the users become accustomed to the system.

Potential users

Potential users identified include:

- Clerical and technical staff in Head Office and the Regional Offices,
- Rural Road Transport Forums

Additional computer literacy training will be necessary, both at Head Office and at the Regional Offices. Initial training in the use of both the programme itself and the database will be required in order that it be utilised effectively.

### 7.2.3 Recommendations

Computer Programme

It is thus recommended that:

- initially the programme "EXCEL" be used for data storage, data manipulation and reporting.
- Head Office and Regional staff responsible for the task of maintaining the system be identified and attend computer literacy courses where necessary,
- where necessary Head Office and Regional staff responsible and accountable for the task of maintaining the system at their respective levels attend a "Windows Operating System " literacy course,
- Head Office and Regional staff responsible for the task of maintaining the system attend an "EXCEL" programme

Identify Staff

Accountability

Education

Staff Access to Computers

proficiency course,

- all identified staff be provided with access to a Personal Computer which is modem linked to the system to enable transmission of information to and from Head Office,
- all staff receive "on the job training" on their respective computers.

On the Job Training

## 7.3 Processing Procedures

**T**here are two stages of data processing in the recommended procedures:

- one that is used for preparation of this report and
- one for ongoing use by the Departmental Staff

### 7.3.1 System Description

The process used for generation of information contained in this report is covered elsewhere in the report.

Study Data

The system recommended for use by the Department commences with the data collected during the study. It is available in one database file for each Transport Forum's area of operation. The following text describes the procedures recommended for each area. The basic unit of area is the Magisterial District which does not necessarily correspond with the Department of Transport Maintenance District boundaries. This is unavoidable but the system will recognise this and any adjustments required can be made.

Database Fields

The base data comprises a list of roads which have been identified and includes information for each road under the headings as listed in Table 7.1 opposite.

**TABLE 7.1 : FIELD NAMES AND DESCRIPTIONS USED TO DESCRIBE COMMUNITY ACCESS ROADS**

DATABASE FIELD NAME	DESCRIPTION
ROAD IDENTIFIER	A unique identification and description of the Community Access Road
PREFIX	Prefix 'A' is applicable to roads which are in very poor condition, and speeds greater than 30 km/hr are seldom possible.  Prefix 'L' is to be used when:- 1. The road is upgraded by DoT to conform with minimum CAR standards or 2. The road was funded by some other public funding source e.g. JSB, IDT or other NGO, TRUMP or Strategic Oil Fund Programme and has not since been maintained but is negotiable at speeds > 30 km/hr.
ROAD_NO	Local Road Number
DATE	Latest date on which road was applied for, examined or built
NAME	The name of the road
FROM	Number of the Main Road, District Road or Local Road on which km 0,0 for this particular Local Road begins
TO	Number of the Main Road, District Road, CAR, area, place name where the CAR ends
LENGTH	Length of road in kilometres
APPLICANT	Authority responsible for making the application : Transport Forum, Tribal Authority, Regional Authority, Development Committee
CONTACT_NM	The name of a contact person or delegate from the applicant
PO_NO	The Applicant's Post Office or Street Number
PO_NM	The Applicant's Post Office or Street Name
CODE	Postal Code
TEL	The contact person's telephone number if any
MAG_DIST	Magisterial District name
MAINT_DIST	Department of Transport Maintenance District description: e.g. 5A
PLAN_NO	Number of the Department's map sheet (blue book) which will ultimately depict the road
POP_T	An assessment of the population directly served by the road

DATABASE FIELD NAME	DESCRIPTION
HEALTH	Health related facilities
CLINIC	The number of clinic buildings served by the road
MOB_CLIN	The number of mobile clinics using the road

DATABASE FIELD NAME	DESCRIPTION
COM_SERV'S	Community Services. Double counting of one building used for various services is permitted
PP	The number of pension pay out points served by the road
CH	The number of Community Halls served by the road
TC	The number of Tribal Courts served by the road

DATABASE FIELD NAME	DESCRIPTION
AGRICULTURAL	Agriculture
AH	The number of agricultural holdings served by the road
AF	The number of agricultural facilities served by the road (loading depots, market gardens, cattle dips)

DATABASE FIELD NAME	DESCRIPTION
COMMERCIAL / INDUSTRIAL	Commercial and Industrial establishments
RET	The number of commercial or industrial establishments occurring along the road providing a retail service
M	The number of commercial manufacturing establishments occurring along the road

DATABASE FIELD NAME	DESCRIPTION
EDUCATION	The number of educational facilities served by the road: viz:
Cr	Crèches
P	Primary schools
CP	Combined primary schools
H	High Schools

DATABASE FIELD NAME	DESCRIPTION
CULTURAL	Cultural
PH	The number of existing cultural or public historical sites with tourism potential occurring along, or in the immediate vicinity of, the road

**TABLE 7.1 : FIELD NAMES AND DESCRIPTIONS USED TO DESCRIBE COMMUNITY ACCESS  
ROADS (...CONTINUED)**

DATABASE FIELD NAME	DESCRIPTION
RELIGIOUS	Religious Institutions. Double counting of courthouses or recreation halls used for this purpose is permitted
W	The number of churches or religious institutions and other places of worship served by the road
TOURISM REC	Provides for Tourism and Recreational facilities which occur along the road
MAJOR STRUCTURES MAJ_STRUC	The number of major stream crossings requiring a significantly large structure e.g. a bridge, causeway or culvert with an estimated cost exceeding R50 000

DATABASE FIELD NAME	DESCRIPTION
ESTIMATED COST EST_COST	An estimate of cost to establish the road to an appropriate standard including the cost of the structures and other topographical restraints
REPORTING RATING	The rating of the road as the sum of the values generated from application of points to facilities served by the road as a function of population. Refer attached spreadsheet information. This field is calculated by the program.
RANK	This field is the resulting priority number generated by a sorting of the road records in descending order of the field 'EST_COST' as the 1 <sup>st</sup> sort key and 'RATING' as the 2 <sup>nd</sup> sort key.

### 7.3.2 Data Manipulation

The Appendix to this Report contains a complete summary of the Community Access Roads which were identified in the various areas during this study. Each of the features (ie the 'field names') under the above headings were allocated points in accordance with the rating system outlined in Table 7.2 overleaf. Where the road information was determined from desktop studies, the term "N/A" (Not Available) has been used to "flag" Fields which require assessment on site. The points for each facility and population category are added together to give a RATING value (Field: RATING).

**TABLE 7.2 : POINTS SYSTEM FOR LOCAL ROADS**

<b>FIELD</b>	<b>ABBREVIATION</b>	<b>DESCRIPTION</b>	<b>POINTS APPLIED</b>
TOTAL POPULATION SERVED	POP_T	CATEGORY 1 - LOW	20
		CATEGORY 2 - MEDIUM - LOW	40
		CATEGORY 3 - MEDIUM	60
		CATEGORY 4 - MEDIUM - HIGH	80
		CATEGORY 5 - HIGH	100
HEALTH	CL	NO OF CLINIC BUILDINGS	30
	MC	No. OF MOBILE CLINICS	10
COMMUNITY SERVICES	PP	No. OF PENSION PAYOUT POINTS	20
	CH	No. COMMUNITY HALLS	10
	TC	No. OF TRIBAL COURTS	20
AGRICULTURE	AH	No. OF AGRICULTURAL HOLDINGS >2 HECTARES	20
	AF	No. OF AGRICULTURAL FACILITIES (DIPPING TANKS ETC)	5
COMMERCIAL AND INDUSTRIAL	RET	No. OF RETAIL ESTABLISHMENTS	10
	M	No. OF COMMERCIAL MANUFACTURING ESTABLISHMENTS	30
EDUCATION	Cr	No. OF CRECHES	0
	P	No. PRIMARY SCHOOLS	20
	CP	No. OF COMBINED PRIMARY SCHOOLS	20
	H	No. OF HIGH SCHOOLS	50
CULTURAL	PH	No. OF CULTURAL OF PUBLIC HISTORICAL SITES	10
RELIGIOUS	W	No. OF PLACES OF WORSHIP	10
TOURISM	REC	No. OF RECREATIONAL FACILITIES	20



Since population is a major contributor to road needs this aspect is treated uniquely. The assessed total population POP\_T served by the road is categorised into one of the 5 categories illustrated in Table 7.3 below. The category is in turn rated numerically as 20, 40, 60, 80 or 100 points. This value is then added to the points determined by other facilities occurring along the road.

<b>CATEGORY</b>	<b>POPULATION SERVED</b>	<b>POINTS AWARDED</b>
1	50 -250	20
2	250 - 500	40
3	500 - 1 000	60
4	1 000 - 2 000	80
5	> 2 000	100

**Rating**

In order for long roads to be compared directly with short roads, a unit length comparison has been made by dividing the total points generated by the length of the road to give a final road rating as points per kilometre.

**Ranking**

After calculating the road rating, the priority list is generated by sorting on the RATING Field with the highest rating being the most important and therefore having the highest priority or RANKING. Further sorting can be carried out under any of the fields at the discretion of the operator or user.

**Example**

A example of a typical summary sheet of Local Roads which have been assessed and ranked for the Enseleni District is given in Table 7.4. Each road occupies one line of the tabulation, and the titles at the head of each column refer to the database fields, as listed in Table 7.1. Points have been awarded according to Tables 7.2 and 7.3, and the roads have been ranked with the highest priority roads for this District being ranked as 1, 2, 3 etc.

KWAZULU-NATAL DEPARTMENT OF TRANSPORT  
LOCAL ROADS FOR RURAL DEVELOPMENT  
LOCAL ROAD NEEDS STUDY FOR THE ENSELENI DISTRICT

Ranking as per priorities in Local Roads for Rural Development Report, Chapter 6  
Ranking done on points per km, except if road is less than 2km, then divide by 2

Pre fix	Applic. Road No.	Map ref	Location Tribal Auth	Estim. Length (km)	Pop. Cat 20	Health		Community Serv			Agriculture		Commerce		Education				Cult	Relig	Touris	TOT pts	Pts per km	Road Type	Constr. Cost (R)	Rank -ing	Accum Road Length
						CI 30	MC 10	PP 10	CH 10	TC 20	AH 20	AF 5	RET 10	M 30	Cr 20	P 20	CP 20	H 50	PH 10	W 5	REC 20						
A	3323	85	Obuka	3.40	2		1	1	2	1	1		8			1		1	6		240	71	7B	153 000	1	3.4	
A	2198	87	Nbonambi	3.20	3	1						1	2			1	1	1	3		200	83	7B	144 000	2	6.8	
A	2190	86	Somopo	2.40	3				1			4			1	1		3		145	60	7B	106 000	3	9.0		
A	3331	101	Madlebe	4.00	5					1		2			1	1	1	3		205	51	7A	300 000	4	13.0		
A	2180	86	Mambuka	4.00	2					1		2			1	1	1	1		145	36	7B	180 000	5	17.0		
A	2192	86	Somopo	5.00	3				1			5				1	1		2		180	36	7B	225 000	6	22.0	
A	2203	86	Mhlana	6.10	3	1	1	1				7		1	1	1		3		215	35	7A	457 500	7	28.1		
A	2202	87	Mhlana	2.60	3							1			1			4		90	35	7A	195 000	8	30.7		
A	2186	85	Ntembeni	3.50	3		1	1				3		1	1			2		120	34	7A	262 500	9	34.2		
A	2195	86	Obizo	5.50	3		1	1			1	2				1	1	3		185	34	7B	247 500	10	39.7		
A	3324	85	Obuka	3.00	2							3		1			1			100	33	7B	135 000	11	42.7		
A	2174	86	Mambuka	1.40	2							2		1	1			1		65	33	7B	63 000	12	44.1		
A	3325	85	Obuka	4.50	4		1	1				3				1		3		145	32	7A	337 500	13	48.6		
A	2211	88	Sokulu	6.50	3		1					7		1		1	1	3		205	32	7B	292 500	14	55.1		
A	2189	85	Ntembeni	5.00	3							3				1	1	3		155	31	7B	225 000	15	60.1		
A	3327	85	Obuka	6.30	5							3				1	1	3		195	31	7A	472 500	16	66.4		
A	3326	85	Obuka	5.60	3		1	1	1			2			1	1		2		170	30	7B	252 000	17	72.0		
A	2168	87	Khoza	4.20	4							4		1				4		120	29	7A	315 000	18	76.2		
A	2164	86	Khoza	6.00	4		1	1	1		1	1			1	1		2		170	28	7A	450 000	19	82.2		
A	3328	85	Obuka	5.50	4				1			3				2		3		155	28	7A	412 500	20	87.7		
A	2175	86	Mambuka	3.40	2				1			3		1		1		2		95	28	7B	153 000	21	91.1		
A	2183	85	Ntembeni	2.00	2							1				1		1		55	28	7B	90 000	22	93.1		
A	2185	85	Ntembeni	4.60	4							3		1				2		125	27	7A	345 000	23	97.7		
A	2169	87	Khoza	3.40	4							2						2		90	26	7A	255 000	24	101.1		
A	2208	88	Sokulu	2.70	2							2				1		2		70	26	7B	121 500	25	103.8		
A	3293	70	Obuka	6.00	4		1	1				4			1			3		155	26	7A	450 000	26	109.8		
A	2201	87	Mhlana	7.00	4		1	1				4				2		3		175	25	7A	525 000	27	116.8		
A	2157	85	Obuka	8.00	3		1					4			2			3		145	24	7B	270 000	28	122.8		
A	2166	86	Khoza	3.40	4							1						2		80	24	7A	255 000	29	126.2		
A	2167	87	Khoza	4.50	4							3		1				3		105	23	7A	337 500	30	130.7		
A	2171	86	Mambuka	2.00	2						1	1		1				2		45	23	7B	90 000	31	132.7		
A	2182	86	Mambuka	4.50	3							1					1			100	22	7A	337 500	32	137.2		
A	2193	86	Somopo	4.00	2							4			1			1		85	21	7B	180 000	33	141.2		
A	2158	85	Obuka	4.50	3		1					2				1		1		95	21	7B	202 500	34	145.7		
A	3292	70	Obuka	10.00	3						1	3		1	1	2	1	4		205	21	7B	450 000	35	155.7		

Sheet 1

TABLE 7.4 : LOCAL ROAD NEEDS FOR THE ENSELENI DISTRICT, RANKED IN ORDER OF PRIORITY - EXAMPLE

Information from each new road application is added to the data list against a road number requested from the Department of Transport's Drawing Office. The information they require to enable allocation of a road number is: Road Name (Field: NAME), its starting point (Field: FROM), its end point (Field: END) and the applicant's name (Field: APPLICANT). It is recommended that all the available data be input and a list of roads with Field ROAD\_NO = 0 generated and printed. This list is simply faxed to the Drawing Office at Head Office requesting road numbers which are input when they are received.

### 7.3.4 Data Updating

#### Mapping

The recommended system of updating maps involves the marking up of a copy of the applicable 1:50 000 cadastral plan with the road and its number. This marked up plan is sent to Head Office Drawing Office where arrangements are made for its inclusion on the master plans, and a road number is assigned to the road. Where larger scale 1: 10 000 ortho-photo mapping is available it may be used for additional information, but should not replace the 1: 50 000 maps which available for the whole of KwaZulu-Natal.

#### Road Number Information & Assessment Form

On receipt of an application, Regional Staff would assess it first on paper and secondly in the field. To enable this procedure a *Road Application Assessment Form* has been developed as shown in Table 7.5 overleaf. Read in conjunction with the evaluation descriptions it provides the information required to update the database.

## 7.4 Report Generation

**R**eports can be lists of any road information appearing under any of the Fields in the database. For example, should the operator or user require a list of road numbers, road names and road lengths for roads in Umbumbulu which are longer than 1,5 km and have one or more mobile clinics using them, then the following procedure is adopted:

Sort the report sheet in ascending order on the field and MAG\_DIST as the 1<sup>st</sup> key and LENGTH as the 2<sup>nd</sup> key . Print the report showing the block to be printed as the entire width of the report spreadsheet but limited to the line above that which indicates a greater length than the 1,5 km required.

## Flexibility

Various standard reports can be generated and each user will have his own preferences and requirements. Report generation requires some knowledge of the system and therefore it has been recommended that computer training be given to the various responsible staff members.

As the database size increases with the receipt of further investigations and community submissions, it will probably become cumbersome using the spreadsheet format. At that stage, the use of a dedicated database programme such as "ACCESS" or in fact "ORACLE" should be considered. This will require additional training of staff which may be handled in-house by the Information Technology Department, with possible outside support. Alternatively a continuation of the training procedures recommended above can be continued.

PROVINCE OF KWAZULU-NATAL  
 DEPARTMENT OF TRANSPORT

**COMMUNITY ACCESS ROAD  
 ROAD APPLICATION ASSESSMENT FORM**
**GENERAL DETAILS:**

DATE OF APPLICATION		ROAD No	
REGION REF.NO.		PLAN No FROM DoT PLAN BOOK	
MAGISTERIAL DISTRICT NAME		MAINT. DIST No	
APPLICANT'S NAME			(Name of T/A or Road Transport Forum)
ROAD NAME			
ROAD LENGTH		km	
FROM	TO:		

**CONTACT DETAILS:**

NAME OF CONTACT PERSON			
TELEPHONE No (inc CODE)			
POSTAL ADDRESS P O BOX POST OFFICE POSTAL CODE		OR STREET No. STREET NAME POSTAL CODE	

**POPULATION:**

POPULATION SERVED BY ROAD		POPULATION CATEGORY	
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**HEALTH:**

No of CLINICS		No of MOBILE CLINICS	
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**COMMUNITY SERVICES:**

No of PENSION PAYOUT POINTS		No of COMMUNITY HALLS	
No of TRIBAL COURTS			

**AGRICULTURAL:**

No of AGRICULTURAL HOLDINGS		No of AGRICULTURAL FACILITIES	
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**COMMERCIAL/ INDUSTRIAL:**

No of RETAIL OUTLETS		No of MANUFACTURING CONCERNS	
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**EDUCATION:**

No of CRECHES		No of PRIMARY SCHOOLS	
No of COMBINED PRIMARY SCHOOLS		No of HIGH SCHOOLS	

**CULTURAL:**

No of PUBLIC HISTORICAL SITES		<b>RELIGIOUS:</b> No of PLACES of WORSHIP	
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**DRAINAGE:**

No of MAJOR STRUCTURES		COMPLETED BY	
		DATE	