DATA CAPTURE AND THE PREPARATION OF THE FIRST GAUTENG OPERATING LICENCES STRATEGIES

J C VORSTER[1], J O EXTER[2] and J W M CAMERON[3]

[1]BKS (Pty) Ltd, P O Box 3173, Pretoria, 0001
[2]Gautrans, Gauteng Dept of Public Transport, Roads and Works, Private Bag X83, Marshalltown, 2107
[3]TRC Africa, P O Box 95230, Waterkloof - Pretoria, 0145

1. BACKGROUND

The preparation of Current Public Transport Records (CPTRs) first became a legal requirement following the promulgation of the National Land Transport Interim Arrangements Act, 1998. The contents of these records are described in Government Gazette Notice 847 of 1998. CPTRs were only to be prepared by core cities of declared Metropolitan Transport Areas (of which six were located in Gauteng).

The purpose of the preparation of CPTRs is given in Notice 847 of 1998 - in essence the CPTR was meant to be a tool or mechanism for the core cities to assist in the formulation of suitable recommendations to the former Local Road Transportation Boards (LRTB) with regard to the application for public transport permits (now called operating licences).

The National Land Transport Transition Act (NLTTA), Act 22 of 2000, confirms the need for preparing a CPTR, not only by core cities, but by all Planning Authorities in the country. Opinion is divided as to whether or not this is a practical, affordable and sustainable activity to be undertaken on an annual basis. Section 23 of the Act reads as follows:

"23(1) Every planning authority must……..prepare for its area a current public transport record, which must become part of its public transport plan and constitute the basis for the development of operating licences strategies, rationalisation plans, public transport plans and integrated transport plans."

The preparation of an Operating Licences Strategy (OLS) is stipulated in Section 24 of the NLTTA as follows:

"24(1) For the purposes of ensuring the planning authorities recommendations to the board will enable that board, in disposing of applications regarding operating licences, to achieve a balance between public transport supply and utilisation that is both effective and efficient, every planning authority must prepare a plan known as an operating licences strategy, which must eventually form part of its public transport plan."

Following the promulgation of the NLTTA, guidelines and requirements for the preparation of the various plans required by the Act were prepared. The guidelines and requirements were eventually adopted by the Committee of Transport Officials (COTO) at a workshop held on 27 March 2001.

ISBN: 0-620-28855-8
South Africa, 15 - 19 July 2002
Conference organised by: Conference Planners
CD-ROM produced by: Document Transformation Technologies

One of these documents deals with Non-metropolitan Current Public Transport Records, and which is essentially a scaled-down version of the CPTR requirements of Government Gazette Notice 847 of 1998. Another document deals with the preparation of Operating Licences Strategies.

The particular section of the NLTTA, which requires the preparation of transport plans, including the CPTR and OLS discussed above, has been withheld pending the preparation of regulations to support the implementation of the Act.

2. GAUTENG PLANNING INITIATIVE

The fact that the planning section of the NLTTA is not operational has serious implications for the Gauteng Operating Licensing Board - the unavailability of Operating Licences Strategies (OLSs) made it extremely difficult for the Gauteng Planning Authorities to make recommendations to the Board on the disposal of applications for operating licences. This led to a decision by the Gauteng Department of Public Transport, Roads and Works (Gautrans) in mid 2001 to initiate the preparation of OLSs in Gauteng including the collection of appropriate information required by this planning process. The planning process was to be carried out jointly with the six regional municipalities of Gauteng (three metropolitan and three district municipalities) and the costs were to be shared on a 70:30 basis between Gautrans and the respective municipalities. A special task team was establishment to guide the data collection and planning processes.

Uncertainties regarding the organisational structures and post establishment at the municipal level were, however, not always conducive to rapid decision-making and the appointment of consultants, resulting in target dates not being achieved. While it was the original intention to complete the Gauteng OLSs by December 2001, it is presently (May 2002) aimed for June 2002.

3. DATA COLLECTION AND DATA PROCESSING

3.1 The first CPTRs

The preparation of Current Public Transport Records (CPTRs) was initiated by the national Department of Transport in early 1998. In Gauteng, each of the six former Metropolitan Transport Areas participated in this process, and work started with the preparation of the CPTRs roughly by mid-1998.

A co-ordination committee was established by Gautrans in October 1998 with the aim of achieving comparable and compatible information and systems. The efforts of the committee were, however, only partially successful; probably the major reason was because it only started to function after some of the surveys and other work related to the CPTRs had already started. It was later realised that the ideal would have been to design the data collection and storage on a provincial-wide basis to ensure uniformity in content and quality.

General observations regarding the extent and quality of the 1998 CPTRs are the following:

- information on capacities and capacity utilisation was, generally, well captured, but;

- most CPTRs were made up of many volumes and files containing a variety of data; the impression was that in some cases any information that was readily available was included to make up volume, whether or not such information was really required or useful;
- information on either side of the boundary of adjacent areas seldom correlated; this again emphasized the importance of better planning and co-ordination prior to actual data collection; and
- different methods and techniques were used in the different areas to collect data as well as on different times and dates - this made it extremely difficult to compare information, and makes the information suspect if it is to be used at the detail level for example to consider permit applications.

Gautrans combined the separate CPTRs into a single GIS-based provincial data base. Data was manipulated and integrated into an extranet information system, an access protected environment, which is accessed via the internet.

In order to achieve some interface with the information systems of the Operating Licensing Board (i.e. the Land Transport Permit System (LTPS) in particular), a common route coding system was agreed upon, although not implemented by all.

At present, the CPTR information is very poorly used, mainly due to it being outdated - the annual updating of the CPTRs (as required by legislation) has not occurred.

3.2 Revised approach

The experience gained with the 1998 CPTRs indicated the importance of simplifying the process of data collection and processing. The 2001/2002 initiative by the Gauteng provincial and municipal authorities for the collection of data required for the preparation of OLSs at the municipal level, differed from the 1998 CPTRs in a number of ways, including:

- A programme was developed whereby data would be captured and updated over a number of years. The focus for 2001/2002 was on the minibus-taxi operations. Information on rail and bus services were to be taken over from the 1998 CPTRs and various other sources.
- The 2001/2002 minibus-taxi data collection and processing was sub-divided into five distinct phases as outlined in Annexure A. This allowed for better management but also improved quality control as the outcome of any one phase would first be assessed before starting with the next.
- The first three phases were done collectively by consultants appointed by Gautrans on behalf of the six municipal authorities. It was realised that it would be much more cost effective to do the basic work on a provincial-wide basis.
- The execution of each of the five phases was preceded by the development of a detailed specification of the work and the required output. This ensured better quality control but also created a sense of ownership amongst the authorities as they all contributed to the specified requirements on how the work was to be executed. Briefing sessions were held, in addition, to explain the work to the participating consultants and to create a common understanding.
- The level of detail of the data collection was significantly scaled down. Compared to the 1998 CPTRs, which recorded data for each route section along any identified route, the 2001/2002 initiative only collected capacity and capacity utilisation information at the origin of the trip. It was in the latter surveys also not required to obtain detailed route descriptions - only the origin, destination and a list of intermediate stopping points were recorded.

Similar to the 1998 CPTRs, a Task Team (Co-ordination Committee) was established to guide the process. The Task Team met regularly, approved responsibilities and budgets, was responsible for the preparation of the specifications and generally acted as a forum where experiences and knowledge could be shared.

At the end of January 2002, Phases 1,2 and 3 of the data collection process were basically completed. Consultants were appointed by the six participating municipalities to undertake the Phases 4 and 5 capacity and capacity utilisation surveys, as well as for the preparation of the respective OLSs. The estimated expenditure for the total project at that stage was calculated as follows:

Phase	Task description	Estimated cost (VAT Incl.)
1	Preparation of a GIS base map	R946 200,00
3	Development of GIS application	
2	Identify operations and services	R852 300,00
4	Capacity and capacity utilisation on routes	R3 392 500,00
5	Capacity and capacity utilisation of ranks	
-	Prepare OLSs	R2 620 000,00
	Total	**R7 811 000,00**

It can be expected that the costs of the updating of the information system and OLSs should be substantially less than the above figures e.g. Phases 1, 2 and 3 would not be repeated in subsequent years. The costs of the execution of the scaled-down capacity and capacity utilisation surveys (Phases 4 and 5) also appears high; consultants possibly over-estimated the extent of the work given the 1998 CPTR experience and probably also allowed for some time losses and other inefficiencies because of uncertainty about the level of co-operation they could expect from the taxi associations.

3.3 Development of the GIS application (Phases 1 and 3)

The scope of work for this part of the project included the updating of the existing street centreline base map, the development of a stand-alone application complimentary to the OLS as well as the refinement of the specifications for the capturing of the operational information during Phases 4 and 5.

The GIS base map was originally prepared in 1998 for the purposes of the CPTR developed at that stage. The updating of this base map proved to be an extensive exercise as various alternative sources had to be contacted to obtain the required information for those areas without any street centreline coverage. While the process is still ongoing, there is already a substantial improvement in coverage as well as the quality of the information compared to the previous version. Data issues that are addressed during the quality assurance process include route continuity, and the completeness of attribute data such as street names, etc.

The development of the stand-alone application was initiated by a request from Gautrans for a tool for the querying of OLS related information. The development of the application went through an extensive process of client/co-consultant comments and subsequent revision of the application.

The application is sub-divided into two distinct functional areas namely the **GIS Viewer** and the **Reports Viewer**. Neither of the areas can execute the intended functionality prior to the selection of a Province and a Metro/District. Selections of the aforementioned are done by means of two combo boxes (drop down lists).
The GIS Viewer part of the application consists of a map window (for spatial presentation), a combination of combo and list boxes as well as standard map/data navigation tools. Figure 1 shows the functional layout of the GIS Viewer.

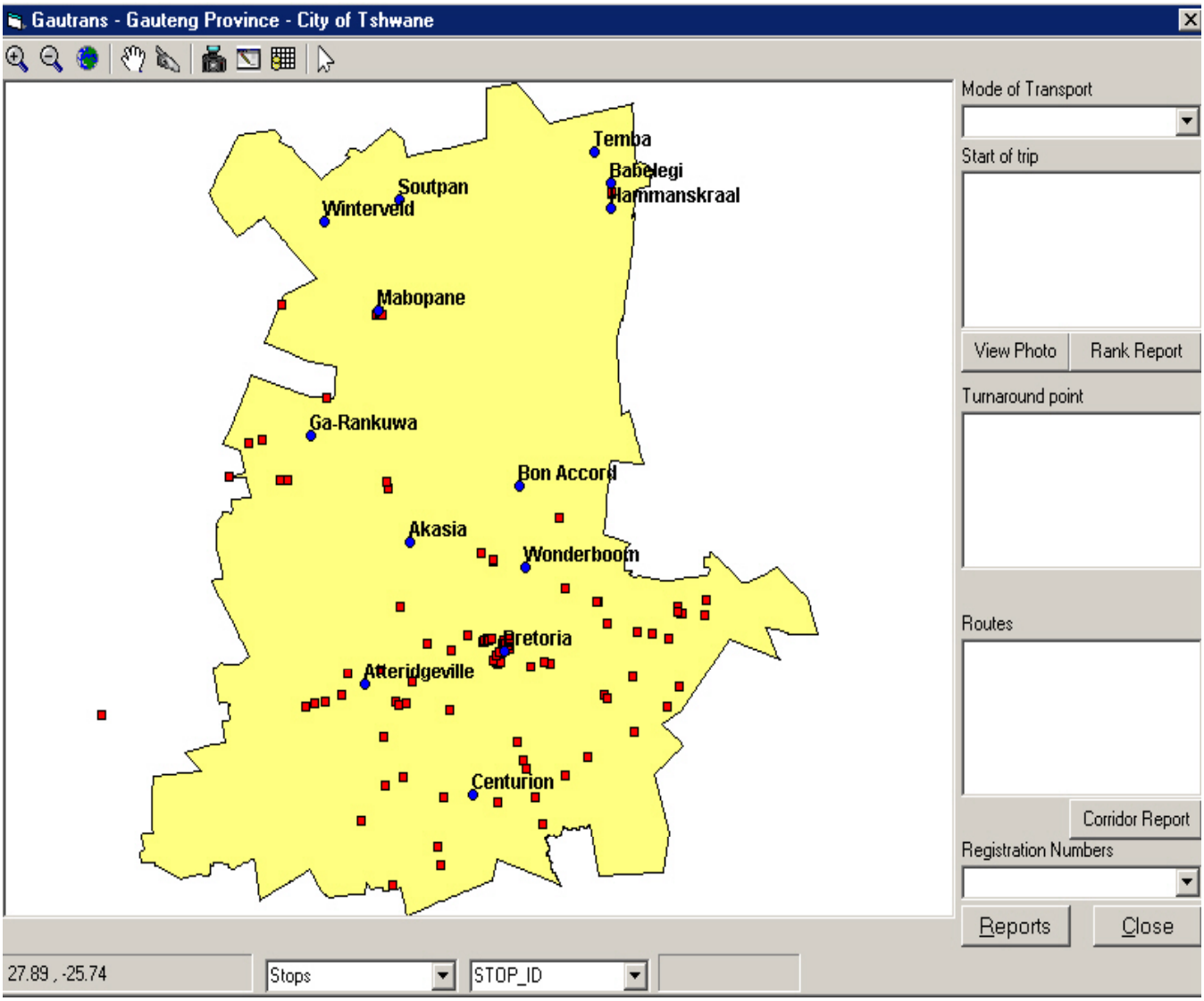

Figure 1: GIS Viewer functional layout

The GIS viewer enables the user to view the following spatial information (See Figure 2):

- Origin ranks (green square)
- Destination/turnaround points (light blue square)
- Intermediate stopping points (brown/blue triangle)
- Proxy routes (straight red line between origin and destination)
- Major towns (blue dots)

Street Centreline Information (light grey lines displayed at first zoom level)

- Municipal boundaries per Metro

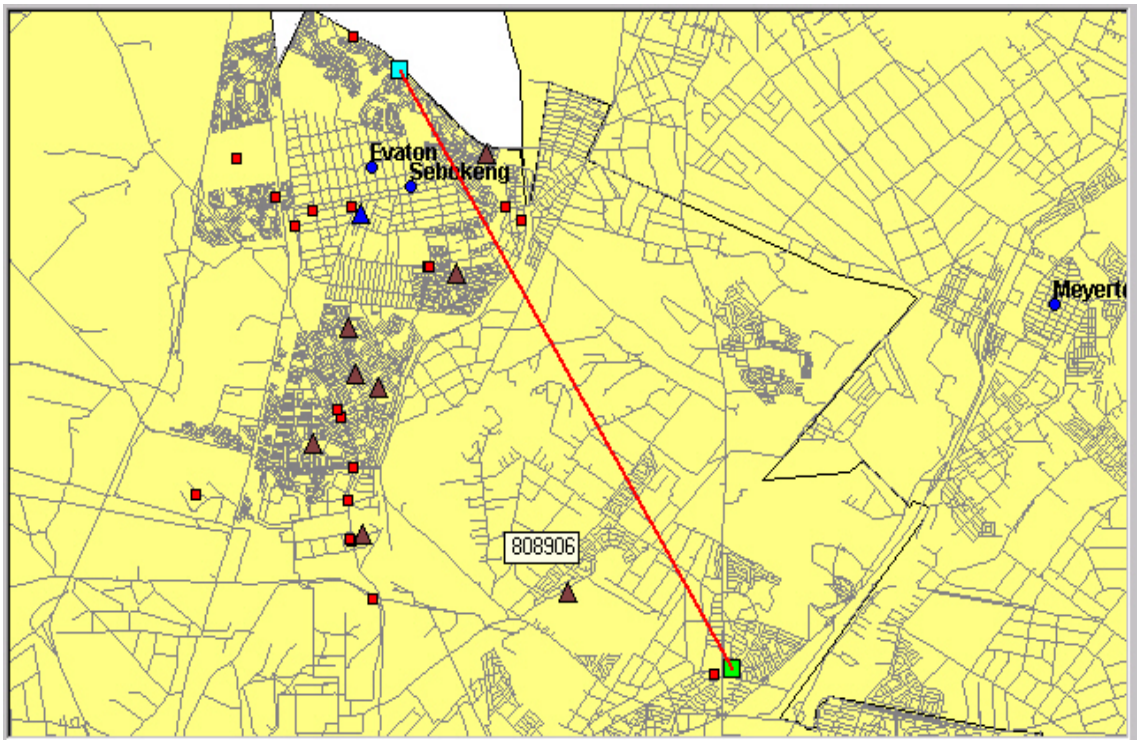

Figure 2: Sample display of spatial information

The Reports Viewer enables the user to view different types of report through a variety of customised selection criteria per report. See Figure 3 for the typical functional layout of the Reports Viewer.

Three different types of reports can be generated, namely:

- Key tables: giving the primary information on capacity and capacity utilisation of corridors and ranks for the identified peak hour.
- Summary tables: similar to the key tables but with more flexibility in terms of the selection of time periods for which queries can be made.
- Detailed Tables: this is the first level of data in the information system. It is data extracted from the raw data, and entered into a specific format for the purpose of the information system. The level of desegregation is similar to that of the raw tables for most of the data items.

The detailed tables are not made available in report format but in Access database format in directories on the CD containing the system.

It is the intention to transform the stand-alone application to a web-based application as soon as the stand-alone model has been tested and proved. This is expected only to be completed after all the Phases 4 and 5 data have been incorporated into the database.

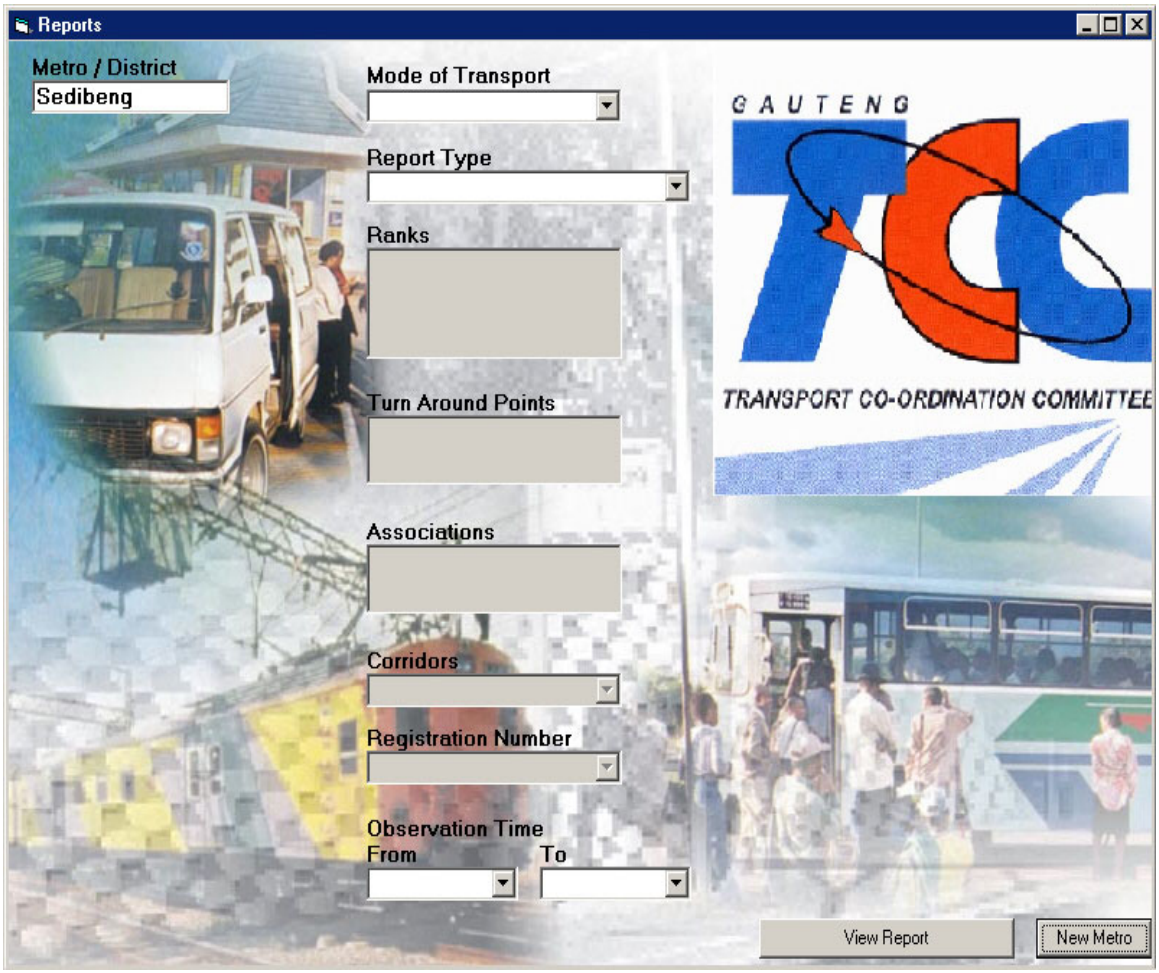

Figure 3: Image of Reports Viewer typical selection criteria

3.4 Initial surveys identifying ranks and routes (Phase 2)

Phase 2 entailed the physical collection of operator data at ranks and the verification thereof by comparing on-site observations and surveys with data contained in the official information systems of the Operating Licensing Board and Registrar such as the LTPS, RAS and NATIS.

Surveys started in October 2001 in the Sedibeng area, but were completed late in January 2002 due to problems encountered in getting the necessary co-operation form the taxi associations in the Johannesburg area. The surveys required the identification of all taxi associations in Gauteng, determining the location and capacities of all ranks from which the associations operate during both the morning and evening peak periods, and obtaining operational data on the destinations that are being served, inter-mediate stopping places along the routes, and vehicle-registration numbers of all vehicles in operation. Photos of the ranks were simultaneously taken as well as the co-ordinates of the ranks by using a hand held GPS receiver. A total of 128 taxi associations are operational in Gauteng, operating from 795 ranks (both morning and evening peak periods).

The taxi industry, generally, co-operated very well although great care was taken to acknowledge them and to work according to the required protocol i.e. by first obtaining the approval of the Provincial Taxi Council, then the different Municipal Taxi Councils and eventually, doing the surveys together with the applicable taxi associations.

All information collected in the process was checked and verified before being entered into the GIS application. This included the submission of the information to the particular metropolitan or district municipality for their approval.

3.5 Capacity and capacity utilisation surveys (Phases 4 and 5)

The Phase 4 and 5 surveys were conducted by different consultants appointed by each of the six metropolitan/district municipalities of Gauteng. Effective co-ordination of the work became essential and required careful planning. The main mechanism used was a detailed specification which was drawn up in advance of the actual appointment of the consultants and which formed the basis for budget and programme. A pilot project was also carried out in December 2001 to test survey forms and procedures and served as input in the drafting of the specification. The following aspects of the surveys are addressed by the specification:

- Survey methodology and survey forms.
- Survey dates and times.
- Rank and route identification and coding.
- Data capturing, storage and dissemination.
- Co-ordination and quality control.

All surveys started at the end of January 2002, following a compulsory consultant briefing session.

To ensure that the captured data would be taken up into the GIS in the correct format, a data capturing tool in Micro-soft Access format was provided to the relevant consultants. Built into the data capturing tool is a dynamic data checking function which identifies any data that is out of range, or inconsistent with data already captured.

The consultants were also provided with a base map of the specific area to be surveyed by them and indicating the detail of all the ranks identified in Phase 2, as well as street centrelines, names of suburbs and a unique code attached to each suburb for referencing purposes. The consultants were also required to record the co-ordinates of ranks by means of a GPS recorder and to take further photos of the ranks. Any ranks or routes not identified during the Phase 2 surveys were to be recorded and discrepancies were to be listed.

As the Phases 4 and 5 surveys only started in February 2002, no feedback can be given on the problems encountered or lessons learnt with this part of the project. A full report back will, however, be given when this paper is presented at the SATC.

4. PREPARATION OF FIRST GAUTENG OLSs

In Gauteng, very little transportation planning was done during the period of municipal transformation. This transformation process has now, to a large extent, been completed and even though the appointment of senior personnel is still pending in some municipalities, Portfolio Committees have been established and the planning process is

slowly gaining momentum. It is the intention of most metropolitan/district municipalities in Gauteng to finalise their first Integrated Transport Plans (ITPs) during the course of 2002.

Ideally, the OLSs should be prepared in parallel to the preparation of the ITPs in order to utilise the vision and policy framework which are basic components of the ITP, to also give direction to the OLSs. The inter-relationship between the OLS and the other planning actions as required by the National Land Transport Transition Act (NLTTA), is shown on Figure 4. As indicated, a transport policy framework is considered a pre-requisite for the preparation of an OLS.

The preparation of the first Gauteng OLSs started at the end of January 2002, and will not have the benefit of a broad and extensive policy framework developed as part of a bigger picture. An interim policy framework will be formulated on the basis that changes may be made to it as the comprehensive planning process kicks in. Various other uncertainties also made the preparation of the OLSs at this stage rather risky, e.g. the taxi recapitalisation process. It was therefore acknowledged that the first OLSs will not be a final product and that it will be reviewed annually.

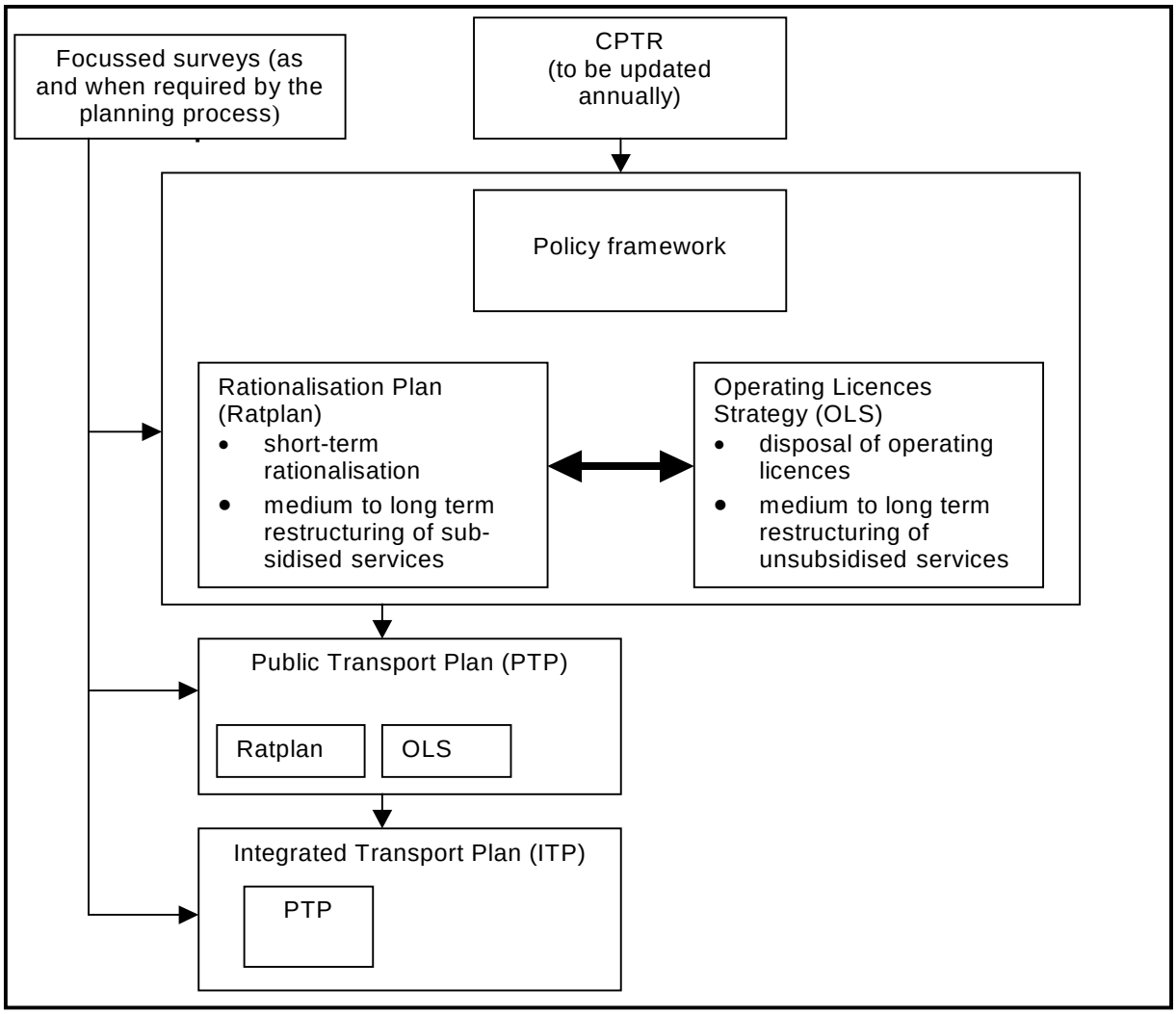

Figure 4: Inter-relationship between OLSs and Other Planning

A guidelines document was prepared to assist with the preparation of the OLSs. This, together with a consultant's briefing session as well as a workshop with the Gauteng Operating Licensing Board, assisted to create a common understanding of the required end product.

The first Gauteng OLSs are to be based on the national guidelines and requirements for the preparation of Operating Licences Strategies published in 2001. However, a more strategic approach is to be followed. The following deviations from the national guidelines were accepted in view of previous problems with the reliability of information captured during the 1998 CPTR preparation:

(i) The analysis of capacities and capacity utilisation is to be done on a corridor basis, rather than on a route basis as proposed in the national document.

(ii) The norm to be applied to identify corridors with an over-supply of services were to be very carefully applied. Levels of utilisation were indicated in bandwidths rather than exact percentages.

(iii) Waiting times were not included as a parameter for the first Gauteng OLSs.

It was also decided to include non-quantitative criteria in the evaluation. This includes the issue of law enforcement relating to vehicle roadworthiness, driver fitness, whether the services are being rendered in terms of a legal permit, etc. Municipalities were requested to qualitatively monitor its liaison with Taxi Councils and Associations and use this information to supplement the more quantitative information.

The outcome of the OLS process will only be known by (roughly) June 2002. Lessons learnt during this process will be communicated at the SATC.

5. CONCLUDING REMARKS

The Operating Licences Strategies will only add value to the planning and management processes if it is based on reliable information, and the outcome is logical and easy to understand. The Gauteng OLSs is a first initiative to prepare this type of plan and the learning curve will probably be very steep. Of great importance is the regular monitoring and updating of the information system and, subsequently, the OLSs themselves. A possibility that might be considered is the establishment of a permanent survey team to gather information on a roving basis throughout the year, in stead of doing it sporadically as at present. Further innovation is clearly required to make the process as simple as possible without sacrificing reliability and quality.

6. ACKNOWLEDGEMENT

The authors wish to thank Gautrans for the permission to publish and deliver this paper at the SATC. The input given by the consultants responsible for Phases 1, 2 and 3 of the planning process as discussed previously in the preparation of this paper is also gratefully acknowledged. They are:

- Messrs M Rademeyer and N Schoeman : AfriGIS
- Mr K van Zyl : SSI
- Mr S Oosthuizen : Siyasi

Views and opinions expressed by the authors in this paper are not necessarily those of the organisation or companies they represent.

ANNEXURE A

PHASED PROSESS OF DATA COLLECTION AND PROCESSING

PHASE	ACTIONS	OUTCOME
1.	Prepare a draft base map: • Aggregate 1998 CPTR information into corridors • Plot GIS maps of the ranks, sub-ranks, stations, terminals and corridors	Draft base maps covering the whole province and showing ranks, terminals, stations and corridors
2.	Identifying operations and services: • Identify all Associations • Link to ranks from which they operate • For each rank, tabulate: - Association - Vehicles - Corridors - Destination • Compare with LTPS/RAS and make corrections	Verified tables showing a matrix of origin ranks to destination ranks (or turnaround points), corridors linking ranks and details of Associations and vehicles stationed at each rank and operating in the respective corridors
3.	Refine (update) draft base map: • Coding of ranks, termini and corridors: - Listing and coding of ranks, termini and boarding points - Listing and coding of corridors • GIS preparation: - Spatial representation of ranks and corridors in GIS format - Aggregate 1998 CPTR rail and bus information into corridors where possible	A single verified GIS-based map covering the total province and showing coded ranks, boarding points and corridors Detail of Associations and vehicles will be provided by rank
4.	Capacity and capacity utilization by corridor: • Determine service capacity: - Number of vehicles - Capacity of vehicles - Total capacity • Determine capacity utilization - number of passengers • Calculate level of utilization • Enter into GIS	For each area, a GIS-based map showing ranks and corridors and detail of capacity and capacity utilization of each corridor
5.	Capacity and capacity utilization of ranks: • Loading facilities - number of bays - max. utilization of bays • Holding facilities - number of bays - max. utilization of bays • Enter into GIS	Detail of capacities and capacity utilization of ranks shown on GIS-based map developed in Phase 3

DATA CAPTURE AND THE PREPARATION OF THE FIRST GAUTENG OPERATING LICENCES STRATEGIES

J C VORSTER[1], J O EXTER[2] and J W M CAMERON[3]

[1]BKS (Pty) Ltd, P O Box 3173, Pretoria, 0001
[2]Gautrans, Gauteng Dept of Public Transport, Roads and Works, Private Bag X83, Marshalltown, 2107
[3]TRC Africa, P O Box 95230, Waterkloof - Pretoria, 0145

Name of Firm: BKS (Pty) Ltd
Name of Staff: **JOHANNES CHRISTIAAN VORSTER**
Profession: Civil Engineer/Head of the Transportation Division (North)
Date of Birth: 16 December 1948
Years with Firm: 22 **Nationality**: South African

Membership of Professional Societies: Member, South African Association of Consulting Engineers, 1991; Member, South African Institution of Civil Engineers, 1977; Registered Professional Engineer, South African Council; of Professional Engineers, Registration No. 770199, 1977

Detailed Tasks Assigned:

KEY EXPERIENCE:
Worked at the former Roodepoort City Council on roads design and transportation planning, in the period 1973 to 1979.

From 1979 to 1984 seconded to the Department of Transport as a member of the Metroplan Consortium advising the Department on the implementation of the Urban Transportation Act, Act 78 of 1977.

From 1984 - stationed in Johannesburg and Pretoria - worked on various studies in Transport and Traffic Engineering.

Specific expertise - Traffic policy and legislation, traffic impact studies, area traffic planning, public transport, and bicycle and pedestrian facility needs.

Became Associate of BKS in March 1982, Specialist Engineer Associate in April 1988 and Director in July 1989. Was promoted to Head of Transportation Engineering, Johannesburg office, in October 1991, and became Head of the Transport Division in November 1998.

EDUCATION:

MEng *(Cum Laude)* University of Stellenbosch	1985
BSc Eng (Hons) University of Pretoria	1978
BSc Eng (Civil) University of Pretoria	1973