

“GO GEORGE” (GIPTN) – PROVISION OF PUBLIC TRANSPORT FIXED INFRASTRUCTURE, AND MOVE TOWARDS PROVIDING UNIVERSAL ACCESS COMPLIANT PEDESTRIAN ENVIRONMENTS

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ABSTRACT

The paper discusses the approach adopted for the development of fixed infrastructure for the George Integrated Public Transport Network (GIPTN) or as it is known by the public, the Go George system, as provided for in terms of the NLTA.

An ‘infrastructure light’ ‘4-stage’ approach was adopted for the provision of the required fixed infrastructure, with attention placed on the Stage 3 activities which deals more specifically, leading to the development of new bus stop design guidelines, with particular attention to the ‘kerbside’ passenger / pedestrian environment. It is in this regard that it was necessary to undertake considerable research into international practices (not described in this paper), and find adaptable solutions for the George situation, and which can be used more widely by others. Central to much of this is the issue of Universal Access Design for which there is a scarcity of local standards and guidelines, and the emphasis to be placed on urban modal priority in future.

The subject is a wide ranging, thus the paper is a mere introduction, but one that should be of considerable interest to many, particularly so as it challenges the traditional ‘road designer’ to respond differently. In doing so it opens the door to a more meaningful dialogue with other ‘built environment’ disciplines, and collectively striving towards the achievement of more sustainable urban settlements, the creation of more liveable towns and cities, and a better quality of life for all.

INTRODUCTION AND BACKGROUND

The George Integrated Public Transport Network (GIPTN) or as it is known by the public, the Go George system, has its origins in the development of the Sandkraal Road Corridor Mobility Strategy; this within the George Municipality, Western Cape. The project was initiated in 2003 with the intention of finding a mechanism for community integration within the corridor between the Thembalethu Township in the

south, and the George CBD to the north. While the project led to the upgrading of a portion of Sandkraal Road (now named Nelson Mandela Boulevard), it evolved into a town wide mobility strategy with the primary focus on the development of a formal public transport system, which is described elsewhere.

The project was initiated and financed by the Province of the Western Cape. This bold initiative preceded that undertaken in some metropolitan centres in preparation for the 2010 FIFA World Football Cup competition. At that time there was understandably uncertainty as to whether or not such a venture would succeed in bringing the mini-bus taxi industry into the process, agree to a business valuation to form the basis for compensation, establish them as a business entity, and then award them the responsibility of operating a 12-year formal bus contract. The relevant legislation (NLTTA) in place at that time precluded negotiations of the type envisaged, but this changed with the promulgation of the National Land Transport Act (NLTA – Act 5 of 2009).

With this uncertainty was the risk that any infrastructure provided prematurely might become a 'white elephant' in the event that it was necessary to abort the project. Thus an 'infrastructure light' approach was adopted.

The NLTA, supported by the National Department of Transport's (NDoT) Public Transport Strategy, significantly changed the public transport transformation landscape. Not only did it allow for operator contracts to be negotiated with non-interim bus contract holders, it required that local municipalities be the Contracting Authorities. It also opened the door to access Public Transport Network Grant (PTNG) funding, for which George qualified due to compliance with the IPTN requirements, and thus became a recipient.

However, with this came the requirement to ensure the all infrastructure provided through the PTNG be Universal Access (UA) Design compliant. South Africa having committed itself by signing the United Nations Convention on the Rights of People with Disabilities in 2007. While it was always the intention to be UA compliant, it soon became apparent that there was a dearth of local standards and guidelines that would comply with international best practice, and the emerging requirements of NDoT and their accredited UA advisors.

AIM AND SCOPE OF THE PAPER

The paper provides a discussion on the infrastructure light and 4-Stage approach adopted for the development of fixed infrastructure for the Go George project. It then briefly focuses on what is referred to as the Stage 3 activities, and deals more specifically with the 'kerbside' passenger / pedestrian environment.

The subject is wide ranging, and has been influenced by a considerable amount of research of international best practice, and what might be suitable locally. As such it should be of considerable interest to all, particularly so as it challenges the traditional 'road(way) designer' to respond to 'road' design differently. In doing so it opens the door to a more meaningful dialogue with other 'built environment' disciplines, and collectively striving towards more sustainable liveable urban environments.

THE 4 STAGE FIXED INFRASTRUCTURE PROGRAM

Stage 1: Pre-operations infrastructure

The approach adopted was to put in place only that fixed infrastructure regarded as essential, and where possible have this in place as close to operational rollout as possible¹. The reason for this being twofold. Firstly there was uncertainty as to whether the minibus taxi industry would fully participate in the migration from minibus taxi type operations to formal scheduled bus operations, and with this the risk that infrastructure provided might be left unused. The second reason was budget constraint related, with bus purchases and compensation paid to existing operators absorbing the bulk of the infrastructure funding available.

That which follows gives brief descriptions of the Stage 1 infrastructure elements.
Temporary bus depot

Use has been made of a disused provincial roads camp located close to the George CBD as a temporary bus depot. The site had to be tidied and paved, and existing temporary buildings refurbished. While planning provided for the storage of some 120 buses, this number was reduced to fewer than 100 buses due to a decision to use a portion of the site for traffic law enforcement activities. Facilities available on site include administrative offices, money handling facilities, dispatching, security, bus cleaning, battery & tyre storage and some workshop space. The latter being of lesser importance as all bus maintenance is undertaken through a service contract. There is opportunity to expand the bus parking area at the presents site (now in progress), and in the medium term, the depot will relocate to a more suitable, better serviced site.



Figure 1: Temporary bus depot layout (pink area used by GIPTN)
(Source – BSM Architects)

¹ The repeated reference to fixed infrastructure is to distinguish this from the bus purchase process which are grouped with infrastructure through the grant funding.

Road upgrades

All likely urban bus roads were examined in order to determine whether these would be suitable to withstand the anticipated increased heavy axle loadings. It was assumed that there was no need to similarly examine rural roads, as these would not be subjected to the same dramatic increase in heavy axle loadings as would be the situation in the urban areas. The work undertaken by VelaVKE (now SMEC) recommended a roadway pavement improvement programme with a budget of some R76 million. Funding challenges resulted in some R22 million being spent prior to the Phase 1 of the system (roll out of the IPTN was split into phases – effectively different suburbs in George)start to operations.



Figure 2: Example of bus road upgrades – Thembalethu community route
(Source: George Municipality Civil Engineering Services (CES))

Intersection improvements and turn circles

Shortly prior to operations commencing, a bus similar to that to be purchased through the bus contract was driven on all bus routes to check critical intersections, road grade changes, etc. Where necessary, these poor situations were corrected. Attention was also given to ensuring that at certain locations bus turn around facilities were timeously provided. In all cases the provision of the turn circles could serve as traffic circles to the benefit of meeting other traffic management or environmental objectives, as shown in Figure 3.



Figure 3: Traffic circle to accommodate bus turning & terminus facilities – Thembaletu (Source: George Municipality CES)

Minimal 'starter' bus stops

The total number of bus stops required for the GIPTN exceeds 600, with the bulk of these within the urban area. As with most public transport systems around the world, the trend is for bus stops to be located in-lane (in-line). Not only is this less costly to provide, it has the advantages of giving the bus priority when re-entering the traffic stream, and generally asserts the position of bus operations in the general traffic mix. Thus to start with, it was decided to build 4m² starter (minimal) bus boarding platforms with flags (bus stop sign and pole), with more than four hundred constructed with the assistance of five local consulting firms, and the use of local small emerging contractors. Included were a few bus stops with nubs (or extended boarders).



Figure 4: Bus stop examples (minimal, with nub & indented / embayed)

Cradock Street IUBT & on-street stops - Phase 1

At some stage in the past there existed a scheduled bus service in George for which a ‘horseshoe’ type bus terminus was provided in Cradock Street, this within the George CBD. With the growth of mini-bus taxi type operations, the bus services disappeared, a minibus taxi (MBT) rank was provided in close proximity, with the horseshoe eventually also being used as a further MBT rank. The question arose as to whether this central location would best serve the GIPTN, and was chosen following an investigation of some eight possible sites.

The design intention is that the ‘horseshoe’ will be used for inter-town services as it will be more suited to buses whose dwell times will be longer, with provision made for six (6) bus stops that will be marked as terminal stops. For the local services it is intended that none of the six (6) on Cradock Street shallow saw tooth stops will be used as terminal stops. The aim being to move buses through the area thereby allowing for boarding and alighting to be distributed to other stops in the CBD, and thus lessening the burden on the Cradock Street facilities, and reduce the average walk distance of passengers. The layout of the facility is shown in Figure 5, with Phase 1 of the project constructed prior to services commencing (buildings & shelters in Stage 3).

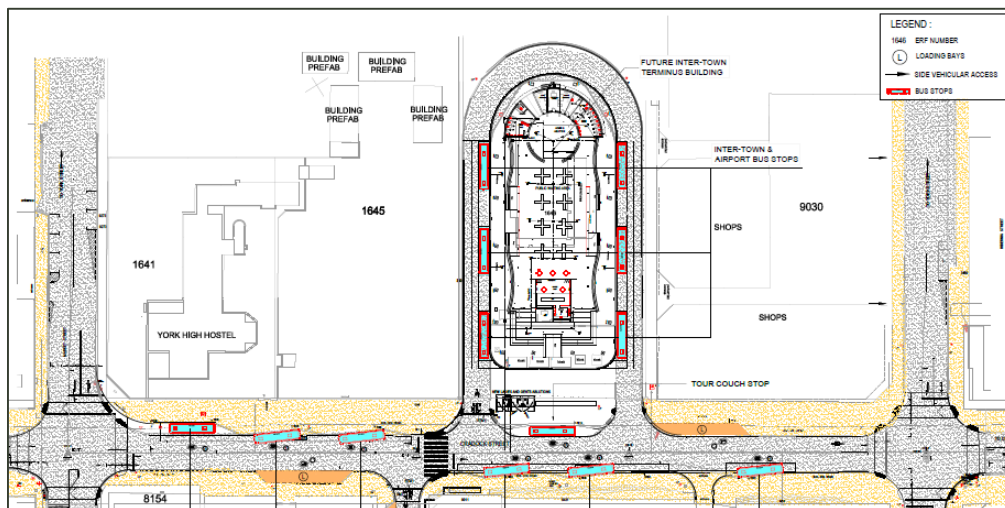


Figure 5: Cradock Street Interchange - initial configuration
(Source: BSM Architects)

CCTV surveillance

The Province through a related project also provided for the establishment of some 30 CCTV at high pedestrian risk areas throughout George. With this a staffed base monitoring centre, and with links to emergency & policing services. CCTV cameras have also been installed on buses to monitor ticket purchasing and on-board behaviour. The system is to be expanded as demand and funding priority allow.

Stage 2: Rollout infrastructure

Prior to each operational phase being rolled out, it was required to put in place certain additional infrastructure elements. This included the legally required bus stop signs and markings, some terminal indented stops, temporary shelter and driver toilets.

One of the major challenges in providing an IPTN in South Africa, is that of overcoming engrained perceptions of how a public transportation system should function. There is a vast difference between what existed, and what is intended, and with this are numerous uncertainties as to the nature and extent of latent travel demands. Thus, it was necessary to continuously refine the system and make necessary operational adjustments. While this required, regular engagement with public to explain the refinements, there has been minimal wasteful infrastructure expenditure, largely due to the infrastructure light approach adopted. Following the implementation of each phase of roll out there would be a period of re-evaluation and services 'refinement', and in most cases this resulted in a migration back towards the original operational plan.

Terminal stops

These are bus stops where the bus may stop for a period longer than that required for passengers to alight and board, and thus allow for holding. Thus terminal stops are generally indented (bayed) so as to reduce inconvenience to other motorists. The intention was to get agreement on the allocation of a terminal stop for each route which is used for adjustments to timetable, and that these would be equipped with a toilet for the bus driver's use, and would be in place prior to the relevant service being implemented. On a number of occasions this intention did not end satisfactorily, and final adjustment have still to be considered.

Transfer stations

Passenger transfers can occur at any point on the network where two bus routes intersect. Firstly there is a resistance to passengers transferring which is understandable; this despite it being fairly common practice within MBT type operations. The second concern is that a transfer often requires passengers to cross a roadway, which immediately raised issues of safety, and the lack of discipline amongst motorists in general. While solutions are being found, the implementation of this is costly and time consuming, and is further discussed in this paper.

Fundamental to the affordability of a formal scheduled public transport system is that of recognising the importance of operational cost minimization through the continuous use of a mixed bus fleet optimisation, and recognising that bus operations cannot cater for all origin to destination trips, thus transferring between routes is necessary. Within the GIPTN, there is no added travel cost associated with passengers transfer, thus the challenge is that of minimising safety risk, and transfer walk distance and time. The latter being an infrastructure issue.

Stage 3: Post-ops rollout - development of road and kerbside infrastructure

With each operational phase rolled out, time was given for the system to settle, which was then followed by an operational 'refinement' process; this being critical as it shows up locations where infrastructural adjustments may be required, and where possible, these can be attended to soonest. These adjustments related predominantly to kerb alignment adjustments and to the positioning of bus stops.

Thus the Stage 3 infrastructure development process commences with an acceptance that an adequate degree operational stability has been reached, and that more detailed attention can then be given to supporting road(way)side and kerbside improvements of a more permanent nature. Paramount amongst these is that of making road crossings safer, which at some locations requires roadway reconfiguration (narrowing of lanes, provision of medians, improved road markings, etc.), and then focusing on the off-bus passenger / pedestrian environment and the provision of shelters, sidewalks, lighting, etc.

The bulk of the GIPTN infrastructure has been contained within existing road reserves and on land owned by public authorities, with no land acquisition required to date. Where services are to operate on Provincial and National Roads, or on roads owned by ACSA and NMMU, Service Level Agreements will be entered into that set out the responsibilities of the parties, as well as responsibilities regarding the provision and maintenance of infrastructure.

Remote & permanent bus depots

For the GIPTN a remote bus depot is required to be operational before the Phase 5 services are rolled out in the Wilderness rural area, this due to the remoteness of the location of the area from the central depot. Together with the development of the depot it is intended to address a number of roadside and kerbside matters simultaneously, and thus contribute to the enhancement of the Touwsrante settlement area.

A permanent bus depot is planned on a site in the Borchers area. Zoning for this site is in place, as is a Record of Decision to proceed with the development. Work on the design of the facility is planned to commence late in 2017.

Interchanges, termini, transfer stations & bus stops

The Phase 2 development of the CBD / Cradock Street (IUBT) Interchange requires the building of a structure with passenger amenities (refer Figure 6). Construction is also to proceed at a number of important transfer stations and terminal facilities (e.g. Blanco, Garden Route Mall, Beach Road, etc.). Planning is under way for a further interchange facility at the Wilderness, and for the upgrading and development of more than 30 transfer stations and route terminal facilities. Similarly attention is being directed to the development of the 600 plus bus stops, the erection of more than 250 shelters together with other amenities, and the upgrading of approach sidewalks to suitable universal access standards.



Figure 6: Stage 3 – CBD / Cradock Street Interchange
(Source: BSM Architects/George Municipality)

Sidewalk improvement programme

Beyond the requirements for improvements surrounding bus stops is that of recognising that all roads provide pedestrian access to the public transport system. Thus there is a responsibility that all of these are perceived as positively contributing to the passenger's experience. Further, it must be remembered that some 60% of pedestrians can be categorised as having one form of special need, be this due to gender, age, physical condition, etc. In George, as is the situation in many urban areas, sidewalks do not receive the same consideration as does the roadway, and in reality, there is a considerable backlog in the development and maintenance of sidewalks. Thus a programme is being put in place to prioritise and systematically improve sidewalk quality.

Road network structural upgrades

As mentioned earlier, pre-operational funding reduced the opportunity to bring roadways up to an acceptable standard. With the first three operational Phases rolled out, and the first having operated for more than a year, there are already indications of premature structural failure of some roadway sections. As a consequence a second pavement management assessment is being undertaken.

An issue to be noted here is that the standard and midi buses (available to the GIPTN) have rear mounted engines, which, when fully loaded, result in high rear axle loadings, which distorts the E80 factors used in the road pavement design process. The rehabilitation of the roadway structure must be treated as high priority so as to minimise longer term operational costs.

Road network operational upgrades

What is being referred to here is the planning and implementation of a range of measures aimed at improving the operational efficiency of the road network. To-date this has included the upgrading of all traffic signals (robots), planning for the installation of traffic signals at some 10 further intersections, and the possible

establishment of a central Area Traffic Control system (ATC or UTC). Attention is also being given to the planning of future preferential lane provision, primarily within the CBD and on Nelson Mandela Boulevard, which in turn demands that there is a clear vision in place regarding the management of other general traffic.

Stage 4: 'External' Node / Corridor integration & development

Virtually all infrastructure development has been undertaken within existing road reserves. However, in order to gain maximum longer term benefit from the investment made in getting the GIPTN operational, it is seen necessary to start looking beyond the road reserve boundaries, and to explore the prospects of enhancing integration with the adjacent land-use activities along the main bus routes in particular.

In effect this brings the project back to the starting point, which was originally a 'corridor mobility strategy' aimed at achieving socio-economic integration & densification along the corridors.

In this regard a number of focus areas have been identified (refer Figure 7), and work is progressing in securing additional support funding to take these forward.

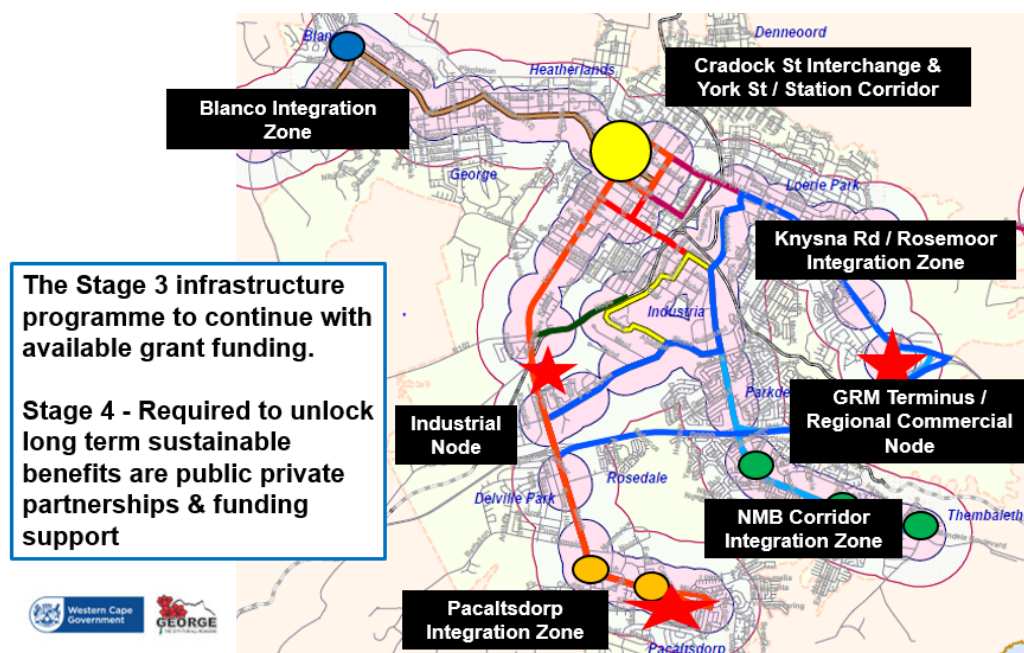


Figure 7: Identified node and corridor development areas

Towards revised design guidelines for roads & bus stops

Planning for the GIPTN has highlighted the need to start putting in place revised guidelines for the design of the urban road networks, how an IPTN type public transport system can best be superimposed and function adequately, and what is required to create safe and attractive complimentary pedestrian environments.

In this regard there are two driving issues that need discussion and consideration, that of modal priority, and universal access design.

The 'pedestrian first' challenge

The WC Provincial White Paper on Transport, and subsequent Public Transport Improvement Programme promoted the 'Public Transport First' slogan, while stated in the context of public transport versus the use of private car mobility, by default this introduces the need for the adoption of a new transport mode prioritization that is more closely aligned with that adopted by numerous cities around the world. Important is bearing in mind that all bus (or train) passenger trips start and finish with a walk trip. Thus the public transport journey includes the experience of what happens at each end of a public transport trip, and what happens where it is required of the passenger to transfer between routes.

Hence a revised mode priority list as given below is proposed;

1. PEDESTRIANS – this includes pedestrians with special categories of needs, which accounts for more than 60% of the population
2. PUBLIC TRANSPORT – with specific reference to formal quality public transport as supported through an IPTN
3. METERED TAXI – these must be fully regulated and be supportive of, and complimentary to, the public transport network
4. BICYCLE – this primarily as a mode of transport used for commuting, shopping and access to community facilities, schools etc., and for family recreational use
5. HEAVY GOODS VEHICLE – the delivery of goods and services, and the removal of waste is essential to local economies, and must be given priority in support of urban densification and growth
6. PRIVATE CAR – the historic dominance of the car has to diminish in importance over time.

The challenge going forward is that of reducing the dominance of private car and making the pedestrian realm as attractive and safe as possible.

When seen within the context of this country's serious road safety record, with pedestrians accounting for some 60% of persons killed, and with some 70% of the population not having access to private transport, then the modal priority promoted here is possibly long overdue. Further, it lends support to the notion that the previously stated 60/40 and even 80/20 public transport / car mode share targets must be taken more seriously. These are achievable, but this does require commitment and a serious transport planning mind-shift.

South Africa's commitment to universal access design

The National Department of Transport requires all public transport networks, regardless of mode, to provide an inclusive services that accommodates passengers with special categories of need. The approach required is through one of universal access design, to which South Africa has committed itself to by signing the United Nations Convention on the Rights of People with Disabilities in 2007. Universal Access is the ability of users to have equal opportunity and access to services, products, systems and environments, regardless of economic situation, social situation, religious or cultural background, gender or functional limitation.

There are broadly two aspects to Universal Access:

- Direct Access, which is directly related to Universal Access Design and refers to direct adaptations to products, environments, services or system designs that significantly improve their accessibility;
- Indirect Access, which uses assistive technology such as wheelchairs, screen readers etc., refers to product, environment, service or system interfaces that enable an add-on assistive technology to provide the user with full access

While this paper focuses on fixed infrastructure, it is necessary to note that this requirement has a direct impact on the type of bus that may be used for an IPTN, and brings with it a variety of operational and infrastructure design challenges. In this regard the current reality is that the local bus market has yet to adapt to providing mini-, midi- and standard low floor or low entry buses that are fully suitable for the local road networks, and adequately comply with universal access design requirements.

CONCLUSION

The GIPTN was initiated on the belief that the introduction of quality public transport, together with the transformation / conversion of the mini-bus taxi industry, would act as a catalyst to the betterment of the pedestrian environment, a change in the way urban areas are perceived, and contribute positively to socio-economic integration and creation of more liveable sustainable urban environments.

In this paper an attempt has been made to provide an indication of the 'infrastructure light' approach adopted for the provision of fixed infrastructure for the George Integrated Public Transport Network (GIPTN). Not only has this given Government flexibility, in other words afforded opportunity to slow the process down, or even abort the transformation process if required with little evidence of wasteful expenditure, it has created the space to investigate infrastructure design aspects, and thus offer discussion on a range of issues which include universal access and sustainable urban development.

The process has opened the door to looking at the 'complete street' rather than a focus on roadways and motor vehicles, and has required the consideration of design approaches not much used locally. Thus far the impacts of the GIPTN is being positively received, and there are strong indications the property developers are reconsidering their approach to land development.