



a world class African city

FRAMEWORK FOR NON-MOTORISED TRANSPORT

JANUARY 2009

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Non- Motorised Transport has been identified as a priority area at National, Provincial and Local Government levels and has the potential to become a feasible and sustainable transport mode in the City. The proposals outlined in this document provide a planning framework for Non-Motorised Transport, providing a policy direction and highlighting priority areas for the implementation of a Non-Motorised Transport network in the City.

1. INTRODUCTION

Non-motorised transport (NMT) includes all forms of movement that are human powered and do not rely on engines or motors for movement. This includes walking, cycling, rickshaws, wheelchairs, animal-drawn carts and recreational activities such as equestrian, rollerblades, skates and scooters.

Whilst NMT forms the most basic part of the transportation system, it is generally recognized as a valuable component of the system due to the benefits it holds. These benefits include environmental benefits, increased access, improved health and quality of life, economic development and increased activity and vibrancy in the street environment.

The Growth and Development Strategy for Johannesburg (2006) seeks “Greater user preference for more environmentally sustainable public transport and non-motorised transport choices”¹. NMT has also been identified as a priority on provincial and national agendas in ‘A Strategic Agenda for Transport in Gauteng’ (2005)² and in the Draft Non-Motorised Transport Policy (2008)³.

“Pro-active absorption of the poor”, “Settlement Restructuring” and “Facilitated social mobility” are all objectives of the Growth Development Strategy⁴. NMT, specifically cycling, would enable individuals in out-lying areas with limited access to public transport, to cycle to the nearest public transport node at a rate almost three times faster than walking. Access to the opportunities in the city via basic low cost mobility and independent movement are benefits which are especially relevant to marginalized communities.

Climate Change and environmental sustainability are rapidly becoming priorities on the global agenda. Non-motorised transport together with public transport has a significant role to play in providing a sustainable alternative to the private motor vehicle, in reducing overall carbon emissions, improving air quality, reducing congestion and moving towards meeting the targets set by the Kyoto agreement.

According to the Gauteng Household Travel Survey (2003), about 37.7% of all trips during the morning peak period in Gauteng are walking trips. Cycle trips represent less than 1% (about 0.6%) of the morning peak trips in the province. Walking is the predominant mode of transport and comprises 1.9 million person trips in the morning peak period (06.00 – 09.00) whilst cycling only comprises about 30 000 person trips in the morning peak periods. Given that level of pedestrian and cycling combined represent close to 40% of all person trips in Gauteng, due regard should be paid to the planning of infrastructure and supporting facilities for these modes.

In Johannesburg, non-motorised forms of transport are predominantly represented by walking and cycling. As such, the strategies formulated as part of this framework focus on the needs of pedestrians and cyclists. These strategies are not however limited to these users and the resultant policies, detailed design and implementation of a NMT system should improve universal access for users such as the disabled, elderly, parents using prams, commuters with suitcases and shopping trolleys etc. The design and upgrade of the pedestrian environment in particular will be required to comply with the National Accessibility Strategy⁴. Whilst it is acknowledged that animal-drawn transport is still being utilised in parts of the City, this is limited to specific areas and provision for this form of transport should be considered in the planning of local NMT networks where appropriate.

A transport planning framework document published in August 2007 and prepared by ARUP⁵ for the City’s Transportation Department provides an overview of NMT and the legislative and policy context. The document provides an analysis of the status quo, national,

provincial and local initiatives, a technical overview, a review of design standards and proposes pilot projects in Rosebank, Mikateka Primary School, Ivory Park and Matiwans Primary School, Orange Farm.

A preliminary costing for Rosebank was included on the following basis:

Walkways	
Unit cost of widening and improving sidewalks	R300 per m
Cycle Paths	
Unit Cost of striping, painting and kerbing	R210 per m

The rationale for the selection of the three proposed projects is not made clear in the available documentation and the document does not include a comprehensive city wide plan for guiding the planning and implementation of programmes and facilities for NMT users.

This document aims to present a policy comprising a set of objectives and strategies to realise an improved NMT environment in Johannesburg. In addition the document identifies key principles which determine the zones and routes that should be considered as priority areas for implementation of NMT infrastructure.

The proposed routes and zones are only developed at a strategic conceptual level and do not include detailed route planning or local and neighbourhood networks. The NMT local and neighbourhood networks should be developed through the development of local area NMT network plans. This document forms a framework under which detailed network planning and financial modeling per area can be undertaken as part of Phase II.



What mitigates against NMT?

2. CONSTRAINTS

Historic spatial planning, and the sprawling, low density nature of the City has resulted in an inequitable access of the City's residents to economic and social opportunities. This is further exacerbated by the limited extent and availability of public transport. The Integrated Transport Plan (2002)⁶ estimates a total proportion of commuter trips by public transport (rail, bus and mini-bus) at 47% during weekday morning commuter peak periods. Cars and vehicles have been prioritized in the streetscape environment even though a 37.7% of trips are walking trips. Whilst a number of strategic transportation initiatives within the City including the Gautrain, BRT and the rail and road upgrade programmes will make a significant contribution to altering the way in which commuters move around the city in the future, the current streetscape and environment does not prioritize cycle or pedestrian movement. There are a number of issues which have been identified as obstacles for non-motorised transport.

2.1. Road Safety

The current perceptions and statistics relating to road accidents / fatalities arguably present the greatest obstacle for the successful implementation of NMT in the City. 40% of all road fatalities in South Africa involve pedestrians. Most pedestrian accidents (about 65%) happen when pedestrians cross a road while about 15% occur when they walk in the road,



and 10% when they walk on the verge⁷.

Cycling in South Africa is a relatively dangerous activity as cyclists are not very visible and are generally not considered equals by motorists in terms of access to road space. The Gauteng guidelines⁸ indicate that “Cyclists make up about 2,5% of all fatalities on South African roads. This figure is quite high relative to the actual number of cyclists on South African roads. The South African average in terms of number of fatal accidents in relation to total number of bicycles on the road, is 18 times higher than the world average.” Without tangible proof that current trends are drastically improving or significant capital investment is made in dedicated cycle lanes this will mitigate against any of the objectives and targets of a NMT strategy for the City.

Footpaths are often incomplete, non-existent or of poor quality, forcing pedestrians into the street. Footpaths are often cluttered with street furniture and services and wide roads and busy intersections are often difficult for pedestrians and cyclists to cross. Road surfaces are often cluttered with debris (stones and litter) which present obstacles for cyclist. In addition the existing footpaths are often not graded or designed with wheelchair users in mind, further limiting accessibility and safety.

2.2. Security

The vast majority of workplaces in the City do not presently make provision for cycle storage facilities. This is also the case in the majority of destination points (libraries, retail centres, People Centres etc)¹. Without secure and monitored storage facilities, it is likely that cycling patterns will remain “circular” and recreational in nature (i.e. start / end point the same, not based on convenience).



Street environments are often ill equipped in terms of lighting, CCTV and direct sight lines. This presents an environment which is unsafe for pedestrians and a haven for criminals especially in hours of darkness.

2.3. Distance & Topography

In addition to the road safety and security aspects noted above, convenience based trips to destination points need to be short distances and with limited gradients. It is recognized that for many South Africans, walking is the only available mode of transport. Whilst international standards recognize distances of 500m – 1km to represent a fair walking distance, the actual daily walking distances for many South African commuters is much further.

The Planning Framework for Non-Motorised Transportation -Infrastructure Improvements, compiled by ARUP (September 2007)⁵ indicates that most walking trips are less than 2km and most bicycling trips, less than 5km in length. It also highlights that reasonable trip distances and times would be 30mins to jobs/school and 10-15mins to shops and services by walking or cycling. Most destinations should be within 10km. Given the low density urban form of the city, many destinations in the City will be in excess of 10km from the point of origin. In the short to medium term, NMT travel to work and school patterns should be linked into the planned BRT, Gautrain and Metro Rail (SARCC) routes in order to reduce travel time by commuters.

¹ There are examples of retail centres, more notably the neighbourhood convenience retail centres, that do make limited provision for cycle storage.

2.4. Climate

International research indicates that weather is a factor (albeit less significant) that affects people’s transport choices, specifically in relation to cycling. Whilst Johannesburg offers one of the most favorable climates for cycling and walking, shelter for pedestrians and cyclists against the evening storms of the Highveld summer may need to be factored into an NMT implementation strategy.

2.5. Supporting Infrastructure and Facilities

Most employers and educational institutions do not make provision for cycle storage, lockers or shower facilities at present. These facilities will be especially important if weekday commuters are to be persuaded to switch from the convenience of using a private vehicle. There is also almost no provision at present for designated cycle lanes and NMT modes remain unprioritised in the streetscape.



This is especially true at conflict points such as intersections, bridges etc. Whilst pedestrian footpaths of varying quality are prevalent in some areas, these are often not continuous and fail to link areas and reflect pedestrian desire lines. Inadequate footpaths and a lack of cycling facilities has the potential to limit the integration and ultimately use of planned public transport infrastructure.

2.6. Status and Convenience

Cycling and walking are generally associated with activities for recreation or with poverty. The connotations of non-motorised transport are as a low-tech affordable means of transport, not innovative and sometimes unpleasant or dangerous.⁸

There is evidence of women being excluded from the use of bicycles in some countries as a result of general economic and social norms⁹. Whilst this has been addressed to some extent in South Africa via the Shova Kalula (Pedal Easy) Programme, further efforts in terms of community awareness will be required to preclude gender bias. A case study in Lima has shown that men and women rank attributes of transport infrastructure differently, with women ranking ‘social safety’ much higher than men and ‘road safety’ being highlighted as an equal priority for both.

Valuation of attributes of transport infrastructure / services by gender

Ranking	Women’s Valuation	Men’s Valuation
1	Social safety	Speed
2	Road safety	Road safety
3	Price	Organisation (schedules/ routes)
4	Comfort	Single fare
5	Courteousy	Social safety
6	Hygiene	Courteousy
7	Organisation	Hygiene

Case Study, Lima, Peru⁸

Car usage and buying patterns are often associated with status of individuals. This combined with the convenience of car usage weighs up against individuals choosing to move to NMT modes.

Without significant promotional efforts, little will be done to change attitudes towards NMT. Comfort afforded by private vehicle usage may increasingly be weighed up against high running and fuel costs and lengthy commute times.

2.7. Competition for Space

Motor vehicles are currently given priority in the road space, often with only a limited width of pavement allocated for pedestrians. This limited space is also often shared with informal traders. Many roads do not have adequate road reserve to accommodate an additional cycle lane or a widened footpath. Waste reclaimers utilising hand pulled trolleys are also becoming more prevalent on the City's streets. The reclaimers often represent a road safety risk both to themselves and the vehicles on the road as they normally use the street to accommodate their trolleys.



What are the opportunities afforded to a newly conceptualised Non-Motorised Strategy?

3. OPPORTUNITIES

3.1. NMT integration to support strategic transport projects

- Bus Rapid Transit System (BRT / Rea Vaya) stations
- Gautrain stations
- SARCC Metrorail Stations
- Shova Kalula Bicycle distribution programme
- New and existing road upgrades
- Major Taxi ranks and facilities eg. Jack Mincer and Metro mall

There are a number of strategic transportation projects currently being implemented across the City. Notably the Bus Rapid Transit System (BRT) and the Gautrain will significantly contribute and expand the existing public transport system. The implementation of BRT and Gautrain stations will introduce new focal points into areas, generating extensive activity and pedestrian movement. It will be important to ensure that routes feeding the station precincts are safe and secure and supporting infrastructure is in place beyond the station precincts themselves to ensure commuters experience a convenient, secure and seamless journey at their points of interchange. Given the extensive investment that has been made in the implementation of these strategic transport projects, it is crucial that the take up and use of these modes is successful and that they are sufficiently integrated into the areas beyond the station precincts. All forms of NMT have a crucial role to play in the successful integration of public transport interchanges into the wider area.

3.1.1. Bus Rapid Transit (BRT) – Rea Vaya

Phase 1a of the BRT route is currently being constructed and there is a unique opportunity to ensure the public realm surrounding the stations is upgraded as part of the BRT station implementation. Whilst the BRT station implementation will include a limited upgrade of the public realm within the immediate vicinity of the individual stations, the broader links to supporting land uses has not been planned for at present eg. Joubert Park BRT station to Park Station and Ellis Park. Phase 1a will be complete by May 2009. There is opportunity to identify broader movement patterns to and from the stations and ensure the pedestrian environment is upgraded to compliment flow to and from the BRT stations. The NMT upgrade should include pavement upgrades, signage, lavatories, lighting, cycle storage, security etc.



Only some of the BRT stations will have capacity to accommodate cycle storage. As the BRT buses will not accommodate cycles on board, it will be important to provide secure cycle storage on street in the event there is no space at stations.

The BRT also provides a major opportunity for NMT in respect of a Park and Ride facility. A recent and on-going study suggests that +/- 140 retail centres are within a 5km distance of the first phase BRT. The possibility of implementing a Park and Ride scheme for vehicles is currently being investigated. If the same principle was applied to bicycles i.e. 5km travel distance and safe storage for bicycles at a retail centre, the scope and potential of the Park and Ride could be further enhanced.

3.1..2. Gautrain

The Gautrain stations will each make some provision for secure cycle parking within the station precinct area (approximately 20 cycle parking spaces initially with space for future expansion). Bicycles will not however be permitted on board the rolling stock. There is an opportunity to include space for a Public Bicycle Scheme (which is an automated bicycle rental system). This would enable commuters to make their short distance commutes to and from the stations by bicycle.



Public realm upgrades as part of the station implementation works will be limited to the station precincts themselves. There is an opportunity to upgrade both the pedestrian and cycling environment to support movement patterns and to create broader links to supporting land uses, taxi ranks, BRT stations and the surrounding area the station serves. Whilst some of the stations will be located centrally within the node, stations such as Marlboro and Midrand are by comparison slightly removed from the heart of the node. Strengthened pedestrian and cycle links will be important for a seamless, safe and convenient commuter experience as well as access for those employed at the various stations.

3.1..3. South African Rail Commuter Corporation (SARCC)

A number of SARCC stations are being upgraded in preparation for the 2010 World Cup. The upgrades are predominantly limited to the station precinct boundaries. There is opportunity to identify broader movement patterns to and from the stations and ensure the pedestrian environment is upgraded to compliment flow to and from the stations. There is also an opportunity to provide cycle storage and associated facilities at the various stations. These could include space for a Public Bicycle Scheme (as described above) for short distance commutes to and from the stations.



3.1..4. Shova Kalula (Pedal Easy) Programme

The Department of Transport initiated this programme in 2000 to promote cycling as a low cost means of mobility. The programme aims to provide 1 000 000 low cost bicycles nationally, targeting mainly scholars, rural women and farm-workers who have poor access to transport. The program also promotes the establishment of micro business which support the maintenance and repair of the bicycles. Approximately 1000 bicycles are planned for distribution in the City, with 350 to be distributed to 12 schools in the south of Johannesburg in February 2009. There is an opportunity to support this initiative by providing cycle infrastructure in the areas where bicycles have been distributed.



3.1..5. New / existing road programme

Several of the City's primary arterial routes have been targeted for major upgrading by Gautrans and JRA. These include: Beyers Naude (northern extent near

Zandspruit) and Malibongwe (northern extent near Lanseria). If the engineering designs for these upgraded roads could include formal pedestrian and cycling lanes, this would eliminate the need for future retrofitting of major arterials in the future. There is an opportunity to include NMT as a standard requirement for all major road upgrades.

3.1..6. Taxi ranks

There are a number of large taxi ranks in the City such as the Metro Mall in the Inner City through which an excess of 150 000¹⁰ commuters move each day. There is an opportunity to provide high quality pedestrian links between taxi ranks and other transport interchanges as well as key destination points.

3.2. NMT integration with Strategic Development Projects :

- 2010 World Cup Stadium precinct upgrades & park and ride facilities
- Baralink – Orlando
- Alexander Renewal Project
- Inner City Strategies including Commercial Core Public Environment Upgrade
- Cosmo City

3.2..1. 2010 initiatives

Ellis Park, Orlando and NASREC precincts are currently being upgraded by the JDA 2010 programme in preparation for 2010. There is an opportunity for the NMT network to link into the upgraded public realm surrounding these areas which are destination points in themselves. Eco-tourism initiatives like rickshaws should be investigated further for transport to and from stadiums for 2010 and local tourism sites following 2010. Secure cycle parking provision should also be explored in both the stadium precincts as well as the park and ride facilities as part of the upgrade. Bicycle parking at stadiums would be a 2010 legacy which could be utilized by future fans wanting to cycle to stadiums. The BRT route will also service the 2010 stadiums and depending on the location of the bicycle parking, there may be an opportunity for the cycle parking to double as BRT cycle parking.

3.2..2. Strategic Capital Investment Areas

There are a number of areas in the City which have been the focus of major capital investment and regeneration. NMT infrastructure could tie into the existing and ongoing upgrades and support the capital investment already in place.

3.3. NMT to release Economic Potential

- Links to Tourist Sites
- Job Creation
- Links to Shopping Centres
- Affordability
- Carbon Trading

3.3..1. Links to Tourist Sites

There is an opportunity to create an NMT network connecting clusters of tourism points of interest. This is particularly relevant in Soweto and the Inner City where small businesses are already providing guided tours on foot and by bicycle.

3.3..2. Job Creation

NMT presents a variety of employment opportunities for individuals and small businesses. These include the construction and maintenance of designated lanes

and footpaths, the supply of spare parts, maintenance and repair of bicycles and security at cycle storage areas. In addition it is likely that informal businesses will benefit from an increase in passing trade on foot and bicycle.

3.3.3. *Links to Shopping Centres*

Shopping Centres, dependent on their size are predominantly positioned to capture the local market in economic nodes. There is an opportunity for the larger centres in particular to accommodate cycle park and ride facilities and lockers and function an interchange for commuters from NMT to public transport. The additional daily footfall has the potential to grow the daily customer base.

3.3.4. *NMT as an Affordable Alternative*

There is an opportunity to strongly promote NMT as a cost saving and green alternative to vehicle transport given the current economic climate and the rising costs of fuel and energy.

3.4. NMT to support movement to and from Educational Institutions

There are a great number of educational institutions which accommodate a learner population greater than 1500. A majority of learners walk to and from schools and tertiary institutions. Given the distribution of these institutions and the concentration of learner populations in the areas surrounding schools and tertiary institutions, there is an opportunity to provide NMT infrastructure in the vicinity of the institutions to improve the safety and convenience of learner commutes by foot and to increase the speed of commutes by introducing cycle infrastructure. There are also strong movement patterns between areas with a great concentration of student residences and tertiary institutions, for example University of Johannesburg, Wits, and Berea, Braamfontein and Milpark.

3.5. NMT to assist in improving Air Quality

There is an opportunity to incorporate NMT as a way in which to meet the strategic objective as highlighted in the Air Quality Management Plan "To promote energy efficiency within all sectors including industrial, commercial, institutional, mining, transportation and domestic energy use". There are six air quality monitoring stations located at Alexandra, Buccleuch, Jabavu, Orange Farm, Delta Park the Newtown which measure a variety of air pollutants. The City has identified a number of air quality hot spots where a reduction in pollutant levels is encouraged in order to improve air quality in line with City and National guidelines. NMT in these areas should be prioritised in order to reduce overall car usage and improve air quality.

3.6. Expansion of the Recreation Routes through Open Spaces

There are a number of informal recreational cycle routes through open spaces. There is potential for these to be expanded and ultimately link into a more formal commuter network. In addition, there is the potential to provide routes which run parallel to water courses below the 1:50 year flood lines given that floodplains are often topographically favorable.

The Kliprivierspruit runs through an extensive network of open space, covering and connecting large areas of Soweto from Kliptown and Pimville to Orlando in the north. Similarly the Braamfontein spruit connects extensive areas of the city north of Braamfontein, from Westdene to Rivonia.

The cycle and pedestrian links through these two open space networks are already extensively used for recreation but are largely informal at present. There is an

opportunity to upgrade these networks to encourage increased use of these spaces, increased security and long term environmental sustainability of the wetlands. The upgrade will assist in ultimately promoting cycling for both recreation and weekday commuting. The location and extent of the two open space networks also provides an opportunity for local neighbourhood NMT networks to link into the expansive recreation networks, which connect areas on a more regional scale.

There is also an opportunity to link into existing NMT programmes such as the Tour de Soweto race and areas in which Shova Kalula has been rolled out.



Who is the target group who will benefit from the implementation of NMT?

4. TARGET GROUP

It is acknowledged that there are two types of NMT users; those who choose NMT modes for reasons relating to the environment, convenience and health and fitness and those users who do not have any option other than NMT and use NMT modes for reasons associated with cost and basic need.

Public transport planners generally consider 500m – 1km a maximum acceptable walking distance and approximately 2km, a maximum acceptable cycling distance. On average NMT commuters will walk/ cycle to places of employment and educational institutions within 30 mins travel distance and to shops and amenities within 10-15 mins travel distance. Most destinations are within a maximum of 10km⁵.

It is recognized that many commuters and learners also walk or cycle far greater distances than those recommended distances highlighted above due to lack of affordability or an alternative option.

Research has shown that a stereotypical urban bicycle user in a developing country is a man, aged 25 – 35 who is employed but does not earn enough money to afford a motorcycle or car. The bicycle saves time and money when compared to the alternatives of a bus or walking⁸.

The following groups are considered to form the target group for NMT :

- Ages 11 to 40 years
- Disadvantaged communities in remote and inaccessible areas of the city
- Learners / scholars at school and tertiary education institutions
- Leisure and recreational cyclists. There is potential to encourage some of these cyclists to become weekday commuters
- Universal access - Disabled users, access for elderly and the very young, parent's with prams etc
- Waste reclaimers with their recycling trolleys
- Employers - encourage staff to convert to cycling by providing facilities (showers, lockers, cycle parking) and incentives such as advance credit to purchase bicycles



What are the objectives of a NMT strategy for the City?

5. VISION

For Johannesburg to be a cycle and pedestrian friendly city where everyone has access to urban opportunities and mobility, walking and cycling are safe and convenient and are the preferred modes for short distance and convenience related trips.

The purpose of this strategy is to promote cycling and walking as an affordable and environmentally sustainable alternative mode of transport to the motor vehicle and to improve access to the city's opportunities for all communities. In order to achieve this, the Council will focus on the following objectives:

6. OBJECTIVES

Primary Objectives

- 6.1. To establish a dedicated network of high quality pedestrian and cycling routes across the City
- 6.2. To establish pedestrian and cycling modes of transport as preferred modes for short distance and convenience related trips within the City;
- 6.3. To increase the percentage modal split of cycling and walking as preferred modes of transport for travel to work and school trips
- 6.4. To facilitate access to the City for marginalised and low income communities
- 6.5. To integrate NMT modes with other strategic public transportation initiatives within the City including the Gautrain, Metrorail and BRT stations in order to enhance local feeder services and support the successful functioning and take up of public transport
- 6.6. To promote increased access to educational institutions by NMT modes

Secondary Objectives that could be achieved through the successful implementation of the policies are:

- 6.7. To place NMT at the forefront of Congestion and Environmental Management plans within the City
- 6.8. To maximise local economic development opportunities related to cycling
- 6.9. To maximise the tourism opportunities related to NMT (ecotourism) and meet the needs of the tourism sector
- 6.10. To promote the health and leisure aspects of NMT
- 6.11. To maximise access to recreation networks in the City



What interventions are required to ensure successful implementation of NMT?

7. STRATEGIC INTERVENTIONS TO ADDRESS CONSTRAINTS

The following strategies are considered necessary interventions to address the constraints facing NMT at present and represent best practice in terms of implementation and long term maintenance.

7.1. ROAD SAFETY			
Strategy	Implementing Body	Current Projects	
7.1.1	Develop a network of cycle and pedestrian paths. Designated separate cycle and pedestrian paths which are separated from motorised traffic will be important on roads which carry high volumes of traffic at high speeds.	COJ DPF, Gauteng Transport, COJ Transportation, JRA	Pedestrianisation initiatives : Nasrec , Orlando, Ellis Park sports precinct, 20 Township Priority Program (Zola, Orlando, Soweto), Park Station precinct (limited public realm works as part of the upgrades)
7.1.2	Incorporate NMT (cycle paths and footpaths) into future road upgrades. Upgrade and maintain existing pedestrian pathways.	JRA	UDF's for Gautrain Stations (some include pedestrian scale design detail)
7.1.3	Implementing planning requirements for developer contributions towards cycle paths where development proposals are located in close proximity to planned and existing cycle/walkways.	DPF, Land Use Management, COJ Transportation	The Township Schemes are in the process of being reviewed, additional requirements in respect of NMT could be fed into this review.
7.1.4	All new development proposals to incorporate NMT provision in and immediately adjacent to site boundary.		
7.1.5	Adopt Urban design standards for footpaths and cycle paths ensuring that this incorporates Universal Design (transportation systems that accommodate people with restricted mobility)	DPF	National Department of Transport has developed a draft design guideline document (June 2002).
7.1.6	Transit agencies should publish maps showing which stations/routes are fully accessible to people with disabilities to assist with trip planning		Gauteng Provincial Government Department of Public Transport, Roads and Works has developed a draft publication " Guidelines for the Provision of Pedestrian and Bicycle Facilities on Provincial Roads in Gauteng (November 2002)
7.1.7	Adopt Technical standards for footpath and cycle path design ensuring this incorporates access for the disabled	Joburg Transport	COJ - "Pedestrian and Bicycle Facility Guidelines: Manual to Plan, Design and Maintain Safe Pedestrian Facilities (Draft1)
7.1.8	Adopt 'Secure by Design' standards (lighting, sight lines, signage, passive surveillance etc).	DPF	
7.1.9	Reduce volume and speed of traffic at points of interaction conflict by implementing traffic calming, streetscape improvements, vehicle restrictions and road space reallocation .	Joburg Transport	City Traffic Calming Policy (2002) - in revision at present
7.1.10	Correct specific roadway hazards to non-motorised transport (sometimes called "spot improvement" programs).	JRA	
7.1.11	Prioritise cyclist and pedestrian movement within the streetscape	COJ Transportation, DPF	
7.1.12	Further education and safety promotion by	DoT, Arrive	

	bodies such as Think Bike and Arrive Alive.	Alive, Think Bike, JMPD	
7.1.13	Bicycle proficiency test for school children to ensure traffic and safety awareness.	Gauteng Department of Education	
7.1.14	Safe Routes to School program which identifies safe cycling and walking routes for children. Work with schools to appoint parents to walk with children, crossing guards etc.		
7.1.15	Revision of bylaws where necessary, law enforcement of safety standards eg cycling helmet	JMPD, Community Safety	
7.1.16	Implement a program of regular management and maintenance of NMT network including reducing conflicts between users, and maintaining cleanliness	JRA, Local Economic Development	
7.1.17	Consider areas which may be suitable for Pedways (indoor urban walking networks that connect buildings and transportation terminals)	DPF , Joburg Transport	

7.2. SECURITY			
Strategy	Implementing Body	Current Projects	
7.2.1	Provision of cycle storage facilities and lockers at transport interchange points such as Gautrain, BRT and SARCC Stations.	Gautrain, Gautrans, SARCC, DPUM	Gautrain stations to include cycle storage and BRT will make provision where possible for cycle storage.
7.2.2	Provision of secure cycle storage at destination points such as schools, sports grounds and community facilities which will be NB to retrofit.	Education, City Parks, Joburg – Sports and Recreation	Discussions held with SARCC and BRT
7.2.3	Provision of curbside bike racks at destinations. Potential to work with ratepayers and CIDs to determine location of storage.		
7.2.4	CCTV, lighting and potential emergency call points will be important aspects for pedestrian security.	JMPD	

7.3. DISTANCE AND TOPOGRAPHY			
Strategy	Implementing Body	Current Projects	
7.3.1	Link the NMT network to public transport nodes to reduce travel distances.	DPUM, Gautrain, SARCC, Department of Transport	Public realm upgrade as part of 2010 stadium precincts at Ellis Park, Orlando and Nasrec
7.3.2	Support mixed and clustered pedestrian oriented land uses which present active frontages at street level in order to support accessibility and reduce trip times from origin to local amenities. (New Urbanism)	DPUM	BRT land use guidelines
7.3.3	Reduce distances for cyclists and pedestrians by increasing road and path Connectivity. eg. special non-motorised shortcuts, such as paths between cul-de-sac heads and mid-block pedestrian links		

7.3.4	Introduce a Public Bicycle System which are automated bicycle rental systems designed to provide efficient mobility for short, utilitarian urban trips.	DPUM, Transport, DOT	
7.3.5	Investigate bicycle racks on the front of buses. This could include existing bus operators, and BRT & Gautrain feeder buses.	DPF, BRT, Gautrain, Transportation, DoT	

7.4. CLIMATE			
Strategy	Implementing Body	Current Projects	
7.4.1	Implement a scheme of shelters along primary cycle routes with a particular focus on shared shelter facilities with existing and proposed bus / BRTshelters.	BRT, Transportation, DPF	BRT implementation of Bus Stations

7.5. STATUS			
Strategy	Implementing Body	Current Projects	
7.5.1	Promotion of cycling as a faster mode of transport. Erect electronic signage indicating to motorists in traffic how long the journey would take by bicycle.	Joburg Transport, JDA	
7.5.2	Promotion of leisure and health aspects, targeting leisure cyclists to switch to becoming weekday commuters	Health and Education, Private Medical Aids	Department of Health has an initiative ' Healthy Living' which could augment NMT promotion
7.5.3	Promote the cost savings of NMT. Encourage employers to offer employees incentives to use NMT for work commutes and meetings by providing allowances for cycle mileage	Treasury, Top 20 Employers	
7.5.4	Promotion of the sustainability aspects of ' going green'. Encourage businesses to use employees use of NMT as part of their energy ratings etc	Environment	
7.5.5	Investigate parking disincentives in appropriate locations where supporting public transport and NMT infrastructure is in place. Careful consideration and analysis of the economic impact to be considered in advance of implementation.	Transport, DPF DPF, BRT, Transport, Retailers	
7.5.6	Introduce a cycle park and ride scheme in conjunction with other park and ride schemes which will allow cyclists to commute short distances to the cycle park facility and integrate with the public transport network	DPF, Joburg Tourism, Transport	
7.5.7	Create a Multi-Modal Access Guide, which includes maps and other information on how to walk and cycle to a particular destination.	Joburg – Transport,	
7.5.8	Implement supporting signage for cycle and pedestrian routes (directional and safety). Potential to include signage indicating to	Gauteng , 2010,Transport	

	drivers that cyclists are allowed use of the lane.		
7.5.9	On-line trip planner that shows drive time & parking cost versus walking time and cycle time		
7.5.10	Publish online/paper maps showing preferred cycle routes: location of cycle lanes, shared lanes, parking; and roads which have a steep gradient (eg. San Francisco and City of Chicago).		
7.5.11	Ensure transit agency websites indicate bicycle parking locations, whether bikes are allowed on vehicles		
7.5.12	Promote cycling events – such as Bogotá’s ciclovia, San Francisco’s Cycle Sundays and Bike to Work Day		

7.6. SUPPORTING INFRASTRUCTURE			
Strategy	Implementing Body	Current Projects	
7.6.1	Cycle parking for staff and visitors and associated facilities (lockers, showers etc) to be a planning requirement for any new commercial development proposals - prioritising those within close proximity to nodal locations (5km)	DPF, LUM	Revision of Town Planning Schemes and Parking Standards could incorporate cycle parking and associated facilities
7.6.2	Land Uses along NMT routes should be oriented towards the street, providing active frontages onto pedestrian and cycle routes	DPF, LUM	BRT Land use Guidelines



Who are the bodies who will have a role to play in the implementation of NMT?

8 ROLE PLAYERS

The interventions highlighted in section 7 involve a range of government departments and sectors. In order to ensure successful implementation, each role-player will need to take responsibility and ensure they have made appropriate provision for NMT. It is acknowledged that the various government departments and sectors are managed by different authorities and role players.

8.1 Primary Interventions to be pursued by Development Planning and Facilitation as part of Phase II of the NMT Framework:

8.1.1 Develop a dedicated NMT Network at Regional and Neighbourhood scale

Whilst this document provides a conceptual strategic framework for implementation of a network on the city wide scale, the detailed design and planning of regional and neighbourhood networks will be required as part of Phase II. The regional network should be focused around the mobility spines and public transport nodes. The neighbourhood network should be focused on linking social services, tourist sites,

amenities and providing safe routes to schools. Once a planned network has been adopted, developer / bulk contributions could be sought from new developments within a 2km radius from planned and existing routes to assist with implementation and maintenance.

DPUM Action: Plan and develop local and neighbourhood NMT networks

8.1.2 Integration with Public Transport Nodes

Successful integration of cycling with public transport will be reliant on the ability of the cyclist to safely store their bicycle at stations or park and ride destinations. In addition it will be important for cyclists to be able to take their bicycles on board public transport so that journeys can be continued by NMT at the end point. On board cycle stowage is unlikely to occur on the Gautrain, Metrorail or BRT rolling stock and the viability of a Public Bicycle System will need to be investigated further for public transport interchanges so that end point distribution of commuters can be undertaken by bicycle.

Convenient, safe, and secure pedestrian linkages to and from public transport nodes are essential to the support of pedestrian movement between public transport stations and destination points in the vicinity. Assisting pedestrian movement has the potential to unlock economic potential of areas alongside these routes and further analysis of pedestrian movement patterns to and from each public transport nodes will be required in order to determine where public realm upgrades should be prioritised.

DPUM Action: Undertake feasibility study for a Public Bicycle System
Analysis of pedestrian movement for priority Public Transport Nodes and plan for upgrades where applicable.

8.1.3 Adopt Urban Design and Technical Standards

There are a number of existing urban design, universal access and technical design standards for cycle and pedestrian paths which could be adapted for use within the City context. These standards should be used to design and evaluate proposed routes to ensure a consistent quality of public realm. There will need to be a focus in terms of design for conflict points such as interchanges and bridges where cycle and pedestrian movement will need to be prioritised.

DPUM Action : Adopt technical and design standards

8.1.4 Review NMT provision requirements as part of Land Use Applications: Cycle Parking standards and developer contributions towards NMT for new developments

The parking standards and revised Town Planning Scheme will need to be amended to incorporate standards per land use for cycle parking and associated facilities (eg. showers and lockers within workplaces). Facilities should be indicated on Site Development Plans and should be reinforced through development conditions. Transport assessments submitted in support of development proposals will need to include NMT as part of the assessment. Developer contributions for NMT will be sought from development proposals falling within 2km of a planned NMT route and will be adjusted on a sliding scale based on land use and proximity to the planned route as reflected within the RSDF. All new developments should incorporate footpaths through the development site and immediately adjacent to the site boundary.

DPUM Action: Adopt revised parking standards and SDF requirements
Develop bulk contributions requirement per land use and adopt
Include NMT routes in revision of RSDFs 2009/2010

8.1.5 Consider incentives for retrofitting of existing developments

Many buildings in the city do not make provision for NMT at present and it will be crucial for the viability of NMT for supporting facilities such as cycle storage, lockers and showers to be available at destination points linked into NMT networks. Funding, sponsorship and incentives will need to be explored for existing developments such as rates rebates and CDM funding. Schools should be prioritized for retrofitting and funding through Education and Gautrans should be investigated.

DPUM Action : Investigation into incentives and sponsorship for retrofitting.
Investigate installation of cycle storage and lockers in Metro centre as a starting point.

8.1.6 Investigate Carbon Trading potential as an alternative funding source for NMT infrastructure

The Clean Development Mechanism (CDM) of the Kyoto Protocol allows projects in developing countries to generate emission credits if they result in emission levels lower than would otherwise be the case; these credits can be marketed and eventually counted against the country's emission obligation. This is already being applied to the BRT system and could be extended to include NMT infrastructure.

8.1.7 Implement signage

Signage promoting safety and directions should be implemented to compliment designated routes. A signage only option could be implemented along routes as an immediate action to assist awareness of cyclists and pedestrians on roads.

DPUM Action : Assessment of priority routes with Transportation and implementation of signage to encourage road safety

8.1.8 Develop a NMT Forum to evaluate proposed routes

An NMT Forum should be established to assess the design and location of proposed NMT routes. Members should include Cycling organizations / clubs, urban designers, traffic engineers, accessible access experts and NMT NGOs.

DPUM Action : Invite individuals to sit on the NMT Forum

8.1.9 Obtain base level statistics for comparison and evaluation purposes

The success of NMT will be measured by the resultant take up of NMT modes of transport and the overall improvement of safety (reduction in fatality rate of cyclists and pedestrians). Air Quality monitoring stations have been installed at 6 point across the city and the comparative air quality readings should be taken in order to assess the impact of NMT on air quality readings. As such base level statistics should be established in order to assist the evaluation and monitoring process.

DPUM Action : Work with Transportation to establish a base level of road safety statistics and Environment to establish a base level of air quality readings.

8.1.10 Establish a database of NMT projects

A database of NMT related projects should be established to ensure infrastructure and investment is being directed into priority areas and there is a co-ordinated approach. These projects include Shova Kalula, Department of Health's Healthy Living Promotion and proposals for tricycles for waste reclaimers

DPUM Action : Liaise with other departments to develop a database of NMT projects

8.2 A series of strategic sector responses is outlined in the table below :

Role Player	Sector Responsibilities
COJ Transportation / Johannesburg Roads Agency	<ul style="list-style-type: none"> ▪ Develop and technical design of a metropolitan NMT network and design local area networks for selected priority routes ▪ Upgrade existing pedestrian facilities and public realm ▪ Adapt and develop technical design guidelines and standards ▪ Amend parking policy to include cycle parking and facilities ▪ Implement traffic calming measures in strategic locations ▪ Adopt NMT specific maintenance program
Gautrain & SARCC	<ul style="list-style-type: none"> ▪ Make provision for cycle parking and lockers in stations ▪ Allocate areas for public bike system within/ adjacent to stations ▪ Implement directional signage / local area map per station
BRT	<ul style="list-style-type: none"> ▪ Make provision for cycle parking and lockers in strategic stations ▪ Implement directional signage / local area map per station
Education	<ul style="list-style-type: none"> ▪ Safety and NMT promotion at schools ▪ Promotion of cycle proficiency test for school children ▪ Evaluate NMT requirements at schools and provision of cycle storage where appropriate
Environment	<ul style="list-style-type: none"> ▪ NMT to be incorporated in Environmental Sector Plan and Air Quality Management Plans
City Parks	<ul style="list-style-type: none"> ▪ Evaluate existing NMT network through public open spaces and upgrade and extend key routes to tie into local area NMT networks on roads.
JMPD	<ul style="list-style-type: none"> ▪ CCTV to be installed and monitored along key routes, Law enforcement



Where should the capital investment focus be for the implementation of NMT infrastructure?

9 RATIONALE AND CRITERIA FOR IDENTIFICATION OF NMT PRIORITY AREAS

Whilst the success and take-up of NMT will be dependent on the implementation of a city wide NMT network, areas where NMT infrastructure should be implemented as a priority should be identified in order to direct initial capital investment.

9.1 Principles to establish areas of priority

Eleven principles have been identified to establish where areas of priority are for implementation of an NMT system in the City. The principles have been divided into those which determine areas which need NMT infrastructure and those which determine the viability of NMT.

The Growth Management Strategy (GMS) identifies priority areas for service upgrading, highlighting areas located around public transport priority areas and marginalized areas as the highest priority areas. The Spatial Development Framework, Regional Spatial Development Frameworks and Precinct Plans all align with the priorities of the GMS, promoting densification around public transport nodes. NMT will be crucial in terms of supporting public transport, functioning both as a feeder to public transport nodes and enabling safe and easy access to key activities surrounding public transport nodes. NMT infrastructure will also assist in creating increased access for the marginalised to the City's opportunities by virtue of the affordability, connectivity and choice of modes. Given the weight of these GMS priorities, they form the first two principles which determine where initial capital investment should go.

9.1.1 Public Transport Priority Areas

- BRT stations/ routes
- Gautrain stations
- Metro Rail Stations
- Major Taxi ranks

It is acknowledged that good linkages to stations and a high quality public environment are crucial in supporting the investment currently being made in public transport infrastructure. A good public environment encourages people to use public transport and facilitates walking to and from the station, it instills a sense of permanence and therefore economic investment and assists in attracting tourists. The focus around these points in terms of implementation should be on:

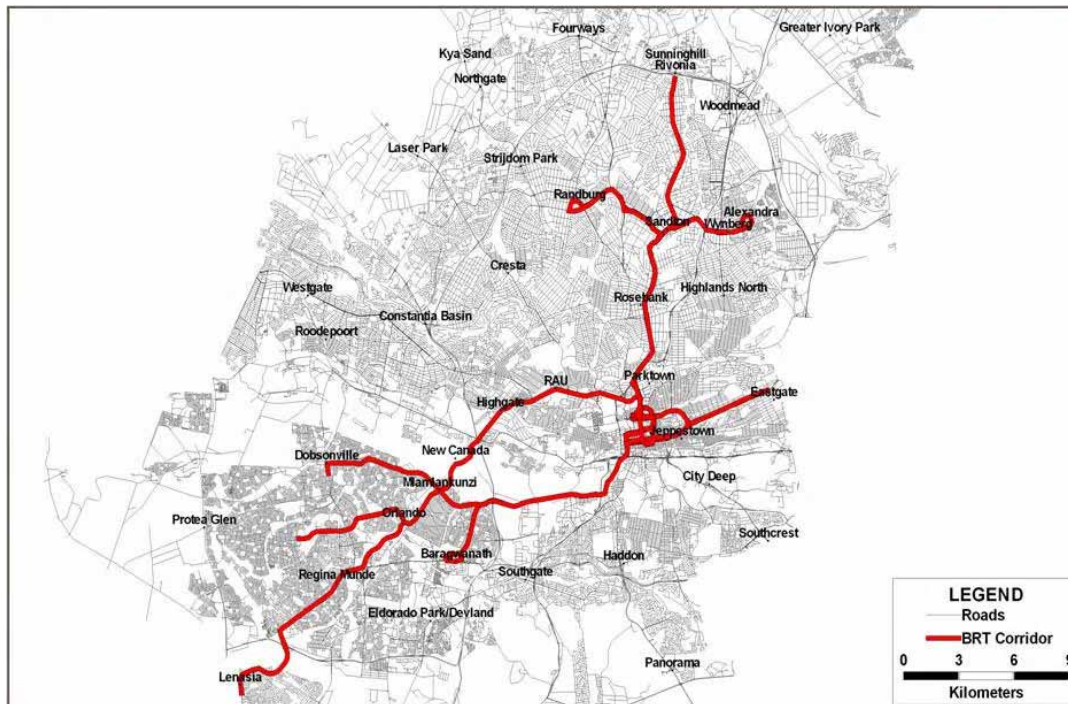
- Upgrading public realm within the immediate vicinity of stations (150m radius) and the links connecting nodes and supporting land uses eg. Joubert Park - Park Station-Jack Mincer (upgrade to include security, lighting as well as urban design aspects).
- Public Bicycle System to be implemented at Gautrain Stations and surrounds.
- Cycling facilities to be incorporated at all train stations and BRT stations where appropriate

9.1.1.1 BRT – Rea Vaya

Phase 1A of the approved BRT system is currently being implemented and will link Soweto (including Nasrec and Orlando stadiums) to the inner city and Ellis Park by May 2009. Phase 1A will incorporate 25.5 km of trunk infrastructure and approximately 27 stations and is anticipated to attract a patronage of approximately 69300 daily commuters. Whilst the BRT stations and the public realm within the immediate vicinity of the BRT terminals and stations will be upgraded, the wider public realm will remain as is. In order to ensure the BRT functions as a world class public transport system, the stations will need to be fully integrated into the areas surrounding the stations and terminals and a variety of supporting infrastructure and services (eg. Toilets, signage, waste management , universal access, security etc) will be required to ensure user convenience and safe access.

The GMS, SDF and RSDFs identify public transport nodes as priority areas and the NMT linkages and infrastructure between the nodes and the supporting land uses in the vicinity will be essential to support the use of BRT infrastructure. NMT has a supporting role to play

in feeding into the BRT system as well as functioning as a distributor of passengers at destination points. As the implementation of BRT routes will be phased, there is an opportunity to phase NMT implementation in line with the phased implementation of BRT stations.



www.reavaya.org.za

An assessment of the stations located along Phase 1A of the BRT trunk route has been undertaken which includes an assessment of the number of feeder and complimentary BRT routes which will service each station, current condition of the pedestrian environment and an assessment of the supporting land uses and population density. Assessment tables can be viewed in Appendix I. Seven priority stations were identified as part of the analysis:

- Regina Mundi
- Mooki Street
- Hermans
- Westgate
- Diagonal Street
- Twist & Mooi Streets
- Joubert Park

The precincts surrounding the 2010 stadiums are already identified for upgrade in respect of the public realm and have therefore been excluded from the BRT priority areas identified.

Whilst the reasons for the choice of BRT priority projects have been outlined above, each area will require a detailed analysis to establish which are the key land uses which support BRT, where the pedestrian linkages and desire lines should be strengthened and which key NMT interventions are required per priority area. An implementation plan per station will be required.

It is acknowledged that good linkages to stations and a high quality public environment are crucial in supporting the investment currently being made in public transport infrastructure.

As such it is recommended that initial investment be focused on upgrading the public environment within a 150m radius of BRT priority stations identified, Park Station and the Gautrain Stations. A good public environment encourages people to use public transport and facilitates walking to and from the stations, it instills a sense of permanence and therefore economic investment. In addition to the upgrade to the public environment, it is recommended that cycle storage be located in close proximity (if not within) each of the above mentioned stations, a public bicycle system be implemented at Gautrain Stations and a supporting cycle network be implemented within 2 km of each station.

9.1.1.2 Public Bicycle System at Gautrain Stations and other public transport nodes

Successful integration of cycling with public transport will be reliant on the ability of the cyclist to safely store their bicycle at stations or park and ride destinations. The safety and convenience of the routes to and from the stations will also be a factor in successful integration. It will be important for cyclists to be able to take their bicycles on board public transport so that journeys can be continued by NMT at the end point of their journey. On board cycle stowage is unlikely to occur on the Gautrain, Metrorail or BRT rolling stock. A Public Bicycle System will need to be investigated further for public transport nodes and interchanges so that end point distribution of commuters can be undertaken by bicycle. It is recommended that this system be pursued at Gautrain stations as an initial implementation phase with a view to roll out the system at other public transport nodes.

Whilst the limited public realm improvements surrounding Gautrain stations will improve the pedestrian experience for commuters using the Gautrain, there will be no immediate provision for cycle storage on board the Gautrain carriages. As such, cycling linked to the Gautrain is likely to be limited to commuting from the point of origin eg. home to the nearest station as there will not be an opportunity for the commuter to take their bicycle on board.

There is an opportunity to introduce a public bicycle system which functions as an end point distributor from Gautrain stations, connecting the local area each station serves. Public Bicycle Systems have been introduced in a number of international cities including Paris, Copenhagen and Barcelona. The system works on the basis of a number of fixed point stations from which members of the public can hire bicycles for short periods of time and return them to any one of the other fixed point stations. Many of the international public bicycle systems are self funded through the sale of the advertising space adjacent to the fixed point bicycle stations. Funding could also be explored through partnerships with City Improvement Districts and sponsors like private medical aids.

The system is designed to maximize convenience for short utilitarian trips, with easy-to-use docking systems widely distributed around the city. The fees associated with hiring the bicycles are normally structured to encourage use for short trips (normally free or a nominal fee for the first 20 minutes). One of the key requirements in the management of such a system, aside from the regular maintenance of the cycles, is the managed redistribution of bicycles from areas that accumulate excess bikes to those which have too few.



There is an opportunity to provide a series of public bicycle stations around Park Station, Rosebank, Sandton and Marlboro Stations, with links into the inner city BRT stations and other business areas such as Illovo, Parkhurst, Dunkeld, Grayston, Wynberg and Linbro Park.

The Vélib system in Paris, France has attracted worldwide attention due to the large number of bikes in the system, with more than 20,000 in 2008. The table below illustrates 5 international case studies where the public bicycle system has been implemented.

Examples of Public Bike Programs

	Paris	Barcelona	Lyon	Frankfurt	Montreal
Operator	JCDecaux	Clear Channel	JCDecaux	DBRent	Stationnement Montreal
Population	2,153,600	1,605,600	466,400	652,600	1,039,500
# Bikes	20,600	3,000*	4,000	720	2,400
# Residents/ Bike	104	535	116	906	433
Technology	Smart card	Smart card	Smart card	Mobile Phone	TBD
Business Model	For Profit	Local Government	For Profit	Local Government	Local Government
Funding	Subscriptions & Outdoor Advertising	Subscriptions & Parking Revenues	Subscriptions & Outdoor Advertising	Subscriptions & General Revenues	Subscriptions & Parking Revenues

<http://www.vtpi.org/tdm/tdm126.htm>

The system is unlikely to operate successfully without supporting infrastructure in place to ensure safe and convenient cycling routes and Public Bike System Stations positioned every 300m.

9.1.2 Access for Marginalised Areas

The focus will be on improving access and choice of transport for areas with poor access to public transport, economic and mixed use nodes, recreation grounds etc

9.1.3 Education Network

There are a large number of schools and tertiary institutions which accommodate a population of learners greater than 1500. 24 Secondary schools have been identified on the basis on size and 11 primary schools have been identified for receipt of Shova Kalula Bicycles . Given that a large majority of learners walk to school, the focus of implementation of NMT will be the provision of a high quality pedestrian environment provide around these institutions to assist pedestrian movement and cycle and pedestrian links between the areas in which students live and the educational institution as well as amenities such as libraries and sports grounds. The distribution of these educational institutions is illustrated in Appendix II. A 2km area surrounding some of the larger schools is shown in order to illustrate the extent of the area which should be considered for NMT implementation and upgrade.

9.1.4 Tourism Network

This network will connect points of interest for tourism, promoting use of NMT especially in areas where there are clusters of tourist sites. There is an opportunity to promote eco-tourism and sightseeing by bicycle. There are a number of walking and cycling tourism businesses already in operation and theses could be supported through infrastructure improvements and provision of cycle storage at tourism sights. Tourism sites are mapped in Appendix II.

9.1.5 Recreation Network

The Kliprivierspruit runs through an extensive network of open space, covering and connecting large areas of Soweto from Kliptown and Pimville to Orlando in the north.

Similarly the Braamfontein spruit connects extensive areas of the city north of Braamfontein, from Westdene to Rivonia.

The cycle and pedestrian links through these two open space networks are already extensively used for recreation by mountain bikes and walkers, but are largely informal at present. There is an opportunity to upgrade these networks to encourage increased use of these spaces, increased security and long term environmental sustainability of the wetlands. Security of the routes will be crucial to ensure success of recreational routes. Aspects such as lighting, police bicycles and horse mounted police should be considered.

The upgrade will assist in ultimately promoting cycling for both recreation and weekday commuting. The location and extent of the two open space networks also provides an opportunity for local neighbourhood NMT networks to link into the expansive recreation networks, which connect areas on a more regional scale.

There is also an opportunity to link into existing programmes such as the Tour De Soweto race, Shova Kalula and the Twenty Priority Townships Programme which has included Orlando and Zola as part of the public realm upgrade and beautification scheme.

The recreation routes are mapped in Appendix II.

9.1.6 Air Quality

There are six air quality monitoring stations in the city. There is an opportunity to utilise NMT to reduce congestion and vehicular traffic in air quality hot spot areas and use reading from air quality monitoring stations to assist in measuring the success of NMT. The location of the Air Quality Monitoring Stations are mapped in Appendix II.

9.1.7 Strategic Development Projects

There are a number of strategic development projects which are the subject of large levels of capital investment. These include the Inner City Regeneration, Baralink, Alexandra Renewal Project and Cosmo City. NMT modes could provide strengthened access to these priority investment areas, supporting the investment and improving accessibility.

9.1.8 2010 Projects

There are a number of 2010 legacy projects currently being implemented in preparation for the 2010 World Cup. Whilst the stadium precincts and park and ride facilities will be upgraded and include an improved pedestrian environment and public realm, cycle storage infrastructure will not form part of the upgrades. There is an opportunity to include cycle infrastructure and storage at stadiums and park and ride facilities as part of the 2010 legacy projects. For example, the University of the Witwatersrand is one of the park and ride facilities which will be used for 2010 and whilst cycle storage for the World Cup will add to the accessibility of the park and ride facility for 2010, the cycle storage units could remain in place for the future use of students on the campus. The 2010 stadiums and park and ride facilities are mapped in Appendix II.

Principles which determine the viability of NMT infrastructure are as follows:

9.1.9 Concentration of Potential NMT Users

The viability of the NMT infrastructure will be dependent on the take up and extent of the use of the infrastructure. As such, it is important that the infrastructure be placed in locations where there is a sufficient density and concentration of potential users. Whilst it is anticipated that the primary users of NMT will be young adults and children, levels of income and employment will also play a role in the take up of NMT.

The concentration of amenities and social services has also been assessed against their proximity to informal settlements, mixed use nodes, Gautrain, SARCC stations and BRT routes. This approach has been taken to assess areas of intensified pedestrian activity. Educational institutions in particular are recognized as being generators of high levels of pedestrian activity. Pedestrian generating land uses have also been considered in areas such as the CBD, Baralink and areas for special events eg. Nasrec, Orlando, Ellis Park, Wanderers

Supporting land uses (including the number of schools, recreation grounds, open space, clinics and libraries) within 500m of mobility routes have been mapped in Appendix III.

9.1.10 Visibility

Given that commuter cycling in particular is not really part of the transportation culture of Johannesburg, the visibility of new routes will be important to spark discussion and to promote NMT. A public bicycle system linked to prominent public transport nodes is likely to spark discussion as well as promotional efforts linked raising the profile of cycling eg. touring cyclists, large cycle races such as the 94.7 and Tour de Soweto etc.

9.1.11 Space and Cost

Viability of NMT provision will also be linked to space within the road and road reserve and cost of acquiring land. This analysis is something which cannot be established at this initial planning stage or level of strategic planning. There are various options for implementation when it comes to cycle paths which may not necessarily require designated lanes, separated from motorized traffic. Whilst this would be the optimum solution and best practice, the space and road reserve available may not allow for designated lanes in certain locations. As such a variety of options will be explored where designated lanes are not viable which may include shared pedestrian and cycle lanes, painted lanes and signage only options where cyclists share road space with motorized traffic.

Traffic conditions will also be a factor in the consideration of where designated lanes will be required for the safety of cyclists.

10. PROPOSED PRIORITY AREAS

The eleven principles outlined in section 9 above, have been mapped and concentrations / clusters of priorities are spatially depicted. The resultant spatial distribution and concentration of the principles has determined areas of priority for implementation. Priority routes and zones have been identified per area on the basis of the principles.

Areas around the priority BRT stations detailed in 9.1.1.1 are identified as priority upgrade areas inclusive of public realm and cycle infrastructure.

All Gautrain stations have been identified as priorities for upgrade as detailed in 9.1.1.2 and include public realm upgrades within the vicinity of the station, cycle links and a public bicycle system.

Routes for Areas 1 – 10 have been developed at a strategic conceptual level and further analysis per area will be required as part of the subsequent phase (Phase II) which will include detailed planning, costing and feasibility. The routes proposed have been depicted with a 500m area either side in order to illustrate that the route may be flexible in order to optimise, safety, shortest distances and comfort. Changes to routes will be made where appropriate, following a more detailed analysis as part of Phase II. Maps illustrating strategic routes are available in Appendix II:

- Area 1: Soweto Network

Over 40% of the population of the City resides in Soweto. The Soweto Network proposed, will link key tourism sites, priority BRT stations (Regina Mundi, Mooki Street and Hermans), Orlando Stadium and the Baralink Node including Vista University, Orlando Dam and major taxi facilities. A recreational route running through the Klipspruit is also proposed which will link areas from Lenasia to Empire Road in the north. There is also an opportunity to connect two primary schools identified for Shova Kalula in Eldorado Park as part of the neighbourhood network planning. The Jabavu air quality monitoring station and hot spot is also located near the route.

- Area 2: Inner City Network

Given the concentration of amenity, economic activity and public transport facilities, the Inner City has been identified as a priority area for implementation. The route proposed links priority BRT stations (Westgate Station, Diagonal Street, Twist and Mooi Streets and Joubert Park), Park Station (Metrorail and Gautrain Stations) with tourist destinations, including Mary Fitzgerald square which is also allocated for use as part of 2010. The route includes a link to the south of the commercial core and links into Braamfontein.

- Area 3: Alexandra - Wynberg – Sandton- Linbro Park Network

The Alexandra network proposed links from Alexandra into Sandton, Wynberg and Linbro Park. The route also proposes improved access for four large Secondary schools, tourist destinations, 2010 facilities and the Marlboro Gautrain Station.

- Area 4 : Rosebank Precinct

A neighbourhood network is proposed in the Rosebank precinct to integrate the Gautrain Station and BRT stations into wider area, including Illovo, Dunkeld and Parkhurst. It is acknowledged that a good public environment encourages people to use public transport, facilitates walking to and from the station, it instills a sense of permanence and therefore economic investment and assists in attracting tourists. The neighbourhood work is also proposed to support the public bicycle system which is proposed at Gautrain Stations.

- Area 5: University of Johannesburg Route

There is large population of students who commute between their places of residence and the University of the Witwatersrand and the University of Johannesburg. The route proposed seeks to link large educational institutions to the Inner City, Braamfontein and Berea.

- Area 6: Zandspruit / Cosmo Priority Route to Northgate

The route aims to increase access to amenity and economic opportunity for a population predominantly reliant on walking great distances. Zandspruit and Cosmo City do not benefit from good linkages or formal public transport into economic or mixed use nodes. The route proposed seeks to support NMT modes connecting Zandspruit and Cosmo to the Northgate node from which a greater variety of public transport and access is available.

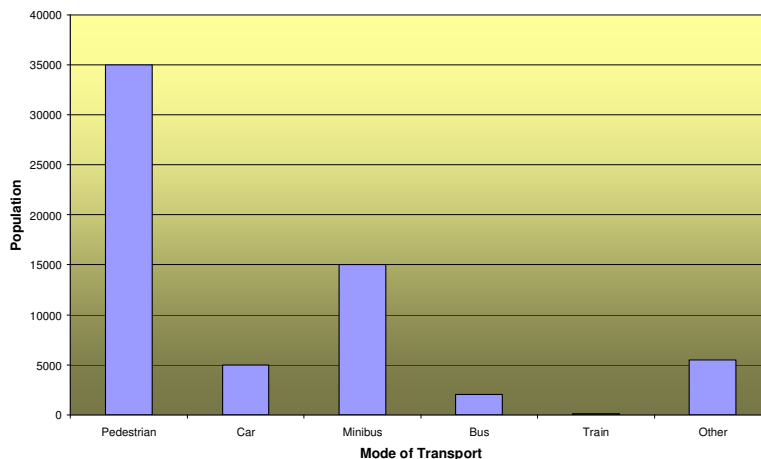
- Area 7 : Diepsloot Priority Route to Fourways

Diepsloot is recognised as a marginalized area which is poorly serviced in terms of access to nodes and the amenities they provide. Fourways is the closest node and the closest area from which residents of Diepsloot will be able to access the BRT system.

The Diepsloot Development Framework 2020 (April 2008) details the movement patterns of the Central Sub Region of Region A, within which Diepsloot falls. The strongest movement of people from the region to neighbouring core areas is to Fourways, followed by Sunninghill, Midrand and Lanseria. The study also reflects that a majority of the population living within this region access social amenities and economic opportunities by foot (35 000 as opposed to 15 000 who use minibus taxis and 5000 who utilize cars). There is therefore a relatively poor level of access to amenities and employment and the introduction of NMT in this area is likely to assist in providing increased access to the region's opportunities.

William Nicol is a mobility spine which is congested during peak times. Whilst a BRT route may reach this area in a later phase of implementation, there is a unique opportunity to provide an affordable alternative to minibus transport and a faster alternative to walking. A cycle lane and an upgraded pedestrian footpath could be accommodated parallel to William Nicol between Diepsloot and Fourways. Cycle Storage would need to be provided at strategic locations such as Fourways Mall, the Fourways/ Pineslopes taxi rank so that cyclists are able to securely store their bicycles and change modes to transport to a taxi/ bus should their commute take them beyond Fourways. A local area NMT network within Diepsloot should focus on providing a safe route to schools such as Diepsloot Primary and Diepsloot Secondary.

Central Sub Region- Movement Analysis



Diepsloot is not well connected in terms of ease of access to amenities and it is considered that NMT will assist in increasing access to opportunities and providing an affordable alternative to the community.



Separate cycle and pedestrian routes should be incorporated parallel to William Nicol and accompanying signage should also be implemented to ensure increased motorist awareness of bicycles. A signage only option will also be considered where accommodation of both a cycle and pedestrian lane cannot physically be accommodated within the road reserve.

- Area 8 : Ivory Park Route to Schools and Midrand

The Ivory Park Route will provide NMT improved access to the three large secondary schools in the area, taxi ranks, the Midrand Campus and Midrand Gautrain Station. A neighbourhood precinct is proposed within a 2km radius from the Gautrain Station in order to encourage people to use public transport, facilitate walking to and from the station and to support the public bicycle system which is proposed at Gautrain Stations.

- Area 9: Orange Farm Priority School Zones

The route proposed in Orange Farm seeks to provide safe, secure, convenient and comfortable access for large schools and a supporting network for those schools which will benefit from Shova Kalula.

- Area 10: Braamfontein Spruit Route

The route adjacent to the Braamfontein Spruit will assist in connecting large areas of the city and will assist in terms of connecting neighbourhood networks on a regional scale. The focus for the route will be on improving security and access, removing barriers and ensuring contiguous routes

11. STAKEHOLDER ENGAGEMENT

A City of Johannesburg workshop was held on 2 December 2008 . Attendees included the City of Tshwane, National Department of Transport, Gauteng Province Department of Transport and Housing, BRT- Rea Vaya, Gautrain and the City of Johannesburg Departments of Environment, Development Planning and Facilitation and Transport. It was committed to further engage with BRT, Gautrain, SARCC, Environment and Air Quality, City of Tshwane, City of Cape Town, BEN, Cycling South Africa, Pedal Power, Gautrans and Land Use Management. A commitment was also made to circulate this document, inviting further comments from all stakeholders.

The following issues were highlighted as part of the workshop discussion and have been incorporated into this document.

- Communication and promotion for changing attitudes, stakeholder engagement and promotion of health and fitness aspects
- Importance of distinction of modes, providing a separate path for each mode (ie. One for pedestrians and one for cyclists). Look at lessons learned from the City of Tshwane. Infrastructure provision should be focused at conflict points where NMT meets Traffic at intersections

- The importance of the Environmental agenda as part of NMT. Priority Areas to be linked to Air Quality Hot Spots
- Waste reclaimers who utilize trolleys and universal access (disabled users, parents with prams, elderly and the very young, commuters with suitcases etc) to be included as target group in planning for NMT
- Priority Pilot Projects to be realistic and implementable in a 1 – 3 year time frame. Opportunity to link into BRT upgrades which are in progress
- Sustained finance and maintenance from Gautrans, National Department of Transport, advertisers /sponsors and NGOs to be investigated to assist in implementation
- NMT to be added as a criteria as part of road adoption by JRA
- Ongoing maintenance and upgrade a serious consideration – mechanisms for regular maintenance (not just reactive) to be explored
- Law enforcement will be key to ensuring NMT safety and restrict the use of cycle lanes and footpaths
- Look at safe routes to schools as a large majority of learners already use NMT and tie in safety education programs
- Parking disincentives to be considered
- Parking standards to be revised to include cycle parking provision and potentially maximum levels of car parking
- Feasibility for priority routes and Public Bike System to be investigated

12. RECOMMENDATIONS

12.1 There are a great number of areas which all require investment for NMT infrastructure. It is recommended that the initial focus be on four focus areas :

- Upgrading the public environment surrounding BRT priority stations identified, upgrading of the public environment and implementation of a Public Bicycle System at Gautrain Stations and Park Station.
- Detailed network planning and implementation of a network in Area 1: Soweto
- Detailed network planning and implementation of a network in the Area 2: Inner City
- Detailed network planning and implementation of a network in Area 3: Alexandra – Sandton – Linbro Park

12.2 It is recommended that current development obligations for new developments are amended to include NMT infrastructure provision. The new obligations will include:

- Amended Parking standards to incorporate standards per land use for cycle parking and associated facilities (eg. secure and undercover cycle parking, showers and lockers within workplaces)
- Site Development Plans must include and indicate provision for NMT. Provision for NMT to be reinforced through development conditions
- Transport assessments submitted in support of a development proposals must include NMT as part of the assessment
- Developer contributions for NMT will be sought from development proposals falling within 2km of a planned NMT cycle route and will be adjusted on a sliding scale based on size, land use and proximity to the planned route
- All new developments to incorporate footpaths through the development site and immediately adjacent to the site boundary where appropriate

12.3 KEY ISSUES, FINDINGS AND PROPOSED INTERVENTIONS FOR PHASE II

A number of interventions are proposed in terms of an implementation plan for the City relating to NMT, namely:

- Develop a dedicated NMT network at local and neighbourhood scale. Further analysis and detailed design of local and neighbourhood NMT network for each priority area to be pursued jointly by Transportation and Development Planning and Facilitation.
- Further analysis of pedestrian movement surrounding priority Public Transport Nodes to be undertaken as part of detailed planning and upgrades scheduled (including lighting, CCTV, public conveniences).
- Undertake feasibility study for Public Bicycle System located at Gautrain Stations.
- Adopt urban design and technical NMT standards for the City which include standards for universal access.
- Establish criteria to determine which categories of roads should include NMT infrastructure as a requirement of road upgrades and new road construction.
- Establish a programme of maintenance for NMT Network.
- Consider incentives for retrofitting of existing developments. Investigate feasibility of using COJ Metro Centre at 158 Loveday Street as a case study.
- Investigate Carbon Trading as a potential alternative funding source for NMT infrastructure, utilising external expertise where necessary
- Assessment of priority routes for the implementation of signage to encourage road safety
- Develop a NMT Forum to evaluate design and location of proposed routes. Forum to include Cycling organizations / clubs, urban design, traffic engineering professionals, accessible access experts and NMT NGOs.
- Obtain base level statistics for comparison and evaluation purposes. The success of NMT will be measured by the resultant take up of NMT modes of transport and the overall improvement of safety (reduction in fatality rate of cyclists and pedestrians). Air Quality monitoring stations have been installed at 6 point across the city and the comparative air quality readings should be taken in order to assess the impact of NMT on air quality readings.
- Establish a database of NMT projects
- Alternative sources of funding at various levels of government together with partnerships should be considered

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