



Isidleke Development, Modderfontein

Addendum Report

Prepared on behalf of: Heartland Properties (Pty) Ltd

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1) Introduction

1.1 BACKGROUND TO THE ORIGINAL EIA

Oryx Environmental was appointed by Heartland Properties in 2005 to undertake an environmental impact assessment (EIA) for the proposed Isidleke development. The development envisages the establishment of a commercial, residential and light industrial district in the western portion of the AECI explosives factory site at Modderfontein in Johannesburg. The project, which covers a total area of approximately 360 hectares, is proposed on the farms Longmeadow 296 I.R. and Longmeadow 297 I.R. (Figure 1.1).



Figure 1.1 Isidleke site, Modderfontein

The environmental impact assessment that was undertaken involved a number of specialist studies including:

- A soil and agricultural potential study.
- A specialist vegetation study.
- A specialist fauna study.
- A separate ornithological study.
- A wetland study.
- An archaeological and cultural heritage study.
- A stormwater study.
- A service infrastructure assessment.
- A traffic impact assessment.

A comprehensive public consultation process was implemented in which the project was advertised in three newspapers and through site notices. A series of focus group meetings with communities, local authorities and interest groups such as the Modderfontein Conservation Society were held and all Interested and Affected Parties (I&APs) were given the opportunity to review relevant documents including the draft Scoping Report and the Environmental Impact Report, its accompanying Environmental Management Plan and the accompanying specialist reports. Two public meetings were held during the public consultation process, one at the scoping stage and another following the review period for the draft Environmental Impact Report.

In managing the environmental sensitivities of the site an open space system, based around the site's drainage lines and an area of wetland was proposed for the development. This would be connected, on the site's eastern boundary to a large conservation area that would be created as part of the development of the greater Modderfontein site.

1.2 THE EXEMPTION PROCESS

The final Environmental Impact Report for the proposed development was submitted to the Gauteng Department of Agriculture, Conservation and Environment (GDACE) in November 2005. Following this, GDACE requested further information and an addendum document was submitted to them in July 2006. Following further reviews, GDACE advised the applicant in 2007 that it could not issue a Record of Decision for the proposed development, as it did not clearly fall within any of the listed activities in terms of the Regulations published in Government Notices R.1182 of the Environment Conservation Act (No.73 of 1989).

During the application process, the regulations for environmental impact assessment under the Environment Conservation Act were replaced by a new set of regulations promulgated under the National Environmental Management Act (No.107 of 1998) (NEMA EIA Regulations). In terms of the new NEMA EIA Regulations, the development clearly falls within the ambit of the following listed activities that require environmental authorisation:

| | | |
|-------|-------|--|
| R.386 | 1(k) | The bulk transportation of sewage and water, including storm water in pipelines. |
| R.386 | 1(m) | Any purpose within the 1:10 year floodline or within 32 metres from the bank of a river system. |
| R.386 | 1(s) | The treatment of effluent, waste water or sewerage with an annual throughput capacity of more than 2,000 cubic metres but less than 15,000 cubic metres. |
| R.386 | 4 | The excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, floodplain or wetland. |
| R.386 | 15 | The construction of a road that is wider than 4 metres or has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long. |
| R.386 | 16(b) | The transformation of undeveloped, vacant or derelict land to residential, mixed, retail, commercial, industrial or institutional use where such development does not constitute infill and where the total area to be transformed is bigger than 1 hectare. |
| R.387 | 2 | Any development activity, including associated structures and infrastructure, where the total area of development is, or is intended to be, 20 hectares or more. |

In view of the fact that a comprehensive EIA had already been undertaken, an application was submitted to GDACE for exemption from the following process provisions stipulated in the NEMA EIA Regulations:

| | |
|-------|--|
| 28 | Steps to be taken after submission of the application |
| 30 | Submission of Scoping Reports to competent authority |
| 31 | Consideration of Scoping Report |
| 32 | Environmental Impact Assessment Reports |
| 33 | Specialist reports and reports on specialised processes |
| 34 | Content of draft Environmental Management Plans |
| 56-59 | Public participation process, register and comments from Interested and Affected Parties |

GDACE has granted the application. A copy of the decision including the conditions and reasons therefore are attached in Appendix A. On the basis of GDACE's decision, the EIA that has been prepared for the proposed Isidleke Development may now be reviewed and a Record of Decision may be issued in accordance with the NEMA EIA Regulations.

The following sections address the conditions, specifically the public consultation process, the need for an updated layout plan and an updated traffic impact assessment.

2) Public consultation process

Included in the conditions stipulated by GDACE, was a requirement for a public participation process to be undertaken on the basis of the following:

- The applicant or EAP managing this exemption application must open and maintain a register which contains the names and addresses of all persons who, as a consequence of the previous public participation process undertaken under the ECA, have submitted written comments or attended meetings with the applicant or EAP.
- All persons who have requested the applicant or EAP managing the application, in writing for their names to be placed on a register.
- All organs of state which have jurisdiction in respect of the activity to which the application relates.
- Registered Interested and Affected Parties will be entitled to comment on all submissions in terms of the provision of regulations 58(1)(a) and (c) and 58(2) (3) (4) (5) and 59.
- In this particular instance the applicant/EAP will not be required to place any adverts in newspapers or on site, but do need to inform all Registered Interested and Affected Parties of the above exemption process and provide the above parties with an opportunity for access to all documentation submitted to date as well as all new documentation to be submitted to the competent authority.

The register of I&APs is contained in Appendix B.

A public consultation process has been implemented in accordance with the requirements of GDACE. On 20 October 2008, a letter was sent to all I&APs, on the original Isidleke development EIA database, to inform them of GDACE's decision regarding the exemption application. A copy of the letter sent from GDACE (see Appendix A) was included in the letter sent to the I&APs and they were informed of their rights to appeal the decision that GDACE had made. The letter also informed I&APs that all documentation would be available for review from 3 November 2008 until 5 December 2008. A copy of the letter is contained in Appendix C.

Due to delays in the completion of the traffic impact assessment, required by GDACE, for the proposed Isidleke development, all documentation to be released for public review was not available from 3 November 2008. Accordingly, a further letter (18 November 2008) was sent to all I&APs informing them that the public review period would be extended to Friday 23 January 2009. A copy of the letter is contained in Appendix D.

3) Layout plan

The sensitivities identified in GDACE's conditions are shown in Figure 3.1. As can be seen from the figure, the following sensitive issues are identified:

- The drainage lines on the site, the Modderfonteinspruit and Jukskei River.
- A headwater wetland, on the western boundary of the site, underlain by pinedene soil.
- 30 metre buffer zones around all watercourses and a 10 metre buffer zone around the headwater (pinedene soil) wetland.
- An ecologically sensitive area to the north of the conservation area along the Modderfonteinspruit.

In addition, the map also indicates the presence of archaeological sites that were identified during the archaeological and heritage specialist study.

It should be noted that the ecologically sensitive area to the north of the conservation area along the Modderfonteinspruit has been substantially transformed since the time of the preparation of the original EIA, as the Gautrain has been constructed through the middle of it.

On the basis of the sensitivities identified in Figure 3.1, a layout plan for the site has been developed (Figure 3.2). As can be seen from the layout plan, the principles stipulated by GDACE have been adhered to:

- Maintenance of an open space network linked to the western boundary of the conservation area.
- Incorporation of the watercourses and wetland into the open space system.
- Minimal crossing of watercourses by internal roads.

Although the wetland area on the western boundary of the Isidleke site has been included as an area of open space in the layout plan, as can be seen from Figure 3.2, the Gautrain is being constructed through the middle of it. This will result in the almost complete transformation of the wetland, which will impact irreparably on its hydrological and ecological functioning.

The southernmost drainage line within the Isidleke site is traversed by one internal road and the proposed K113 road. The Marlboro Road Extension that is proposed to cross the Modderfontein Conservation Area also traverses the area of open space. A single internal road traverses the two northern drainage lines.

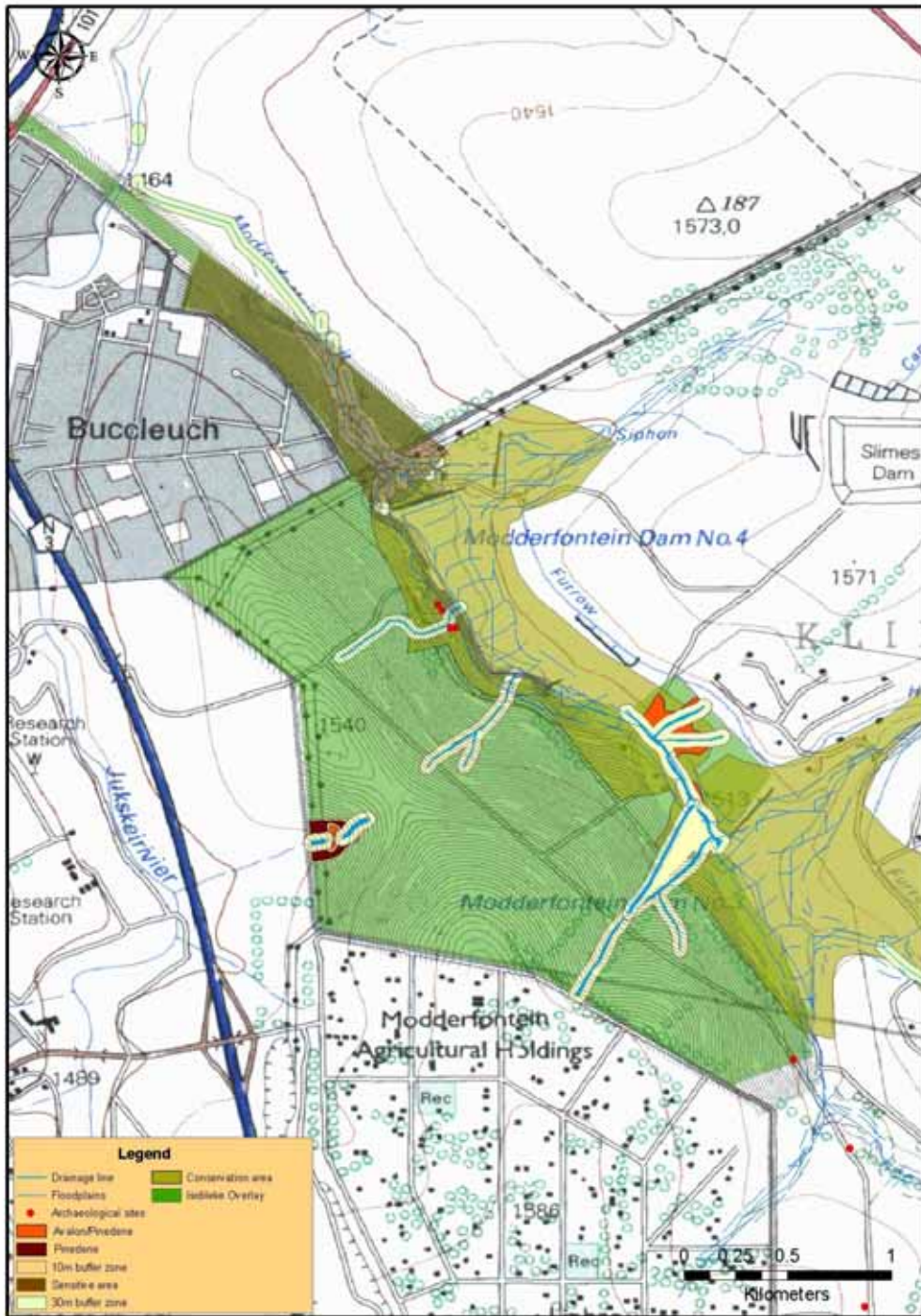


Figure 3.1 Isidleke site sensitivity

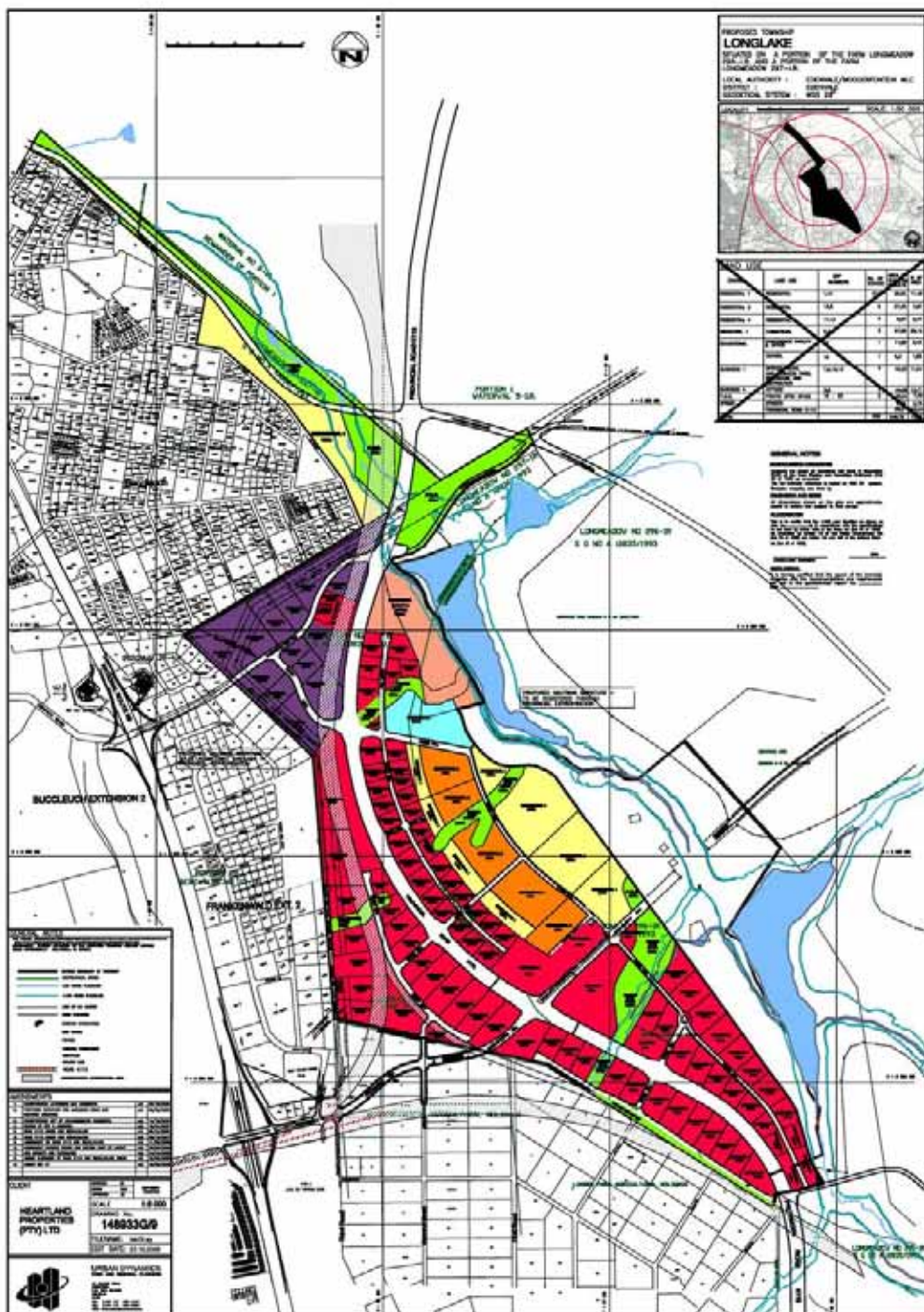


Figure 3.1 Isidleke development layout plan

4) Traffic impact assessment

The following section provides a summary of the full specialist traffic impact assessment that was undertaken by Arup (Pty) Ltd and is presented in Appendix E.

4.1 STRATEGIC LOCATION OF MODDERFONTEIN

Isidleke, which is within the AECl owned Modderfontein site, is strategically located to the north-east of the Johannesburg CBD. Figure 4.1 shows the Modderfontein Development Area in the context of the regional future road network as well as the Gautrain corridor.

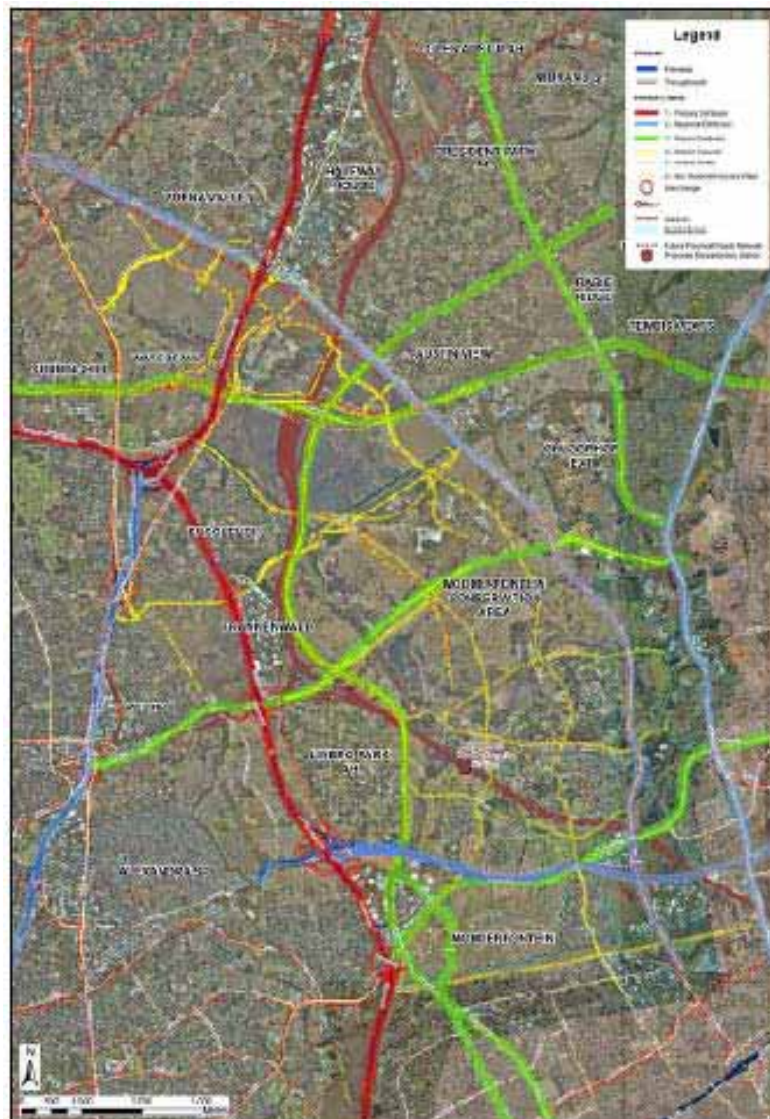


Figure 4.1 Local road network and provincial and national routes

The area is strategically located in terms of the following transportation infrastructure:

- O R Tambo International Airport and Grand Central Airport in Midrand.
- The Gautrain Rapid Rail System near to the Marlboro Station and the diversion of lines to Midrand and Rhodesfield.
- The main freeway road corridors of the M1, N1 and N3 and hence its accessibility to the regional strategic road network.

The site is further located strategically in terms of its close proximity to:

- Alexandra and Tembisa Townships, sources of human resources.
- Sandton, the financial heart of the South African economy.
- The Ekurhuleni Metropolitan area and the substantial industrial and commercial activities in that metropolis.
- Midrand, Sunninghill and Rivonia, including the proposed development at Frankenwald.
- The substantial regional developments proposed in Midrand (Zonki'zizwe and Waterfall), Kyalami and Frankenwald.

4.2 SCOPE OF THE TRAFFIC IMPACT ASSESSMENT

The traffic impact assessment (TIA) was carried out within the context of the strategic Modderfontein planning framework and the Roads Master Plan that has been developed, which has been documented separately in a report prepared by Arup Transportation Planning entitled *Modderfontein Development Framework, Roads Master Planning Study*, August 2008. The transportation modelling work of the Development Framework has been used to develop the traffic modelling approach for the TIA. The TIA assesses:

- The traffic generation implications of the proposed Isidleke Development.
- The traffic implications of the development on the local road network including access into the proposed development.
- Develops the detailed road network in the vicinity of the proposed development and evaluates the levels of service provided during the weekday AM and PM in the 2015 horizon year.

4.3 METHODOLOGY

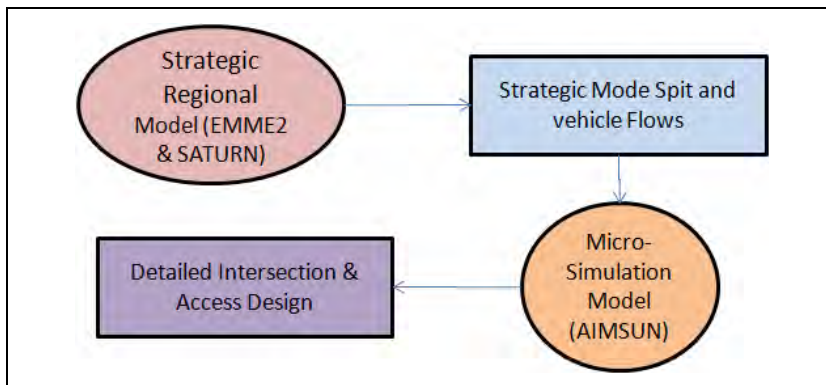
The methodology used to develop the TIA was prefaced on three key issues:

- 1) Consultation with the relevant roads authorities, which was undertaken during several workshops and meetings with the Johannesburg Roads Agency (JRA), The City of Johannesburg Transport Department, the Gauteng Department of Public Transport Roads and Works and the South African national Roads Agency Limited.

- 2) The provision of an adequate public transport network to ensure that the mode split could be biased toward public transport.
- 3) The transportation Implementation Plan should reflect the input and agreement of the various roads authorities and the public transport infrastructure and services required to ensure that the forecast mode shares are in fact achieved.

Transportation modelling was undertaken at two levels. The first was at the strategic level using the Gautrans GTS2000 EMME/2 model. This model was able to predict the mode share and the vehicular flows on the road network. It was also used to take into account the traffic from other regional developments and to undertake road network scenario analyses.

An AIMSUN based micro-simulation was used to model the flows from the regional model to undertake the detailed planning and design of the individual site accesses within Modderfontein and the necessary intersection lane configurations and control measures necessary (mainly signal plan designs).



Weekday AM peak hour was used as the forecasting basis for the strategic model but for the AIMSUN model, the PM peak hour was considered by:

- Transposing the AM peak hour matrices from the strategic model to estimate the PM peak hour.
- Adding the retail related trips to the transposed matrix to provide an estimate of the total PM peak hour demand.

The TIA therefore uses the AIMSUN model to assess traffic impacts of the proposed development and determine access and transport network needs.

4.3 ROAD NETWORKS ASSUMPTIONS

The road network and study area assumed for the 2015 and ultimate horizon years are shown in the Figure 4.2. The important roads that have been assumed in place for each horizon year are as follows – 2015 AM:

- The Gauteng Freeway Improvement Scheme (GFIS) including the Marlboro Interchange upgrade and the addition of an extra lane to the N1 and N3 freeways.

- The frontage roads for the PWV3, but not the PWV3 itself.
- The full length of the K113 (some sections of this road are not on AECI property).
- Marlboro Road Extension between the Marlboro Interchange and Maxwell Drive.
- The Kelvin Drive Extension from the M1 Woodmead Interchange through to the K113.
- Maxwell Drive between the M1 and the Modderfontein CBD.

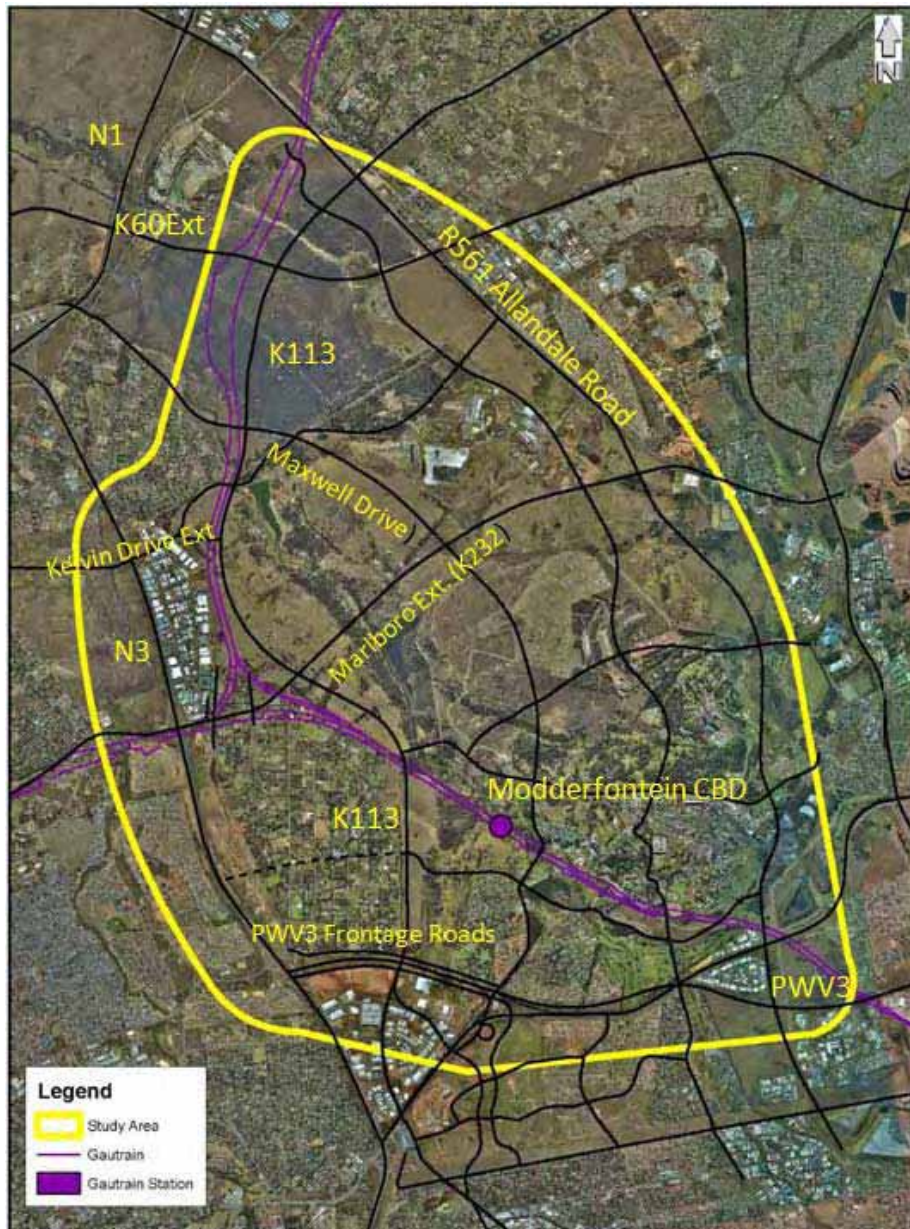


Figure 4.2 Road network assumptions

4.4 TRIP GENERATION

4.4.1 Trip generation approach

The application of the average vehicle occupancy assumption allows for the estimation of person trip ends. These trip ends are then input into the mode choice model and public and private person trip matrices estimated. The re-application of the vehicle occupancy rate to the private person matrix enables the vehicular trip matrix to be estimated. This matrix is then input into the trip assignment process.

4.4.2 Trip generation rates

The trip generation rates applied to the land use data are based on empirical evidence obtained from surveys at various land use types. The trip in:out proportions are the same as those recommended by the Department of Transport.

Table 4.1 Trip generation rates

| Land use type | Category | AM and PM peak hour vehicle trip rates | | | |
|---|-----------------|--|------|-----------------|------|
| | | Empirical rate | | DoT rate (1995) | |
| | | AM | PM | AM | PM |
| Residential trips (per unit) | Low income | 0.40 | 0.40 | 0.50 | 0.50 |
| | Middle income | 1.00 | 1.00 | 1.10 | 1.10 |
| | High income | 1.40 | 1.40 | 1.50 | 1.50 |
| Office (trips per 100m ²) | General offices | 2.00 | 2.00 | 2.30 | 2.30 |
| Industrial (trips per 100m ²) | Light industry | 0.90 | 0.90 | 0.90 | 0.90 |
| Retail (trips per 100m ²) | Regional | 0.20 | 2.69 | 0.00 | 3.44 |

The application of these rates provides the estimates of person trip ends by land use type for the development. The total number of person trips prior to mode choice is shown for each land use precinct. Importantly, it has been assumed that 5% of trips are made within in the development (i.e. intra-zonally) and therefore the trip rates have been reduced by this amount.

4.4.3 Ultimate (2028) and 2015 AM peak hour trip ends

Table 4.2 presents the trip ends associated with the Ultimate (2028) and 2015 land use for the proposed Isidleke development precincts prior to the application of mode choice.

The table shows that the total number of person trips associated with the 2015 AM peak hour forecast period is approximately 18,600 person trips. After the application of the mode choice for 2015, the proportion of public transport trips is approximately 7,600 persons, and the private vehicle trips are 9,100 trips.

Table 4.2 2015 AM peak hour trip ends (vehicles and persons prior to mode choice)

| Precinct | Total 2015 AM Peak Hour | | | | | |
|--------------|-------------------------|------|-------------------|--------------|---------------------|----------------------|
| | All split | | Vehicle all trips | | All person trips | |
| | In | Out | In | Out | In (1.2 pers/vehc.) | Out (1.2 pers/vehc.) |
| Precinct 21 | 0.85 | 0.15 | 1,852 | 327 | 2,222 | 392 |
| Precinct 22 | 0.85 | 0.15 | 2,779 | 490 | 3,335 | 589 |
| Precinct 23 | 0.85 | 0.15 | 3,148 | 556 | 3,778 | 667 |
| Precinct 24 | 0.25 | 0.75 | 441 | 165 | 529 | 198 |
| Precinct 24 | 0.25 | 0.75 | 756 | 284 | 907 | 340 |
| Precinct 27 | 0.85 | 0.15 | 4,059 | 716 | 4,871 | 860 |
| TOTAL | | | 13,035 | 2,538 | 15,642 | 3,046 |

4.5 MODE CHOICE

The introduction of a mode choice model into the modelling process enables the mode choice at two levels to be estimated as follows:

- The primary mode choice between public and private transport.
- The secondary mode choice between the various public transport modes.

The mode choice model was developed from the Gautrans GTS 2000 model. The inputs include the trip ends estimated from the trip generation model, the generalised costs and the public transport network assumptions (i.e. routes & frequencies by mode). The details of the mode choice model are provided in the *Modderfontein Development Framework, Roads Master Planning Study, August 2008*.

4.5.1 Public transport routes

The public transport routes assumed for the study for both the 2015 and ultimate development are shown in Figure 4.3. The public transport routes assumptions made were as follows:

- The BRT was assumed to operate to the Modderfontein Gautrain from the planned Alexandra – Sandton BRT route. The alignment was assumed to extend along London Road, across the N3 onto the PWV3 frontage roads.
- Bus routes were assumed to extend from the main centres in Midrand, Sunninghill and Rivonia as well as from Kempton Park and Edenvale in Ekurhuleni. Taxi routes were also assumed from these areas including Tembisa.

- The Gautrain services were assumed to operate from Hatfield and Park Station (i.e. a north–south route) and from O R Tambo International Airport to Sandton, stopping at Modderfontein Station.

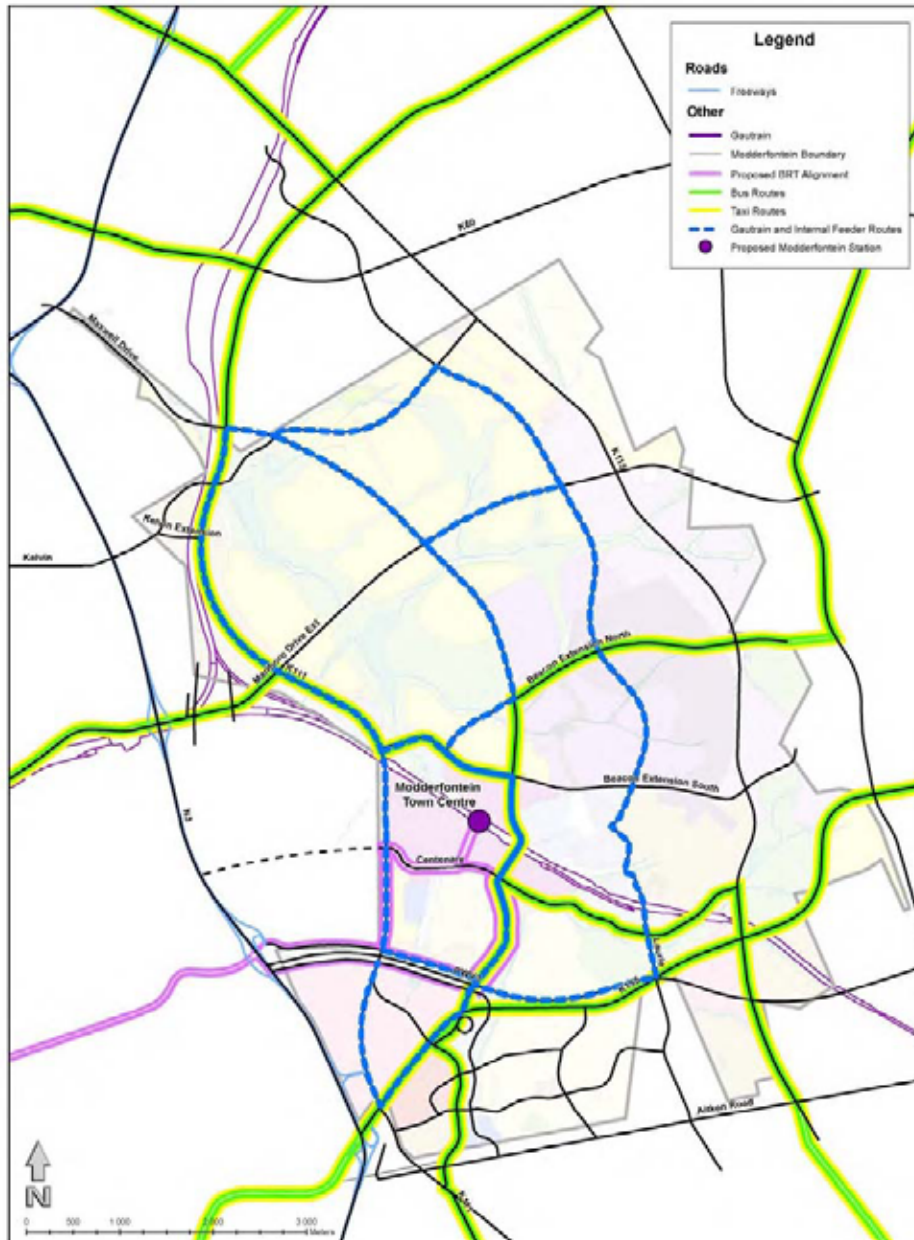


Figure 4.3 Public transport routes

4.5.2 The estimated mode share

Based on the public transport and car generalised costs, the estimated primary and secondary mode shares are as follows.

2015 AM peak hour

The primary mode share for 2015 AM shows approximately 40% of the mode share for public transport and 60% for the private (car) mode.

The secondary mode share shows that approximately 35% of the public transport users are likely to use the taxi mode. This is followed by BRT at 26% and bus at 21%. The Gautrain makes up the balance of trips. If the Gautrain Modderfontein station is not in place by 2015, the mode share for public transport drops marginally by 4%, with the other public transport modes taking up the difference in trips, i.e. bus - 24%, taxi - 43% and BRT - 33%.

4.6 TRIP DISTRIBUTION

As discussed earlier, the distribution of trips to and from Modderfontein have been derived from the Gautrans GTS 2000 EMME/2 model. The distribution of trips to the site from all origins is widespread, with regional origins.

4.7 TRIP ASSIGNMENT

The trip assignments are focussed on the road assignment of vehicle trips. These are shown in the following sections.

4.7.1 AM peak hours

In addressing the areas around the Marlboro Interchange, Marlboro Extension and the K113 during the 2015 AM peak hour, the following important points were noted:

- The Marlboro Extension Road (K232) carries a significant amount of traffic, especially between the K113 and the Marlboro Interchange. This is therefore an important piece of roadway, acting as the link for traffic between the K113 and the N3.
- Kelvin Drive Extension carries a significant amount of traffic and forms an important component in the overall network. It is strongly recommended that this link is included in the network for the 2015 horizon year as it provides additional east-west capacity. Without it, the Marlboro Extension Road carries a much higher traffic volume, resulting in peak hour congestion on this link.
- The K113 carries a significant amount of traffic south of the intersection with Marlboro Extension, and significantly less north of the intersection. The decision to build the southern section first is thus appropriate.
- Maxwell Drive carries a significant amount of traffic and is also an important link in the network.

The important aspects for the ultimate peak hour traffic are as follows:

- The Marlboro Extension link carries approximately 3,000 vehicles per hour in the peak direction, ultimately requiring 3 lanes per direction.

- Kelvin Drive Extension carries approximately 1,600 vehicles per hour in the peak direction, ultimately requiring two lanes per direction.
- The K113 carries high volumes along its length, ultimately requiring 3 lanes per direction.

4.7.2 Road network classification

The Modderfontein Development Area Strategic Transport Study developed a road classification system for the region based on the Road Infrastructure Strategy Framework for South Africa (RISFSA) classification. It is important to note that the RISFSA hierarchy is strategic with no operational details being provided in regard intersection spacing, speeds, etc. To apply this classification to the Proposed Isidleke development context, it was found necessary to disaggregate the Class 3 and 4 roads into two sub-classes, and apply operational parameters to them, particularly the intersection spacing. This sub-classification is shown in the Table 4.3 below with examples of roads in each classification.

Table 4.3 Isidleke road hierarchy class disaggregation

| RISFSA class | Sub-class | Road example | Minimum intersection spacing |
|--------------|-----------|---------------------|---|
| 3 | 3A | K113 | 500m |
| | 3B | M60 (Marlboro Ext.) | 450m with left in – left out provisions |
| 4 | 4A | Kelvin Ext./Mastiff | 350m with left in – left out provisions |
| | 4B | Frankenwald | 150 |
| 5 | 5 | Internal roads | As required but not closer than 15m to the nearest intersection |

4.8 NETWORK PHASING

4.8.1 Development accessibility investigation

An accessibility investigation for the proposed Isidleke development was carried out to provide an indication of the areas that could be developed first based on their accessibility. To undertake this, the following assumptions were made:

- Phase 1: This is a limited access phase, relying on Maxwell Drive only, i.e. without the K113, Marlboro Drive Extension or Kelvin Drive Extension.
- Phase 2: Accessibility is increased with the addition of the Kelvin Drive Extension. An important issue that needs to still be confirmed is the land availability through Linbro Business Park.

- Phase 3: Phases 1 and 2 plus the implementation of the southern section of the K113 (i.e. from Marlboro Extension to the PWV3 frontage roads) and Marlboro Extension to the K113.
- Phase 4: The implementation of the northern section of the K113 between Marlboro Drive Extension and the K60.

The interpretation of the strategic modelling of these network phases resulted in the identification of the areas within the proposed Isidleke development that could be developed with these access assumptions. The developable areas for each phase are shown in Figure 4.4.

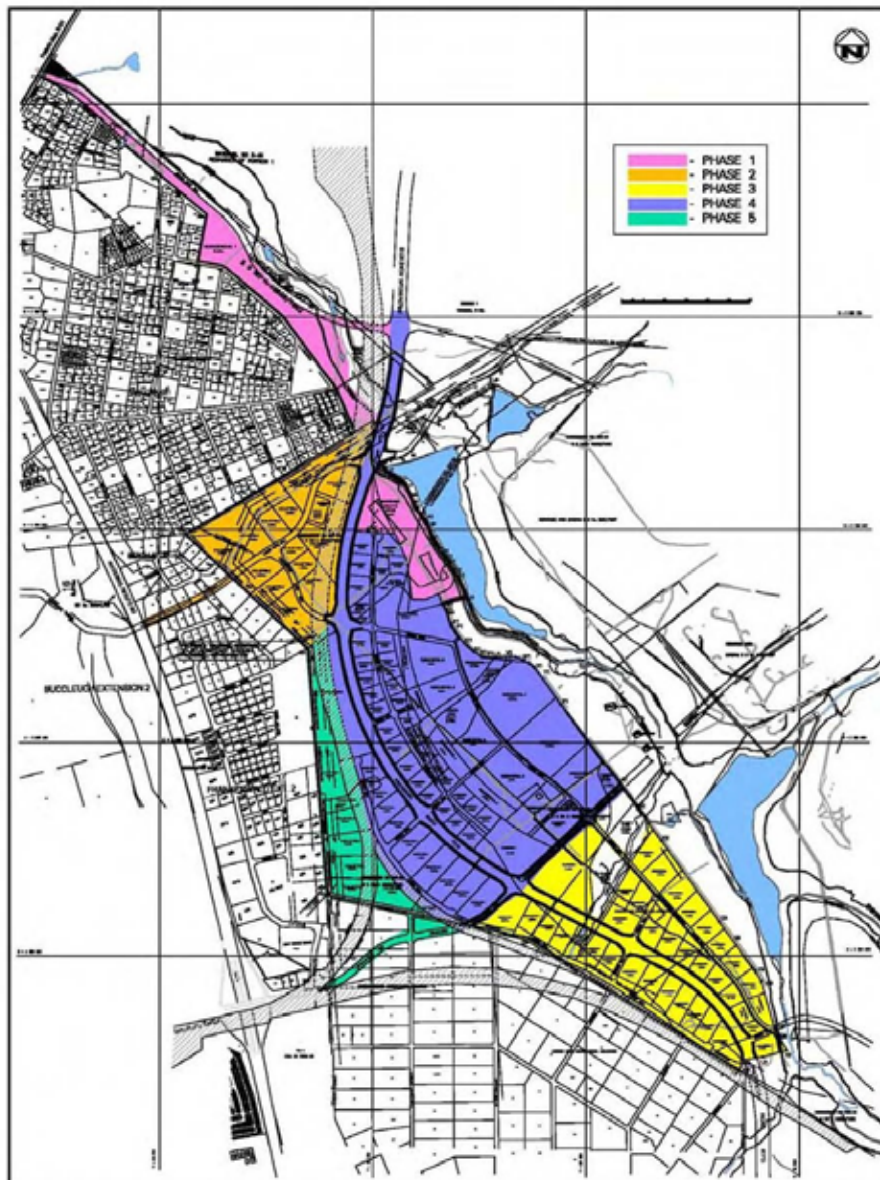


Figure 4.4 Proposed development phasing for the Isidleke site

4.9 TRAFFIC IMPACT ASSESSMENT

The traffic impact of the proposed Isidleke development is based on the micro-simulation model.

4.9.1 Development proposal

The effect of land use on transport demand and modal split was considered in the development of the proposed township's land-use budget and layout to achieve a high level of internal trips. By combining a number of land uses in one township, a mix of land uses was developed, complemented by suitable density that would encourage a modal split in favour of public and non-motorised transport. Additionally, land uses such as schools, which are fundamental for trip reduction, were included in the land use planning.

4.9.2 External roads

There are presently no existing roads of sufficient capacity from which access to the proposed development site can be taken. New link roads will therefore need to be constructed to provide access to the township. The development anticipates the township being bisected by two main arterial roads – the K113 in the north-south direction and Marlboro Extension in the east-west direction.

The Marlboro Extension

The majority of the Marlboro extension is located on AECI land, but the section through Linbro Park is not owned by AECI. Through discussions and meetings held with Gautrans and JRA, they have agreed on the alignment and road reserve for Marlboro Extension. The JRA will be in a position to obtain the required land in Linbro Park when rezoning applications for properties in the Linbro Park area are made.

At the intersection with Starfield Drive and the adjacent Third Street, the reserve has been severely restricted by the two Gautrain cuttings, leaving virtually no scope to widen the available reserve at this point. Therefore, the maximum space available will allow for no more than two through lanes per direction, accommodating separate turning movements.

The Linbro Agricultural Holding area has been earmarked for high density residential development with an indicated 15,000 residents and will require an additional access from the north which JRA have requested be provided from Second Street. A combination of one-way movements and at-grade intersections with 3rd and 2nd Streets were incorporated in the layout.

Impending township applications on the remaining holdings north of the southern railway line will require access from 2nd Street.

The vertical alignment is affected by the proposed North-South direct rail link from Midrand to OR Tambo, which is in cut at the top of the alignment and the K113 is situated in a 2m deep cut at the point of intersection. An at-grade access with Marlboro Extension is required to the southern extent of the proposed Isidleke development.

The current proposal for access from Marlboro Extension would be classified as a Class 3 Road, but due to the various constraints on the road from a vertical alignment, it will fall under the jurisdiction of JRA with a 70km/h design speed. A 32m road reserve with 2 lanes in either direction and a 5m centre reserve can be achieved.

The K113

The K113 is a north-south K-route under the jurisdiction of Gautrans. The detailed design of the road will comply with provincial road standards. It is proposed to be constructed as a four lane dual carriageway road. The necessary turning lanes are required at the main intersections.

Kelvin Drive Extension/Mastiff Road

As previously indicated, this road is an important link into the proposed Isidleke development. It diverts traffic from the Marlboro Interchange and therefore reduces congestion on the Marlboro Drive Extension. The constraints to the construction of this road are the culvert provisions under the N3 Freeway (allowing only a single lane per direction), as well as the land availability through the Linbro Business Park. In the short-term however, a single lane per direction will be adequate from a traffic operations point of view.

4.9.3 Site access

Traffic from the proposed Isidleke development will be able to access the surrounding proposed road network via four intersections (Figure 4.5). These include three intersections on K113, at the Kelvin Road Ext./Mastiff Road intersection and two intersections between Kelvin Road Ext. and Marlboro Drive Ext. The fourth access is located on Marlboro Drive Extension between the K113 and the Conservation area.

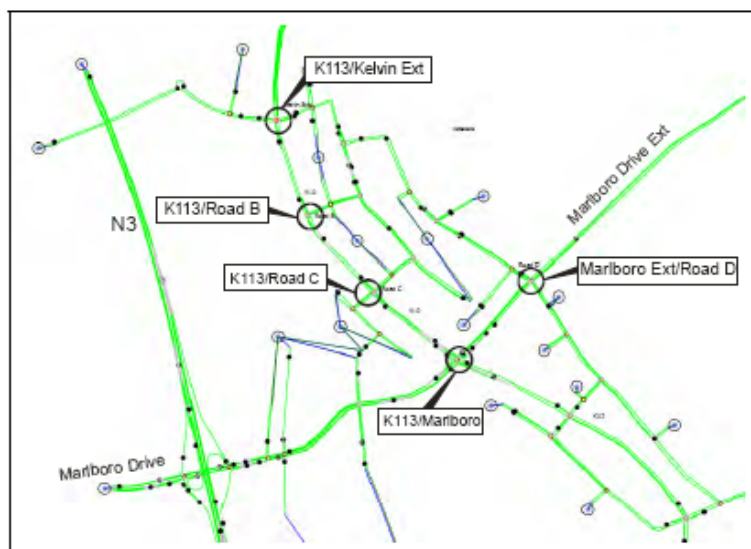


Figure 4.5 Access to the proposed Isidleke development

The micro-simulation model was used to determine the access and transport network requirements for the proposed Isidleke development. All intersections will require signals and all movements will be allowed at these access intersections. Based on the modelling, the intersections operate at acceptable levels of service during the peak periods.

4.9.4 Public transport

A detailed proposed public transport network for the entire Modderfontein Development area has been developed. The K113 is proposed to be a bus-route and buses will run in mixed traffic. The Gautrain Feeder services area, proposed be extended to the intersection of Beacon Extension and K113 at the southern extent of the Isidleke site, places it within close proximity of the planned public transport network. An environment should therefore be created that encourages public transport usage and reduces the number of vehicle trips inside the site.

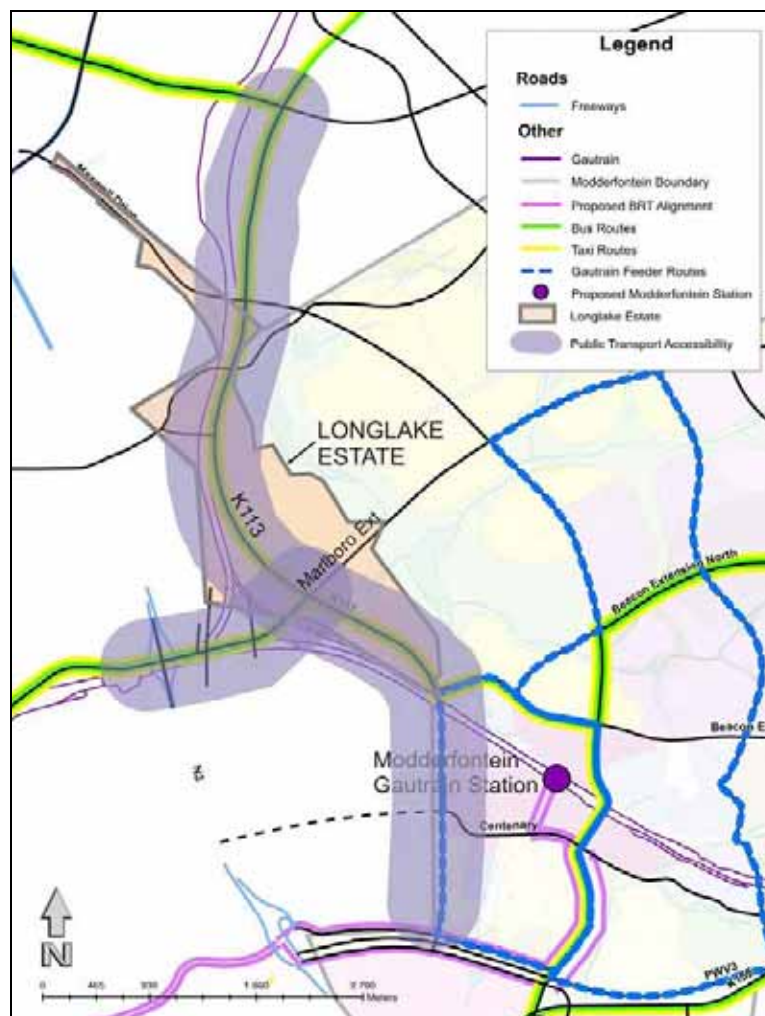


Figure 4.6 Public transport coverage of the Isidleke development

Within the proposed Isidleke development, there is nearly 100% coverage of areas within 400m from a public transport route (Figure 4.6). On the eastern side of the development the coverage needs to be extended however. It is proposed that an internal feeder service be provided in the development connecting public transport services on the K113.

The internal public transport service should be integrated with public transport services in the surrounding area. Such integration will ensure that the public transport demand stimulated through the integrated land use and transport planning of the proposed Isidleke development positively impacts on public transport usage in the Modderfontein development area as a whole.

4.9.5 Development layout

The internal layout and access positions are dictated by the external roads and will be amended to incorporate the access positions on K113 approved by Gautrans. The detailed internal layout needs to be developed in such a way that non-motorised (walking and cycling) is encouraged to make sure all transport users and not simply those of car users are catered for. For this purpose a Non-Motorised transport (NMT) strategy should be developed and implemented along with the road infrastructure, as retro-fitting NMT infrastructure is difficult and expensive. The road reserves will be able to cater for the NMT infrastructure.

The internal roads cross-sections should allow for public transport facilities, pedestrian and bicycle lanes. During the detailed design of the site, the infrastructure for this development should include:

- Provision of an internal public transport network that integrates with the external public transport services, which mainly consists of the public transport services on K113.
- Incorporation of transport interchanges that are integrated into the proposed activity/business centres, particularly at the business node near the intersection of K113 and Marlboro Extension to facilitate the efficient transfer of passengers and minimise walking distances.
- Provision of public transport lay-bys at conveniently located intersections.
- Lay-bys and shelters at bus and minibus taxi stops along all public transport routes on the site.
- The provision of high frequency feeder taxi services along the proposed public transport routes.
- An extensive bicycle/pedestrian network within the site and safe linkages to major destinations beyond the site.

4.10 CONCLUSIONS AND RECOMMENDATIONS

Due to the scale of development, transport and land use planning have been integrated. This has allowed for a shift in transport planning focussing not only on car users, but balancing the needs of all transport users instead.

Because of this, it was necessary to make changes to the traditional method of traffic impact assessments (TIA's) to correctly present a modal split away from private cars. The modelling work undertaken for the Modderfontein Transport Master plan was used to assess the traffic impact of the proposed Isidleke development.

The most important conclusions are:

- The proposed 2015 network for the Modderfontein area and the proposed Isidleke development in particular is able to provide the necessary levels of service appropriate for the weekday AM and PM peak hours.
- The ultimate development can also be catered for adequately by the Roads Master Plan.
- Public transport provision (bus, taxi, and rail) plays an important role in development of an appropriate mode split.
- The Gautrain Modderfontein Station is not likely to be in place by 2015, but does not impact on the proposed Isidleke development mode choice materially. However for the ultimate development the provision of the Gautrain services at Modderfontein station is important to provide a convenient supply of various transport modes for the development.

For the proposed Isidleke development, it is recommended that:

- An internal feeder service is provided in the development connecting public transport services on K113.
- The internal roads cross-sections should allow for public transport facilities, pedestrian and bicycle lanes.

5) Environmental management at Isidleke

The impact mitigation and environmental management at the proposed Isidleke development site have been addressed in detail in the Isidleke Environmental Impact Report and the accompanying addendum report. This has been acknowledged by GDACE in the conditions stipulated in their decision on the exemption application (Appendix A). Accordingly, the following section addresses the conditions set out by GDACE in approving the exemption application (Appendix A).

5.1 THE CONDITIONS STIPULATED BY GDACE

In granting the exemption, GDACE, stipulated the following conditions:

- a) A detailed roads and access plan needs to be submitted that defines the position of access roads and the phasing of the road construction to provide access to phases of the development. This is required in terms of the approach regarding the use of suspensive conditions related to the above access roads should authorisation be granted. An updated Traffic Impact Assessment Report with a focus on cumulative traffic impacts also needs to be submitted for review.
- b) The watercourse (drainage lines) as shown in Figure 4.1 of the Addendum to the Environmental Impact Assessment Report (page 11) and the entire Modderfonteinspruit, the Jukskei River and the associated tributaries on site are incorporated into the Isidleke open space system.
- c) The wetland (pinedene soil) as shown in Figure 3.2 of the Addendum to the Environmental Impact Assessment Report (page 8) is incorporated into the Isidleke open space system.
- d) All the above watercourses should have a 30 metre buffer and the wetland has a 10 metre buffer, as per Section 3 of the Addendum to the Environmental Impact Assessment Report (pages 6 to 8).
- e) New sewer pipelines are to be located outside the watercourse buffer areas.
- f) Storm water management is implemented as per Section 4 of the Addendum to the Environmental Impact Assessment Report (page 9 to 10).
- g) The mitigation measures and environmental management plan (excluding agricultural measures and traffic impact measures as set out in Section 7 and 8 of the Environmental Impact Assessment Report (Volume 1) are implemented.
- h) The sensitive area along the Modderfonteinspruit (northern section of Isidleke), on figure 3.6.4 of the Environmental Impact Assessment Report (Volume 1 page 15), and the Modderfonteinspruit, the Jukskei River and associated tributaries are linked into the open space network.
- i) The principles outlined in the open space plan is implemented, namely:
 - a. Maintenance of an open space network linked to the western boundary of the conservation area.

- b. Incorporation of the watercourses and wetland into the open space system.
- c. Minimal crossing of watercourses by internal roads.
- j) A final layout plan or plans clearly indicating the above requirements must be submitted to the Department for review.

Additional information that GDACE requested, in addition to that provided in the original reports, relates to the final layout plan, which has been presented in Section 3 of this document, and a detailed road and access plan and traffic impact assessment. The details of the traffic impact assessment were presented in Section 4 of this document. The following section specifically addresses the phasing aspects of the road construction to provide access to phases of the development in accordance with the approach to suspensive conditions that has been agreed between GDACE and the proponent.

5.2 SUSPENSIVE CONDITIONS

As was shown in section 4.8 of the traffic impact assessment above, the phasing for the development of the roads network for the entire Modderfontein region has been identified based on the most immediate needs for development of the site. With respect to the proposed Isidleke development, specifically, this requires that the Marlboro Extension from the Marlboro Interchange to the K113 be constructed before 2015 and that the full extent of the K113 be constructed by 2015.

The traffic impact assessment included a development accessibility investigation (Section 4.8.1). This indicates the portions of the Isidleke site that will become available for development as parts of the proposed road network are developed. It must be acknowledged that some of these roads will require environmental authorisation under the NEMA EIA Regulations due to factors such as their regional significance and the widths of their reserves. The implication of this is that if environmental authorisation is given for the proposed Isidleke development, this will be conditional upon the later environmental authorisation of the roads that provide access to them. The approach to suspensive conditions will therefore be to authorise the proposed development subject to the environmental authorisation of the different elements of the road network. The implications of this for the Isidleke development are that:

- Environmental authorisation for Phases 3 and 4 of the Isidleke development is conditional upon the environmental authorisation of the Marlboro Drive Extension and the K113 that will provide access to and from them.
- Phases 3 and 4 of the Isidleke development may only be constructed at such time as the Marlboro Drive Extension and the K113 required to provide access to and from them have been granted environmental authorisation.
- If environmental authorisation for the Marlboro Drive Extension and the K113 is not granted, the phase of the Isidleke development affected by

it will have to be re-designed and an amendment to the original environmental authorisation for the development will be required.

Under the EIA for the proposed Isidleke development, the internal road network will be assessed by GDACE and a decision on whether to provide environmental authorisation for it will be made. This process will include all of the internal roads and two road extensions that will occur only within the Isidleke site. These are:

Phase 1: Maxwell Drive, which will provide access to phase 1 of the proposed Isidleke development.

Phase 2: Kelvin Drive Extension, which will provide access to phase 2 of the proposed Isidleke development.

In terms of the phasing identified in section 4.8.1 of the traffic impact assessment above, the following roads will require environmental authorisation prior to the development of the portions of the Isidleke site:

Phase 3: Marlboro Drive Extension and the K113, south of Marlboro Drive, will require environmental authorisation to provide access to phase 3 of the proposed Isidleke development.

Phase 4: The northern section of the K113, between Marlboro Drive Extension and the K60, will require environmental authorisation to provide access to phase 4 of the proposed Isidleke development.

6) Conclusion

The information set out in this addendum addresses the requirements of GDACE as set out in their letter approving the exemption application (Appendix A). In summary it addresses the following:

- Implementation of public consultation process in which I&APs were informed of GDACE's decision and their rights to appeal it and were given the opportunity to review and comment on all original and new documentation.
- An updated layout plan which adheres to the principles stipulated by GDACE including:
 - Maintenance of an open space network linked to the western boundary of the conservation area.
 - Incorporation of the watercourses and wetland into the open space system.
 - Minimal crossing of watercourses by internal roads.
- A detailed roads and access plan that defines the position of access roads and the phasing of road construction to provide access to the phases of the development. This addresses the suspensive conditions agreed to between GDACE and the proponent should authorisation be granted.
- An updated Traffic Impact Assessment Report that comprehensively addresses cumulative traffic impacts and identifies detailed options for utilisation of public transport.

The impact assessment process for the proposed Isidleke development identified a range of potential impacts, both negative and positive, which may occur both during the construction and operational phases of the proposed development. Through implementation of the mitigation and environmental management measures set out in the original Environmental Impact Report and its addendum report though, the overall residual impact of the proposed development will include low to negligible negative impacts with the potential to create a number of positive impacts that will contribute towards the protection of the ecology in the region and will add value towards responsible urban development in Gauteng.