TRANSPORTATION
STATUS QUO TECHNICAL NOTE:
KWAMASHU A (TEMBALILHE & DUFFS ROAD)
This report represents a working draft report for the:

Transportation Status Quo:
Technical Node

Revised 14 August 2015 for:
ethekwini Municipality

By:
Royal HaskoningDHV (PTY) Ltd
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1 Introduction

1.1 Study Area

Royal HaskoningDHV has been appointed to undertake the KwaMashu Regeneration plan. This project involves the identification and prioritisation of the role of infrastructure, facilities and land use planning in assisting and supporting the community in its upliftment efforts.

The main national route providing access to the study area is the N2. The site can also be accessed from the R102 to the east and Inanda Road to the west.

Figure 1.1: KwaMashu Study Area Locality Plan

1.2 Objective

The objective of this report is to present the traffic and transportation status quo for the KwaMashu study area, as well as committed traffic and transportation projects for the area.

1.3 Methodology

Information was gathered via the following:

1) Interviews
   - Engagement with eThekwini Municipality (eThekwini Transport Authority)
     - Consultation with Senior Managers Mr. Robin Chetty and Mr. Manoj Rampersad
     - Consultation with Mr. Carlos Esteves regarding traffic and infrastructure aspects of the proposed BRT
   - Engagement with PRASA
     - Consultation with Sonitha Pooran and team regarding the PRASA rail station upgrades

2) Document Reviews
   - Northern Public Transport and Land Use Corridor Study: Consolidated Report (Phases 1-6)
   - IRPTN conceptual plans of BRT stations
   - Feeder networks for Bus Rapid Transport (BRT)
   - eThekwini Municipality IRPTN wall – to – wall Plan
   - Traffic counts from eThekwini Municipality
   - Accident statistics from eThekwini Municipality

The study area is directly accessed by four major roads; Malandela Road to the north, the MR577 to the south, KwaMashu Highway to the east and Queen Nandi Drive to the west. A study area plan layout can be found in Appendix A of this report.

The study area is ideally situated in terms of close proximity to economic and industrial hubs such as the Phoenix Industrial, Umgeni Business Park and Springfield.
2 General Access

The main national route providing access to the study area is the N2. The site can also be accessed from the R102 to the east and Inanda Road to the west.

The study area is directly accessed by four major roads; Malandela Road to the north, the MR577 to the south, KwaMashu Highway to the east and Queen Nandi Drive to the west.

A layout of the study area showing the major roads can be found in Appendix A of this report.

There are only four vehicular accesses to the study area. These are found at the intersection of:

- Queen Nandi Drive/ Amamzimtoti Drive
- Malandela Road/ Musa Road
- MR577/ Lark Road
- The Umbundo Road overpass

There are three pedestrian bridges across the rail lines as well as one across the MR577. The two rail stations found within the area are the Tembalihle and Duff’s Road stations.

Figure 2.1: Vehicular and Pedestrian Accesses to KwaMashu Study Area
3 Non-Motorised Traffic

The KwaMashu study area comprises of a high number of low income people. The expected common mode of transportation is public transport and walking. The study area comprises of four subsections; KwaMashu A, KwaMashu B, Duffs Road and Crossroads, as shown in Figure 3.1 below.

3.1 External Road Network

Pedestrian bridges as well as intersections linking to the external road network are shown in Figure 3 above. There are limited pedestrian facilities linking the study area to neighbouring areas.

There are a high number of pedestrians concentrated at the rail stations, especially during the morning and afternoon peak periods.

Mount Royal and Mount Moriah are areas of commercial and industrial activity. Mount Moriah is located on the south – east side of the KwaMashu Highway. A high number of pedestrians cross from these areas to the rail stations.

3.2 Internal Road network

KwaMashu B as well as Duff’s Road consists of low to middle income housing units with a formalised road network and pedestrian facilities such as sidewalks. Access to residential properties from the main road network is good.

KwaMashu A consists of low to no income formal and informal residential units. There are limited access roads through the area with minimal to no formal pedestrian facilities. There is poor pedestrian prioritisation as the network is unstructured and relies on vehicle routes. The existing roads provide access to clusters of houses, with no formal pedestrian facilities from roads to individual properties. As a result, informal pathways are used. This can be dangerous for commuting pedestrians as these pathways are generally unsafe and not well lit at night.

The Crossroads development is a governmental, industrial and commercial area. There are inadequate pedestrian facilities such as sidewalks and pedestrian crossings.

There is limited linkages between different subsections; KwaMashu A, KwaMashu B, Duff’s Road and Crossroads. Two roads connect KwaMashu A to KwaMashu B, as shown in Figure 3. Duff’s Road is completely segregated from KwaMashu A by the rail line; however, there is a pedestrian bridge across the Duff’s Road rail station.
4 Motorised Traffic

4.1 Public Transport

4.1.1 Rail

The passenger rail line in eThekwini expands from Umlazi – Durban – KwaMashu. There are two rail stations located within the KwaMashu study area: The Duff’s Road and Tembalihle Stations as shown in the figure below. Within the morning peak, a train stops approximately every hour at the stations, travelling from KwaMashu to Durban. Within the afternoon peak, a train arrives at the stations around every 20 minutes, originating from the Durban CBD and areas of Durban.

![Figure 4.1: Location of Tembalihle and Duff’s Road Station](image)

The daily passenger volumes using these stations in both directions are shown in Table 4.1 below.

<table>
<thead>
<tr>
<th>Station</th>
<th>Passenger Volumes (in both directions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tembalihle</td>
<td>16 590</td>
</tr>
<tr>
<td>Duffs Road</td>
<td>31 210</td>
</tr>
</tbody>
</table>

It can be seen from these values that the Duff’s Road station caters for almost twice the volumes of the Tembalihle Station.

According to PRASA statistics, an additional 10 – 20% of these volumes contribute to pedestrian walk throughs, as there are pedestrian bridges across the rail stations.

The figure below presents a comparison of the number of rail passengers for rail stations north of the Umgeni River. The Duff’s Road and Tembalihle Stations have the highest number of passengers on a weekday. The utilisation of these stations is high and should be taken into consideration in the planning of pedestrian facilities.

![Figure 4.2: Comparison of rail passengers for stations north of the Umgeni River](image)

1 Iyer - Northern Public Transport and Land Use Corridor Study: Consolidated Report (Phases 1-6)

The passenger volumes at Duff's Road station are high because this is a junction station feeding all areas in the metro and beyond (Bridge City, KwaMashu and Stanger in the north) and towards Durban it feeds trains travelling towards Greenwood Park and Effingham lines.

It should be noted that the values in the figures were taken from the rail census (2006 – 2008). Passenger numbers should increase yearly, it is expected that the Duff’s Road and Tembalihle Stations will follow a similar trend, and still have a high degree of utilisation. However there has been change in passengers-flows after the opening of Bridge City and to date there is no data available on what effect this new station has had on passenger numbers through the two existing stations.

The proposed feeder systems for the rail stations are found in Appendix B of this report.

The Table 4.2 presents the traffic related characteristics of both stations.

### Table 4.2: Rail Station Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Duff’s Road Station</th>
<th>Tembalihle Station</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location</strong></td>
<td>Part of western bifurcation rail route</td>
<td>Part of western bifurcation rail route</td>
</tr>
<tr>
<td><strong>Surroundings</strong></td>
<td>Surrounded by pockets of informal settlement, hostels, row housing and low income housing</td>
<td>Surrounded by dense, informal low income and hostel developments south of the station Schools and playing fields to the north of station</td>
</tr>
<tr>
<td><strong>Accessibility</strong></td>
<td>Not easily accessible from the main roads in KwaMashu. Passengers using rail generally walk to station adjacent to rail corridor No parking facilities in the vicinity of the station – car park on the side of the road</td>
<td>Accessible via bus or taxi Parking available for station employees only</td>
</tr>
<tr>
<td><strong>Feeder systems</strong></td>
<td>A mini bus rank is located to the west of the station</td>
<td>Taxi rank located adjacent to station</td>
</tr>
<tr>
<td><strong>Passenger origination and destination</strong></td>
<td>Originate from different areas of KwaMashu Destinations include Durban; Stanger and Umlazi; Duffsroad is junction station: Majority of passengers don’t originate from KwaMashu</td>
<td>Originate primarily from sections D, C, L, J as well as Inanda (areas adjacent to the study area on the north and west border)</td>
</tr>
</tbody>
</table>

---

3 Adapted from Iyer - Northern Public Transport and Land Use Corridor Study: Consolidated Report
4.1.2 Taxis and Buses

The taxi and bus networks for the area are currently not clearly defined. There are taxi ranks located adjacent to the rail stations as well as a formalised taxi rank at Crossroads. There are also lay-byes on the MR577 as well as Malandela Road.

Information on the services is currently not available from the relevant Transport Authority.

4.2 Private Vehicles

The study area is bordered by four major roads; Malandela Road to the north, the MR577 to the south, KwaMashu Highway to the east and Queen Nandi Drive to the west as shown in the figure below.

In terms of vehicular access, there are four accesses into the study area. These are located at the intersection of:

1) Queen Nandi Drive/ Amamzimtoti Drive
2) Malandela Road/ Musa Road
3) MR577/ Lark Road
4) The Umbundo Road overpass

4.2.1 External Road Network

Linkages to the external neighbouring communities are limited. The KwaMashu B area has one vehicular access to Queen Nandi Drive, as well as access to areas of KwaMashu D via the Umbundo Road overpass.

The Duff’s Road area has only one vehicular access, found on the intersection of Lark Road and the MR577.

Crossroads is well located in terms of access to the KwaMashu Highway/ Malandela Road interchange.

4.2.2 Internal Road network

The subsections of KwaMashu have different characteristics with regard to a road network and vehicle circulation.

KwaMashu B and Duff’s Road have a more developed road network in terms of ease of access to individual residential properties. There is a defined road network with adequate circulation through the area.

KwaMashu A has few roads within the area. The roads provide access to clusters of housing units and not individual properties. Informal pedestrian paths have been created because of this. These paths are generally unsafe as they are not well lit at night.

A section of KwaMashu A as well as a section from KwaMashu B is shown below.
Linkages between these subsections are limited. There are only two roads connecting KwaMashu A to KwaMashu B. These roads are Sivumelane Road and Umbundo Road. The Duff’s Road area is completely segregated in terms of access to areas within the KwaMashu study area – due to the presence of the rail line. Access to Crossroads from KwaMashu A is provided on Malandela Road via the Musa Road / Malandela Road intersection.

Figure 4.6: Linkages between neighbourhoods

Figure 4.7: Road Network Layout
4.2.3 Traffic volumes

The 12 hour traffic counts for the main vehicular accesses within the study area shown below:

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Approach</th>
<th>Movement</th>
<th>12 Hour Traffic Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Musa Road/ Malandela Road (June 2014)</td>
<td>North</td>
<td>LT</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>438</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>LT</td>
<td>549</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>458</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>184</td>
</tr>
<tr>
<td></td>
<td>East</td>
<td>LT</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>613</td>
</tr>
<tr>
<td></td>
<td>West</td>
<td>LT</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>143</td>
</tr>
<tr>
<td>Lark Road/ MR577 (June 2009)</td>
<td>North</td>
<td>LT</td>
<td>685</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>LT</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>169</td>
</tr>
<tr>
<td></td>
<td>East</td>
<td>LT</td>
<td>202</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>1608</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>555</td>
</tr>
<tr>
<td></td>
<td>West</td>
<td>LT</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>1811</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>6</td>
</tr>
<tr>
<td>Amamzimtoti/ Queen Nandi Drive (July 2014)</td>
<td>North</td>
<td>LT</td>
<td>194</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>4565</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>392</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>LT</td>
<td>603</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>4941</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>East</td>
<td>LT</td>
<td>545</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>West</td>
<td>LT</td>
<td>411</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RT</td>
<td>539</td>
</tr>
</tbody>
</table>

The through volumes are shown in the figure above. The Lark Road/ MR577 intersection volumes were grown at 3% per year to obtain 2014 volumes.

The dominant vehicle movement for Malandela Road is towards the Malandela Road/ KwaMashu Highway Interchange. The west leg of the Musa Road/ Malandela Road intersection forms the entrance to the Crossroads Taxi Rank. There are also high volumes turning into the taxi rank from Malandela Road South.

High traffic volumes are encountered on the MR577 in both directions (east-west and west-east) as well as Queen Nandi Drive.
5 Accident Statistics

The accident statistics for the three year period 2012 – 2014 is shown below:

Table 5.1: Accident statistics for the period 2012 - 2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Queen Nandi Drive</th>
<th>KwaMashu Highway</th>
<th>Malandela Road</th>
<th>MR577</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>PED: 10</td>
<td>13</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>DEATHS: 2</td>
<td>1</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>CAS: 63</td>
<td>22</td>
<td>26</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>ACC: 117</td>
<td>130</td>
<td>136</td>
<td>73</td>
</tr>
<tr>
<td>2013</td>
<td>PED: 11</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>DEATHS: 0</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CAS: 45</td>
<td>25</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>ACC: 107</td>
<td>112</td>
<td>97</td>
<td>80</td>
</tr>
<tr>
<td>2014</td>
<td>PED: 8</td>
<td>5</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>DEATHS: 1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>CAS: 42</td>
<td>34</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>ACC: 113</td>
<td>103</td>
<td>107</td>
<td>75</td>
</tr>
</tbody>
</table>

5.1 Major Roads

There seems to be no upward trend in terms of the number of accidents occurring on these major roads within our study area.

Same direction accidents were found to be the most common accident type occurring on these roads, especially at signalised intersections. These consist mostly of rear end accidents at stops.

Most vehicle/pedestrian accidents were found to most occur at the following intersections:

- Queen Nandi/ MR577
- Queen Nandi Drive/ Malandela Road
- Queen Nandi Drive/ Amamzimtoti Drive

There is currently no information available on accident statistics within the area.
6 Important Findings and Implications

6.1 Future Public Transport Planning for the Area

The eThekwini Municipality IRPTN has various public transport initiatives for the area. Part of the IRPTN pertaining to the study area consists of the proposed Bus Rapid Transport (BRT) and PRASA Station Modernisation Upgrades.

6.1.1 BRT

The BRT for this area will include two corridors, the C1 and C3 corridors. The C1 corridor will extend between the Durban CBD to Bridge City while the C1 corridor will extend between Pinetown to Bridge City, as shown in the figure below.

According to the eThekwini Transport Authority, the C3 corridor will be developed and operational in the short term while the C1 corridor is to be developed in the longer term.

For our proposed study area, the BRT stops are to be located at the intersection of:

- Queen Nandi Drive/ MR577
- MR577/ Avoca Hills Drive
- Malandela Road/ KwaMashu Highway

The BRT lanes will be in the middle of the roadway, in two separate lanes, with a central raised pedestrian platform at the stops. Currently, we have typical layout plan of a BRT stop – we will acquire stop specific layouts upon meeting with the eThekwini Transport Authority.

The proposed BRT feeder system layouts can be found in Appendix B of this technical note.
6.1.2 PRASA Station Modernisation Upgrades

The PRASA modernisation plan consists of the upgrade of station infrastructure as well as upgrades to the informal trader stalls surrounding these areas.

Duff’s Road station is part of Phase One of the upgrade and is already under construction. The Tembalihle station is part of Phase Two – within the next 2 years.

The Duff’s Road station upgrade layout is shown in Figure 6.3 and Figure 6.4 below as well as in Appendix C.

6.2 Key Issues

The Mount Royal and Mount Moriah areas are industrial and economic hubs within this region, as well as a residential area. As a result, there are high numbers of pedestrians crossing on the railway line between Mount Royal and Mount Moriah and the rail stations. The KwaMashu Highway separates KwaMashu from these two areas.

The Duff’s Road residential area is completely segregated in terms of vehicular access to KwaMashu A and the western areas because of the rail line. The only vehicular access lies at the intersection of the MR577 and Lark Road.

Pedestrian links to the main access routes as well as hubs of social and economic activity should be prioritised. Integration with the external communities should be encouraged. The study area should have a clearly defined modal hierarchy, in which pedestrians are prioritised. The Figure below shows the areas of economic and social activity. Pedestrian links to these areas, as well as any proposed new developments, are important.
6.3 Opportunities

One of the main opportunities for this area is the introduction of the proposed BRT as well the PRASA Station Modernisation Upgrades. An increase in public transport infrastructure would attract more commuters to these transport nodes. Pedestrian access and facilities to these nodes are important — Transit Orientated Design (TOD) principles should be adopted.

TOD principles centre on maximising the use of public transport by optimising non-motorised transport (NMT). The population densities within the area (40 000 - 45 000 people) area are adequate enough to support a properly developed public transport network.

In order to incorporate TOD, there should be a central NMT focus towards the public transport nodes within the area, i.e. the two rail stations as well as the proposed BRT stops.

The blue circles show the 400m and 800m design circles around the public transport stations, in which NMT will be prioritised. For the purposes of this report, these circles were only shown around the rail stations, but during detailed design, will be carried out on all public transport nodes within the area.

Figure 6.6: Transit Orientated Design toward Public Transport Nodes

The green “loop” road in the figure above represents the concept road envisaged, linking subsections within the study area, as well as to the major roads bordering the study area. This road will improve public transport circulation within the area and will link up to the BRT feeder system.

6.4 Information Gaps

The following information is still outstanding:
- Accident statistics within the area
- Car/ pedestrian volumes within the area
- CPTR data
7 Conclusion

The following conclusions were drawn from the study:

- KwaMashu B, Duff’s Road and Crossroads have adequate infrastructure with regards to the provision of pedestrian facilities as well as a suitable road network and circulation.

- Pedestrian movement within the KwaMashu A area is limited in terms of proper pedestrian pathways and facilities to the areas of economic and social activity, as well as to individual residential properties. Informal pathways are used.

- Vehicular access to KwaMashu A is inadequate. KwaMashu A has few roads within the area. The roads provide access to clusters of housing units and not individual properties.

- There are currently undefined feeder systems within the study area (Taxi and bus)

- The rail stations as well as the proposed BRT situated within the study area are important public transport nodes for the residents of KwaMashu and should be a focus when considering the detail design for the area. Transit orientated design is a key prioritisation for this.

8 Appendices

- Appendix A: Study Area
- Appendix B: Proposed BRT Layout and Stops
- Appendix C: Duff’s Road Station Upgrade Layout And Proposed Feeders
- Appendix D: Traffic Counts
Appendix A: Study Area
Appendix B: Proposed BRT Layout and Stops

[Map image of proposed BRT layout and stops]
Appendix C: Duff's Station Upgrade Layout & Proposed Feeder

SITE PLAN FOR DUFFS ROAD STATION - SITE BOUNDARIES

SITE PLAN FOR DUFFS ROAD STATION - ALTERATIONS AND NEW WORK
Appendix D: Traffic Counts