

CHAPTER 13 ASSESSMENT: MTHAMVUNA RIVER TO ISIPINGO INTERCHANGE

This chapter provides an assessment of the key potential biophysical, socio-economic and cultural/historical heritage impacts, as appropriate, that would result from the construction and operational phases of the proposed works, including physical toll plazas, along the existing R61 and N2 between the Mthamvuna River and the Isipingo Interchange - see Figures 13.1 and 13.2.

13.1 INTRODUCTION

The proposed works along the existing R61 and N2 between the Mthamvuna River and the Isipingo Interchange are described in detail in Section 4.2.6, with accompanying illustrations being shown in Figures 4.25 to 4.32. All proposed construction activities would take place within the existing road reserve, with the exception of the Adams Road Interchange and the proposed mainline toll plazas at Park Rynie and Isipingo.

In summary, the following works are proposed along this section of the proposed toll highway, where required:

- Upgrading of at-grade intersections;
- Construction of Port Edward and Southbroom Interchanges (refer to Figures 4.27 and 4.28);
- Improvement of intersection layouts;
- Consolidation of access points – illegal and dangerous accesses would be closed and feeder roads constructed to provide access at new, safe and appropriate access [would be undertaken under a separate approval process];
- Safety improvements;
- Minor rehabilitation and resurfacing;
- Construction of seven sets of ramp toll plazas (on existing interchanges);
- Construction of the proposed Park Rynie mainline toll plaza (in close proximity to the Park Rynie on- and off-ramps - refer to Figure 4.29);
- Widening of the Amanzimtoti Bridge;
- Addition of a third lane and paved shoulder from Amanzimtoti River northward;
- Reconstruction of the Adams Road Interchange to improve the operational safety of the interchange;
- Addition of a fourth lane between Dickens Road and Joyner Road Interchanges in each direction (refer to Figure 4.31); and
- Construction of the proposed Isipingo mainline toll plaza south of the Prospecton Road (Isipingo) Interchange (refer to Figure 4.32).

The existing N2 South Coast Toll Road, which comprises the Oribi mainline and ramp toll plazas, Izotsha ramp toll plazas and Umtentweni ramp toll plazas, would be incorporated into the proposed project.

A description of the key characteristics of the biophysical, socio-economic and cultural/historical heritage environment along this section of the proposed toll highway is provided in Chapter 6, as appropriate.

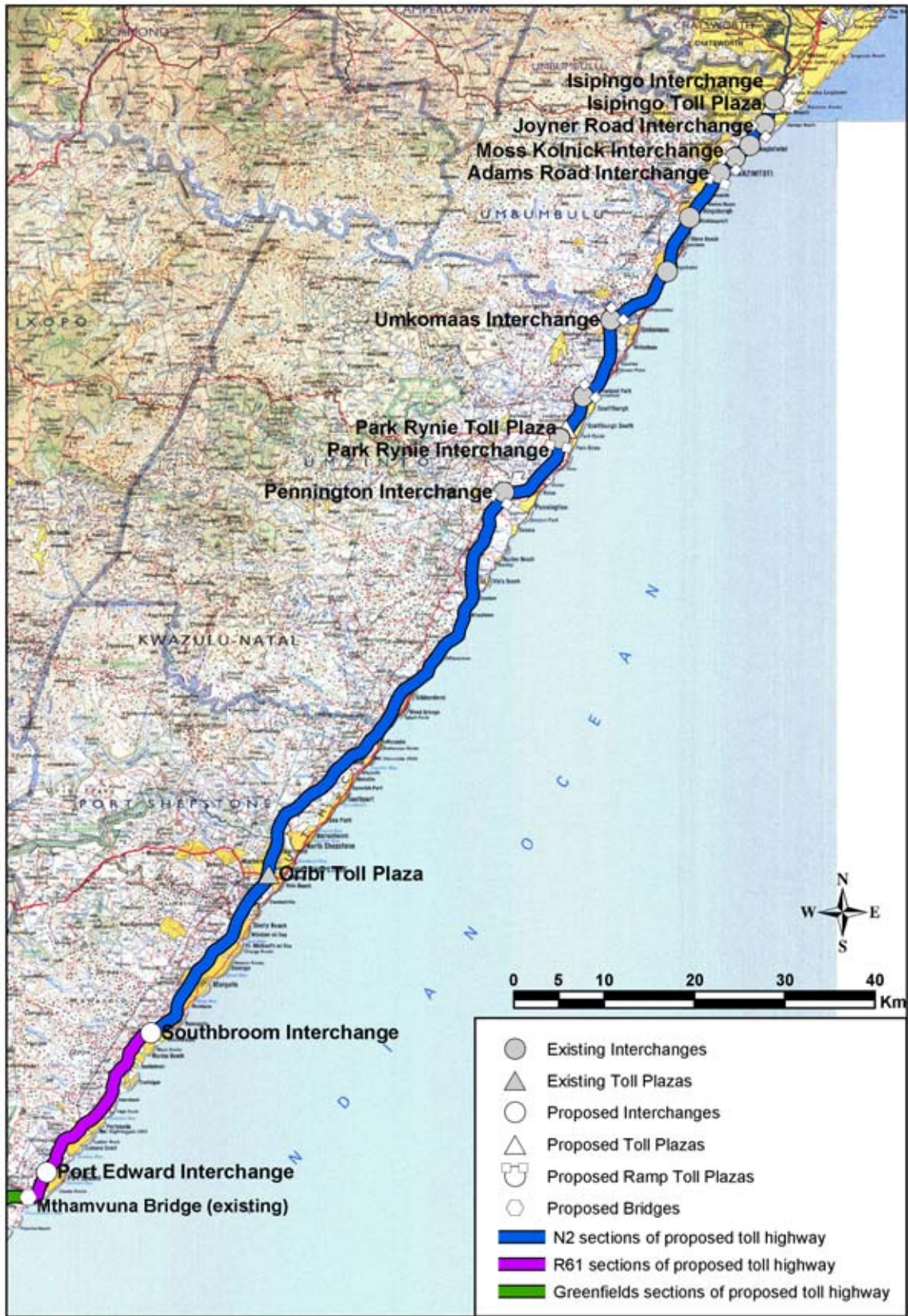


Figure 13.1: Section of the proposed toll highway between the Mthamvuna River and Isipingo Interchange



Figure 13.2: Detailed section of the proposed toll highway between Pennington and Isipingo

The assessment of potential direct, indirect and cumulative impacts associated with the construction and operational phases of the proposed project are based on the findings of the relevant specialist studies undertaken during the EIA process. The respective specialist reports provide detailed descriptions of the study approach followed, the identified risk sources and potential impacts – Volumes 2 to 4, Appendices 1 to 13.

13.2 ASSESSMENT OF POTENTIAL IMPACTS

It is anticipated that the proposed works along this section of the proposed toll highway would result in key potential impacts relating to the following aspects: vegetation and flora; fauna; aquatic ecosystems; social; noise; air quality; and visual. These are addressed separately below.

13.2.1 VEGETATION AND FLORA

The proposed widening of the existing road and widening of the bridge at the Amanzimtoti River would result in key potential impacts on vegetation and flora in terms of the following aspects: loss of habitat, biodiversity and species of special concern; increased run-off and drainage, soil erosion, silt loads and sedimentation; and invasion by weeds and invasive alien plants. A summary of the assessment of the key potential impacts on vegetation and flora is provided in Table 13.1.

Loss and/or fragmentation of habitat, loss of biodiversity and/or loss of species of special concern

The proposed widening of the existing road to accommodate additional lanes may result in the loss of some habitat, with associated biodiversity and species of special concern. Such remaining habitat, which includes habitat associated with KwaZulu-Natal Coastal Belt vegetation (Endangered), is, however, scattered and consists of small remaining patches. It is considered unlikely that the proposed widening of the existing road would affect remaining patches of coastal thicket, but if they are affected the impact would be significant due to the high conservation status of the vegetation type. The potential permanent, localised loss of habitat is assessed to be of **medium** intensity and significance.

The proposed widening of the bridge at the Amanzimtoti may affect riparian and floodplain vegetation alongside the existing bridge site which is already moderately disturbed. The potential localised loss and fragmentation of habitat is assessed to be of **medium** intensity and significance.

Minimisation and restriction of site clearing to the area required for construction purposes only, limiting disturbance to adjacent undisturbed natural vegetation and identification of any Species of Special Concern by a botanical expert where indigenous thicket vegetation is encountered and revegetation of remaining disturbed areas with site indigenous species and minimisation of impacts on riparian and floodplain areas would result in probable residual impacts of **LOW** significance.

Increased run-off and drainage, soil erosion, silt loads and sedimentation

The increased pavement area associated with the proposed widening of the road and bridge at the Amanzimtoti River would probably result in increased run-off and drainage, soil erosion, silt loads and sedimentation. The potential localised loss or disturbance to vegetation and flora would probably be of medium intensity over the long term and is thus considered to be of **medium** significance. Minimisation and restriction of site clearing to areas required for construction purposes only, implementation of erosion and sediment control measures, appropriate location of site offices and ongoing monitoring and maintenance of revegetation works would reduce the significance of the potential impact to **LOW**.

Invasion by weeds and invasive alien plants

Invasion by weeds and invasive alien plants would be facilitated by disturbance resulting from construction-related activities and would likely be of greater importance during the operational phase. Potential localised impacts on the composition and function of the natural vegetation and flora would probably occur at a medium intensity over the long term. These potential impacts are thus deemed to be of **medium** significance. It is considered that implementation of an effective weed control programme would reduce the potential impact to **LOW** significance.

Table 13.1: Summary assessment of key potential impacts on vegetation and flora – Mthamvuna River to Isipingo Interchange

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Impacts associated with loss of habitat, biodiversity and species of special concern						
Without mitigation	Local	Permanent	Medium	Probable	Medium	Medium
With mitigation	Local	Permanent	Low	Probable	LOW	Medium
Impacts associated with increased runoff and drainage, soil erosion, silt loads and sedimentation						
Without mitigation	Local	Long term	Medium	Probable	Medium	Medium
With mitigation	Local	Long term	Low	Probable	LOW	Medium
Impacts associated with invasion by weeds and invasive alien plants						
Without mitigation	Local	Long term	Medium	Probable	Medium	High
With mitigation	Local	Long term	Low	Probable	LOW	High

13.2.2 FAUNA

The anticipated increased road traffic associated with the operational phase of the proposed toll highway would result in key potential impacts on fauna in terms of the following aspects: invasion of alien faunal species; increased fire risk; chemical pollution; and noise and light pollution. A summary of the assessment of the key potential faunal impacts is provided in Table 13.2.

Invasion of alien faunal species

The probable passive translocation of alien faunal species associated with the anticipated increased road traffic along this section of the proposed toll highway is assessed to be of medium intensity over the long term and is thus deemed to be of **medium** significance. Active culling programmes of problem animals would reduce the significance of the probable residual impact to **LOW**.

Increased fire risk

Fire, particularly in grasslands, is a natural phenomenon. However, it is probable that the risk of accidental fires would increase as a result of improved access to this section of the proposed toll highway. The associated permanent long-term loss of fauna is assessed to be of **medium** intensity and significance. Ensuring vegetation in the road reserve is kept low by way of regular maintenance and that rest stops and associated structures are not situated adjacent to sensitive habitats would reduce the potential impacts associated with increased fire risk to **LOW** significance.

Chemical pollution

Probable negative effects on population sizes and developmental abnormalities of amphibian populations due to polluted surface run-off are assessed to be of medium intensity over the long term. The significance of the potential impacts on fauna is thus considered as **medium**. Restricting and controlling the use of herbicides in the road reserve would reduce the significance of the potential impacts associated with chemical pollution to **LOW**.

Noise and light pollution

Probable long-term disturbance to breeding faunal populations as a result of increased noise and light pollution from increased traffic volumes and lighting at mainline toll plazas and interchanges is assessed to be of **MEDIUM** intensity and significance. It is considered unlikely that disturbance to breeding faunal populations associated with noise and light pollution could be reduced.

Table 13.2: Summary assessment of key potential impacts on fauna – Mthamvuna River to Isipingo Interchange

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Invasion of alien faunal species						
Without mitigation	Local	Long term	Medium	Probable	Medium	Medium
With mitigation	Local	Long term	Low	Probable	LOW	Medium
Impacts associated with increased fire risk						
Without mitigation	Local	Long term	Medium	Probable	Medium	Medium
With mitigation	Local	Long term	Low	Probable	LOW	Medium
Impacts associated with chemical pollution						
Without mitigation	Local	Long term	Medium	Probable	Medium	Medium
With mitigation	Local	Long term	Low	Probable	LOW	Medium
Impacts associated with noise and light pollution						
Without mitigation	Local	Long term	Medium	Probable	Medium	Medium
With mitigation	Local	Long term	Medium	Probable	MEDIUM	Medium

13.2.3 AQUATIC ECOSYSTEMS**Riparian and instream vegetation**

Key potential impacts on riparian and instream vegetation are anticipated during the construction and operational phases of the proposed toll highway. These would be associated with the following: destruction of riparian vegetation and loss of sensitive habitats; increased surface run-off; surface and groundwater pollution; reduction in permeable surfaces; diversion of flow by hard surfaces; and change in vegetation community type. A summary of the assessment of the key potential impacts is provided in Table 13.3.

Destruction of riparian vegetation and loss of sensitive habitats

The proposed works along this section of the proposed toll highway would result in destruction of riparian vegetation and loss of sensitive habitat. The expected permanent impact is assessed to be of medium intensity at a local level and is assigned a **high** significance rating due to the nature of the riparian vegetation and the important role it plays within the riverine ecosystems. Clearing of vegetation during the drier winter months, limiting clearing to areas immediately needed for construction, undertaking vegetation stripping in parallel with road construction and avoiding large stands of Palmiet would reduce the significance of the potential impact to **LOW**.

Increased surface run-off

Site clearing activities and the increased pavement area associated with the proposed upgrading, rehabilitation and widening of the road, where required, would result in increased surface run-off and increased risk of erosion. Vegetation attenuates surface water flow which, consequently, encourages permeation of the soils and contributes to maintaining water table levels. The anticipated permanent impact on riparian and instream vegetation during the construction and operational phases is assessed to be of **medium** intensity and significance. Potential residual impacts of **LOW** significance are expected with implementation of a surface stormwater drainage system and the use of swales during construction (which should then be grassed for the operational phase).

Surface water and groundwater pollution

Construction activities would probably result in sediment loads entering the adjacent freshwater ecosystems, leading to increased turbidities and sedimentation risks in downstream areas. Diesel, oils and other chemical substances conveyed along the road during the operational phase would pose a threat to the continued functioning of the instream and adjacent areas, if by chance these are dispersed via surface run-off, or permeate into the groundwater. Changes to water quality (surface and groundwater) affect the functioning of plants and other instream biota. The potential impact on riparian and instream vegetation along this section of the proposed toll highway is assessed to be permanent and of medium intensity at a local level. The significance of the potential impact is thus rated as **medium**. Formulation and implementation of erosion and sediment control measures, proper storage of construction materials (including fuels and oils), emergency plans, construction camp management procedures and appropriate location (i.e. well removed from aquatic systems) of stockpiles, site offices, etc. would reduce the potential impact to **LOW** significance.

Reduction in permeable surfaces

The hard surfaces associated with the proposed upgrading, rehabilitation and widening of this section of the proposed toll highway would reduce the amount of permeable surfaces for water to penetrate the soils and maintain the local groundwater systems. The potential indirect impact on riparian and instream vegetation due to changes in soil moisture status is assessed to be permanent and of medium intensity at a local level. This potential impact is thus rated of **medium** significance. Revegetation of all remaining disturbed areas with appropriate plant species would reduce the potential impact to **LOW** significance.

Diversion of flow by hard surfaces

The increased area of hard surfaces would probably divert flow away from water bodies, as well as increase flow velocities of run-off and increase the risk of pollution if the stormwater contains any spilled oils, fuels or coolants from passing traffic. The potential permanent impact on riparian and instream vegetation is assessed to be of **medium** intensity and significance. Residual potential impacts of **LOW** significance would result by way of the design and use of stormwater retention swales and oil traps to prevent contamination of downstream areas.

Change in vegetation community type

Disturbance of the natural vegetation caused by the construction activities would lead to the potential introduction of exotic plant species. The potential localised change to the indigenous riparian and instream vegetation is assessed to be of permanent duration and **medium** intensity and significance. Implementation of an appropriate rehabilitation and weed control programme would result in a potential residual impact of **LOW** significance.

Table 13.3: Summary assessment of key potential impacts on riparian and instream vegetation – Mthamvuna River to Isipingo Interchange

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Destruction of riparian vegetation and loss of sensitive habitats						
Without mitigation	Local	Permanent	Medium	Definite	Medium	High
With mitigation	Local	Permanent	Low	Definite	LOW	High
Impacts associated with increased surface run-off						
Without mitigation	Local	Permanent	Medium	Definite	Medium	High
With mitigation	Local	Permanent	Low	Definite	LOW	High
Impacts associated with surface and groundwater pollution						
Without mitigation	Local	Permanent	Medium	Definite	Medium	High
With mitigation	Local	Permanent	Low	Definite	LOW	High

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Impacts associated with reduction in permeable surfaces						
Without mitigation	Local	Permanent	Medium	Definite	Medium	High
With mitigation	Local	Permanent	Low	Definite	LOW	High
Impacts associated with diversion of flow by hard surfaces						
Without mitigation	Local	Permanent	Medium	Definite	Medium	High
With mitigation	Local	Permanent	Low	Definite	LOW	High
Change in vegetation community type						
Without mitigation	Local	Permanent	Medium	Definite	Medium	High
With mitigation	Local	Permanent	Low	Definite	LOW	High

Estuaries

The construction and operational phases of the proposed toll highway would result in key potential impacts on estuaries as a result of the following: sedimentation; water quality changes; and improved access. A summary of the assessment of the key potential impacts is provided in Table 13.4.

Sedimentation

Sediments, deposited into the river and estuary catchments crossed by the existing R61 and N2 as a result of the proposed works along this section of the proposed toll highway, would ultimately be conveyed into estuaries (mostly Temporary Open Closed Estuaries) considered to be vulnerable to sedimentation impacts. The ichthyofaunal, water quality and aesthetic status of the estuaries along this section of the proposed toll highway is described as “moderate-good” but “very poor” in places (ichthyofaunal), “very poor” to “good” (water quality) and “moderate-good” to “poor” (aesthetic status), respectively. Potential impacts of high intensity in the short term would occur at a regional level due to the extent of the area covered and the importance of the estuaries in terms of diversity and fish breeding and nursery grounds. The highly probable impact is thus considered to be of **medium** significance. Implementation of mitigation measures applicable to “riparian and instream vegetation”, as stipulated above, would result in a probable impact of **LOW** significance.

Water quality changes

Water quality changes in the estuaries are expected as a result of potential oil, grease and fuel spillages in the river and estuary catchments during both the construction and operational phases. The potential impact on the water quality status of the estuaries in the region is assessed to be of high intensity during construction, and medium intensity during the operational phase. The potential impact is thus assessed to be of **medium** significance during both the construction and operational phases. Implementation of construction-related mitigation measures applicable to “riparian and instream vegetation”, as stipulated above, would reduce the potential impact to **LOW** significance during the construction phase. It is considered, however, that potential impacts associated with the operational phase, such as spillages and sheet-wash off the road into the river catchments (which would ultimately discharge into the estuaries) would be more difficult to mitigate. The significance of the potential residual impact on water quality changes in estuaries during the operational phase is thus considered to remain **MEDIUM**.

Table 13.4: Summary assessment of key potential impacts on estuaries – Mthamvuna River to Isipingo Interchange

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Impacts associated with sedimentation						
Without mitigation	Regional	Short term	High	Highly probable	Medium	Medium
With mitigation	Regional	Short term	Medium	Probable	LOW	Medium
Impacts associated with water quality changes						
Without mitigation	Regional	Short/Medium term	High/Medium	Probable	Medium	Medium
With mitigation	Regional	Short/Medium term	Medium	Probable	LOW/MEDIUM	Medium

13.2.4 SOCIAL

The proposed toll highway would result in key potential social impacts relating to the following: increased employment opportunities; increased safety hazards for pedestrians and traffic; increased HIV/AIDS and STD risks; increased crime; construction-related traffic delays; increased taxi-related tension and violence; and resettlement of affected households. A summary of the assessment of the key potential impacts is provided in Table 13.5.

Increased employment opportunities

Unemployment figures for wards along this section of the proposed toll highway are often below 20%, which indicate that unemployment levels along this section of the proposed toll highway are generally markedly lower than for most of the Eastern Cape sections. The proposed project would increase the potential for job creation in the section between the Mthamvuna River and the Isipingo Interchange. Both direct and indirect jobs of a temporary nature are likely to occur during the construction phase while the operational phase is likely to generate more permanent and sustainable employment opportunities. The significance of the anticipated positive impact associated with increased employment opportunities is assessed to be **positive medium** (during construction) and **positive low-medium** (during the operational phase). Optimisation measures such as establishment of a “labour and employment desk”, use of labour-intensive methods where possible, use of local labour as far as possible and remuneration beyond the minimum wage rate would increase the significance of the potential positive impact to **POSITIVE HIGH** and **POSITIVE MEDIUM** significance during the construction and operational phases, respectively.

Increased safety hazards for pedestrians and traffic

Construction sites and associated activities, and an increase in traffic volumes during the operational phase, would lead to increased safety hazards for pedestrians and traffic. The potential impact is assessed to be of **medium** significance during the construction and operational phases. Regular inspection and maintenance of fencing, erection of appropriate warning signs and implementation of community risk awareness programmes would reduce the intensity and significance of the potential impact to **LOW**.

Increased risk of HIV/AIDS and STDs

The anticipated influx of construction workers during construction, and the anticipated increased long-distance truck traffic on the proposed toll highway, would probably result in an increased risk of HIV/AIDS and STDs. The potential impact is assessed to be of **medium** significance during the construction and operational phases, respectively. Mitigation measures aimed at reducing the spread of HIV/AIDS and STDs, such as the design and implementation of appropriate HIV/AIDS and STD awareness and prevention campaigns, maximisation of job opportunities to local people who do not need to be housed in construction accommodation, and availability of an adequate supply of free condoms for workers would reduce the risk of the spread of HIV/AIDS and STDs to **LOW-MEDIUM** significance during the construction and operational phases.

Increased crime

Potential increase in criminal activity could occur in this section of the proposed toll highway due to an influx of workers during construction and the increased regional accessibility of the area during the operational phase. The probable impact is assessed of **medium** significance during the construction and operational phases. Liaison with the local police to monitor changes during construction and operation, provision of additional security if required and assistance with establishment of Community Policing Forums where they do not exist would reduce the probability and significance of the potential impact to **LOW**.

Construction-related traffic delays

Traffic delays and accommodation of traffic during construction would result in potential increased incidences of road rage and time delays for road users and would be detrimental to the efficient running of business. According to many stakeholders, potential construction-related delays could possibly also make the South Coast less attractive to tourists. The probable impact is assessed to be of **MEDIUM** significance without and with mitigation since it is deemed unlikely that the impact can be effectively mitigated. However, it is recommended that construction activities be properly scheduled to minimise delays and that an effective public communication strategy be formulated and implemented to inform road users of construction activities timeously.

Increased taxi-related tension and violence

It is anticipated that the proposed toll highway would result in potential increased internal taxi-related tension and violence associated with the profitability of certain routes. This potential impact is considered to be of **medium** intensity and significance over the long term. The intensity, and hence significance, of this potential impact would be reduced to **LOW** through consultation with the relevant taxi industries, in particular regarding the implementation of tolling and potential discounts.

Table 13.5: Summary assessment of key potential social impacts – Mthamvuna River to Isipingo Interchange

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Impacts associated with increased employment opportunities						
Without mitigation	Local-Regional	Short/Long term	Medium/High	Definite	Low-medium+/Medium+	High
With mitigation	Local-Regional	Short/Long term	High	Definite	MEDIUM+/HIGH+	High
Increased safety hazards for pedestrians and traffic						
Without mitigation	Local-Regional	Short/Permanent	High	Definite	Medium	Medium
With mitigation	Local-Regional	Short/Permanent	Medium	Definite	LOW	Medium
Impacts associated with increased risk of HIV/AIDS and STDs						
Without mitigation	Local	Permanent	Medium	Probable	Medium	Medium
With mitigation	Local	Permanent	Low-Medium	Probable	LOW-MEDIUM	Medium
Increased crime						
Without mitigation	Local	Permanent	Medium	Probable	Medium	Medium
With mitigation	Local	Permanent	Low	Probable	LOW	Medium
Impacts associated with construction-related traffic delays						
Without mitigation	Local	Short/Long term	Medium/High	Probable	Medium	Medium
With mitigation	Local	Short/Long term	Medium/High	Probable	MEDIUM	Medium
Increased taxi-related tension						
Without mitigation	Local	Long term	Medium	Probable	Medium	Medium
With mitigation	Local	Long term	Low	Probable	LOW	Medium

13.2.5 NOISE

It is anticipated that the proposed Pennington ramp toll plazas, Park Rynie mainline toll plaza, Adams Road ramp toll plazas and additional lanes in this section of the proposed toll highway would result in key potential noise impacts. A summary of the assessment of the key potential impacts is provided in Table 13.6.

Pennington ramp toll plazas

Settlements are located within 40 m to the west of the southern off-ramp. It is considered that the elevated ramp and ramp toll plaza would screen the residences from traffic noise on the highway thereby rendering noise on the ramp more noticeable. The intensity and significance of the highly probable noise

impact is rated to be **high**. Noise mitigation procedures would be required in the form of a 2 m high noise barrier extending 20 m on either side of the toll booth. It is expected that the residual intensity and significance of the noise impact would be reduced to **LOW-MEDIUM**.

Park Rynie mainline toll plaza

Suburban residential land would be located approximately 350 m east of the location for the proposed Park Rynie mainline toll plaza. It is predicted that the intensity of the noise impact associated with the operation of the toll plaza would range between low and medium, thus the potential impact is deemed of **medium** significance. Locating the toll plaza at least 630 m from the nearest suburban residential land would reduce the intensity and significance of the noise impact to **NEGLIGIBLE**. Alternatively, a noise barrier (of at least 3 m height and extending 100 m beyond each side of the toll booths) would reduce the intensity and significance of the potential noise impact to **LOW**.

Adams Road ramp toll plazas

Commercial land would be located to the east of the reconstructed Adams Road Interchange and ramp toll plazas for which no noise impact is anticipated. However, noise sensitive land is situated in close proximity of both the existing ramps. The increased elevation of the proposed new off-ramp and commencement of the on-ramp would result in these being more exposed to existing residences. The potential intensity and significance of the noise impact on this land is assessed to be **high**. The potential noise impact of toll plazas on the new ramps, and relevant noise mitigation measures, would need to be determined and incorporated at the detail design stage, as appropriate.

Additional lanes between the Amanzimtoti River Bridge and Isipingo Interchange

Road traffic on the existing N2 between Amanzimtoti and the Isipingo Interchange causes the current noise rating level on adjacent land to significantly exceed the 65 dBA maximum limit stipulated by the Noise Control Regulations for all noise sensitive land excluding land zoned for industrial use. The addition of a third lane (and fourth lane between Dickens Road and Joyner Road Interchanges in each direction) is expected to result in a further increase in the noise rating level. The N2 passes through residential suburbs along this section of the proposed toll highway with residential properties extending up to the road reserve. At least one school (i.e. Umbogintwini Primary) also bounds the road reserve. In terms of the Noise Control Regulations, noise mitigation measures along this section would need to be implemented to reduce the noise rating level to 65 dBA on all land zoned for residential, educational, hospital and office use. This implies the **reduction of existing noise levels** that are significantly higher than 65 dBA. Due to the variation in topography, the distance to nearest noise sensitive land, the available space and the ground conditions for the erection of noise barriers, the mitigation measures along this section of the proposed toll highway would need to be determined and incorporated at the detailed design stage, with due regard to cost implications of each alternative and/or combined noise mitigation procedures.

It should be noted that compliance with the legal requirements of the Noise Control Regulations (ensuring that the noise rating level does not exceed 65 dBA) might still result in a noise impact that is unacceptable in terms of SANS 10103 (refer to the noise specialist report, Volume 3, Appendix 8).

Table 13.6: Summary assessment of key potential noise impacts – Mthamvuna River to Isipingo Interchange

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Impacts associated with the proposed Pennington ramp toll plazas						
Without mitigation	Local	Long term	High	Highly probable	High	Medium
With mitigation	Local	Long term	Low-Medium	Highly probable	LOW-MEDIUM	Medium

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Impacts associated with the proposed Park Rynie mainline and ramp toll plazas						
Without mitigation	Local	Long term	Medium	Highly probable	Medium	Medium
With mitigation	Local	Long term	Negligible/Low	Highly probable	NONE/LOW	Medium
Impacts associated with the proposed Adams Road ramp toll plazas						
Without mitigation	Local	Long term	High	Highly probable	High	Medium
With mitigation	Local	Long term	*	Highly probable	*	Medium
Impacts associated with the proposed additional lanes						
Without mitigation	Local	Long term	Very high	Highly probable	Very high	Medium
With mitigation	Local	Long term	*	Highly probable	*	Medium

* To be determined during detailed design

13.2.6 AIR QUALITY

Key potential impacts on air quality are predicted in the section between Amanzimtoti and the Isipingo Interchange. A summary of the assessment of the key potential impacts is provided in Table 13.7.

The average daily vehicle numbers at Prospecton of 54 000 (in 2005 – the “base case”) is estimated to increase to about 150 000 (“do nothing” scenario) and 133 000 (with implementation of the proposed toll highway) in 2035. The expected increase in traffic volumes would result in ambient concentrations of all modelled pollutants (carbon monoxide, oxides of nitrogen, selected Volatile Organic Compounds, etc. – see specialist air quality report in Volume 4, Appendix 9) to far exceed the Air Quality Act standard horizontally from the roadside and beyond the modelled 1 km approach and departure from the Isipingo mainline toll plaza. In 2015, 2025 and 2035, both carbon monoxide and particulate matter concentrations are predicted to exceed the respective limit and standard values but this would be restricted to the immediate roadside. At Prospecton and the Isipingo mainline toll plaza the associated air quality impacts would remain at a local scale, but would persist as long as the road is operational. The probable impact on air quality is assessed to be of **MEDIUM** significance without and with mitigation.

Potential health risks due to nitrogen dioxide exposure are predicted at certain locations for the “base case” and subsequent years (up to 2035) in both the “do nothing” scenario and with implementation of the proposed toll highway, as follows:

- 2005 - Prospecton (up to about 100 m from the roadside);
- 2015 – Prospecton (up to about 250 m);
- 2025 – Prospecton (up to 500 m and beyond); Scottburgh (up to 50m); and
- 2035 – Prospecton (up to 500 m and beyond); Scottburgh (up to 100 m); Sezela (up to 50m).

It is recommended that discussions be held with the local municipalities, in particular the eThekweni Municipality, to address the long-term plans for air quality management in the relevant areas. The following recommendations are made with regard to toll plazas: sites with favourable meteorological conditions should be considered in the finalisation of toll plaza locations – the factors to consider are relatively elevated flat areas, avoiding valley sites and areas where the general wind flow is impeded by topography; toll plazas should not be located in the immediate vicinity of areas where people live and carry out their daily business; traffic flow through the toll plazas should be optimised and vehicle idling times should be limited to a minimum, particularly during peak times; an occupational health study should be conducted to assess the impact on workers’ health – this study may also assess design specifications for the toll booths to isolate the occupants as far as possible from the ambient environment; and the air quality in toll booths should be monitored for a period of time taking into account diurnal and seasonal traffic volumes.

Table 13.7: Summary assessment of key potential air quality impacts – Mthamvuna River to Isipingo Interchange

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Impacts associated with anticipated increased traffic volumes and the proposed Isipingo Toll Plaza in the Prospecton area						
Without mitigation	Local	Long term	Medium	Probable	Medium	Medium
With mitigation	Local	Long term	Medium	Probable	MEDIUM	Medium

13.2.7 VISUAL

The only key potential visual impact identified along this section of the proposed toll highway relates to the proposed Park Rynie and Isipingo mainline toll plazas. A summary of the assessment of this key potential impact is provided in Table 13.8.

The proposed Park Rynie and Isipingo mainline toll plazas would be located within or close to urban areas already impacted and affected by well lit industrial facilities of similar visual nature as a toll plaza (see Figures 13.3 and 13.4). The Visual Absorption Capacity of the areas is regarded as medium to high due to the height of adjacent vegetation and diverse surrounding visual pattern. This would assist in blending the structure with the surrounding landscape. It is considered that a brightly lit plaza would result in a higher negative visual impact during the night due to the highly visible and intrusive beacon effect of the lighting. The highly probable, permanent visual impact of the proposed Park Rynie and Isipingo mainline toll plazas is rated to be of **medium** significance. Implementation of mitigation measures such as the use of colour variations, building form, lighting, landscaping and screening in order to reduce scale, avoiding reflection or deflection of sunlight or artificial light and avoiding light spillage would result in a residual visual impact of **LOW-MEDIUM** significance.

Table 13.8: Summary assessment of key potential visual impacts – Mthamvuna River to Isipingo Interchange

ISSUE / IMPACT	EXTENT	DURATION	INTENSITY	PROBABILITY	SIGNIFICANCE	CONFIDENCE
Impacts associated with the proposed Park Rynie and Isipingo mainline toll plazas						
Without mitigation	Local	Permanent	Medium	Highly probable	Medium	Medium
With mitigation	Local	Permanent	Low-medium	Highly probable	LOW-MEDIUM	Medium



Figure 13.3: Park Rynie mainline toll plaza viewshed analysis



Figure 13.4: Isipingo mainline toll plaza viewshed analysis