

PART E: CONCLUSIONS AND RECOMMENDATIONS

Part E of this report comprises one chapter providing conclusions and recommendations to the EIA:

- **Chapter 16 – Conclusions and recommendations:** Provides conclusions to the EIA through an overall summary of the significance of key potential impacts associated with the proposed works, including physical toll plazas, along the road sections of the proposed toll highway. Conclusions to the comparative assessment of alternative route alignments and toll plaza locations brought forward for further investigation in this phase of the EIA process are also provided. Recommendations are then made on preferred alternative route alignments and mainline toll plaza locations and mitigation, enhancement and management measures applicable to the further planning, design, construction and operation of the proposed project (if approved).

CHAPTER 16 CONCLUSIONS AND RECOMMENDATIONS

This chapter provides conclusions to the EIA through providing a summary of the significance of key potential impacts associated with the construction and operational phases of the proposed works, including physical toll plazas, along the various road sections of the proposed toll highway. A summary is also provided of the comparative assessment of the alternative route alignments (Section 16.3) and alternative toll plaza locations (Section 16.4) considered in the relevant road sections. Conclusions on the evaluation of the overall ecological, social and economic sustainability of the proposed project are also provided. Recommendations are then made on preferred alternative route alignments and mainline toll plaza locations and mitigation, enhancement and management measures applicable to the further planning, design, construction and operation of the proposed project (if approved).

16.1 INTRODUCTION

The Scoping Study phase of this EIA process resulted in the identification of numerous issues and concerns relating to the proposed N2 Wild Coast Toll Highway. The issues and concerns which were to be addressed in the Impact Assessment phase of the EIA process were comprehensively described in Chapter 8 of the FSR. These related to potential biophysical, social and economic impacts which could result from the construction and operational phases of the proposed project. The findings of 13 specialist studies on these potential impacts are integrated and synthesised in this report.

The Scoping Study included consideration of various alternatives, namely the “do nothing” alternative, alternative route alignments and alternative positions for certain proposed mainline toll plazas. The following alternatives were considered in the Scoping Study:

- Upgrading the existing N2 between Mthatha and Port Shepstone in relation to the “do nothing” alternative;
- Upgrading the existing R61 between Mthatha and Port Shepstone in relation to the “do nothing” alternative;
- Gallagher route between Mthatha and Port Shepstone in relation to the “do nothing” alternative; and
- Alternative greenfields routes between Lusikisiki and the Mthamvuna River, as follows:
 - SANRAL’s preferred alignment;
 - The Inland Mzamba route;
 - The coastal route;
 - The SDI route;
 - The WESSA route; and
 - The Coastal Mzamba route.

In addition, a number of localised alternative route alignments were considered in the FSR, as follows:

- Upgrading the existing R61 between Ndwalane and Ntafufu River via the Pondoland Bridge; and
- Site-specific alternative route alignments in the greenfields sections of the proposed route, i.e. between Ndwalane and the Ntafufu River and between Lusikisiki and the Mthamvuna River.

The FSR provided a comparative analysis of the environmental, technical, financial and economic implications of the alternative route alignments, as appropriate, and indicated which ones would be carried forward for assessment in the Impact Assessment phase of this EIA. The following alternatives were considered “feasible” and were taken forward for further investigation and assessment in the Impact Assessment phase of the EIA:

- The “do nothing” alternative;
- SANRAL’s preferred alignment between Lusikisiki and the Mthamvuna River;
- The Coastal Mzamba route between Lusikisiki and the Mthamvuna River;
- Alternative mainline toll plaza positions to SANRAL’s preferred Ndwalane and Mthentu mainline toll plazas; and
- The site-specific alternative route alignments in the greenfields sections of the proposed project, i.e. in the sections between Ndwalane and Ntafufu and between Lusikisiki and the Mthamvuna River, as follows:
 - for the proposed alignment between Ndwalane and the Mzimvubu River;
 - for the proposed alignment in the vicinity of Ntafufu village and the Ntafufu River;
 - for the proposed alignment across the Msikaba River;
 - for the proposed alignment across the Mthentu River; and
 - for the proposed alignment across the Mnyameni River.

The potential implications of the “do nothing” alternative were used mainly as a “base case” against which the potential impacts of the proposed project and the other identified feasible alternatives were measured. The various alternatives considered in the Impact Assessment phase of the EIA are addressed, as appropriate, in Parts C and D of this report, and are summarised in Sections 16.3 and 16.4 below.

16.2 CONCLUSIONS: ASSESSMENT OF ROAD SECTIONS

16.2.1 GONUBIE INTERCHANGE TO NGOBOZI

As mentioned in Sections 4.2.1 and 7.1, all proposed construction activities between the Gonubie Interchange and Ngobozi would take place within the existing road reserve, with the exception of the proposed Komga Interchange and the mainline toll plaza at Ngobozi. Table 16.1 provides an overall summary of the significance of key potential impacts (without and with mitigation/enhancement) that would result from the proposed works along this road section.

The assessment has identified the following key residual negative and positive impacts:

Key residual negative impacts

It is anticipated that the proposed works along this road section would result in key residual negative impacts of **MEDIUM** significance in relation to the following:

- Impacts associated with water quality changes in estuaries during the operational phase;
- Impacts associated with graves; and
- Visual impacts associated with the proposed Ngobozi mainline toll plaza.

Key residual positive impacts

The following key residual positive impacts of **POSITIVE HIGH** significance are anticipated:

- Social impacts associated with increased employment opportunities during the construction phase;
- Social impacts associated with improved livestock safety; and
- Tourism impacts associated with an increase in the number of tourism products.

Key residual positive impacts of **POSITIVE MEDIUM** or **POSITIVE MEDIUM-HIGH** significance are anticipated in relation to the following:

- Social impacts associated with increased employment opportunities during the operational phase;
- Social impacts associated with improved safety for vehicle road users;
- Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route;
- Planning/development impacts associated with the nodal point at Mooiplaas; and
- Planning/development impacts associated with the proposed Komga Interchange.

Table 16.1: Overall summary of key potential impacts associated with the proposed works between the Gonubie Interchange and Ngobozi [ratings are negative unless indicated otherwise; ratings in () indicate impacts where no applicable/feasible mitigation/enhancement measures were identified]

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| VEGETATION AND FLORA | | | |
| Ngobozi mainline toll plaza and widening of road | Increased run-off and drainage, soil erosion, silt loads and sedimentation during construction and operation | Medium | LOW |
| | Invasion by alien weeds and invader plants | Medium | LOW |
| Upgrading of intersections | | | |
| FAUNA | | | |
| Operational phase of proposed toll highway | Impacts associated with increased fire risk | Medium | LOW |
| | Impacts associated with chemical pollution | Medium | LOW |
| | Impacts associated with noise and light pollution | Medium | LOW |
| AQUATIC ECOSYSTEMS | | | |
| RIPARIAN AND INSTREAM VEGETATION | | | |
| Construction and operation of the proposed toll highway, in particular river crossings | Destruction of riparian vegetation and loss of sensitive habitats during construction | High | LOW |
| | Increased surface run-off velocities leading to risk of erosion (due to loss of riparian vegetation) and drying out of localised catchments (due to diversion away from these catchments) | Medium | LOW |
| | Impacts associated with risk of surface and groundwater pollution during construction | Medium | LOW |
| | Impacts associated with reduction in permeable surfaces | Medium | LOW |
| | Impacts associated with diversion of flow from hard surfaces | Medium | LOW |
| | Change in vegetation community type as a result of introducing exotic plant species during construction | Medium | LOW |
| WETLANDS | | | |
| Hard surfaces associated with the proposed upgrading and widening of the road | Impacts associated with diversion of flow by hard surfaces | Medium | LOW |
| | Impacts associated with change in vegetation community type | Medium | LOW |
| | Physical change to wetland areas | Medium | LOW |
| ESTUARIES | | | |
| Proposed upgrading and rehabilitation | Impacts associated with sedimentation | Medium | LOW |
| Potential oil, grease and fuel spillages in the river catchments | Impacts associated with water quality changes | Medium | LOW / MEDIUM |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|---|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| SOCIAL | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increased employment opportunities | <i>Low-medium+</i> | <i>MEDIUM+/HIGH+</i> |
| | Impacts associated with improved safety for vehicle road users | <i>Medium+</i> | <i>MEDIUM+</i> |
| | Impacts associated with reduction of access points | <i>Medium</i> | <i>LOW-MEDIUM</i> |
| | Impacts associated with increased risk of HIV/AIDS and STDs | <i>Medium</i> | <i>LOW-MEDIUM</i> |
| | Impacts associated with traffic delays | <i>Medium</i> | <i>LOW</i> |
| | Impacts associated with increased taxi-related tension | <i>Medium-high</i> | <i>LOW-MEDIUM</i> |
| | Impacts associated with improved livestock safety | <i>High+</i> | <i>HIGH+</i> |
| | Impacts associated with negative influences on existing family networks and social structures | <i>Medium</i> | <i>LOW-MEDIUM</i> |
| TOURISM | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increase in the number of tourism products | <i>Medium+</i> | <i>HIGH+</i> |
| | Impacts associated with increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route | <i>Medium+</i> | <i>MEDIUM-HIGH+</i> |
| CULTURAL AND HISTORICAL HERITAGE | | | |
| Construction of the proposed toll highway | Impacts associated with graves | <i>High</i> | <i>MEDIUM</i> |
| VISUAL | | | |
| Ngobozi mainline toll plaza | Visual impacts | <i>High</i> | <i>MEDIUM</i> |
| PLANNING/DEVELOPMENT | | | |
| Operation of the proposed toll highway | Impacts associated with the nodal point at Mooiplaas | <i>Medium+</i> | <i>MEDIUM+</i> |
| | Impacts associated with the proposed Komga Interchange | <i>Medium+</i> | <i>MEDIUM+</i> |

16.2.2 NGOBOZI TO MTHATHA (NGQELENI)

As mentioned in Sections 4.2.2 and 8.1, the proposed works along this section of the proposed toll highway would generally involve upgrading and widening within the existing road reserve, except for the proposed interchanges, intersection upgrades, safety and access upgrades in Butterworth and Dutywa and the mainline toll plaza near the Candu River. Table 16.2 provides an overall summary of the significance of key potential impacts (without and with mitigation/enhancement) that would result from the proposed works between Ngobozi and Mthatha (Ngqeleni).

The assessment has identified the following key residual negative and positive impacts:

Key residual negative impacts

It is anticipated that the proposed works along this road section would result in key residual negative impacts of **HIGH** significance in relation to social impacts associated with reduction of access points onto the proposed toll highway.

The following key residual negative impacts of **MEDIUM** significance are anticipated:

- Impacts associated with water quality changes in estuaries during the operational phase;
- Resettlement of affected households;
- Rural severance effects;
- Urban severance effects;
- Impacts associated with graves;
- Visual impacts associated with the proposed Candu mainline toll plaza; and
- Planning/development implications for Butterworth and Dutywa.

Key residual positive impacts

The following key residual positive impacts of **POSITIVE HIGH** significance are anticipated:

- Social impacts associated with increased employment opportunities during the construction phase;
- Social impacts associated with improved safety for vehicle road users;
- Social impacts associated with improved livestock safety; and
- Tourism impacts associated with an increase in the number of tourism products.

Key residual positive impacts of **POSITIVE MEDIUM** or **POSITIVE MEDIUM-HIGH** significance are anticipated in relation to the following:

- Social impacts associated with increased employment opportunities during the operational phase;
- Social impacts associated with improved traffic flow;
- Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route;
- Planning/development impacts associated with nodal points at Qunu and Viedgesville; and
- Planning/development implications for Mthatha.

Table 16.2: Overall summary of key potential impacts associated with the proposed works between Ngobozi and Mthatha (Ngqeleni) [ratings are negative unless indicated otherwise; ratings in () indicate impacts where no applicable/feasible mitigation/enhancement measures were identified]

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| VEGETATION AND FLORA | | | |
| Candu mainline toll plaza | Increased run-off and drainage, soil erosion, silt loads and sedimentation during construction and operation | Medium | LOW |
| | Invasion by alien weeds and invader plants | Medium | LOW |
| Upgrading of intersections | | | |
| Widening of road | Loss of habitat | Medium | LOW |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during construction and operation | Medium | LOW |
| | Invasion by alien weeds and invader plants | Medium | LOW |
| New carriageway bridges at the Mthatha and Corana rivers | Loss of habitat | Medium | LOW |
| | Fragmentation of habitat | Medium | LOW |
| | Invasion by alien weeds and invader plants | Medium | LOW |
| | Disruption of the flow of nutrients and materials | Medium | LOW |
| FAUNA | | | |
| Operation of proposed toll highway | Impacts associated with increased fire risk | Medium | LOW |
| | Impacts associated with chemical pollution | Medium | LOW |
| | Impacts associated with noise and light pollution | Medium | LOW |
| AQUATIC ECOSYSTEMS | | | |
| RIPARIAN AND INSTREAM VEGETATION | | | |
| Construction and operation of the proposed toll highway, in particular river crossings | Destruction of riparian vegetation and loss of sensitive habitats during construction | High | LOW |
| | Increased surface run-off velocities leading to risk of erosion (due to loss of riparian vegetation) and drying out of localised catchments (due to diversion away from these catchments) | Medium | LOW |
| | Impacts associated with risk of surface and groundwater pollution during construction | Medium | LOW |
| | Impacts associated with reduction in permeable surfaces | Medium | LOW |
| | Impacts associated with diversion of flow from hard surfaces | Medium | LOW |
| | Change in vegetation community type as a result of introducing exotic plant species during construction | Medium | LOW |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|---|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| WETLANDS | | | |
| Hard surfaces associated with the proposed upgrading and widening of the road | Impacts associated with diversion of flow by hard surfaces | Medium | LOW |
| | Impacts associated with change in vegetation community type | Medium | LOW |
| | Physical change to wetland areas | Medium | LOW |
| ESTUARIES | | | |
| Proposed upgrading and rehabilitation | Impacts associated with sedimentation | Medium | LOW |
| Potential oil, grease and fuel spillages in the river catchments | Impacts associated with water quality changes | Medium | LOW / MEDIUM |
| SOCIAL | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increased employment opportunities | <i>Low-medium+</i> | <i>MEDIUM+/HIGH+</i> |
| | Impacts associated with improved safety for vehicle road users | <i>High+</i> | <i>HIGH+</i> |
| | Impacts associated with reduction of access points | <i>Very high</i> | <i>HIGH</i> |
| | Impacts associated with increased risk of HIV/AIDS and STDs | Medium | LOW-MEDIUM |
| | Impacts associated with traffic delays | Medium | LOW |
| | Impacts associated with increased taxi-related tension | Medium-high | LOW-MEDIUM |
| | Impacts associated with improved traffic flow | <u>Medium+</u> | <u>MEDIUM+</u> |
| | Impacts associated with improved livestock safety | <i>High+</i> | <i>HIGH+</i> |
| | Impacts associated with loss of use of the existing road reserve | Medium | LOW |
| | Impacts associated with resettlement of affected households | High | MEDIUM |
| | Impacts associated with loss of grazing and arable land of displaced households | Medium | LOW |
| | Impacts associated with rural severance effects | Medium/High | LOW/MEDIUM |
| | Impacts associated with urban severance effects | High | MEDIUM |
| | Impacts associated with uncontrolled secondary development | Medium | LOW |
| Impacts associated with negative influences on existing family networks and social structures | Medium | LOW-MEDIUM | |
| TOURISM | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increase in the number of tourism products | <i>Medium+</i> | <i>HIGH+</i> |
| | Impacts associated with increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route | <i>Medium+</i> | <i>MEDIUM-HIGH+</i> |
| CULTURAL AND HISTORICAL HERITAGE | | | |
| Construction of the proposed toll highway | Impacts associated with graves | High | MEDIUM |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|-------------------------------------|-----------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHAMNCEMENT |
| VISUAL | | | |
| Candu mainline toll plaza | Visual impacts | High | MEDIUM |
| PLANNING/DEVELOPMENT | | | |
| Operation of the proposed toll highway | Impacts associated with the proposed Ndabakazi Interchange | Medium (Neutral) | LOW+ |
| | Implications for Butterworth | High | MEDIUM |
| | Implications for Dutywa | High | MEDIUM |
| | Implications for Mthatha | High | MEDIUM+ |
| | Impacts associated with nodal points at Qunu and Viedgesville | Medium+ | MEDIUM+ |

16.2.3 MTHATHA (NGQELENI) TO NDWALANE

The proposed works along this section of the proposed toll highway, as described in Sections 4.2.3 and 9.1, would generally take place within the existing road reserve, except for short sections requiring widening, intersection upgrades, vehicular overpasses and interchanges. Measures to stabilise cuts and fills may also require additional land outside the existing road reserve. Table 16.3 provides an overall summary of the significance of key potential impacts (without and with mitigation/enhancement) that would result from the proposed works between Mthatha (Ngqeleni) and Ndwalane.

The assessment has identified the following key residual negative and positive impacts:

Key residual negative impacts

It is anticipated that the proposed works along this road section would result in key residual negative impacts of **MEDIUM** significance in relation to the following:

- Disruption of faunal movement during the operational phase;
- Faunal impacts associated with noise and light pollution;
- Impacts associated with water quality changes in estuaries during the operational phase;
- Social impacts associated with resettlement of affected households;
- Rural severance effects;
- Negative influences on existing family networks and social structures;
- Tourism impacts associated with increased access to environmentally sensitive areas; and
- Impacts associated with graves.

Key residual positive impacts

The following key residual positive impacts of **POSITIVE HIGH** significance are anticipated:

- Social impacts associated with increased employment opportunities during the construction and operational phase;
- Social impacts associated with improved safety for vehicle road users;
- Social impacts associated with improved livestock safety; and
- Tourism impacts associated with an increase in the number of tourism products.

Key residual positive impacts of **POSITIVE MEDIUM** or **POSITIVE MEDIUM-HIGH** significance are anticipated in relation to the following:

- Social impacts associated with improvement in transport provision;
- Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route; and
- Planning/development implications for the Thombo area.

Table 16.3: Overall summary of key potential impacts associated with the proposed works between Mthatha (Ngqeleni) and Ndwalane [ratings are negative unless indicated otherwise; ratings in () indicate impacts where no applicable/feasible mitigation/enhancement measures were identified]

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|-------------------------------------|----------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| VEGETATION AND FLORA | | | |
| Upgrading of intersections | Invasion by alien weeds and invader plants | Medium | LOW |
| Widening of road | Loss of habitat | Medium | LOW |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during construction and operation | Medium | LOW |
| | Invasion by alien weeds and invader plants | Medium | LOW |
| Bridge widening at Mngazi River | Loss of habitat | Medium | LOW |
| | Fragmentation of habitat | Medium | LOW |
| | Invasion by alien weeds and invader plants | Medium | LOW |
| | Disruption of the flow of nutrients and materials | Medium | LOW |
| FAUNA | | | |
| Operation of the proposed toll highway | Disruption of faunal movement | Medium | (MEDIUM) |
| | Impacts associated with invasion of alien species | Medium | LOW |
| | Impacts associated with increased fire risk | Medium | LOW |
| | Impacts associated with chemical pollution | Medium | LOW |
| | Impacts associated with noise and light pollution | Medium | (MEDIUM) |
| AQUATIC ECOSYSTEMS | | | |
| RIPARIAN AND INSTREAM VEGETATION | | | |
| Construction and operation of the proposed toll highway, in particular river crossings | Destruction of riparian vegetation and loss of sensitive habitats during construction | High | LOW |
| | Increased surface run-off velocities leading to risk of erosion (due to loss of riparian vegetation) and drying out of localised catchments (due to diversion away from these catchments) | Medium | LOW |
| | Impacts associated with risk of surface and groundwater pollution during construction | Medium | LOW |
| | Impacts associated with reduction in permeable surfaces | Medium | LOW |
| | Impacts associated with diversion of flow from hard surfaces | Medium | LOW |
| | Change in vegetation community type as a result of introducing exotic plant species during construction | Medium | LOW |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|---|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| WETLANDS | | | |
| Proposed upgrading and widening of the road | Physical change to wetland areas | Medium | LOW |
| ESTUARIES | | | |
| Proposed upgrading and rehabilitation and operation of the road | Impacts associated with sedimentation | Medium | LOW |
| | Impacts associated with water quality changes | Medium | LOW / MEDIUM |
| | Impacts associated with improved access | Very high | HIGH |
| SOCIAL | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increased employment opportunities | Medium+/High+ | HIGH+ |
| | Impacts associated with improved safety for vehicle road users | High+ | (HIGH+) |
| | Increased safety hazards for pedestrians | Medium | LOW |
| | Impacts associated with increased risk of HIV/AIDS and STDs | Medium | LOW-MEDIUM |
| | Increased crime | Medium | LOW |
| | Impacts associated with traffic delays | Medium | LOW |
| | Increased taxi-related tension | Medium | LOW |
| | Impacts associated with improved livestock safety | High+ | (HIGH+) |
| | Impacts associated with loss of use of the existing road reserve | Medium | LOW |
| | Impacts associated with resettlement of affected households | High | MEDIUM |
| | Impacts associated with rural severance effects | Medium/High | LOW/MEDIUM |
| | Impacts associated with uncontrolled secondary development | Medium | LOW |
| | Impacts associated with improvement in transport provision | Medium+ | (MEDIUM+) |
| Impacts associated with negative influences on existing family networks and social structures | Medium-high | MEDIUM | |
| TOURISM | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increase in the number of tourism products | Medium+ | HIGH+ |
| | Impacts associated with increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route | Medium+ | MEDIUM-HIGH+ |
| | Impacts associated with increased access to environmentally sensitive areas | Medium | (MEDIUM) |
| CULTURAL AND HISTORICAL HERITAGE | | | |
| Construction of the proposed toll highway | Impacts associated with graves | High | MEDIUM |
| PLANNING/DEVELOPMENT | | | |
| Operation of the proposed toll highway | Impacts associated with nodes along the existing R61 | Medium (Neutral) | LOW+ |
| | Implications for the Thombo area | Medium+ | MEDIUM+ |

16.2.4 NDWALANE TO NTAUFUFU RIVER

This section of the proposed toll highway, as described in Sections 4.2.4 and 10.1, would involve the construction of a new “greenfields” road to national road standards between Ndwalane and Ntafufu. The proposed new road would divert from the existing R61 approximately 10 km inland of Port St Johns and would bypass the existing Mzimvubu Pondoland Bridge. The proposed new road would comprise a two-lane single carriageway highway, with climbing lanes where required and a minimum design speed of 100 to 120 km/h. The width of the road would generally be a minimum of 12.4 m (2x3.7 m lanes and 2x2.5 m paved shoulders) within a road reserve of 80 m. The proposed new road includes the construction of a major high-level bridge crossing over the Mzimvubu River, a conventional bridge over the Ntafufu River and interchanges at Ndwalane and Ntafufu. Table 16.4 provides an overall summary of the significance of key potential impacts (without and with mitigation/enhancement) that would result from the proposed works between Ndwalane and the Ntafufu River.

The assessment has identified the following key residual negative and positive impacts:

Key residual negative impacts

It is anticipated that the proposed works along this road section would result in key residual negative impacts of **HIGH** significance in relation to the following:

- Faunal impacts associated with loss of sensitive habitats during construction;
- Impacts on estuaries associated with improved access; and
- Noise impacts associated with operation of the proposed toll highway.

The following key residual negative impacts of **MEDIUM** significance are anticipated:

- Vegetation and flora impacts associated with loss of habitat, loss of biodiversity and fragmentation of habitat;
- Vegetation and flora impacts associated with increased accessibility of remote habitats;
- Vegetation and flora impacts associated with reduction in resilience/stability of ecosystems;
- Faunal impacts associated with loss of faunal diversity and loss of Species of Special Concern;
- Disruption of faunal movement during the operational phase;
- Faunal impacts associated with chemical pollution;
- Faunal impacts associated with noise and light pollution;
- Impacts associated with water quality changes in estuaries during the operational phase;
- Social impacts associated with increased safety hazards for pedestrians and traffic;
- Social impacts associated with loss of use of the existing road reserve;
- Rural severance effects;
- Negative influences on existing family networks and social structures;
- Tourism impacts associated with increased access to environmentally sensitive areas;
- Impacts associated with graves; and
- Visual impacts associated with the proposed new bridges.

Key residual positive impacts

The following key residual positive impacts of **POSITIVE HIGH** significance are anticipated:

- Social impacts associated with increased employment opportunities;
- Social impacts associated with improved safety for vehicle road users;
- Social impacts associated with improved livestock safety; and
- Tourism impacts associated with an increase in the number of tourism products.

Key residual positive impacts of **POSITIVE MEDIUM** or **POSITIVE MEDIUM-HIGH** significance are anticipated in relation to the following:

- Social impacts associated with improvement in transport provision; and
- Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route.

Table 16.4: Overall summary of key potential impacts associated with the proposed works between Ndwalane and the Ntafufu River [ratings are negative unless indicated otherwise; ratings in () indicate impacts where no applicable/feasible mitigation measures were identified; mitigation measures in () indicate recommendations considered not effective in reducing the significance of potential impacts]

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| VEGETATION AND FLORA | | | |
| Proposed new road (along alternative alignments 1e and 2f – SANRAL preferred routes) with interchanges at Ndwalane and Ntafufu | Loss of habitat | High | MEDIUM |
| | Loss of biodiversity | Medium | (MEDIUM) |
| | Fragmentation of habitat | High | MEDIUM |
| | Loss of species of special concern | Medium | LOW |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | Medium | LOW |
| | Invasion by alien weeds and invader plants during the operational phase | High | LOW |
| | Increased accessibility of remote habitats during the operational phase | Medium | (MEDIUM) |
| | Reduction in resilience/stability of ecosystems | Medium | (MEDIUM) |
| Ndwalane mainline and ramp toll plazas | | | |
| Ndwalane mainline and ramp toll plazas | Loss of habitat | Medium | (MEDIUM) |
| | Loss of biodiversity | Medium | LOW |
| | Loss of species of special concern | Medium | LOW |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | Medium | LOW |
| | Invasion by alien weeds and invader plants during the operational phase | High | LOW |
| Proposed high-level bridge over the Mzimvubu River | | | |
| Proposed high-level bridge over the Mzimvubu River | Loss of habitat | Medium | LOW |
| | Fragmentation of habitat | Medium | LOW |
| | Invasion by alien weeds and invader plants during the operational phase | High | LOW |
| | Disruption of the flow of nutrients and materials during construction | Medium | LOW |
| FAUNA | | | |
| Proposed new road (along alternative alignments 1e and 2f – SANRAL preferred routes), new bridges and interchanges at Ndwalane and Ntafufu | Loss of sensitive faunal habitats | High | (HIGH) |
| | Loss of faunal diversity | Medium | (MEDIUM) |
| | Loss of species of special concern | Medium | (MEDIUM) |
| | Impacts on the Cape Griffon Vulture | Medium | LOW |
| | Disruption to faunal movement | Medium | (MEDIUM) |
| | Impacts associated with invasion of alien fauna | Medium | LOW |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| | Impacts associated with increased fire risk | Medium | LOW |
| | Impacts associated with chemical pollution | Medium | (MEDIUM) |
| | Impacts associated with noise and light pollution | Medium | (MEDIUM) |
| | Impacts associated with ecosystem disruption | Medium | LOW |
| AQUATIC ECOSYSTEMS | | | |
| RIPARIAN AND INSTREAM VEGETATION | | | |
| Proposed new road, in particular river crossings | Destruction of riparian vegetation and loss of sensitive habitats during construction | High | LOW |
| | Increased surface run-off velocities leading to risk of erosion (due to loss of riparian vegetation) and drying out of localised catchments (due to diversion away from these catchments) | Medium | LOW |
| | Impacts associated with risk of surface and groundwater pollution during construction | Medium | LOW |
| | Impacts associated with reduction in permeable surfaces | Medium | LOW |
| | Impacts associated with diversion of flow from hard surfaces | Medium | LOW |
| | Change in vegetation community type as a result of introducing exotic plant species during construction | Medium | LOW |
| RIVERS | | | |
| Construction and operation of the proposed bridges | Impacts associated with change in channel structure and loss of instream habitat | Medium/High | LOW |
| | Risk of surface and groundwater pollution | Medium | LOW |
| | Changes in ecosystem structure and function, and loss of biodiversity | Medium | LOW/LOW-MEDIUM |
| WETLANDS | | | |
| Construction and operation of the proposed greenfields section | Impacts associated with risk of surface and groundwater pollution | Medium/High | LOW |
| | Impacts associated with reduction in permeable surfaces | Medium | LOW |
| | Impacts associated with diversion of flow by hard surfaces | Medium | LOW |
| | Change in vegetation community type | Medium/High | LOW |
| | Physical change to wetland areas | Medium | LOW |
| ESTUARIES | | | |
| Construction and operation of the proposed greenfields section | Impacts associated with sedimentation | Medium | LOW |
| | Impacts associated with water quality changes | Medium | LOW/MEDIUM |
| | Impacts associated with improved access | Very high | HIGH |
| SOCIAL | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increased employment opportunities | Medium+/High+ | HIGH+ |
| | Impacts associated with improved safety for vehicle road users | High+ | (HIGH+) |
| | Increased safety hazards for pedestrians and traffic | Medium/High | LOW/MEDIUM |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| | Impacts associated with increased risk of HIV/AIDS and STDs | Medium | LOW-MEDIUM |
| | Increased crime | Medium | LOW |
| | Increased taxi-related tension and violence | Medium | LOW |
| | Impacts associated with improved livestock safety | <i>High+</i> | <i>(HIGH+)</i> |
| | Impacts associated with loss of use of the existing road reserve | Medium | (MEDIUM) |
| | Impacts associated with rural severance effects | Medium/High | LOW/MEDIUM |
| | Impacts associated with uncontrolled secondary development | Medium-high | LOW |
| | Impacts associated with improvement in transport provision | <i>Medium+</i> | <i>(MEDIUM+)</i> |
| | Impacts associated with negative influences on existing family networks and social structures | Medium-high | MEDIUM |
| TOURISM | | | |
| Operation of the proposed toll highway | Impacts associated with increase in the number of tourism products | <i>Medium+</i> | <i>HIGH+</i> |
| | Impacts associated with increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route | <i>Medium+</i> | <i>MEDIUM-HIGH+</i> |
| | Impacts associated with increased access to environmentally sensitive areas | Medium | (MEDIUM) |
| CULTURAL AND HISTORICAL HERITAGE | | | |
| Construction and operation of the proposed greenfields section | Impacts associated with graves | High | MEDIUM |
| | Archaeological sites | Medium-high | LOW-MEDIUM |
| NOISE | | | |
| Construction and operation of the proposed greenfields section | Noise impacts | Medium/Very high | LOW/HIGH |
| Proposed Ndwalane mainline and ramp toll plazas | | Medium | NONE/LOW |
| VISUAL | | | |
| Proposed Ndwalane mainline toll plaza | Visual impacts | Medium | LOW-MEDIUM |
| Mzimvubu and Ntafufu River bridges | | Medium | (MEDIUM) |
| PLANNING/DEVELOPMENT | | | |
| Operation of the proposed toll highway | Implications for the Ntafufu area | Medium | MEDIUM (NEUTRAL) |

16.2.5 NTAUFUFU RIVER TO LUSIKISIKI (MAGWA INTERSECTION)

The proposed works along this section of the proposed toll highway, as described in Sections 4.2.5 and 11.1, would generally involve upgrading and widening within the existing road reserve, except for the proposed Lusikisiki Interchange and safety features such as over- and underpasses. Table 16.5 provides an overall summary of the significance of key potential impacts (without and with mitigation/enhancement) that would result from the proposed works between the Ntafufu River and Lusikisiki (Magwa Intersection).

The assessment has identified the following key residual negative and positive impacts:

Key residual negative impacts

It is anticipated that the proposed works along this road section would result in key residual negative impacts of **HIGH** significance in relation to impacts on estuaries as a result of improved access.

The following key residual negative impacts of **MEDIUM** significance are anticipated:

- Loss of faunal diversity;
- Invasion of faunal species;
- Impacts associated with water quality changes in estuaries during the operational phase;
- Social impacts associated with an increased risk of HIV/AIDS;
- Social impacts associated with construction-related traffic delays;
- Resettlement of affected households;
- Rural severance effects;
- Negative influences on existing family networks and social structures;
- Tourism impacts associated with increased access to environmentally sensitive areas; and
- Impacts associated with graves.

Key residual positive impacts

The following key residual positive impacts of **POSITIVE HIGH** significance are anticipated:

- Social impacts associated with increased employment opportunities during the construction and operational phase;
- Social impacts associated with improved safety for vehicle road users; and
- Tourism impacts associated with an increase in the number of tourism products.

Key residual positive impacts of **POSITIVE MEDIUM** or **POSITIVE MEDIUM-HIGH** significance are anticipated in relation to the following:

- Social impacts associated with improvement in transport provision;
- Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route; and
- Planning/development implications for the Mbotyi tourism node.

Table 16.5: Overall summary of key potential impacts associated with the proposed works between the Ntafufu River and Lusikisiki (Magwa Intersection) [ratings are negative unless indicated otherwise; ratings in () indicate impacts where no applicable/feasible mitigation/enhancement measures were identified]

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|---|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| VEGETATION AND FLORA | | | |
| Construction of Lusikisiki Interchange and upgrading of intersections | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | Medium | LOW |
| | Invasion by alien weeds and invader plants | Medium | LOW |
| Widening and re-alignment of road | Loss of habitat | Medium | LOW |
| | Loss of species of special concern | Medium | LOW |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during operation | Medium | LOW |
| | Invasion by alien weeds and invader plants during construction and operation | Medium | LOW |
| | Disruption of the flow of nutrients and materials during construction | Medium | VERY LOW |
| Widening of Mzintlava River bridge | Loss of habitat | Medium | LOW |
| | Fragmentation of habitat | Medium | LOW |
| | Invasion by alien weeds and invader plants during construction and operation | Medium | LOW |
| | Disruption of the flow of nutrients and materials during construction | Medium | LOW |
| FAUNA | | | |
| Upgrading and widening of the existing R61 and operation of proposed toll highway | Loss of faunal diversity | Medium | (MEDIUM) |
| | Disruption of faunal movement | Medium | LOW |
| | Impacts associated with invasion of alien species | Medium | (MEDIUM) |
| | Impacts associated with increased fire risk | Medium | LOW |
| | Impacts associated with chemical pollution | Medium | LOW |
| | Impacts associated with noise and light pollution | Medium | LOW |
| | Impacts associated with ecosystem disruption | Medium | LOW |
| AQUATIC ECOSYSTEMS | | | |
| RIPARIAN AND INSTREAM VEGETATION | | | |
| Upgrading and widening of the existing R61 and operation of proposed toll highway | Destruction of riparian vegetation and loss of sensitive habitats during construction | High | LOW |
| | Increased surface run-off velocities leading to risk of erosion (due to loss of riparian vegetation) and drying out of localised catchments (due to diversion away from these catchments) | Medium | LOW |
| | Impacts associated with risk of surface and groundwater pollution during construction | Medium | LOW |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|---|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| | Impacts associated with reduction in permeable surfaces | Medium | LOW |
| | Impacts associated with diversion of flow from hard surfaces | Medium | LOW |
| | Change in vegetation community type as a result of introducing exotic plant species during construction | Medium | LOW |
| WETLANDS | | | |
| Construction and operational phases of the proposed toll highway | Impacts associated with diversion of flow by hard surfaces | Medium | LOW |
| | Change in vegetation community type | Medium | LOW |
| | Physical change to wetland areas | Medium | LOW |
| ESTUARIES | | | |
| Construction and operational phases of the proposed toll highway | Impacts associated with sedimentation | Medium | LOW |
| | Impacts associated with water quality changes | Medium | LOW/MEDIUM |
| | Impacts associated with improved access | Very high | HIGH |
| SOCIAL | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increased employment opportunities | Medium+/High+ | HIGH+ |
| | Impacts associated with improved safety for vehicle road users | High+ | (HIGH+) |
| | Increased safety hazards for pedestrians and traffic | Medium | LOW |
| | Impacts associated with increased risk of HIV/AIDS and STDs | Medium/High | LOW/MEDIUM |
| | Increased crime | Medium | LOW |
| | Impacts associated with construction-related traffic delays | Medium-high/Medium | MEDIUM/LOW |
| | Increased taxi-related tension and violence | Medium | LOW |
| | Impacts associated with improved livestock safety | High+ | (HIGH+) |
| | Impacts associated with loss of use of the existing road reserve | Medium | LOW |
| | Impacts associated with resettlement of affected households | High | MEDIUM |
| | Impacts associated with rural severance effects | Medium/High | LOW/MEDIUM |
| | Impacts associated with uncontrolled secondary development | Medium-high | LOW |
| | Impacts associated with improvement in transport provision | Medium+ | (MEDIUM+) |
| Impacts associated with negative influences on existing family networks and social structures | Medium-high | MEDIUM | |
| TOURISM | | | |
| Operation of the proposed toll highway | Impacts associated with increase in the number of tourism products | Medium+ | HIGH+ |
| | Impacts associated with increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route | Medium+ | MEDIUM-HIGH+ |
| | Impacts associated with increased access to environmentally sensitive areas | Medium | (MEDIUM) |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|--|-------------------------------------|----------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| CULTURAL AND HISTORICAL HERITAGE | | | |
| Construction and operation of the proposed toll highway | Impacts associated with graves | High | MEDIUM |
| NOISE | | | |
| Traffic on the four-lane undivided through the outskirts of Lusikisiki | Noise impacts | Low/High/Very high | NEGLIGIBLE/LOW |
| PLANNING/DEVELOPMENT | | | |
| Operation of the proposed toll highway | Implications for the Mbotyi tourism node | <i>Medium+</i> | <i>MEDIUM+</i> |

16.2.6 LUSIKISIKI (MAGWA INTERSECTION) TO MTHAMVUNA RIVER

The proposed works along this section of the proposed toll highway, as described in Sections 4.2.6 and 12.1, would involve the construction of a new “greenfields” road to national standards (as per description provided in Section 12.1). A number of deeply incised gorges and minor streams would be crossed. The gorges, some in the order of 200 m to 300 m deep, include the Msikaba, Mthentu, Mnyameni and Mzamba River gorges. Table 16.6 provides an overall summary of key potential impacts (without and with mitigation/enhancement) that would result from the proposed works between Lusikisiki (Magwa Intersection) and the Mthamvuna River.

The assessment has identified the following key residual negative and positive impacts:

Key residual negative impacts

It is anticipated that the proposed works along this road section would result in key residual negative impacts of **HIGH** significance in relation to the following:

- Faunal impacts associated with loss of sensitive habitats during construction;
- Impacts on estuaries associated with improved access; and
- Noise impacts associated with operation of the proposed toll highway.

The following key residual negative impacts of **MEDIUM** significance are anticipated:

- Vegetation and flora impacts associated with loss of habitat, loss of biodiversity and fragmentation of habitat;
- Vegetation and flora impacts associated with increased accessibility of remote habitats;
- Vegetation and flora impacts associated with reduction in resilience/stability of ecosystems;
- Faunal impacts associated with loss of faunal diversity and loss of Species of Special Concern;
- Disruption of faunal movement during the operational phase;
- Faunal impacts associated with chemical pollution;
- Faunal impacts associated with noise and light pollution;
- Impacts associated with water quality changes in estuaries during the operational phase;
- Social impacts associated with increased safety hazards for pedestrians and traffic;
- Social impacts associated with loss of use of the existing road reserve;
- Rural severance effects;
- Negative influences on existing family networks and social structures;
- Tourism impacts associated with increased access to environmentally sensitive areas;
- Impacts associated with graves; and
- Visual impacts associated with the proposed new bridges.

Key residual positive impacts

The following key residual positive impacts of **POSITIVE HIGH** significance are anticipated:

- Social impacts associated with increased employment opportunities;
- Social impacts associated with improved safety for vehicle road users; and
- Tourism impacts associated with an increase in the number of tourism products.

Key residual positive impacts of **POSITIVE MEDIUM** or **POSITIVE MEDIUM-HIGH** significance are anticipated in relation to the following:

- Social impacts associated with improvement in transport provision; and
- Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route.

Table 16.6: Overall summary of key potential impacts associated with the proposed works between Lusikisiki (Magwa Intersection) and the Mthamvuna River [ratings are negative unless indicated otherwise; ratings in () indicate impacts where no applicable/feasible mitigation/enhancement measures were identified]

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|---|----------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| VEGETATION AND FLORA | | | |
| Proposed new road (along alternative alignments 5g4, 9e and 10c – SANRAL preferred routes) without bridges, toll plaza, etc. | Loss of habitat | Very high | HIGH |
| | Loss of biodiversity | Medium | (MEDIUM) |
| | Fragmentation of habitat | High | (HIGH) |
| | Loss of species of special concern | High | MEDIUM |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | Medium | LOW |
| | Invasion by alien weeds and invader plants during the operational phase | High | LOW |
| | Strip/ribbon/secondary development during operational phase | High | (HIGH) |
| | Increased accessibility of remote habitats during the operational phase | High | (HIGH) |
| | Reduction in resilience/stability of ecosystems | Medium | (MEDIUM) |
| Proposed high-level bridge over the Msikaba River (along alternative alignment 5g4 – SANRAL preferred route) | Loss of habitat | Medium | (MEDIUM) |
| | Loss of biodiversity | Medium | (MEDIUM) |
| | Fragmentation of habitat | Medium | (MEDIUM) |
| | Loss of species of special concern | High | MEDIUM |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | High | LOW |
| | Invasion by alien weeds and invader plants during the operational phase | High | LOW |
| | Increased accessibility of remote habitats during the operational phase | High | (HIGH) |
| | | Reduction in resilience/stability of ecosystems | Medium |
| Proposed high-level bridge over the Mthentu River (along alternative alignment 9e – SANRAL preferred route) | Loss of habitat | High | MEDIUM |
| | Loss of biodiversity | High | MEDIUM |
| | Fragmentation of habitat | High | MEDIUM |
| | Loss of species of special concern | High | MEDIUM |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | High | LOW |
| | Invasion by alien weeds and invader plants during the operational phase | High | LOW |
| | Increased accessibility of remote habitats during the operational phase | High | (HIGH) |
| | | Reduction in resilience/stability of ecosystems | Medium |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|---|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| Proposed high-level bridge over the Kwadlambu River (along the SANRAL preferred route) | Loss of habitat | High | MEDIUM |
| | Loss of biodiversity | Medium | LOW |
| | Fragmentation of habitat | High | MEDIUM |
| | Loss of species of special concern | High | MEDIUM |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | High | MEDIUM |
| | Invasion by alien weeds and invader plants during the operational phase | High | LOW |
| | Reduction in resilience/stability of ecosystems | High | MEDIUM |
| | Disruption of the flow of nutrients and materials during construction | High | MEDIUM |
| Proposed high-level bridge over the Mnyameni (along alternative alignment 10c – SANRAL preferred route), Kulumbe, Mpahlane and Mzamba rivers | Loss of habitat | Medium | (MEDIUM) |
| | Loss of biodiversity | Medium | (MEDIUM) |
| | Fragmentation of habitat | Medium | (MEDIUM) |
| | Loss of species of special concern | Medium | LOW |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | High | MEDIUM |
| | Invasion by alien weeds and invader plants during the operational phase | High | LOW |
| | Reduction in resilience/stability of ecosystems | Medium | LOW |
| | Proposed intersections with district roads (along the SANRAL preferred route), Mtentu mainline toll plaza and R61 Interchange | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | Medium |
| Invasion by alien weeds and invader plants during the operational phase | | Medium | LOW |
| Strip/ribbon/secondary development during operational phase | | Medium | (MEDIUM) |
| Reduction in resilience/stability of ecosystems during the operational phase | | Medium | LOW |
| Disruption of the flow of nutrients and materials during the operational phase | | Medium | LOW |
| FAUNA | | | |
| Proposed new road (along alternative alignments 5g4, 9e and 10c – SANRAL preferred routes) | Loss of sensitive faunal habitats | Medium | LOW |
| | Loss of faunal diversity | Medium | (MEDIUM) |
| | Loss of species of special concern | Medium | (MEDIUM) |
| | Impacts on the Cape Griffon Vulture | High | MEDIUM |
| | Disruption to faunal movement | Medium | (MEDIUM) |
| | Impacts associated with invasion of alien faunal species | Medium | LOW |
| | Impacts associated with increased fire risk | Medium | (MEDIUM) |
| | Impacts associated with chemical pollution | Medium | (MEDIUM) |
| Impacts associated with noise and light pollution | Medium | (MEDIUM) | |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| | Impacts associated with ecosystem disruption | Medium | LOW |
| AQUATIC ECOSYSTEMS | | | |
| RIPARIAN AND INSTREAM VEGETATION | | | |
| Proposed new road, in particular river crossings | Destruction of riparian vegetation and loss of sensitive habitats during construction | High | LOW |
| | Increased surface run-off velocities leading to risk of erosion (due to loss of riparian vegetation) and drying out of localised catchments (due to diversion away from these catchments) | Medium | LOW |
| | Impacts associated with risk of surface and groundwater pollution during construction | Medium | LOW |
| | Impacts associated with reduction in permeable surfaces | Medium | LOW |
| | Impacts associated with diversion of flow from hard surfaces | Medium | LOW |
| | Change in vegetation community type as a result of introducing exotic plant species during construction | Medium | LOW |
| RIVERS | | | |
| Construction and operation of the proposed bridges | Impacts associated with change in channel structure and loss of instream habitat | High | LOW |
| | Risk of surface and groundwater pollution | Medium/High | LOW |
| | Changes in ecosystem structure and function, and loss of biodiversity | Medium/High | LOW |
| WETLANDS | | | |
| Construction and operation of the proposed greenfields section | Impacts associated with increased surface run-off | Medium/High | LOW/MEDIUM |
| | Impacts associated with risk of surface and groundwater pollution | Medium/High | LOW/MEDIUM |
| | Impacts associated with reduction in permeable surfaces | High | LOW |
| | Impacts associated with diversion of flow by hard surfaces | Medium | LOW |
| | Impacts associated with change in vegetation community type | Medium | LOW |
| | Physical change to wetland areas | Medium | LOW |
| ESTUARIES | | | |
| Construction and operation of the proposed greenfields section | Impacts associated with sedimentation | Medium | LOW |
| | Impacts associated with water quality changes | Medium | LOW/MEDIUM |
| | Impacts associated with improved access | Very high | HIGH |
| SOILS, LAND USE AND AGRICULTURE | | | |
| Construction and operation of the proposed toll highway | Impacts associated with improved regional access | High+ | (HIGH+) |
| | Impacts associated with improved extension services | Medium+ | (MEDIUM+) |
| | Impacts associated with improved access to production credit | Medium+ | (MEDIUM+) |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|---|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| SOCIAL | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increased employment opportunities | <i>Medium+/High+</i> | <i>HIGH+</i> |
| | Impacts associated with improved safety for vehicle road users | <i>High+</i> | <i>(HIGH+)</i> |
| | Increased safety hazards for pedestrians and traffic | <i>High/Very high</i> | <i>MEDIUM</i> |
| | Impacts associated with increased risk of HIV/AIDS and STDs | <i>Medium/High</i> | <i>LOW/MEDIUM</i> |
| | Increased crime | <i>Medium</i> | <i>LOW</i> |
| | Increased taxi-related tension and violence | <i>Medium</i> | <i>LOW</i> |
| | Impacts associated with resettlement of affected households | <i>High</i> | <i>MEDIUM</i> |
| | Impacts associated with rural severance effects | <i>Medium/High</i> | <i>LOW/MEDIUM</i> |
| | Impacts associated with uncontrolled secondary development | <i>Medium-high</i> | <i>LOW</i> |
| | Impacts associated with improvement in transport provision | <i>Medium-high+</i> | <i>(MEDIUM-HIGH+)</i> |
| Impacts associated with negative influences on existing family networks and social structures | <i>Medium-high</i> | <i>MEDIUM</i> | |
| TOURISM | | | |
| Operation of the proposed toll highway | Impacts associated with increase in the number of tourism products | <i>Medium+</i> | <i>HIGH+</i> |
| | Impacts associated with increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route | <i>Medium+</i> | <i>MEDIUM-HIGH+</i> |
| | Impacts associated with increased access to environmentally sensitive areas | <i>High</i> | <i>(HIGH)</i> |
| CULTURAL AND HISTORICAL HERITAGE | | | |
| Construction and operation of the proposed greenfields section | Impacts associated with places to which oral traditions are attached or which are associated with living heritage | <i>High</i> | <i>(HIGH)</i> |
| | Impacts associated with landscapes and natural features | <i>High</i> | <i>(HIGH)</i> |
| | Impacts associated with graves | <i>High</i> | <i>MEDIUM</i> |
| | Archaeological sites | <i>Medium-high</i> | <i>LOW-MEDIUM</i> |
| NOISE | | | |
| Construction and operation of the proposed greenfields section | Noise impacts | <i>Low to Very high</i> | <i>LOW TO HIGH</i> |
| VISUAL | | | |
| Impacts associated with the proposed new road (Mateku Waterfall area) and the Mthentu mainline toll plaza | Visual impacts | <i>High</i> | <i>MEDIUM</i> |
| Impacts associated with the proposed Msikaba and Mthentu River bridges | | <i>High</i> | <i>MEDIUM-HIGH</i> |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|--------------------|-------------------------------------|----------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| Impacts associated with the proposed Kwadlambu, Mnyameni, Kulumbe, Mpahlane and Mzamba River bridges | | Medium | (MEDIUM) |
| PLANNING/DEVELOPMENT | | | |
| Construction and operation of the proposed toll highway | Land claims | Medium | (MEDIUM) |
| | Ribbon development | High | (HIGH) |

16.2.7 MTHAMVUNA RIVER TO ISIPINGO INTERCHANGE

The proposed works along this section of the proposed toll highway, as described in Sections 4.2.7 and 13.1, would generally involve upgrading and widening within the existing road reserve, except for the proposed Adams Road Interchange and the proposed mainline toll plazas at Park Rynie and Isipingo. No major road upgrades would be undertaken in the vicinity of the three protected areas located adjacent to the existing R61 in this section of the proposed toll highway. Table 16.7 provides an overall summary of the significance of key potential impacts (without and with mitigation/enhancement) that would result from the proposed works between the Mthamvuna River and the Isipingo Interchange.

The assessment has identified the following key residual negative and positive impacts:

Key residual negative impacts

It is anticipated that the proposed works along this road section would result in key residual negative impacts of **MEDIUM** significance in relation to the following:

- Faunal impacts associated with noise and light pollution;
- Impacts associated with water quality changes in estuaries during the operational phase;
- Social impacts associated with construction-related traffic delays; and
- Impacts associated with anticipated increased traffic volumes and the proposed Isipingo Toll Plaza in the Prospecton area.

Key residual positive impacts

Key residual positive impacts of **POSITIVE HIGH** significance are anticipated in relation to social impacts associated with increased employment opportunities during the construction and operational phase.

Applicable noise mitigation associated with the proposed Adams Road ramp toll plazas and the proposed additional lanes between the Amanzimtoti River bridge and the Isipingo Interchange 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 procedure.

Table 16.7: Overall summary of key potential impacts associated with the proposed works between the Mthamvuna River and the Isipingo Interchange [ratings are negative unless indicated otherwise; ratings in () indicate impacts where no applicable/feasible mitigation/enhancement measures were identified]

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|--|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| VEGETATION AND FLORA | | | |
| Widening of roads | Loss of habitat | Medium | LOW |
| | Loss of biodiversity | Medium | LOW |
| | Loss of species of special concern | Medium | LOW |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | Medium | LOW |
| | Invasion by alien weeds and invader plants during the operational phase | Medium | LOW |
| Widening of Amanzimtoti River bridge | Loss of habitat | Medium | LOW |
| | Fragmentation of habitat | Medium | LOW |
| | Increased run-off and drainage, soil erosion, silt loads and sedimentation during the operational phase | Medium | LOW |
| | Invasion by alien weeds and invader plants during the operational phase | Medium | LOW |
| | Disruption of the flow of nutrients and materials during construction | Medium | LOW |
| FAUNA | | | |
| Upgrading and widening of the existing N2 and operation of proposed toll highway | Impacts associated invasion of alien faunal species | Medium | LOW |
| | Impacts associated with increased fire risk | Medium | LOW |
| | Impacts associated with chemical pollution | Medium | LOW |
| | Impacts associated with noise and light pollution | Medium | (MEDIUM) |
| AQUATIC ECOSYSTEMS | | | |
| RIPARIAN AND INSTREAM VEGETATION | | | |
| Construction and operation of the proposed toll highway, in particular river crossings | Destruction of riparian vegetation and loss of sensitive habitats during construction | High | LOW |
| | Increased surface run-off velocities leading to risk of erosion and drying out of localised catchments | Medium | LOW |
| | Impacts associated with risk of surface and groundwater pollution during construction | Medium | LOW |
| | Impacts associated with reduction in permeable surfaces | Medium | LOW |
| | Impacts associated with diversion of flow from hard surfaces | Medium | LOW |
| | Change in vegetation community type as a result of introducing exotic plant species during construction | Medium | LOW |

| ENVIRONMENTAL ASPECT / PROPOSED WORKS | POTENTIAL IMPACT | IMPACT SIGNIFICANCE | |
|---|---|----------------------------------|-------------------------------|
| | | WITHOUT MITIGATION / ENHANCEMENT | WITH MITIGATION / ENHANCEMENT |
| ESTUARIES | | | |
| Construction and operation of the proposed toll highway | Impacts associated with sedimentation | Medium | LOW |
| | Impacts associated with water quality changes | Medium | LOW/(MEDIUM) |
| SOCIAL | | | |
| Construction and operation of the proposed toll highway | Impacts associated with increased employment opportunities | Medium+ | HIGH+ |
| | Increased safety hazards for pedestrians and traffic | Medium | LOW |
| | Impacts associated with increased risk of HIV/AIDS and STDs | Medium | LOW-MEDIUM |
| | Increased crime | Medium | LOW |
| | Impacts associated with construction-related traffic delays | Medium | (MEDIUM) |
| | Increased taxi-related tension | Medium | LOW |
| NOISE | | | |
| Impacts associated with the proposed Pennington ramp toll plazas | Noise impacts | High | LOW-MEDIUM |
| Impacts associated with the proposed Park Rynie mainline and ramp toll plazas | | Medium | NONE/LOW |
| Impacts associated with the proposed Adams Road ramp toll plazas | | High | * |
| Impacts associated with the proposed additional lanes | | Very high | * |
| AIR QUALITY | | | |
| Impacts associated with anticipated increased traffic volumes and the proposed Isipingo Toll Plaza in the Prospecton area | Air quality impacts | Medium | (MEDIUM) |
| VISUAL | | | |
| Impacts associated with the proposed Park Rynie and Isipingo mainline toll plazas | Visual impacts | Medium | LOW-MEDIUM |

* To be determined during detailed design

16.3 CONCLUSIONS: COMPARATIVE ASSESSMENT OF ALTERNATIVE ALIGNMENTS

16.3.1 COMPARATIVE ASSESSMENT OF ALTERNATIVE 1B VERSUS THE SANRAL PREFERRED ROUTE BETWEEN NDWALANE AND THE MZIMVUBU RIVER

A summary of potential residual impacts of Alternative 1b versus the SANRAL preferred route (Alternative 1e) is provided in Table 16.8.

Table 16.8: Summary comparative assessment of potential residual impacts of the site-specific alternative routes between Ndwalane and the Mzimvubu River

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | |
|---|--|--------------------|
| | SANRAL PREFERRED ROUTE | ALTERNATIVE 1B |
| VEGETATION AND FLORA | | |
| Overall impacts on vegetation and flora as a result of disruption of the flow of nutrients and materials, loss of habitat, loss of biodiversity, reduction in resilience/stability of ecosystems, etc.) | LOW TO MEDIUM | MEDIUM |
| FAUNA | | |
| Loss of sensitive faunal habitat | HIGH | MEDIUM |
| AQUATIC ECOSYSTEMS | | |
| Overall impacts on riparian and instream vegetation | <u>LOW TO MEDIUM</u> | <u>LOW TO HIGH</u> |
| Overall impacts on rivers and wetlands | LOW TO LOW-MEDIUM | LOW TO LOW-MEDIUM |
| Overall impacts on estuaries | LOW TO HIGH | LOW TO HIGH |
| SOILS, LAND USE AND AGRICULTURE | | |
| Overall impacts on soils, land use and agriculture | LOW | HIGH |
| SOCIAL | | |
| Overall social impacts (severance effects, loss of arable land etc.) | MEDIUM | MEDIUM |
| CULTURAL AND HISTORICAL HERITAGE | | |
| Overall cultural and historical heritage impacts (graves, archaeological sites etc.) | LOW TO MEDIUM | LOW TO MEDIUM |
| NOISE | | |
| Noise impacts | LOW / HIGH | LOW |

The following conclusions are drawn:

Alternative 1b would present major advantages over the SANRAL preferred route in terms of limiting potential impacts on sensitive faunal habitats and potential noise impacts to nearest residences. However, this route would result in residual impacts of **HIGH** significance on prime riparian irrigation land and riparian ecosystems at the crossing of the Mzimvubu River. Also, it is anticipated that both routes would result in residual indirect impacts of **HIGH** significance due to increased recreational and development-related pressures which would be exerted on sensitive estuaries in the region due to improved access. Thus, consideration of the overall environmental implications of the two site-specific alternative routes does not reveal a clearly favoured route option. SANRAL has indicated that the construction of a major road in the floodplain of a river would not be preferable from a practical, strategic and technical perspective since the road would have to be raised to clear the 1:100 year flood line.

16.3.2 COMPARATIVE ASSESSMENT OF ALTERNATIVE 2A VERSUS THE SANRAL PREFERRED ROUTE IN THE VICINITY OF NTAUFUFU VILLAGE AND THE NTAUFUFU RIVER

A summary of potential residual impacts of Alternative 2a versus the SANRAL preferred route (Alternative 2f) is provided in Table 16.9.

Table 16.9: Summary comparative assessment of potential residual impacts of the site-specific alternative alignments in the vicinity of Ntafufu Village and the Ntafufu River

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | |
|--|--|-------------------|
| | SANRAL PREFERRED ROUTE | ALTERNATIVE 2A |
| VEGETATION AND FLORA | | |
| Overall impacts on vegetation and flora (as a result of loss of habitat, increased run-off and drainage, soil erosion, silt loads and sedimentation, etc.) | NEGLECTIBLE TO LOW | NONE TO LOW |
| FAUNA | | |
| Overall impacts on fauna (habitats, ecosystems etc.) | LOW TO MEDIUM | LOW TO MEDIUM |
| AQUATIC ECOSYSTEMS | | |
| Overall impacts on riparian and instream vegetation | LOW | LOW |
| Overall impacts on rivers and wetlands | LOW TO LOW-MEDIUM | LOW TO LOW-MEDIUM |
| Overall impacts on estuaries | LOW TO HIGH | LOW TO HIGH |
| SOILS, LAND USE AND AGRICULTURE | | |
| Overall impacts on soils, land use and agriculture | LOW | NONE |
| SOCIAL | | |
| Overall social impacts (severance effects, loss of arable land etc.) | LOW | MEDIUM |
| CULTURAL AND HISTORICAL HERITAGE | | |
| Overall cultural and historical heritage impacts (graves, archaeological sites, etc.) | LOW TO MEDIUM | LOW TO MEDIUM |
| NOISE | | |
| Noise impacts | MEDIUM | MEDIUM |

The following conclusions are drawn:

It is considered that the key factor to be considered in determining a preferred route in the Ntafufu area would be the potential impacts on the two local Ntafufu schools, providing that adequate compensation/replacement of the affected irrigation scheme and school playing fields adjacent to the river occurs. In this regard, the SANRAL preferred route (Alternative 2f) is considered more favourable, due solely to the additional threat Alternative 2a would pose to the Ntafufu Senior Secondary School.

16.3.3 COMPARATIVE ASSESSMENT OF ALTERNATIVES 5E AND 5G VERSUS THE SANRAL PREFERRED ROUTE ACROSS THE MSIKABA RIVER

A summary of the potential residual impacts, where applicable, of Alternatives 5e and 5g versus the SANRAL preferred route (Alternative 5g4) is provided in Table 16.10.

Table 16.10: Summary comparative assessment of potential residual impacts, where applicable, of the site-specific alternative alignments across the Msikaba River

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | | |
|---|--|----------------------|----------------------|
| | SANRAL PREFERRED ROUTE | ALTERNATIVE 5E | ALTERNATIVE 5G |
| VEGETATION AND FLORA | | | |
| Loss of habitat and increased accessibility of remote areas | HIGH | HIGH | HIGH |
| Loss of biodiversity | HIGH | HIGH | MEDIUM |
| Fragmentation of habitat, loss of species of special concern, increased runoff and drainage, soils erosion, silt loads and sedimentation, strip/ribbon/secondary development, reduction in resilience/stability of ecosystems and disruption of the flow of nutrients and materials | MEDIUM | MEDIUM | MEDIUM |
| Invasion by weeds and invasive alien plants and vehicular pollution of soil, air or water | LOW | LOW | LOW |
| Pollution at construction camps and increased risk of veld fires | VERY LOW | VERY LOW | VERY LOW |
| FAUNA | | | |
| Overall impacts on fauna (via loss of habitats, loss of faunal diversity, ecosystem disruption, etc.) | LOW TO MEDIUM | LOW TO MEDIUM-HIGH | LOW TO MEDIUM |
| AQUATIC ECOSYSTEMS | | | |
| Overall impacts on riparian and instream vegetation | LOW | LOW | LOW |
| Overall impacts on riverine environments | LOW | LOW | LOW |
| Overall impacts on wetlands | LOW | LOW TO HIGH | LOW TO HIGH |
| Overall impacts on estuaries | LOW TO MEDIUM | LOW TO MEDIUM | LOW TO MEDIUM |
| SOILS, LAND USE AND AGRICULTURE | | | |
| Overall impacts on soils, land use and agriculture | LOW TO MEDIUM | LOW TO MEDIUM | LOW TO MEDIUM |
| SOCIAL | | | |
| Overall social impacts (severance effects, loss of arable land etc.) | LOW TO HIGH+ | LOW TO HIGH+ | LOW TO HIGH+ |
| CULTURAL AND HISTORICAL HERITAGE | | | |
| Overall cultural and historical heritage impacts (graves, archaeological sites) | LOW-MEDIUM TO MEDIUM | LOW-MEDIUM TO MEDIUM | LOW-MEDIUM TO MEDIUM |
| NOISE | | | |
| Overall noise impacts | LOW TO HIGH | LOW TO HIGH | LOW TO HIGH |

The following conclusions are drawn:

Alternative 5e is considered the least favourable route alignment from vegetation/flora and faunal perspectives since it would result in most severe impacts on forests and faunal habitat, including disturbance to Lanner Falcon nests on the cliffs at the Mateku Waterfall, and would pose the greatest potential risk of erosion. While Alternative 5g would be marginally favoured over the SANRAL preferred route (Alternative 5g4) from a botanical point of view, it is less favoured in terms of potential noise impacts. However, Alternatives 5e and 5g would both result in potential residual impacts of **MEDIUM** and **HIGH** significance on wetlands and are thus considered unfavourable from an aquatic ecosystems perspective. Thus, consideration of the overall implications of the various alternative alignments across the Msikaba River indicates that the SANRAL preferred route (Alternative 5g4) would result in the least overall impacts on the affected environment. It should be noted, however, that the SANRAL preferred route would result in potential residual impacts of **HIGH** significance in terms of loss of habitat, increased accessibility of remote areas, loss of biodiversity and noise.

16.3.4 COMPARATIVE ASSESSMENT OF ALTERNATIVE 9D5 VERSUS THE SANRAL PREFERRED ROUTE ACROSS THE MTHENTU RIVER

A summary of the potential residual impacts, where applicable, of Alternative 9d5 versus the SANRAL preferred route (Alternative 9e) is provided in Table 16.11

Table 16.11: Summary comparative assessment of potential residual impacts, where applicable, of Alternative 9d5 versus the SANRAL preferred route across the Mthentu River

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | |
|---|--|----------------------|
| | SANRAL PREFERRED ROUTE | ALTERNATIVE 9D5 |
| VEGETATION AND FLORA | | |
| Loss of habitat and biodiversity | HIGH | HIGH |
| Fragmentation of habitat, loss of species of special concern, increased runoff and drainage, soils erosion, silt loads and sedimentation, strip/ribbon/secondary development, increased accessibility of remote areas and reduction in the resilience/stability of ecosystems | MEDIUM | MEDIUM |
| Invasion by weeds and invasive alien plants, vehicular pollution of soil, air or water and disruption of the flow of nutrients and materials | LOW | LOW |
| Pollution at construction camps and increased risk of veld fires | VERY LOW | VERY LOW |
| FAUNA | | |
| Overall faunal impacts | LOW TO MEDIUM | LOW TO MEDIUM |
| AQUATIC ECOSYSTEMS | | |
| Overall impacts on riparian and instream vegetation | LOW | LOW |
| Overall impacts on riverine environments | LOW | LOW |
| Overall impacts on wetlands | LOW | LOW TO HIGH |
| Overall impacts on estuaries | LOW TO MEDIUM | LOW TO MEDIUM |
| SOILS, LAND USE AND AGRICULTURE | | |
| Overall impacts on soils, land use and agriculture | LOW TO MEDIUM | LOW TO MEDIUM |
| SOCIAL | | |
| Overall social impacts (severance effects, loss of arable land, etc.) | LOW TO HIGH+ | LOW TO HIGH+ |
| CULTURAL AND HISTORICAL HERITAGE | | |
| Overall cultural and historical heritage impacts (graves, archaeological sites) | LOW-MEDIUM TO MEDIUM | LOW-MEDIUM TO MEDIUM |
| NOISE | | |
| Noise impacts | LOW TO HIGH | LOW TO HIGH |

The following conclusions are drawn:

The assessment (refer to Section 12.3.3) indicates that the SANRAL preferred route would be favoured in terms of fauna, aquatic ecosystems, soils, land use and agriculture and social aspects, although potential residual impacts of the two alignments are the same. Neither alignment is considered more favourable from botanical and cultural/historical heritage perspectives. In terms of potential noise impacts, certain sections of both routes are considered more suitable than the other. Thus, on balance, the SANRAL preferred route (Alternative 9e) is considered more favourable. It should be noted, however, that potential residual impacts of **HIGH** significance are anticipated in terms of loss of habitat, loss of biodiversity and noise.

16.3.5 COMPARATIVE ASSESSMENT OF THE COASTAL MZAMBA ROUTE VERSUS THE SANRAL PREFERRED ROUTE BETWEEN LUSIKISIKI (MTHENTU RIVER) AND THE MTHAMVUNA RIVER

A summary of potential residual impacts, where applicable, of the Coastal Mzamba route versus the SANRAL preferred route between Lusikisiki and the Mthamvuna River is provided in Table 16.12. Since the two routes would follow the same route up to the Mthentu River crossing, the comparative assessment focuses on the section between the Mthentu and Mthamvuna rivers.

Table 16.12: Summary comparative assessment of potential residual impacts, where applicable, of the Coastal Mzamba versus the SANRAL preferred route

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | |
|---|--|-------------------------|
| | SANRAL PREFERRED ROUTE | COASTAL MZAMBA ROUTE |
| VEGETATION AND FLORA | | |
| Loss and fragmentation of habitat | LOW | HIGH |
| Increased runoff and drainage, soils erosion, silt loads and sedimentation, reduction in resilience/stability of ecosystems and disruption of the flow of nutrients | LOW | MEDIUM |
| Strip/ribbon/secondary development and increased access to remote habitats | MEDIUM | MEDIUM |
| Loss of biodiversity, loss of species of special concern, invasion by weeds and invasive alien plants and vehicular pollution of soil, air or water | LOW | LOW |
| Pollution at construction camps and increased risk of veld fires | VERY LOW | VERY LOW |
| FAUNA | | |
| Overall faunal impacts | LOW TO MEDIUM | LOW TO MEDIUM |
| AQUATIC ECOSYSTEMS | | |
| Overall impacts on riparian and instream vegetation | LOW | LOW |
| Overall impacts on riverine environments | LOW | LOW |
| Overall impacts on wetlands | LOW TO MEDIUM | LOW TO MEDIUM |
| Overall impacts on estuaries (sedimentation, water quality changes and improved access) | LOW TO HIGH | LOW TO HIGH |
| Overall impacts on estuaries (water quantity) | NONE | HIGH |
| SOILS, LAND USE AND AGRICULTURE | | |
| Overall impacts on soils, land use and agriculture (improved regional access, improved extension services and improved access to production credit) | <i>MEDIUM+ TO HIGH+</i> | <i>MEDIUM+ TO HIGH+</i> |
| SOCIAL | | |
| Overall social impacts (employment, severance effects, etc.) | LOW TO <i>HIGH+</i> | LOW TO <i>HIGH+</i> |
| CULTURAL AND HISTORICAL HERITAGE | | |
| Overall cultural and historical heritage impacts | LOW-MEDIUM TO HIGH | LOW-MEDIUM TO HIGH |
| NOISE | | |
| Noise impacts | LOW TO HIGH | LOW TO HIGH |
| VISUAL | | |
| Visual impacts (between Mthentu and Mthamvuna rivers) | LOW | LOW |
| PLANNING/DEVELOPMENT | | |
| Overall impacts | MEDIUM TO HIGH | MEDIUM TO HIGH |

The following conclusions are drawn:

The Coastal Mzamba route would offer a number of advantages over the SANRAL preferred route between the Mthentu and Mthamvuna rivers, in particular relating to its compatibility with the Wild Coast SDF's proposed Land Use Management Areas and lower potential social and visual impacts. Also, should uncontrolled ribbon development or attraction of settlements take place along the SANRAL

preferred route, this would affect a greater proportion of the planned area for the proposed Wild Coast/Pondoland National Park and identified “nature tourism” zones.

In many other respects, especially in terms of direct, indirect and cumulative biophysical impacts associated with the presence of numerous source wetland areas, the Coastal Mzamba route is considered less favourable than the SANRAL preferred route. Key differences in this regard relate to loss and fragmentation of habitat and water quantity impacts on the (indirectly) affected estuaries.

Thus, the key factor to consider in selecting a preferred route is whether the relative importance attached to compatibility with the Wild Coast SDF's Land Use Management Areas and the additional area (4 %) of the proposed Park that would be incorporated east of the Coastal Mzamba route outweighs the likely direct, indirect and cumulative impacts on aquatic ecosystems that would be associated with this route. In terms of economic aspects, the economic specialist study calculated the Present Worth of Cost of the Coastal Mzamba route (R 1,597.91 million) to be marginally higher than the SANRAL preferred route (R 1,587.59 million). Thus, from an economic (and technical - primarily associated with construction of a major road through numerous wetland areas) perspective the Coastal Mzamba route would be less favourable. However, irrespective of the selected route, it should be ensured that political and institutional will and capacity is developed to undertake pro-active and structured development planning, review and/or development of detailed Land Use Management Systems and liaison between Traditional Authorities and Municipalities with regard to allocation of land according to a common vision for ecologically sustainable development, if the proposed project is approved.

16.3.6 COMPARATIVE ASSESSMENT OF ALTERNATIVES 10A AND 10E VERSUS THE SANRAL PREFERRED ROUTE ACROSS THE MNYAMENI RIVER

A summary of the potential residual impacts, where applicable, of Alternatives 10a and 10e versus the SANRAL preferred route (Alternative 10c) is provided in Table 16.13.

Table 16.13: Summary comparative assessment of potential residual impacts of Alternatives 10a and 10e versus the SANRAL preferred route across the Mnyameni River

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | | |
|---|--|-----------------|-----------------|
| | SANRAL PREFERRED ROUTE | ALTERNATIVE 10A | ALTERNATIVE 10E |
| VEGETATION AND FLORA | | | |
| Loss of habitat | MEDIUM | HIGH | HIGH |
| Loss of biodiversity and fragmentation of habitat | MEDIUM | HIGH | MEDIUM |
| Loss of species of special concern, increased runoff and drainage, soils erosion, silt loads and sedimentation, strip/ribbon/secondary development, increased accessibility of remote areas and reduction in resilience/stability of ecosystems | MEDIUM | MEDIUM | MEDIUM |
| Invasion by weeds and invasive alien plants, vehicular pollution of soil, air or water and disruption of the flow of nutrients and materials | LOW | LOW | LOW |
| Pollution at construction camps and increased risk of veld fires | VERY LOW | VERY LOW | VERY LOW |
| FAUNA | | | |
| Overall impacts on fauna (via loss of habitats, loss of faunal diversity, ecosystem disruption, etc.) | LOW TO MEDIUM | LOW TO MEDIUM | LOW TO MEDIUM |
| AQUATIC ECOSYSTEMS | | | |
| Overall impacts on riparian and instream vegetation | LOW | LOW | LOW |
| Overall impacts on riverine environments | LOW | LOW | LOW |
| Overall impacts on wetlands | LOW | LOW TO HIGH | LOW TO HIGH |

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | | |
|---|--|----------------------|--------------------|
| | SANRAL PREFERRED ROUTE | ALTERNATIVE 10A | ALTERNATIVE 10E |
| Overall impacts on estuaries | LOW TO MEDIUM | LOW TO MEDIUM | LOW TO MEDIUM |
| SOILS, LAND USE AND AGRICULTURE | | | |
| Overall impacts on soils, land use and agriculture | LOW TO MEDIUM | LOW TO MEDIUM | LOW TO MEDIUM |
| SOCIAL | | | |
| Overall social impacts (severance effects, loss of arable land, etc.) | LOW TO HIGH+ | LOW TO HIGH+ | LOW TO HIGH+ |
| CULTURAL AND HISTORICAL HERITAGE | | | |
| Overall cultural and historical heritage impacts (graves, archaeological sites) | LOW-MEDIUM TO MEDIUM | LOW-MEDIUM TO MEDIUM | LOW-MEDIUM TO HIGH |
| NOISE | | | |
| Noise impacts | LOW TO HIGH | LOW TO HIGH | LOW TO HIGH |

The following conclusions are drawn:

The key differences between the various alternative route alignments across the Mnyameni River relate to potential impacts associated with loss of habitat, loss of biodiversity, fragmentation of habitat, aquatic ecosystems (wetlands) and cultural and historical heritage. Since the SANRAL preferred route would generally result in lower impacts than Alternatives 10a and 10e it is considered the most favourable alignment. It should be noted, however, that potential residual impacts of **HIGH** significance are anticipated in terms of potential noise impacts, irrespective of the selected route.

16.4 CONCLUSIONS: COMPARATIVE ASSESSMENT OF ALTERNATIVE MAINLINE TOLL PLAZA LOCATIONS

16.4.1 ALTERNATIVE NDWALANE MAINLINE TOLL PLAZA LOCATION VERSUS THE SANRAL PREFERRED NDWALANE LOCATION

A summary of potential residual impacts, where applicable, of the Alternative Ndwalane mainline toll plaza location versus SANRAL's preferred Ndwalane mainline toll plaza location is provided in Table 16.14.

Table 16.14: Summary comparative assessment of potential residual impacts, where applicable, of the Alternative Ndwalane Toll Plaza versus SANRAL's proposed Ndwalane Toll Plaza

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | |
|---|--|---------------------------------|
| | PROPOSED NDWALANE TOLL PLAZA | ALTERNATIVE NDWALANE TOLL PLAZA |
| VEGETATION AND FLORA | | |
| Loss of habitat | MEDIUM | LOW |
| Fragmentation of habitat; loss of species of special concern | LOW | - |
| Loss of biodiversity; increased runoff and drainage, soils erosion, silt loads and sedimentation; invasion by weeds and invasive alien plants | LOW | LOW |
| Pollution at construction camps and increased risk of veld fires | VERY LOW | VERY LOW |
| FAUNA | | |
| Overall faunal impacts | LOW | LOW |
| AQUATIC ECOSYSTEMS | | |
| Overall impacts on aquatic ecosystems | LOW | LOW |
| SOCIAL | | |
| Uncontrolled secondary development | LOW | LOW |

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | |
|----------------|--|---------------------------------|
| | PROPOSED NDWALANE TOLL PLAZA | ALTERNATIVE NDWALANE TOLL PLAZA |
| NOISE | | |
| Noise impacts | NONE/LOW | NEGLECTIBLE/LOW |
| VISUAL | | |
| Visual impacts | LOW-MEDIUM | LOW |

The following conclusions are drawn:

The Alternative Ndwalane mainline toll plaza would, overall, be more favourable than SANRAL's preferred Ndwalane mainline toll plaza location in terms of potential impacts relating to vegetation and flora, aquatic ecosystems and visual aspects. Moreover, the SANRAL preferred location would result in key potential residual impacts associated with potential loss of habitat.

16.4.2 ALTERNATIVE MTHENTU MAINLINE TOLL PLAZA LOCATION VERSUS THE SANRAL PREFERRED MTHENTU LOCATION

A summary of potential residual impacts, where applicable, of the Alternative Mthentu mainline toll plaza location versus SANRAL'S preferred Mthentu mainline toll plaza location is provided in Table 16.15.

Table 16.15: Summary comparative assessment of potential residual impacts, where applicable, of the Alternative Mthentu Toll Plaza versus the proposed Mthentu Toll Plaza

| ISSUE / IMPACT | SIGNIFICANCE OF POTENTIAL RESIDUAL IMPACTS | |
|--|--|--------------------------------|
| | PROPOSED MTHENTU TOLL PLAZA | ALTERNATIVE MTHENTU TOLL PLAZA |
| VEGETATION AND FLORA | | |
| Strip/ribbon/secondary development | MEDIUM | MEDIUM |
| Loss of habitat and biodiversity, increased runoff and drainage, soils erosion, silt loads and sedimentation, invasion by weeds and invasive alien plants, reduction in the resilience/stability of ecosystems and disruption of the flow of nutrients and materials | LOW | LOW |
| Pollution at construction camps and increased risk of veld fires | VERY LOW | VERY LOW |
| FAUNA | | |
| Overall faunal impacts | VERY LOW | VERY LOW |
| AQUATIC ECOSYSTEMS | | |
| Overall impacts on aquatic ecosystems | LOW | LOW |
| SOILS, LAND USE AND AGRICULTURE | | |
| Overall impacts on soils, land use and agriculture | LOW | LOW |
| CULTURAL AND HISTORICAL HERITAGE | | |
| Overall cultural and historical heritage impacts (graves, archaeological sites) | LOW-MEDIUM | LOW-MEDIUM |
| NOISE | | |
| Noise impacts | LOW | LOW |
| VISUAL | | |
| Visual impacts | MEDIUM | LOW-MEDIUM |

The following conclusions are drawn:

Table 16.15 indicates that the key difference between the two alternative mainline plaza locations relates to potential residual visual impacts. The Alternative Mthentu Toll Plaza location is considered more favourable as it would result in lower potential visual impacts. Also, although the significance ratings for potential residual impacts on aquatic ecosystems are the same, it is considered that the Alternative Mthentu mainline toll plaza location would be preferred since it would avoid the risk of any potential

negative impacts on larger wetland habitats. Key potential residual impacts on vegetation and flora are anticipated in terms of possible strip/ribbon/secondary development, irrespective of the selected mainline toll plaza location.

16.5 CONCLUSIONS: PROJECT-SCALE AND TOLL FUNDING-RELATED ISSUES

16.5.1 VEGETATION AND FLORA

Vegetation and flora

Overall impacts on the Pondoland Centre of Endemism

It is clear from published information on the PCE that it has a high conservation/biodiversity value and that it has been identified as having high conservation priority. Any impact that reduces the overall area of the PCE, reduces the ecological integrity of the area or would result in losses of key biodiversity components is potentially serious.

The assessment has shown that the proposed new road would result in residual impacts of **HIGH** significance in terms of loss of habitat, fragmentation of habitat, strip/ribbon/secondary development and increased accessibility of remote habitats.

An analysis of the impacts associated with a reduction in the opportunity to undertake effective conservation, biodiversity conservation planning or establish conservation areas in the region indicates that the SANRAL preferred alignment potentially reduces the core area of the proposed park to 88% of its planned area while the Coastal Mzamba alignment would result in this included proportion becoming almost 92% of the desired area.

Ecological sustainability

The development of the proposed new road could potentially lead to some *loss of biological diversity*. It is unlikely to lead to a change in conservation status of any species but may lead to a change in conservation status (from Vulnerable to Endangered) of a vegetation type (Pondoland-Ugu Sandstone Coastal Sourveld) if all secondary and/or cumulative impacts are realised. [* Note: This assessment is based on Driver *et al.*, 2005 and Mucina & Rutherford, 2006. However, according to the “Draft National List of Threatened Ecosystems” (published under the provisions of the National Environmental Management: Biodiversity Act, 2004 in General Notice 1477 of 6 November 2009) Pondoland-Ugu Sandstone Coastal Sourveld is “Not Listed”. If the current List remains unchanged, the implications would be that the reclassification of Pondoland-Ugu Sandstone Coastal Sourveld would be from “Not Listed” to “Vulnerable”, the latter being a less serious conservation status than “Endangered”.]

The proposed new road may threaten some local scale *ecological process*. At a regional scale the proposed new road is thought to present a barrier that may result in dispersal and migration processes in a coastal-inland direction being affected, but is unlikely to affect regional scale movement of water or nutrients through the landscape.

There is a risk of *exceeding thresholds* at a local scale (primarily loss of habitat due to direct and indirect impacts), but these can be controlled by the implementation of mitigation measures (assuming management commitment and effective monitoring and reporting). There is less risk of exceeding thresholds at a regional scale, except for the overall loss of habitat due to direct and indirect impacts - the loss of habitat within Pondoland-Ugu Sandstone Coastal Sourveld could lead to a change in conservation status from Vulnerable to Endangered [refer to “*Note” above], which indicates that the threshold beyond which ecosystem processes and patterns can be maintained is being approached.

At a local scale, the road may *threaten some key ecological process* linked to life support systems, but this effect dissipates quickly with distance from the road and is unlikely to be important at a regional scale.

Pondoland grasslands are potentially at risk from the proposed new road and its associated impacts. The potential threat of the proposed new road to *protected, important, unique, sensitive, irreplaceable areas* is therefore potentially significant in the absence of effective conservation management of the area.

The proposed road cannot be considered potentially responsible for *exacerbating human-induced climate change*.

The proposed road would lead to the direct loss of areas of grassland in greenfields areas as well as some forest, which is considered by definition to be *irreversible loss of natural capital*. Due to the highly sensitive nature of the PCE as a whole, any loss of habitat may be considered to be incremental reduction in the ecological viability of the area. The proposed new road may therefore be considered to lead to irreversible loss of natural capital that is potentially significant.

It is considered unlikely that there are any *impacts that are unknown or uncertain* although there is some uncertainty about impacts in the study area due to social factors in the absence of the proposed project taking place.

It is considered very difficult to attribute *substantial negative cumulative impacts* to the presence of the proposed new road rather than current trends within the PCE area. It is estimated that the proposed new road and its potential secondary and/or cumulative impacts (including possible strip/ribbon/nodal development) could lead to sufficient loss of habitat to result in Pondoland-Ugu Coastal Sourveld being re-categorised as an Endangered vegetation type [refer to “*Note” above]. It is likely that other proposed projects in the area would further exacerbate this loss of habitat and make it more likely that habitat loss would lead to re-categorisation of the vegetation type.

On the basis of the above criteria, the proposed new road is considered not ecologically sustainable. However, if secondary and/or cumulative impacts can be controlled and conservation measures can be put in place to effectively protect core components of the PCE then the assessment of five of these criteria may be reversed/become insignificant and the proposed project could then be considered to be ecologically sustainable.

Given the potential significant residual negative impacts of the proposed project (in particular the greenfields sections – refer to Part C) on natural habitats, and uncertainties associated with the control of potential indirect and/or cumulative impacts and future biodiversity conservation measures to be effected in the Pondoland area, it is recommended that a Biodiversity Offset agreement be developed and implemented. Initial discussions with the relevant national authorities (refer to Chapter 2, Box 2.2(6)) have indicated that the “normal” Biodiversity Offset – i.e. acquiring “like for like” land – would not necessarily represent the most appropriate type of Biodiversity Offset in light of the nature of the land tenure system in the affected area. Feasible alternative options (e.g. a trust fund) would need to be considered and evaluated. Details of the most appropriate type (and cost) of Biodiversity Offset would need to be informed by further specialist (including legal) input, as appropriate, and engagement between SANRAL and the relevant national and provincial conservation authorities. SANRAL has committed itself to the development and implementation of such a Biodiversity Offset agreement.

16.5.2 AQUATIC ECOSYSTEMS

Although the systems within the study area were found to be largely in a natural condition, current land use practices, sand winning, poor secondary roads and bridges, and alien plant infestations have impacted on the status of the aquatic environment. In the interests of pro-active environmental management, future developments should thus not result in further degradation. Areas of particular concern are the greenfields routes, where the majority of the headwaters already require some form of rehabilitation due to the impacts mentioned above. Rivers that presently require rehabilitation would include, amongst others, the Mzimvubu, Kwadlambu and Mnyameni rivers, but concerted effort to eradicate all alien plants throughout the entire study area would be required.

With implementation of suitable mitigation and proactive management most of the impacts related directly to the proposed toll highway could be managed. SANRAL should take as many precautions to manage and monitor all phases of the development and should form part of any forum to manage the region.

16.5.3 SOCIAL

The upgrading of the route between Gonubie Interchange and Mthatha would likely vastly improve the safety of this section of road and could lead to a reduction in serious road accidents. Death and severe injury are amongst the most severe of negative social impacts and that any significant progress in reducing injury and death would have a high and positive social impact.

Along the section between Mthatha and the Mthamvuna River, despite the anticipated negative impacts associated with development in greenfields areas, the overwhelming opinions of people consulted was a need for greater access into the area. Reasons given for this varied from a need to ease the burden of travel into and out of the area, providing better access to health and other services and the creation of jobs.

One of the significant issues identified is the potential negative impacts of tolling the existing section of road between Port Shepstone and the Isipingo Interchange. This issue relates to the availability of alternative routes, travel options, economics and the political reasons for tolling.

Although not entirely within the control of SANRAL, the matter of capacity amongst the various role players along the route is also of concern. Consequently, if the project were to proceed, it would be important for all authorities to consider the need to coordinate their efforts towards making the project a success.

Overall, it is considered that the potential social benefits of the proposed project, as assessed along the entire route, and if enhanced as recommended, would outweigh the potential negative impacts, and that the proposed project would be of social benefit on a national basis as well as being beneficial for both the Eastern Cape and KwaZulu-Natal provinces.

In order to minimise the anticipated negative impacts and enhance potential benefits, it is recommended that key policies and plans (such as resettlement, employment, skills development, community empowerment, etc.) be developed to effectively manage key social issues associated with the proposed project. It is also recommended that a social monitoring and evaluation programme be developed for the construction phase of the proposed project.

16.5.4 TRAFFIC DIVERSION

It is apparent from the capacity analysis that the N2 between Prospecton and Moss Kolnik is running close to or exceeding capacity in the so-called design hour (the 30th highest hourly volume of the year), while the R102 is currently still operating at acceptable levels of service.

The highly probable impact of traffic diversion away from the N2 Prospecton-Southbroom section is assessed to be of **medium** and **high** intensity and significance on the adjacent road system during the construction and operational phases, respectively. Implementation of the mitigation measures would reduce the traffic diversion impact to **LOW** significance during the construction and operational phases.

Three alternative mitigation options have been identified, as follows:

- Introduction of a system to allow local users on the N2 Prospecton-Winklespruit, Winklespruit-Hibberdene and Hibberdene-Southbroom sections to pay a toll tariff directly related to the distance of the toll section that they actually use (i.e. a local user discount preferably linked to the use of electronic toll tags);
- Include visitors into the local user discount scheme (since frequent visitors may become toll road avoiders) by equipping toll lanes at the planned physical plazas with ETC readers and erection of Open Road Tolling gantries on appropriate interchange ramps in order to effectively create closed ETC systems on the N2 Prospecton-Winklespruit and Winklespruit-Hibberdene sections and, ideally, also on the Hibberdene-Southbroom section; and
- A third alternative could be implemented if a decision were made, in future, that the upgraded freeways of the Durban metropolitan area would be tolled by means of Open Road Tolling (a process in terms of which vehicles are tolled electronically whilst travelling at normal highway speeds in a free flow traffic situation and where no stopping or speed reduction is required for toll payment purposes). In the event that an Open Road Tolling approach should be considered for the Durban-Pietermaritzburg area, it would be feasible to use such a toll strategy for the proposed tolling of the N2 Prospecton-Winklespruit section.

It should be noted that the recent completion of the Arbour Town Mall and associated developments west of the N2 between the Moss Kolnik Drive and Dickens Road interchanges would create an additional alternative for traffic from the Moss Kolnik Interchange (or further south) travelling to/from Durban. This alternative (Arbour Town Street/Oppenheimer/Kynoch/Old Main Road) would be slightly longer in length and travel time than the R102 between the Moss Kolnik and Prospecton interchanges. To the extent that the Arbour Town Street/Oppenheimer/Kynoch/Old Main Road alternative route may attract some of the remaining diverted R102 traffic (approximately 100 vehicles per day) after implementation of the recommended mitigation measures, it would be further reducing the potential residual traffic diversion impact on the R102 (residual impact assessed to be of **LOW** significance).

16.5.5 NOISE

The existing day-time noise rating level of 74 dBA on residential land flanking Kingsway, Umbogintwini, is exceptionally high - exceeding the acceptable outdoor day-time noise rating level in a suburban district (with little road traffic) by 24 dB and in an urban residential district by 19 dB. Based on the ADT values the predicted increase in the day-time noise rating level over the subsequent 10 and 15 years would be barely significant, with or without tolling of the existing N2. However, any increase would exacerbate an already unacceptably high exposure to road traffic noise on residential land in this suburb. The existing, and potential future noise impact along on the alternative R102 at Umbogintwini and similar land further south along the R102 (without and with tolling of the existing N2), is assessed to be of **VERY HIGH**

intensity and significance. In this instance, inadequate planning has resulted in a situation whereby technical noise mitigation alternatives cannot be practically implemented.

The rehabilitation of the existing R102 road surface with a low-noise road surface would result in a reduction in noise emission to levels below existing levels even after the increase in traffic predicted after 15 years without or with tolling. This represents the limit of technical mitigation procedures that could be applied to the R102 directly adjacent to properties. Attracting through-traffic away from the R102 onto the N2 by non-tolling of the N2 skirting residential suburbs south of Durban, or effective implementation of the traffic diversion mitigation measures recommended above, would result in a further modest reduction in noise levels.

16.5.6 AIR QUALITY

It is predicted that potential localised air quality impacts on the R102 and R620 alternative routes would be of **LOW-MEDIUM** intensity and significance without and with mitigation. It is considered unlikely that the significance of the potential impact could be reduced. However, 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.

16.5.7 TOURISM

Impacts on bypassed towns on the existing N2

Towns along the existing N2 between Mthatha and Port Shepstone include Qumbu, Mount Frere, Mount Ayliff, Kokstad and Harding. These towns rely primarily on transit along the existing N2 section. Most of the towns on the existing N2 section are undeveloped as tourism destinations. However, Kokstad and Harding have become stop-over destinations. The potential negative tourism impacts on bypassed towns on the existing N2 are deemed to be of **MEDIUM** intensity and significance without and with mitigation.

High-volume tourism versus eco-tourism

The tourism specialist believes that there is room for more intensive tourism developments on the Wild Coast as well as eco-tourism enterprise. This is seen to be particularly the case if the proposed Wild Coast/Pondoland National Park plans go ahead, but with the number of nature reserves in the area it is considered that eco-tourism will be viable with or without the proposed Park.

16.5.8 ECONOMIC

Overall economic sustainability

The economic analysis indicates that the proposed project, given the various assumptions (of which the most critical were those related to the value of time and the traffic growth rate), would definitely be economically justified, with an IRR of 15.4 %. The proposed project is also considered to be financially viable, with an IRR of 10.4 %. In the financial analysis it was assumed that the toll income would be 75 % of the total savings in road user costs.

The freeway section between Winklespruit and Isipingo Interchange would, similarly, be economically justified, with an IRR of 37.9 %.

In addition to being justified from a micro-economic viewpoint, the project's "very good" one-off income-multiplier effect and significant recurring non-user benefits would support the macro-economic objectives of

(1) full employment, (2) economic growth, (3) price stability, and (4) equitable distribution of income. On aggregate it is considered that the proposed project would make a significant contribution to the primary macro-economic goal of improving the wealth of the Eastern Cape and KwaZulu-Natal provinces. In view of the fact that these benefits would not be diverted or transferred from other provinces, but be generated locally, the average annual net macro-economic gain of R 2,612 million would also accrue to the country as a whole (i.e. the road would be instrumental that South Africa's national product increases by R 2,612 million annually).

16.5.9 PLANNING/DEVELOPMENT

Compatibility of the proposed toll highway (in particular the greenfields sections) with relevant Eastern Cape regional and strategic planning initiatives

An evaluation of the compatibility of the proposed toll highway (in particular the greenfields sections) with eight Eastern Cape regional and strategic planning initiatives reveals the following:

- The proposed toll highway would be compatible with five of the eight planning initiatives, namely the Wild Coast Tourism Development Policy, the Wild Coast SDI, the Provincial Growth and Development Plan, the Eastern Cape SDP and the Eastern Cape Tourism Master Plan;
- The proposed toll highway is considered incompatible with the Wild Coast SDF since the greenfields sections, in particular, would traverse areas earmarked as “Nature Tourism” and “No Development” zones. Furthermore, the SDF does not incorporate any alignment of the proposed toll highway into its spatial planning and expresses the view that the proposed project would result in significant (negative) ecological, social and economic impacts;
- The Wild Coast SEA recommends a re-alignment of the greenfields sections of the proposed toll highway and states that the proposed toll highway could only be sustainable if the alignment formed the boundary of the PCE. Note that the findings of the FSR indicate that a route north-west of the Msikaba Sandstone Formation that would avoid the PCE would be most favourable in terms of limiting potential impacts on ecologically sensitive habitats but would affect the highest number of homesteads and businesses. Furthermore, it was not considered viable from financial and economic perspectives. Such a route was thus not carried forward for further investigation in the Impact Assessment phase of the EIA. Thus, the proposed toll highway is considered incompatible with the SEA's recommended re-alignment of the greenfields sections to form the boundary of the PCE; and
- The SANRAL preferred and Coastal Mzamba routes would not have a major impact on the potential to undertake biodiversity conservation planning in the PCE area and are thus not considered incompatible with the proposed Wild Coast/Pondoland National Park. However, the Coastal Mzamba route would be more favourable in this regard.

16.6 OVERALL KEY RESIDUAL IMPACTS OF THE PROPOSED PROJECT

The identified overall key residual positive and negative impacts that would result from the proposed project (improved access and linkage to the region, in particular the Wild Coast area, through a shorter and safer road link between the Eastern Cape/Western Cape and KwaZulu-Natal) are set out below. The overall key residual positive impacts include aspects relating to the financial and economic viability of the proposed project (such as reduced road user costs), potential regional developmental economic benefits, employment opportunities, increased tourism products, improved livestock safety on the Eastern Cape sections of the existing N2 and R61 and improved safety for vehicle road users.

The overall key residual negative impacts include aspects relating to loss and/or degradation of sensitive natural habitats due to potential direct, indirect and/or cumulative impacts, possible impacts on estuaries

associated with improved access to the region, potential impacts of traffic diversion on the volume/capacity ratio of available alternative routes in KwaZulu-Natal (if full toll tariffs were charged), and potential noise impacts on certain noise sensitive areas.

16.6.1 OVERALL KEY RESIDUAL POSITIVE IMPACTS

The following overall key residual positive impacts would result from the proposed project:

- a) The proposed toll highway should benefit all users along the entire length of the road if the principle that “the toll fee is less than the road user benefits” is applied. Benefits include (1) reductions in road user costs (where road user costs comprise vehicle operating costs plus travel time cost plus accident cost) and/or (2) road user revenue increases as a result of new road usage. The largest portion of the benefits to road users would accrue in the Eastern Cape because this would be where the major distance saving would occur and most new business would be created. The economic analysis indicates that the proposed project, given the various assumptions (of which the most critical were those related to the value of time and the traffic growth rate), would definitely be economically justified, with an IRR of 15.4 %. The proposed project is also considered to be financially viable, with an IRR of 10.4 %. In the financial analysis it was assumed that the toll income would be 75 % of the total savings in road user costs;
- b) The proposed additional lanes along the freeway section between Winklespruit and Isipingo Interchange would, similarly, be economically justified, with an IRR of 37.9 %;
- c) The regional income-multiplier effect would increase the present (2007) value of the investment amount of R 4,309 million to an eventual once-off regional gross income of R 17,884 million. After deduction of this investment amount, the net increase in one-off regional income is expected to equal R 13,575 million;
- d) Once the road is in operation regional economic income would be accelerated on a recurring basis. The following economic sectors in the Eastern Cape and KwaZulu-Natal would enjoy increased income: (1) agriculture; (2) forestry; (3) manufacturing; (4) construction (i.e. property development); (5) finance and real estate; and (6) trade, tourism and catering. The estimated present (2007) value of this additional income is approximately R 15,829 million;
- e) The present (2007) value of the net regional developmental economic benefits that implementation and use of the proposed toll highway would yield is the total of the net regional income-multiplier effect of R 13,575 million, and the present value of accelerated business income of R 15,829 million. These add up to R 29,404 million. Over the 30-year analysis period of the road at a real discount rate of eight percent this value is equivalent to additional domestic income of R 2,612 million per annum;
- f) Although the proposed new link between Mthatha and Port Edward would attract traffic from the existing N2 route, the newly generated traffic benefits on the proposed new road would by far exceed any reduction of business on the existing road section. (It is estimated that traffic generation in the first year of operation would translate into an economic benefit of over R 500 million in the Eastern Cape Province and KwaZulu-Natal. Of this, approximately R 150 million would accrue to existing and new business between Mthatha, Port St Johns and Port Edward);
- g) Approximately 6 800 project-related jobs would be generated annually during the construction phase. There is a high probability to generate up to 21 300 indirect or non-project-related jobs annually during this phase, resulting in a total employment creation of 28 100 jobs annually during construction. This would have a positive economic impact on a regional level in the short term;

- h) During the service period of the road there is the potential to generate approximately 900 directly road-related permanent (sustainable) jobs annually. Usage and operation of the road would generate approximately 18 000 indirect job opportunities per annum, resulting in an average employment creation of 18 900 jobs annually during the service period of the road;
- i) The proposed toll highway would result in an increase in the number of tourism products in the study area due to an expected increase in growth in overnight tourists;
- j) It is anticipated that the proposed project would result in improved livestock safety on the Eastern Cape sections of the existing N2 and R61, that would be incorporated into the proposed toll highway, which are characterised by significant safety hazards associated with the presence of livestock on the road, providing fencing is kept intact; and
- k) The proposed toll highway would significantly improve safety for vehicle road users along the existing N2 through the former Transkei, which has been identified as amongst the most accident-prone roads in the country.

16.6.2 OVERALL KEY RESIDUAL NEGATIVE IMPACTS

The following overall key residual negative impacts would result from the proposed project:

- a) Reduction of access points along the section between Ngobozi and Mthatha would result in high numbers of users having to walk or drive greater distances to access the proposed toll highway and/or to get to their destinations. This would also have cumulative impacts on time and effort invested in other productive and domestic activities;
- b) The habitats which occur between Ndwalane and the Ntafufu River, such as the forest and thicket patches, are considered sensitive faunal habitats due to their isolated and fragmented nature. The proposed toll highway would bisect and thus increase the fragmentation of these habitats. An appropriate, scientifically grounded and legally binding Biodiversity Offset agreement between SANRAL, the competent authority and relevant national and provincial conservation authorities should be developed and implemented, as appropriate, if the proposed project is approved;
- c) Increased recreational and development-related pressures could be exerted on important and sensitive estuaries as a result of the anticipated improved access to the region. These could result in significant negative impacts on the ecological functioning and aesthetics of the estuaries, if not managed appropriately;
- d) The proposed new road would be located between 10 m and 250 m from numerous dwellings in the section from Ndwalane to the Ntafufu River. A noise barrier would have little effect due to the residences generally being at a higher elevation than the proposed new road while a low-noise road surface would only reduce the intensity of the noise at the nearest residences to 60 dBA;
- e) The construction of the proposed greenfields section between Lusikisiki and the Mthamvuna River would result in loss of habitat associated with Pondoland-Ugu Sandstone Coastal Sourveld vegetation. This vegetation type forms one of the two primary habitats constituting the PCE [refer to “*Note” above]. In a worst-case scenario (assuming construction activities occur across the entire road reserve rather than in a construction corridor of about 30 m) approximately 0.3 % of the remaining extent of this vegetation type would be lost directly as a result of construction of the proposed new road. However, it should be noted that a large proportion (more than 50 %) of the affected area between Lusikisiki and the Mthamvuna River has been transformed by cultivation;

- f) The proposed toll highway would result in fragmentation of habitat between the Mthentu and the Mthamvuna rivers. Vegetation and flora could be significantly impacted by way of impaired gene flow within fragmented populations and creation of edges. However, the area between the Mthentu and Mthamvuna rivers also suffers from the greatest degree of transformation and degradation due to cultivation;
- g) In a worst-case scenario (assuming that there would be no limitation to development along the coast due to increased accessibility of these areas as a result of the proposed new road), there could be a risk of significant loss (approximately 9.6 % of the remaining extent) of Pondoland-Ugu Sandstone Coastal Sourveld due to strip/ribbon/secondary development;
- h) The proposed new road and bridges over the Msikaba and Mthentu rivers would probably make previously inaccessible areas more accessible, especially for the removal of medicinal products and other species for which there may be horticultural interest. The current rates of harvesting of medicinal plants have already lead to the depletion of many species near existing settlements;
- i) The proposed new road in the greenfields section between Lusikisiki and the Mthamvuna River would affect the ability of communities to continue utilising places and resources associated with the oral traditions and living heritage within the Amadiba Tribal Authority area. Also, the entire area may be considered as an integral part of an ethnographic landscape that has evolved over the last 1 000 years and would be significantly affected by the proposed new road;
- j) It is expected that the day-time noise rating level at residential dwellings located within 50 m of the proposed new road between Lusikisiki and the Mthamvuna River would be in excess of 65 dBA. In terms of the Noise Control Regulations noise mitigation would be required in order to ensure that the noise rating level does not exceed 65 dBA at any of the affected residential dwellings;
- k) Ribbon/strip/secondary development could gradually occur alongside the proposed new road between Lusikisiki and the Mthamvuna River. This would place a strain on Municipalities as a result of growing demands for new infrastructure and social services in these areas. As a consequence, large public-funded investments along the existing major routes may need to be re-prioritised to meet demands in the new areas, and competition for resources and delivery may occur;
- l) Significant negative impacts on the volume/capacity ratio on the R102 and, consequently, the level of service and quality of travel are predicted if full toll tariffs were charged at the mainline toll plazas in KwaZulu-Natal; and
- m) The existing day-time noise rating level of 74 dBA on residential land flanking Kingsway, Umbogintwini, and similar land further south along the R102, is exceptionally high. Based on the ADT values the predicted increase in the day-time noise rating level over the next 10 and 15 years would be barely significant, with or without tolling of the existing N2. However, any increase would exacerbate an already unacceptably high exposure to road traffic noise on residential land in this suburb.

16.7 RECOMMENDATIONS

This section provides recommendations on alternative route alignments and mainline toll plaza locations, highlights further required investigations, provides general recommendations and summarises the key mitigation measures that should be implemented during the further planning and design, construction and operational phases of the proposed project. Relevant requirements should be incorporated into any

“conditions of approval”, as appropriate, if the proposed project were to be authorised. Some generic construction-related mitigation measures are listed at the end of this section.

16.7.1 RECOMMENDATIONS ON ALTERNATIVE ROUTE ALIGNMENTS

- a) From an overall environmental perspective neither of the two alternative alignments between Ndwalane and the Mzimvubu River represent a clearly favoured route option. Consideration of technical aspects indicate that the SANRAL preferred route (Alternative 1e) is more suitable since it would not require sections of the road to be raised to clear the 1:100 year floodline of the Mzimvubu River and would have better foundation conditions for the proposed Mzimvubu River bridge;
- b) Of the two alternative alignments assessed in the vicinity of the Ntafufu Village and the Ntafufu River, the SANRAL preferred route (Alternative 2f) is considered more suitable since Alternative 2a would result in additional impacts on the Ntafufu Senior Secondary School;
- c) The SANRAL preferred route (Alternative 5g4) for the crossing of the Msikaba River would result in the least overall impacts on the receiving environment and is thus considered the most favourable option;
- d) Of the two alternative alignments assessed for the crossing of the Mthentu River, the SANRAL preferred route (Alternative 9e) is, on balance, considered more favourable;
- e) Although the Coastal Mzamba route would offer a number of advantages over the SANRAL preferred route between Lusikisiki (the Mthentu River) and the Mthamvuna River (in particular relating to conservation planning, social and visual impacts), the most significant difference between the two routes relate to potential direct, indirect and cumulative impacts on the biophysical environment. Since the SANRAL preferred route would result in substantially less severe potential impacts on the biophysical environment, and would be preferable from economic and technical perspectives, it is considered more favourable; and
- f) Since the SANRAL preferred route (Alternative 10c) would generally result in lower impacts than Alternatives 10a and 10e across the Mnyameni River, it is considered the most suitable alignment.

Thus, the SANRAL preferred route would, overall, be preferred over the other alternative route alignments in the specific road sections. Refer to Section 4.1 above for a description of the key potential negative impacts associated with the SANRAL preferred route in the various road sections.

16.7.2 RECOMMENDATIONS ON ALTERNATIVE MAINLINE TOLL PLAZA LOCATIONS

- a) The Alternative Ndwalane mainline toll plaza location is preferred over the SANRAL preferred Ndwalane Toll Plaza location since it would result in less severe potential impacts in terms of vegetation and flora, aquatic ecosystems and visual aspects; and
- b) The Alternative Mthentu mainline toll plaza location is considered more favourable than the SANRAL preferred Mthentu Toll Plaza location since it would result in lower potential visual impacts and would avoid the risk of any potential negative impacts on large wetland habitats.

Thus, the alternative mainline toll plaza locations would, overall, be preferred over the SANRAL preferred toll plaza locations.

16.7.3 FURTHER INVESTIGATIONS

- a) The potential noise impacts, and relevant noise mitigation measures, associated with the proposed Adams Road ramp toll plazas and proposed additional lanes between the Amanzimtoti River and Prospecton should be determined and incorporated during the detailed design stage;

- b) A heritage practitioner should be appointed to undertake a supplementary inspection of limited sections of the approved alignment, in different terrain types, with the objective of determining the degree to which vegetation cover could have limited the discovery of any heritage resources; and
- c) Relevant specialist (including legal) input should be obtained in order to inform the development of an appropriate, scientifically grounded and legally binding Biodiversity Offset agreement between SANRAL, the competent authority and relevant national and provincial conservation authorities.

16.7.4 GENERAL RECOMMENDATIONS

- a) The management of all site preparation and construction activities should be undertaken by way of the compilation of a comprehensive Construction EMP which should include the key mitigation measures summarised below, as appropriate;
- b) Effective implementation and management of the Construction EMP should be ensured by appointment of a suitably qualified and experienced ECO;
- c) Recommendations applicable to the post-construction phase should be incorporated in an Operational EMP, including provision for ongoing monitoring and management; and
- d) Mitigation/enhancement measures applicable to any Concessionaire or Contractor should be formally included in their contract documentation, as appropriate.

16.7.5 SUMMARY OF KEY MITIGATION MEASURES

Table 16.16 summarises the key mitigation measures applicable to the further planning and design, construction and operational phases of the proposed toll highway, as identified in the respective specialist reports (Volumes 2 to 4 of the Draft/Final EIR) and Parts C and D of this report. It also identifies the relevant party(-ies) responsible for implementation of the mitigation measures and additional resources required, where appropriate. This information will be incorporated into the Draft EMP which will, amongst others, also set out the requirements for the administration and management of all environmental obligations, including continued public communication and liaison, as appropriate.

Table 16.16: Summary table of key mitigation measures applicable to the further planning and design, construction and operational phases of the proposed toll highway, with identification of responsible party(-ies) and additional resources required, where appropriate

| ENVIRONMENTAL ASPECT / ISSUE / MITIGATION MEASURE | APPLICABLE PROJECT PHASE | RESPONSIBLE PARTY(-IES) | ADDITIONAL RESOURCES REQUIRED |
|--|--|--|---------------------------------------|
| VEGETATION AND FLORA | | | |
| Identify any areas of sensitive vegetation and erect temporary fencing around such areas; Fencing must be retained during construction activities (refers primarily to sensitive vegetation adjacent to construction activities). | Planning and Design; Construction | SANRAL; Concessionaire; Contractor; ECO; Designated Environmental Officer (DEO) ¹ | Botanical specialist |
| Minimise and restrict clearing to the area required for road construction purposes only and strictly control disturbance to adjacent vegetation communities and/or trees within the working corridor. | Planning and Design; Construction | SANRAL; Concessionaire; Contractor; ECO; DEO | - |
| Address all potential biodiversity risks in the EMP, which include: Appropriate locating of stockpiles, site offices and infrastructure to limit damage to sensitive vegetation; Preventing the spread of invasive alien plants and weeds through proper identification and control; Site protection measures for existing vegetation and flora. Compile and implement a Vegetation and Flora Management Plan, including a Revegetation Plan and Weed Management Plan. | Planning and Design; Construction; Operational | SANRAL; Concessionaire; Contractor; ECO; DEO | Specialist as required |
| Obtain all necessary permits prior to construction (e.g. for removal of protected species). | Planning and Design | SANRAL; Concessionaire; ECO; DEO | Botanical specialist |
| Secure a Biodiversity Offset: Develop and implement an appropriate Biodiversity Offset. Details of the most appropriate type (and cost) of Biodiversity Offset would need to be informed by further specialist (including legal) input, as appropriate, and engagement between SANRAL and the relevant national and provincial conservation authorities. | Planning and Design | SANRAL; DEA; National and Provincial Conservation Authorities | Specialists as required |
| The relevant requirements of the Vegetation and Flora Management Plan should be reviewed (and preferably prepared) by someone with the appropriate biological skills and knowledge. | Design; Construction; Operational | SANRAL; Concessionaire | Botanical specialist |
| Retain indigenous species where possible along the alignment. | Design; Construction | SANRAL; Concessionaire; Contractor; ECO; DEO | Botanical specialist |
| On-site seed collection and transplanting of indigenous species for inclusion in revegetation works. | Construction; Operational | SANRAL; Concessionaire; Contractor; ECO; DEO | Horticultural/revegetation specialist |
| Chop and mulch cleared indigenous vegetation for use in revegetation works. | Construction; Operational | SANRAL; Concessionaire; Contractor; ECO; DEO | Horticultural/revegetation specialist |
| Ensure that Contractors are made aware of the environmental issues and associated risks prior to commencement of construction. Biodiversity aspects that need to be included in the induction process include: Extent of "no go" areas; Areas of significant vegetation and habitat; Potential discovery of additional populations of sensitive species and what to do in this event. | Design; Construction | SANRAL; Concessionaire; Contractor; ECO; DEO | Botanical specialist |

¹ A DEO would be appointed by each service provider who carries out any construction activities for the Concessionaire.

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| Implement erosion and sediment control measures in order to protect habitats. For example, drainage of road runoff through grassy channels, as an erosion and sediment control measure, greatly reduces toxic solid- and heavy-metal concentrations. | Design; Construction; Operational | SANRAL; Concessionaire; Contractor; ECO; DEO | - |
| Ongoing monitoring should take place during the construction phase in order to assess the success of mitigation measures. This may be done at different levels of detail, e.g. visual assessments, sampling, monitoring of alien plants, etc. | Construction | SANRAL; Concessionaire; Contractor; ECO; DEO | Botanical specialist |
| Post-construction commitment to monitoring and management of biodiversity and revegetation works must be ensured. | Operational | SANRAL; Concessionaire; Contractor; ECO; DEO | - |
| FAUNA | | | |
| Avoid disturbances to the breeding colonies of the Cape Griffon Vulture: Air and road traffic should observe the maximum possible exclusion zone around the Msikaba colony. | Planning and Design; Construction; Operational | SANRAL; Concessionaire | - |
| Helicopter and fixed wing flights down the gorge from the Msikaba bridge should be banned, or maintain a maximum height of 1 000 m; Access to breeding ledges by humans (other than registered researchers) and feral dogs must be prohibited; Dead or injured birds discovered below bridge crossing points should be identified and recorded and communicated to the Vulture Study Group; Off-set the loss of carcasses (associated with reduced livestock mortalities from the fenced road) and foraging habitat – supplementary feeding with vulture restaurants may be required – consult the Vulture Study Group in this regard. | Planning and Design; Operational | SANRAL DWEA; National and Provincial Conservation Authorities | - |
| Rest stops and associated structures should not be placed adjacent to sensitive habitats (forests or wetlands). | Planning and Design | SANRAL; Concessionaire; Independent Engineer | - |
| Install under-road culverts for any breeding toads along the proposed toll highway. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | Fauna specialist |
| Associated power and telephone lines should incorporate bird deflectors where they cross major river gorges. The most suitable type and spacing should be determined in consultation with experts. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer | Fauna specialist |
| Underpasses should be large enough to allow maintenance of water flow and soil hydrodynamics, and to serve as migratory paths for small animals. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | - |
| No borrow pits or associated requirements should be sited in the vulture exclusion zone. | Planning and Design | SANRAL; Concessionaire; Independent Engineer; ECO; DEO | - |
| Identify any sensitive faunal habitats on site and erect temporary fencing around such areas. | Construction | SANRAL; Concessionaire; Contractor; ECO; DEO | Fauna specialist |
| Blasting operations should be restricted to the day, and should avoid the Cape Griffon Vulture (Msikaba colony) egg-laying season (March-July). | Construction | SANRAL; Concessionaire; Contractor; ECO; DEO | - |
| Ensure vegetation in road reserve is kept short by way of regular maintenance. Road reserves should be maintained in order to function as effective firebreaks. | Operational | SANRAL; Concessionaire; ECO ; DEO | - |
| Restrict and control the use of herbicides in the road reserve and at toll plazas. | Operational | SANRAL; Concessionaire; ECO; DEO | - |

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| SANRAL should encourage the relevant conservation authorities to implement active culling programmes of alien fauna (particularly certain birds and introduced rodents). | Operational | SANRAL; Provincial Conservation Authorities | - |
| AQUATIC ECOSYSTEMS | | | |
| Clearing of Vegetation: Clearing of vegetation should be scheduled for the drier winter months and limited to areas immediately needed for construction. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| Construction near wetlands: Construction of the road should as far as possible not occur within any wetlands, resulting in their alteration or removal. This includes assessing the possible changes to wetland conditions; hydrological regimes etc. on wetland function when selecting sites for borrow pits, a requirement in the Department of Mineral Resources mining permit process. If wetlands cannot be avoided then any loss of wetland structure and functioning must be compensated. Ensure that no flows are altered; SANRAL's Drainage manual stipulations shall be implemented during design, i.e. flows are not diverted or impounded by the physical structure of the road. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| <p>Loss of instream habitat due to changes in channel structure and condition:</p> <ul style="list-style-type: none"> • Bridges should, if at all possible, span the entire width of the channel and floodplain so as to avoid disturbance to the riparian zones of rivers. • Pillars, columns or bridge buttresses should not be placed in instream or in riparian zones, if at all possible. • The disturbance of instream channels and riparian zones during bridge construction must be minimized. • The number and width of pillars, vertical columns and buttresses placed within the river channel and floodplain should be minimised. <p>Physical structures, which could later alter hydrological regimes, should not be placed in the vicinity of any wetlands.</p> | Planning and Design | SANRAL; Independent Engineer | - |
| Changes in drainage patterns due to the construction of the road: Adequate drainage must be included in the road design so as to ensure effective drainage of wetland areas. Rehabilitation of slopes must be carried out (e.g. particularly where bridge-building will take place in river gorges) so as to ensure the recovery of established drainage patterns; The use of Reno mattresses and Armourflex is recommended for the diversion of stormwater from entering wetlands or streams directly. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |

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| <p>Change in ecosystem structure and function, and subsequently biodiversity:</p> <ul style="list-style-type: none"> • Engineering design must reduce impacts on aquatic systems, and in so doing, reduce the possibility of changes in ecosystem structure and function, by maintaining base flows and reducing potential sedimentation or erosion. Additional precautionary measures should be taken to avoid excessive disturbance in sensitive areas. • Sensitive areas, where the possibility of impact is high, should be monitored before and after construction so as to detect changes in the present state of aquatic biota (e.g. numbers of alien fish species). • Hydrogeological regimes of the important wetland areas should be maintained with little or no alteration, e.g. the wetland areas near Mateku Falls (Atentule River). • Large construction footprints (bridge piers) should be limited to within reason, to reduce the overall impact on the floodplain areas. These areas not only contribute to the general ecology, but also dissipate major floods. Bridge piers and associated works, should not increase the extent of the floodlines, but take cognisance of these. • Specific species that would be required in rehabilitation include the <i>Cyperus</i>, <i>Juncus</i>, <i>Typha capensis</i>, <i>Setaria</i> and <i>Prionium serratum</i>. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | Aquatic specialist |
| <p>Increased surface run-off: The construction of a surface stormwater drainage system during the construction phase must be done in a manner that would protect the quality and quantity of the downstream system. The use of swales, which could then be grassed for the operational phase, is recommended as the swales would attenuate run-off water. The purpose of the retention swales is to ensure that stormwater containing silt and other sediments will settle out (commonly accepted sound environmental practice). It is expected that seepage, evaporation and overflow will occur in the swale retention areas ensuring that the water released off-site is of a better quality. It is further recommended that these swales and retention ponds be incorporated into the operational phase.</p> | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| <p>Risk of surface and groundwater pollution, including turbidity loads due to sedimentation and other pollutants: The EMP should include all identified measures to avoid excessive sediment loads and other contaminants in rivers and wetlands. For example: all construction materials including fuels and oil should be stored in a demarcated area that is contained within a berm; erosion control measures should be monitored to ensure their effectiveness; silt traps and culverts should be regularly maintained and cleared so as to ensure effective drainage; mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any river channel; local people should be employed to act as litter patrols on a weekly or daily basis if necessary, to ensure that pollution is controlled at all times; etc.</p> <p>Emergency plans must be in place in case of spillages onto road surfaces and/or into river and wetland systems.</p> | Construction; Operational | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | Community Liaison service provider |

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| Reduction in permeable surfaces: The area covered by the footprint of the development should be balanced with suitable stormwater run-off areas, making extensive use of grassed swales, gabions and Reno mattresses - this would reduce surface flow velocities and allow time for the water to permeate the local soils and groundwater systems and would maintain localised flows to sustain the surrounding wetlands and/or vegetation. | Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| Diversion of flow by hard surfaces: Stormwater should be discharged into retention swales. These could be used to enhance the sense of place, if they are grassed with indigenous vegetation. Any stormwater should not enter any wetland areas directly, but only via structures such as swales. The toll plazas must be designed with oil traps to prevent any contamination of the downstream areas. | Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| SOILS, LAND USE AND AGRICULTURE | | | |
| The position of over- and underpasses should be further discussed with affected farmers. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | Design and Land Management service provider |
| Maximise the potential positive impact of the proposed toll road through facilitating the development of markets and producer co-operatives for such commodities as sugarcane, timber, maize and livestock in Pondoland. | Construction; Operational | National and Provincial departments such as Department of Agriculture, Forestry and Fisheries; District and Local Authorities; private sector | |
| Farmers should be warned before blasting is to occur to be able to save poultry in communal broiler houses from suffocation by corralling them into smaller groups. Loss of production is however inevitable and compensation the only option. Mitigation should aim at minimising losses. Future poultry houses should not be built within 500 m of the proposed toll road especially where there are steep downhill where the possibility of vehicle backfiring increases. | Construction (as appropriate) | SANRAL; Concessionaire; Contractor; District and Local Authorities | Community Liaison service provider |
| Topsoil should be stockpiled separately from subsoil. Stockpiles should not be higher than 2 m to avoid compaction. Stockpiled soil should be seeded to maintain biological activity and to keep alien invader species from establishing on it and seeding it. Care must be taken not to allow heavy traffic over the soil. | Construction | SANRAL; Concessionaire; Contractor; ECO; DEO | - |
| Liaise with government extension services to determine how to assist with aiding the agricultural extension workers perform their work efficiently. | Construction; Operational | SANRAL; National and Provincial departments such as Department of Agriculture, Forestry and Fisheries; District, Local and Traditional Authorities | - |
| The road must be fenced to safeguard both traffic and livestock. Grass within the road reserve should be mown/cut each year where possible to help prevent the spread of fires. | Operational | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| SOCIAL | | | |
| Compile a Social Management Plan which would incorporate all the mitigation measures set out below, and include a monitoring regime. | Planning and Design | SANRAL | Social specialist |

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| Increased employment opportunities: Establish a Labour and Employment Desk; Create opportunities for the employment of women; Where possible use labour-intensive methods of construction; use local labour as far as possible; Develop a community labour agreement with targets for employment and for progression; Go beyond the minimum wage rate and invest in local staff. | Planning and Design; Construction; Operational | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | Community Liaison service provider |
| Increased SMME opportunities: Establish a local SMME recruitment preference policy; Implement a monitoring system to ensure that the Concessionaire honours the local SMME recruitment preference policy and the various policies and provisions developed by the Department of Trade and Industry. | Planning and Design; Construction; Operational | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| Optimisation of improved safety for road users: Carefully select and position under- and over-passes; Introduce active and efficient traffic control and development mechanisms; Ensure close cooperation and effective communication between all relevant traffic authorities. | Planning and Design; Operational | SANRAL; Concessionaire; Independent Engineer; Provincial, District, Local and Traditional Authorities | Design and Land Management service providers |
| Increased cost of doing business and concomitant loss of income: Reduce the number of toll points and/or introduce discounts for local business; Where it could be demonstrated that the introduction of the toll road had been directly responsible for the creation of sub-economic farming units then the units should be expropriated in their entirety providing adequate compensation. | Planning and Design; Operational | SANRAL; Concessionaire | Design and Land Management service providers |
| Increased cost of accessing services and employment for marginal and advantaged communities: Reduce the number of toll points and/or introduce appropriate local user discounts; Introduce discounts for public transport providers. | Planning and Design; Operational | SANRAL; Concessionaire | |
| The reduction of access points onto the highway: Design adequate numbers of strategically placed access points; Where access cannot be provided, make discounts available to local users so as to alleviate additional costs incurred. | Planning and Design; Construction; Operational | SANRAL; Independent Engineer; Concessionaire | Design and Land Management, and Community Liaison service providers |
| Increased safety hazards for pedestrians and traffic: Fencing should be inspected weekly and maintained properly; Ensure that signs, which should be pictorial/graphic and in the vernacular, are erected on all boundary fences warning against entering the construction area/road reserve; Public awareness programmes should be developed and implemented to identify areas of particular risk and approaches to reduce risk - this is expected to include awareness programmes at schools and along roads leading to the site to advise children as well as other frequent users of the dangers of traffic; Traffic calming and speed control measures for access to construction sites should be instigated in consultation with the local authorities. | Construction; Operational | SANRAL; Independent Engineer; Concessionaire; Contractor; ECO; DEO | - |

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| <p>Increased HIV/AIDS and STD risks associated with construction gangs and increased truck traffic:</p> <ul style="list-style-type: none"> • Design and implement, in consultation with local HIV/AIDS organisations and government structures, an HIV/AIDS and STD awareness and prevention campaign. This campaign should use various common practice methodologies in order to ensure social and cultural sensitivity. • Ensure that job opportunities available to local people who do not need to be housed in construction accommodation are maximised; • Make HIV/AIDS and STD awareness and prevention programmes a condition of contract for all suppliers and sub-contractors; • Provide an adequate supply of free condoms to all workers. Condoms should be located in the bathrooms and other communal areas on the construction site; • Introduce a voluntary counselling and testing programme during the construction phase and continued during operations. This should be undertaken in conjunction with the existing VCT programmes; • Undertake an HIV/AIDS and STD prevalence survey amongst all workers on a regular basis. It will involve a voluntary test available to 100% of the workforce [note that voluntary samples are not necessarily statistically accurate]. The results of the survey will help to determine the HIV/AIDS and STD strategy. When and if statistically representative results are obtained the results of the survey should be made available to management and workers at the same time. Results should be presented as statistical returns that ensure confidentiality. <p>During the operational phase an HIV/AIDS and STD awareness and prevention campaign directed at local villages along the route should be implemented, in association with HIV/AIDS organisations and government structures. This should include information dissemination sessions within the villages and provision of pamphlets and condoms.</p> | Planning and Design; Construction; Operational | SANRAL; Concessionaire; Contractor; Government and HIV/AIDS NGOs | - |
| <p>Secondary effects such as potential increased crime: Establish liaison structures with local police to monitor changes during the construction phase; Where necessary additional security should be provided; South African legislation makes allowance for the establishment of Community Policing Forums - where they do not exist in the affected areas, assistance should be provided with facilitating the establishment of these forums.</p> | Construction | SANRAL; Concessionaire | Community Liaison service provider |
| <p>Construction related traffic delays and traffic accommodation: Proper scheduling of construction activities to minimize delays; Public communication strategy to inform road users.</p> | Construction; Operational | SANRAL; Independent Engineer; Concessionaire; Contractor; ECO; DEO | Community Liaison service provider |
| <p>Potential increase in tensions in the taxi industry: Enter into negotiations with taxi associations well in advance of implementation of toll fees; Ensure that either sufficient discounts are in place to obviate the development of tensions, or that route allocations are such that no particular taxi operator is significantly penalized; Allow sufficient time for taxi associations to adapt to the new circumstances.</p> | Operational | SANRAL; Independent Engineer; Concessionaire | Community Liaison service provider |

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| Improvement in local traffic congestion within the towns through which the highway passes: In order to maximise the opportunity to ease congestion particularly within the Mthatha area it would be imperative for all relevant authorities to work in close cooperation in this regard and to set up clear communication channels. | Operational | SANRAL; Independent Engineer; Concessionaire; Provincial, District, Local and Traditional Authorities | Community Liaison, and Design and Land Management service providers |
| Improved livestock safety: Carefully select and position under- and over-passes; Ensure close cooperation and effective communication between all relevant authorities; Introduce active and efficient control and development mechanisms. | Planning and Design; Operational | SANRAL; Concessionaire; Independent Engineer; Provincial, District, Local and Traditional Authorities | Design and Land Management service providers |
| Loss of use of the existing road reserve to local communities: Provide an alternate resource for those affected by the loss of use of the existing road reserve. | Operational | SANRAL; Concessionaire | Community Liaison service provider |
| Resettlement of affected households and loss: Ensure resettlement is undertaken in terms of best international practice and in terms of agreements reached with the Department of Rural Development and Land Reform in order to ensure no affected persons would be worse off as a result of the proposed project. These should be consolidated in a Resettlement Action Plan which should include, amongst others, the following: Comprehensive consultation with Traditional Authorities; Consultation with "host" communities; Allocation of arable (equivalent) land; Relocation and erection of new dwellings; Compensation for lost crops; Relocation of livestock resources; Provision of appropriately-sited over- and under-passes. | Planning and Design; Construction; Operational (as appropriate) | SANRAL; Independent Engineer; Department of Rural Development and Land Reform; Traditional Authorities | Design and Land Management, and Community Liaison service providers |
| Rural severance effects: Design and provide crossing points that are sufficiently distributed so as to replace and/or mimic those internal routes currently used by the communities; Ensure that central service nodes (schools, clinics, water points, places of worship, etc) remain easily and safely accessible; Ensure that crossing points, such as under- and over-passes, are adequate for people and livestock. | Planning and Design; Construction | SANRAL; Independent Engineer; Concessionaire; Contractor; Department of Rural Development and Land Reform; Traditional Authorities | Design and Land Management, and Community Liaison service providers |
| Urban severance effects: Develop one-way streets or bypasses that are aligned around or to one side of the centre of the towns (as appropriate); Crossing points would also need to be maintained and upgraded at intersections in towns; Central service nodes (schools, clinics, water points, places of worship, etc) should remain easily and safely accessible. | Planning and Design; Construction; Operational (as appropriate) | SANRAL; Concessionaire; Contractor; Provincial, District, Local and Traditional Authorities; Independent Engineer | Design and Land Management, and Community Liaison service providers |
| Loss and disturbance of sites of cultural, spiritual or religious significance: The component of cultural, spiritual and religious sites should also form part of the Terms of Reference for a Resettlement Action Plan; Ensure that all cultural, spiritual and religious aspects are dealt with to the satisfaction of those affected; The recommendations of the specialist heritage study should be implemented. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Department of Rural Development and Land Reform; Heritage authorities | Design and Land Management service providers |

| ENVIRONMENTAL ASPECT / ISSUE / MITIGATION MEASURE | APPLICABLE PROJECT PHASE | RESPONSIBLE PARTY(-IES) | ADDITIONAL RESOURCES REQUIRED |
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| Increased congestion on non-toll roads and at critical access points: Monitor existing traffic flows on possible alternative routes and traffic flows after implementation of the proposed project, as per the "traffic diversion" recommendations. Mitigation should include, amongst others, the following (as appropriate): Reduce the number of toll points and/or introduce discounts for local commuters; Set tolls at rates that encourage users to take advantage of time and associated cost savings of the new facility; Implement an education campaign aimed at demonstrating time and associated cost savings. | Planning and Design; Construction; Operational | SANRAL; Concessionaire; Independent Engineer | Design and Land Management service providers |
| Effect of construction workers and job seekers on existing family networks and social structures: Ensure that the number of job opportunities made available to local people is maximised; Maintain communication channels between the contractor and local community structures; Condoms must be made readily accessible to workers; Liaise with the South African Police Services (SAPS) and community structures to ensure that the workforce is controlled; Workers not from the area must be provided with adequate on-site temporary accommodation and amenities; On completion of the work all temporary accommodation must be dismantled and removed. | Construction | SANRAL; Concessionaire; Contractor; SAPS | - |
| TOURISM | | | |
| Promote tourism and develop tourism products. | Planning and Design; Construction; Operational | Tourism organisations and government agencies at national (e.g. Department of Tourism and SA Tourism), provincial (e.g. EC Tourism and KZN Wildlife) and local level (e.g. relevant local municipalities along the proposed toll highway and existing N2); SANRAL; Concessionaire (marketing of tourism attractions which form part of the toll highway, such as major bridges) | - |
| Promote tourism and hospitality-related skills as part of the overall skills development programme. | Planning and Design; Construction; Operational | SANRAL; Concessionaire; Contractor | Community Liaison service providers |
| Create feeder routes. | Planning and Design; Construction; | SANRAL; Concessionaire; Local and Traditional Authorities | Design and Land Management, and Community Liaison service providers |
| Minimise impacts on environmentally sensitive areas in order to sustain eco-tourism. | Planning and Design; Operational | SANRAL; National and Provincial Conservation Authorities; Local and Traditional Authorities | - |

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| CULTURAL AND HISTORICAL HERITAGE | | | |
| Comply with the requirements of Section 36 of the National Heritage Resources Act, 1999 (and associated guidelines) in terms of protection and/or relocation of graves. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | Design and Land Management, and Community Liaison service providers; Archaeology specialist |
| Ensure that the EMP includes the required protocol and guidelines to be followed in the event of any heritage resources being uncovered during construction. In terms of palaeontology, a palaeontologist must be asked, before commencement of the proposed project, what monitoring etc. may be needed for any road cuttings that were either highlighted as sensitive in the original specialist report or not assessed in that report – any relevant requirements in this regard should be included in the EMP. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | Archaeology specialist |
| Ensure that environmental induction/awareness courses for construction personnel include relevant heritage-related aspects to enable personnel to participate effectively in heritage resource management. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| Undertake regular monitoring as construction activities proceed. | Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | Heritage specialist |
| NOISE | | | |
| Greenfields sections (and any other new roads): A low-noise, porous road surface should be applied where the proposed toll highway would be within 500 m from residential suburbs, schools, hospitals and places of worship. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| Existing N2 between Amanzimtoti and Isipingo: A low-noise road surface should be applied along the entire length of the existing N2 where additional lanes are proposed. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| In addition to low-noise road surfaces, noise barriers of at least 2 m height would need to be constructed where boundaries of residences, schools, hospitals and places of worship are within 100 m of the nearest road edge (in order to ensure a day-time noise rating level of 55 dBA is not exceeded on residential and other noise-sensitive land). The actual minimum height required would need to be calculated based on the local topography and distance from the road edge at which a noise barrier can be erected. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | Acoustical engineer |
| Ensure the EMP includes provisions relating to working hours and appropriate control of noise-generating activities as required by applicable legislation, regulations and/or by-laws. | Planning and Design; Construction; Operational | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| For construction of the proposed new roads in rural areas it is recommended that machinery with the lowest noise emission be used and that a well-planned and co-ordinated “fast track” procedure be implemented to complete the total construction process in any area in the shortest possible time. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |

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| Attracting through-traffic away from the R102 onto the N2 by non-tolling of the N2 skirting residential suburbs south of Durban, or effective implementation of the traffic diversion mitigation measures (see below), would result in a further modest reduction in noise levels (the latter would result from rehabilitation of the existing R102 road surface with a low-noise road surface). | Planning and Design; Operational | SANRAL; Concessionaire; Independent Engineer; Provincial, District, Local and Traditional Authorities | - |
| AIR QUALITY | | | |
| Sites where favourable meteorological dispersion prevails should be considered in finalising the location of toll plazas. The factors to consider are relatively elevated flat areas, avoiding valley sites and areas where the general wind flow is impeded by topography. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | Technical adviser; Specialist as required |
| Ensure that the EMP includes an Air Quality Management Plan. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | Specialist as required |
| Optimise traffic flow through the toll plazas and ensure that vehicle idling times are limited to a minimum, particularly at peak times or during periods of high pollution potential. | Planning and Design; Operational | SANRAL; Concessionaire; Independent Engineer | Technical adviser; Specialist as required |
| 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. | Planning and Design; Operational | SANRAL; Concessionaire; Independent Engineer | Technical adviser; Specialist as required |
| Ensure that the Contractor adopts the required dust and exhaust emission control measures during construction. These should include the following: Implementation of traffic control measures to limit vehicle-entrained dust from unpaved roads e.g. by limiting vehicle speeds; Implementation of a spraying programme for stockpiles to ensure sufficient moisture content is maintained to suppress dust generation; Washing of tyres and the undercarriage of vehicles as they leave the construction site to minimise off-site impacts; Installation of a dust extraction unit on the crusher plant to ensure the collection of dust for subsequent and appropriate disposal; Implementation of a maintenance programme for all construction vehicles to ensure they operate optimally to reduce their emissions to the atmosphere; Installation of an emissions control device on the asphalt plant exhaust. | Construction | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| Air quality in toll booths should be monitored for a period of time in order to ensure that worker health and safety is continually evaluated and managed. The monitoring should take into account diurnal and seasonal traffic volumes. Monitored data should be reviewed periodically. | Operational | SANRAL; Concessionaire; Independent Engineer; ECO; DEO | Specialist as required |
| Discussions should be held with the eThekweni Municipality Health Department to address the long-term plans for air quality management in the area. | Operational | SANRAL; Concessionaire | Specialist as required |
| VISUAL | | | |
| The route alignment should be adjusted out of the Mateku Waterfall viewshed and moved further east beyond the low ridge east of the proposed route. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | Technical adviser |
| Bridges should be designed with appropriate, high aesthetical design criteria. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | - |
| A tourist viewing point should be incorporated into the road design where visitors can stop and view from strategic points at the Msikaba and Mthentu River bridges. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | Technical adviser |

| ENVIRONMENTAL ASPECT / ISSUE / MITIGATION MEASURE | APPLICABLE PROJECT PHASE | RESPONSIBLE PARTY(-IES) | ADDITIONAL RESOURCES REQUIRED |
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| A landscape architect should be appointed during the design phase to integrate the project components with the surrounding landscape so that the project blends in physically and aesthetically with the surrounding landscape. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | Landscape Architect |
| Detailed specifications for effective rehabilitation of the construction area and road reserve should be included in the contract documentation so that the tasks can be costed and monitored for compliance. | Planning and Design; Construction; Operational | SANRAL; Concessionaire; Independent Engineer; Contractor; ECO; DEO | - |
| Colour variations on toll plazas should be considered to reduce their scale. Both horizontal and vertical colour differences should be used in a manner that would help to visually break up the large roof and side surfaces. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | - |
| The heights from which floodlights are fixed should be reduced. Also, identify zones of high and low lighting requirements with the focus of the lights being inward, rather than outward. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | - |
| A Landscape Development Plan should be developed timeously for all toll plazas and interchanges. | Planning and Design | SANRAL; Concessionaire; Independent Engineer | Landscape Architect |
| Screening berms should be constructed, where appropriate, to limit the visual impact of toll plazas. This should be considered in relation to the recommendations of the noise specialist. | Planning and Design; Construction | SANRAL; Concessionaire; Independent Engineer | Landscape Architect |
| TRAFFIC DIVERSION | | | |
| During construction it should be ensured that the same number of lanes on multi-lane sections are available during peak periods as are currently available. | Planning and Design; Construction | SANRAL; Independent Engineer; Concessionaire; Contractor; ECO; DEO | - |
| Introduce a system to allow local users on the N2 Prospecton-Winklespruit, Winklespruit-Hibberdene and Hibberdene-Southbroom sections to pay toll tariffs directly related to the distance of the toll section that is used (i.e. a local user discount linked to the use of electronic toll tags). | Planning and Design | SANRAL; Concessionaire | - |
| Visitors could be included in the local user discount scheme as well by creating closed Electronic Toll Collection systems on the N2 Prospecton-Winklespruit and Winklespruit-Hibberdene sections and, ideally, also on the Hibberdene-Southbroom section. | Planning and Design | SANRAL; Concessionaire | - |
| Open Road Tolling - if a decision were made, in future, that the upgraded freeways of the Durban metropolitan area would be tolled by means of Open Road Tolling (a process in terms of which vehicles are tolled electronically whilst travelling at normal highway speeds in a free flow traffic situation and where no stopping or speed reduction is required for toll payment purposes). In the event that an Open Road Tolling approach should be considered for the Durban-Pietermaritzburg area, it would be feasible to use such a toll strategy for the proposed tolling of the N2 Prospecton-Winklespruit section. | Planning and Design | SANRAL; Concessionaire | - |
| Prescribe minimum acceptable attraction rates at toll plazas on the following road sections in the tender documentation and request a tender proposal for achieving such minimum attraction rates: N2 Prospecton-Winklespruit; N2 Winklespruit-Hibberdene; N2 Hibberdene-Southbroom. | Planning and Design | SANRAL | Traffic adviser |
| Ensure that the likelihood of success of tenderers' proposals to achieve attraction rates play a role in the evaluation of tenders. | Planning and Design | SANRAL | - |

| ENVIRONMENTAL ASPECT / ISSUE / MITIGATION MEASURE | APPLICABLE PROJECT PHASE | RESPONSIBLE PARTY(-IES) | ADDITIONAL RESOURCES REQUIRED |
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| Prescribe maximum acceptable queue lengths or average waiting time during peak periods at toll plazas and penalties for non-compliance. | Planning and Design; Operational | SANRAL; Concessionaire | Traffic adviser |
| Monitor the attraction rates to specifically the following toll road sections (at toll plaza locations) by means of Origin-Destination surveys on alternative routes: N2 Prospecton-Winklespruit; N2 Winklespruit-Hibberdene; N2 Hibberdene-Southbroom. If actual toll road attraction is below prescribed toll road attraction, require corrective action from Concessionaire (such as a reduction of toll tariffs). | Operational | SANRAL | Traffic adviser |
| Measure toll plaza queue lengths/waiting times and apply penalties, if required (especially at the proposed Isipingo plaza). | Operational | SANRAL | Traffic adviser |
| PLANNING/DEVELOPMENT | | | |
| Ensure that proposed intersection upgrading accommodate planned land uses at identified nodes. | Planning and Design | SANRAL; Independent Engineer; Concessionaire; Provincial, District, Local and Traditional Authorities | Design and Land Management service providers; Technical adviser |
| Bypasses, with proper intersection to allow traffic to enter and leave the CBD, should be constructed at Butterworth, Dutywa and Mthatha. | Planning and Design | SANRAL; Independent Engineer; Concessionaire; Provincial, District, Local and Traditional Authorities | Design and Land Management service providers; Technical adviser |
| Interchanges should be considered at the Libode and Ngqeleni intersections. | Planning and Design | SANRAL; Independent Engineer; Concessionaire; Provincial, District, Local and Traditional Authorities | Design and Land Management service providers; Technical adviser |
| Consultation with the Regional Land Claims Commissioner's office and land claimants should be undertaken regarding the resolution of applicable land claims. | Planning and Design | SANRAL | Design and Land Management service providers |

| ENVIRONMENTAL ASPECT / ISSUE / MITIGATION MEASURE | APPLICABLE PROJECT PHASE | RESPONSIBLE PARTY(-IES) | ADDITIONAL RESOURCES REQUIRED |
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| <p>Ribbon development should be curtailed by way of pro-active and structured development planning following proper planning and sustainable development principles. Municipalities should ensure that the following is undertaken:</p> <ul style="list-style-type: none"> • Discourage informal traders from setting up stalls in areas where no off-road parking would be available. • Ensure that SDFs take cognisance of potential development areas/nodes. Proper spatial planning within these nodes should be carried out as soon as possible to guide development and assist with policing of illegal invasion/activities, etc. • SDFs should be reviewed annually to determine growth needs, trends, etc. and necessary amendments made in terms of planning and sustainable development principles and procedures. • Officials should guide development to nodal areas and prevent ribbon development, which would drain further the existing limited resources of the municipalities. • Land Use Management Guidelines of SDFs should be enforced. | <p>Planning and Design; Construction; Operational</p> | <p>SANRAL; provincial departments of Local Government and Traditional Affairs; District, Local and Traditional Authorities</p> | <p>Increased capacity of Authorities</p> |
| ECONOMIC | | | |
| <p>Process leading to Financial Closure: Discounts should be negotiated where frequent road users in the vicinity of toll plazas would use the road for a distance shorter than that for which the fee is calculated, would be impacted negatively.</p> | <p>Planning and Design; Operational</p> | <p>SANRAL; Concessionaire</p> | |
| <p>Process leading to Financial Closure: The majority of vulnerable people use bus and taxi transport and special rates for these types of vehicles should be considered.</p> | <p>Planning and Design; Operational</p> | <p>SANRAL; Concessionaire</p> | |

16.7.6 GENERIC CONSTRUCTION-RELATED MITIGATION

Generic construction-related mitigation measures which should be incorporated into the Draft EMP, as appropriate, include the following:

- Vegetation stripping should occur in parallel with the progress of road construction to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment;
- All cut and fill slopes, as well as all areas disturbed by construction activity (including temporary access roads, laydown areas, etc.), should be appropriately stabilised/protected and rehabilitated as soon as possible after final shaping. Such progressive rehabilitation measures would allow the maximum growth period before the completion of construction. Where practical, roadside landscaping and revegetation should use species locally indigenous to the site;
- All areas affected by construction activities and where dust will be generated would require dust suppression by regular wetting, possibly by means of a water bowser, or by means of a soil-binding compound. Regularly monitor levels of dust generation on site; and
- All vehicles and construction machinery should be maintained to a standard that minimises noise and air pollution. Construction activities and vehicle movement should be restricted to daylight hours.

CCA ENVIRONMENTAL (Pty) Ltd
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