May 2024

# Final Scoping Report

# AUAS ROAD UPGRADE ESIA

ENVIRO DYNAMICS
Environmental Management Consultants

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|---|---|
| PROJECT NAME | Auas Road Upgrade, Windhoek |
| REPORT | FInal Scoping Report |
| STAGE OF REPORT | Final |
| CLIENT | Roads Authority Namibia |
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| DATE OF RELEASE | May 2024 |
| CONTRIBUTORS TO THE REPORT | Stephanie van Zyl<br>Norman van Zyl |

I hereby declare that I do:

(a) have knowledge of and experience in conducting environmental impact assessments, including knowledge of the Environmental Management Act (7 of 2007), and the Environmental Impact Assessment Regulations (2012), hereinafter referred to as "the Act and Regulations" and guidelines that have relevance to the proposed activity;

(b) perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;

(c) comply with the mentioned Act and Regulations, guidelines and other applicable laws.

I also declare that there is, to my knowledge, no information in my possession that reasonably has or may have the potential of influencing –

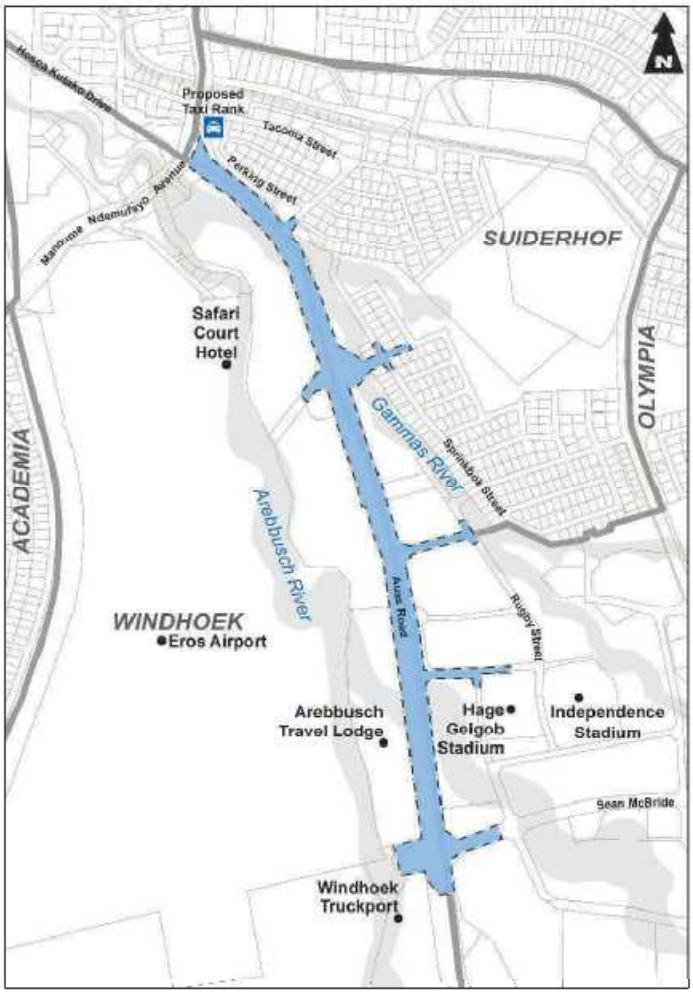
(i) any decision to be taken with respect to the application in terms of the Act and Regulations; or

(ii) the objectivity of this report, plan or document prepared in terms of the Act and Regulations.

Stephanie van Zyl

## BACKGROUND

The Roads Authority of Namibia have appointed Lithon Project Consultants to conduct the design, tender and construction supervision of Auas Road, Windhoek. It is the major arterial which enters Windhoek from Rehoboth, south of the city.




Route of the Auas Road Upgrade Project

The upgrading involves the section of Auas Road from the intersection between Auas Road and Sean McBride Street, northwards to the intersection with Mandume Ndemufayo Ave. The works involve the widening of the road, from a single lane to dual carriageway, with a median. The intersections along the relevant road section will also be upgraded.

Enviro Dynamics has been appointed to conduct the Environmental and Social Impact assessment of the project, which requires public participation in terms of the Namibian Environmental Management Act and its Regulations.

This Scoping Report includes the findings of the environmental assessment process for the project.

## SUMMARY IMPACT ASSESSMENT

The Scoping process for the Auas Upgrade project, has, using experience, stakeholder inputs, primary and secondary data of the project area, identified and assessed the following key potential impacts:

Key to colours in table:

| | |
|---|---|
| | Positive impacts |
| | Negative impacts |

| IMPACT | SIGNICANCE RATING PRE-MITIGATION/ENHANCEMENT | SIGNIFICANCE RATING ASSUMING MITIGATION /ENHANCEMENT |
|---|---|---|
| DURING CONSTRUCTION | | |
| Employment - sustaining existing jobs for 12 months | Low | Low |
| Sustained local spend, supporting the local economy | Low | Low |
| Increased traffic congestion and disruption, leading to user dissatisfaction, frustration and delays | Low | Low |
| Dust causing nuisance, affecting receptor health, and limiting outdoor activities | Medium | Low |

| IMPACT | SIGNICANCE RATING PRE-MITIGATION/ENHANCEMENT | SIGNIFICANCE RATING ASSUMING MITIGATION /ENHANCEMENT |
|---|---|---|
| Noise affecting sensitive receptors who rely on the need for a quiet environment | Medium | Low |
| Nuisances, disturbances and conflict caused by the activities and movements of the workforce in the area, including safety risk, poaching, uncontrolled food stalls and ablutions. | Medium | Low |
| Soil, surface and groundwater pollution caused by polluting substances handled, spilled and discarded, concrete mixing, and waste. | Medium | Low |
| Loss of riverbank stabilising vegetation, protected and other trees, causing erosion, biodiversity loss, loss of visual relief and shade | High | Medium |
| OPERATIONAL PHASE | | |
| Improved traffic flow and increased driver satisfaction, causing more traffic to use the road, eliminating existing traffic flow problems in neighbourhoods, particularly Springbok Street | High | High |
| Improved pedestrian and cycling opportunities leading to an improved experience for these users and increased sustainability | Medium | Medium |
| Improved traffic flow in Tacoma/Perkin Street area | Medium | Medium to high |
| Increased anti-social behaviour at taxi rank area in Tacoma/Perking Street area, resulting in an unsafe environment lacking tranquillity | Medium | Low |

| IMPACT | SIGNICANCE RATING PRE-MITIGATION/ENHANCEMENT | SIGNIFICANCE RATING ASSUMING MITIGATION /ENHANCEMENT |
|---|---|---|
| and detracting from business in the surrounding streets | | |
| Loss of existing portion of open space at proposed taxi rank | Medium | Medium |
| Improved traffic flow at Blackwood Street and Springbok Street Intersection | High | High |
| Traffic congestion, noise, loss of tranquillity, due to traffic from the NDF base | High | Low[1] |
| Change in informal access points to certain establishments along the route | Low [2] | Low |
| Noise and nuisances due to the new lanes being some 10m closer to the properties to the west | Medium | Low |

The positive impacts of the project are considered to be highly beneficial to the Windhoek community, namely the obvious traffic relief that will result in Auas Road and surrounds.

Negative impacts nevertheless need to be addressed, including loss of biodiversity which should be off-set, and social concerns relating to construction nuisances, and concerns related to some of the sites and intersections in the area. Key mitigation measures are summarised below.

[1] Although an alternative route would have been a reasonable alternative, the new entrance is already a reality.

[2] Low overall, but highly significant change for one property, i.e. Movenpick Hotel.

## SUMMARY MITIGATION

*Alternatives*

1) The no-go alternative for this project would entail continued traffic congestion along Auas Road and into the surrounding Suiderhof, as well as the congestion of taxi's and uncontrolled parking in Tacoma and Perking Streets. The project going ahead will make a significant improvement to the traffic situation of Auas Road and surrounding area.

2) An alternative for the Auas Road upgrade is to place the lanes on the eastern side of the existing road to avoid trees loss. However, this would require the purchase of land from private land owners since there is not enough space for the new lanes there. Additional temporary detours would be needed to accommodate traffic during construction, including culverts at the riverbed, making this option expensive. Trees will also need to be removed for detours during construction. Approximately 30% less trees would be forfeited for this alternative, excluding trees to be removed for the temporary bypasses.

3) As explained in Section2.2.1 of this report, three alternative sites were considered for the taxi rank. Each of these sites have problems with parking and vehicle movement space, are too small, or are not well located. More importantly however, the demand for taxi's parking in the Tacoma Street area will remain a reality and regardless of the facility; the taxi's will most probably continue to wait for and pick up their customers at this site.

4) It was suggested that the Blaubock Street link proposal not be built. However, this link will ease the current congestion at Blackwood Street. The planning of this link exists. It is anticipated that the overall traffic flow in the area will improve when the Auas Road upgrade is completed.

5) The proposed NDF entrance in Blaubock Street, however, will significantly increase traffic to this street if it is used as access road to the new NDF headquarters currently under construction. It has been stated, that this link is necessary as a quick exit in case of emergency. It is therefore proposed that this access route be used in case of emergency and an alternative access route is required from an arterial road that would divert the daily traffic from the NDF headquarters out of the residential area. The latter though might not be practically possible. The NDF Base already obtains access through a residential area and has already built its entrance towards Blaubock Street. The expansion of the NDF Base in itself is not part of this EIA and regardless whether the link with Auas Road will be provided or not, and with the base already enjoying access from Blaubock Street, the additional generated traffic will be inevitable. It is therefore advisable to mitigate impact within the residential area and redirect traffic to an arterial on the shortest possible way.

*Mitigation proposed*

1) Noise, dust, workforce issues and pollution expected during construction will need particular attention in this urban area with tourism facilities, which is also a

protected groundwater area. However, with good management strategies, such as aligning construction activities with prevailing wind directions to avoid noise and dust, and other normal construction management strategies, these impacts can be largely controlled. The contractor will require a competent environmental control officer to ensure these matters receive the necessary attention.

2) The significant loss of trees, including protected Sheperds Trees and Camelthorn Trees, also culturally and ecologically valuable, need to be limited as far as possible and strictly enforced. It is recommended that lost trees be replaced with the species removed, including Camelthorn, Sweetthorn, Buffalo Thorn, and Sheperds Tree, as well as with other endemic species that will adapt well. These can be planted in the park area next to the proposed taxi rank, and along the road on the side verges and road median.

3) The replacement of trees should also be used to create a noise barrier along the western properties, especially where they are close to the road or where they have sensitive receptors such as the Arebbusch camping area, or the recreational facility of the hotel.

4) It is recommended that a landscape architect/urban designer or similarly qualified entity be appointed to assist in integrating the design of the taxi rank, pedestrian and cycling lanes, to form an integrated and pleasant corridor at Windhoek's entrance. This will turn the fact that a portion of the existing park, and a significant number of trees is being lost into a positive development, as off-set for those significant losses.

5) The expected increase in anti-social behaviour at the taxi rank requires policing and control, including cleaning and management of the ablution facility. It is proposed that the area be enclosed with a palisade fence. Poles and curbs should be used in Perkin Street to deter minibus taxi's from parking there. The City of Windhoek's Public Transport Division has committed to appoint a service provider to manage the facility. This will include security and ensuring operations take place in an orderly way. This is a crucial step to ensure order at the site, and should be implemented.

6) The specific properties which need to change their informal accesses from Auas Road will be provided with alternative access points from Auas Road or an alternative road. The consultant should consult the affected properties and inform them accordingly.

7) A dedicated grievance mechanism as part of the ESMP is crucial to field concerns and complaints from the public during construction in a constructive manner and to ensure they are timely addressed with feedback communicated.

If these mitigation measures are implemented, then the biophysical and social losses of the project will be successfully dealt with, save for the new NDF Base main entrance which is beyond the scope of this project. The specific mitigation measures are included in the Environmental and Social Management Plan.

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Appendix C: Stakeholder Engagement Report

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# 1 INTRODUCTION

## 1.1 BACKGROUND

The Roads Authority of Namibia have appointed Lithon Project Consultants to conduct the design, tender and construction supervision of Auas Road, Windhoek. It is the major arterial which enters Windhoek from Rehoboth, south of the city.

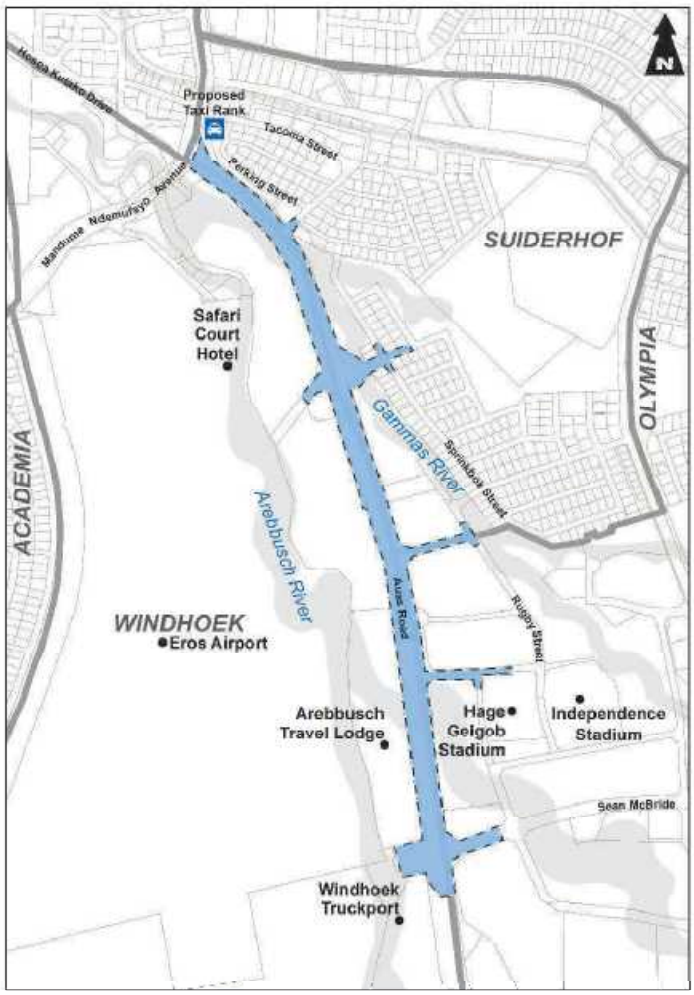


Figure 1: Route of the Auas Road Upgrade Project

The upgrading involves the section of Auas Road from the intersection between Auas Road and Sean McBride Street, northwards to the intersection with Mandume Ndemufayo Ave. The works involve the widening of the road, from a single lane to dual carriageway, with a median. The intersections along the relevant road section will also be upgraded.

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## 1.2 TERMS OF REFERENCE

### 1.2.1 SCOPE OF WORK

The following specific items are included in the Terms of Reference for this ESIA process, with the aim to obtain an Environmental Clearance Certificate, according to the Environmental Management Regulations of 2012.

1) Vegetation evaluation focussing on valuable and protected trees and the Arebbusch River.
2) Route visit and land use evaluation focussing on the affected properties surrounding the road upgrade and its proposed intersections, acknowledging that the proposed road upgrade takes place on Municipal and State-owned land, i.e. no land acquisition will be required.
3) Ecological and social baseline description of the affected area, focussing on elements likely to be affected.
4) Compilation and implementation of a Stakeholder Engagement Plan, including:
    a. Background Information Document
    b. Press notices in two national newspapers for two consecutive weeks.
    c. One public meeting
    d. Focal meetings with specifically affected people/groups and authorities as may be needed
    e. Direct contact with directed affected businesses/residents
    f. Ongoing e-mail communication and distribution of reports for review with registered stakeholder database.
5) Ongoing interaction withe Design Team to investigation and propose mitigation options, alternatives and solutions.
6) Preparation of a Draft Scoping Report and Environmental Management Plan.
7) Submission of the reports to the relevant authorities and stakeholders for review, and incorporation of comments.
8) Necessary application procedures on the portal of MEFT, and submit the necessary hard copies, to obtain the ECC.

### 1.2.2 EXCLUSIONS

1) Borrow pits require a specific investigation and it is assumed that no new borrow pits will be made on this project.

2) Report back meetings are not envisaged and therefore not included in the scope of works. Should there be significant conflict among stakeholders about the project after the report has been circulated to them, feedback meetings should be considered.
3) The specialist investigations done are as described in the above scope of work, should any other specialist investigations be required, they will be requested separately.

## 1.3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

The Regulations require an independent and qualified Environmental Assessment Practitioner (EAP) to undertake the ESIA on behalf of the proponent. Stephanie van Zyl is the EAP responsible for this work (see attached CV in Appendix A).

# 2 PROJECT DESCRIPTION

## 2.1 BACKGROUND

The rehabilitation and widening project starts and includes the Sean McBride Road intersection and extends up to the Mandume Ndemufayo Avenue intersection, which is approximately 2,3 km in length.

Auas Road is a main urban arterial road, under the jurisdiction of the City of Windhoek, located to the south of Windhoek, which accommodate traffic into Windhoek to and from the B1 national road. Auas Road forms part of the main north-south corridor through Windhoek linking with Hosea Kutako Drive, and as a result is a critical corridor responsible for carrying large volumes of traffic, including heavy vehicles into and dispersing through Windhoek.

Currently, Auas Road opens into a dual carriageway upstream of the first primary intersection with Michelle McLean and Frankie Fredericks streets. The road again narrows to a single-lane carriageway downstream of the intersection with Sean McBride Street up to the intersection with Mandume Ndemufayo Avenue. This creates a serious bottleneck for traffic flow, especially during peak traffic hours, resulting in time-consuming congestion and driver frustration.

## 2.2 PROJECT ROUTE

The project involves the following (Figure 2):

- Widening of existing Auas Road to two lane dual carriageway capacity;
- Portion from Hosea Kutako Drive up to Blackwood Street might require three lanes per direction subject to the recommendations of the latest Traffic Impact Assessment conducted;
- Rehabilitation or reconstruction of existing road surface as the outbound lanes;
- Providing barrier kerbingand paved sidewalks as per the City of Windhoek's Non-Motorized Transport Strategy to both the new and existing carriageway;
- Upgrading of the following intersections:
    - Sean McBride inclusive reconstruction of a portion of Golf Street
    - Hosea Kutako Drive / Mandume Ndemufayo Avenue (limited work, focussing south of Mandume Ndemufayo Ave)
    - Blackwood Street and establishing a full intersection with access to Erf 9021 Windhoek
    - Netbal Street, including extension up to existing tarred road
    - Stadion Street, including establishing a full intersection with access to Erf 8019 Windhoek
    - Aviation Road and constructing of a new link with Springbok Road providing a link to the new facilities at the military base via Blaubock Str (Figure 3).

- Provision of the Tacoma taxi and bus facility (Figure 4, see in Section 2.2.1);
- new Wood traders area along Netbal Street, opposite the rugby stadium.
- Pavement Analysis of existing road sections
- Provision of drainage structures and associated flood line analysis
- Geotechnical investigation of structures to be provided
- Streetlights for Auas Road to be upgraded

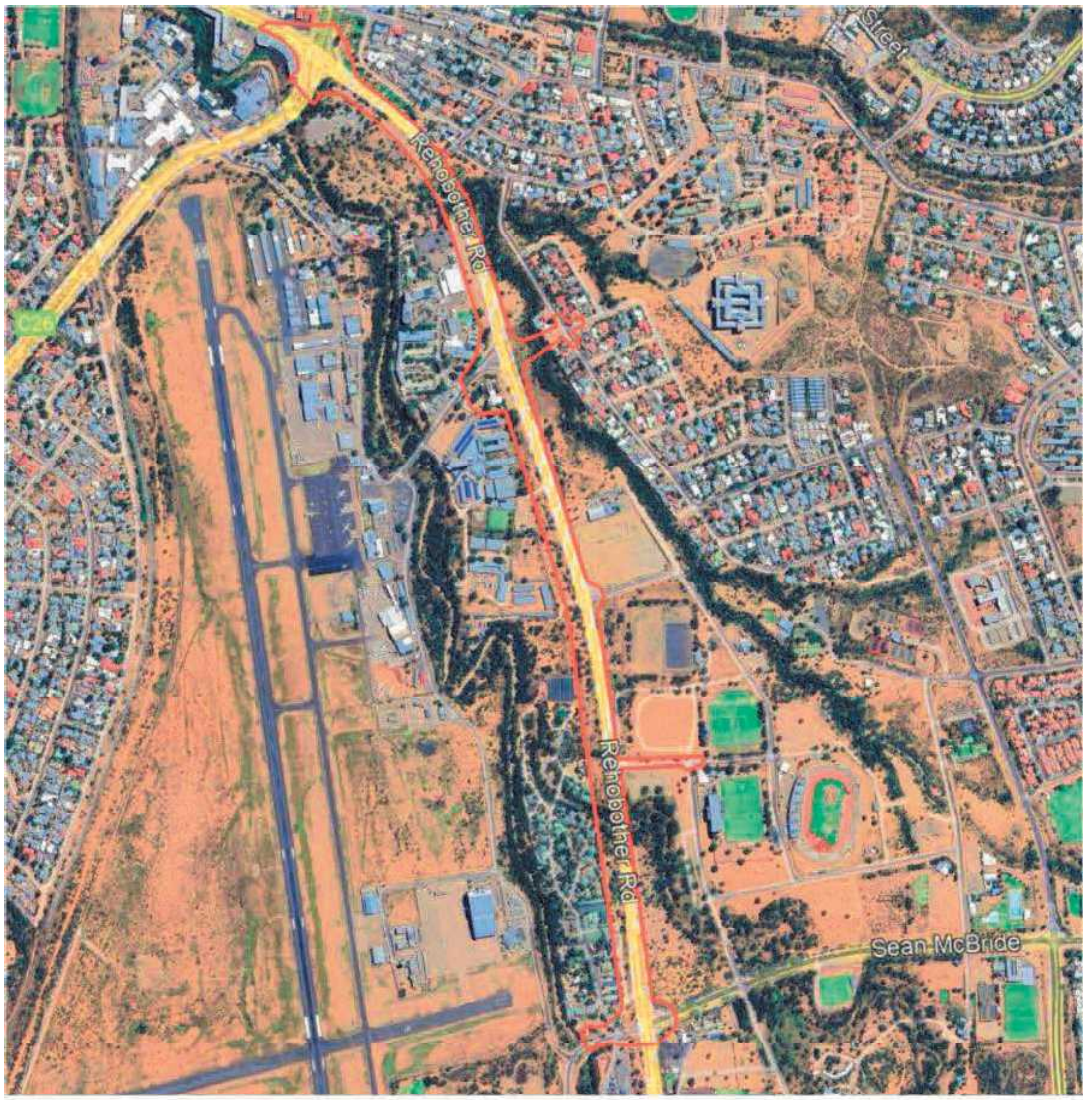


Figure 2: Project Route overlaid onto aerial photography (Google Earth).

The Route as overlaid on Google Earth, is displayed in Figure 2 below.

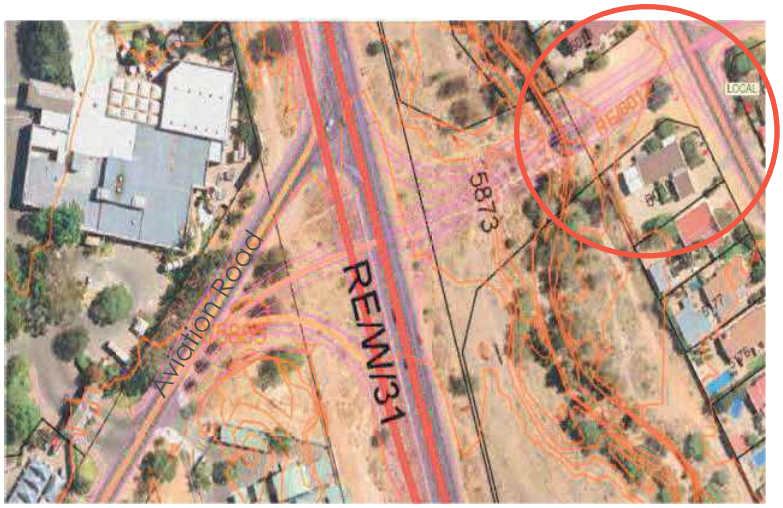


Figure 3: Erven 6018 and 6019 will have a new road passing due to the new link between Aviation Road and Springbok Street.

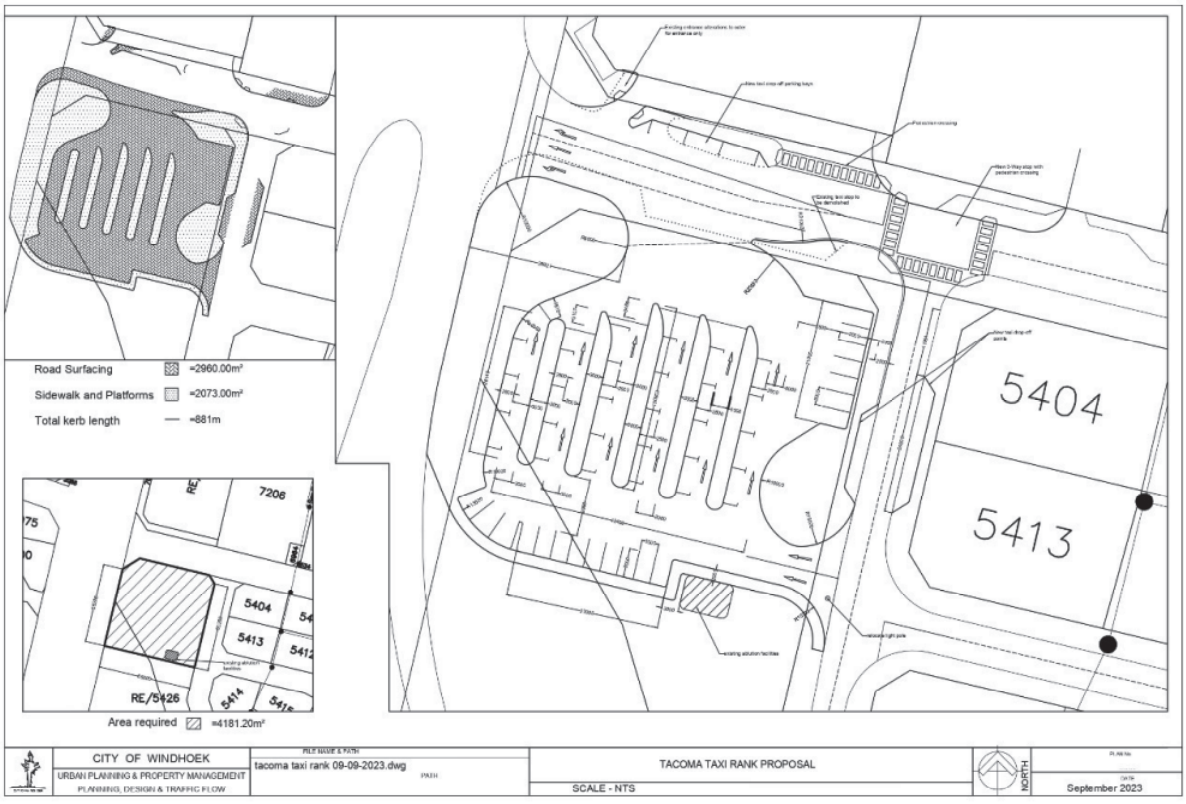


Figure 4: Proposed taxi rank Tacoma Street

The land required for the project is all reserved for road purposes and owned by either the Windhoek Municipality or the State.

### 2.2.1 DETAILS OF THE TAXI RANK

Over time a local informal pick-up point for long distance taxis between Windhoek and Rehoboth developed at the southern corner of the intersection of Mandume Ndemufayo Ave. and Tacoma Str. This causes significant traffic congestion at the intersection.

The rationale for the final site of the long-distance taxi rank is as follows:

- The City of Windhoek has no control over the issuing of long-distance taxi licences, which is the sole responsibility of the Ministry of Works and Transport.
- Therefore, the City of Windhoek cannot limit the amount of long-distance taxis but is responsible for how these taxis operate within the city limits.
- Over time the illegal use of the Tacoma Street sidewalk as a long distance taxi rank developed, causing congestion and the City of Windhoek received complaints from operators and users causing a nuisance in the direct vicinity of the informal taxi rank.
- Short term policing of the area is not sustainable, therefore the City of Windhoek identified three alternative sites for formally developing a new long distance taxi rank to serve this need in the southern area of Windhoek.
- The north portion of the city park bordering Tacoma Street.
- The south-western portion bordering the Mandume Ndemufayo Ave and the Auas Road / Hosea Kutako Drive.
- The portion bordering Auas Road immediately north of the Aviation Road intersection to the east.
- Two of the alternatives were deemed unsuitable upon further investigation, being privately owned or too far away from the informal taxi rank, which is also conveniently close to service station facilities.
- After consultation with the City of Windhoek Parks Department, the site on the city park off Tacoma Street was selected as the preferred option.

The City of Windhoek therefore intend to develop the new formal taxi rank at this intersection on the existing open space (park) with access from Tacoma and Perkin Streets and an exit to Tacoma St.

The capacity of the taxi rank will be suitable for up to 25 vehicles. The City of Windhoek's Public Transport Division will appoint a service provider to manage the

facility. This will include security and ensuring operations take place in an orderly way.

The taxis will be able to access the taxi rank from Tacoma Street and from Perkin Street. The exit will be via Tacoma St to Mandume Ndemufayo Ave only, with an additional slip lane to the Takoma St/ Mandume Ndemufayo Ave intersection.

The current park ablution facility will be upgraded and incorporated into the taxi rank.

### 2.2.2 DETAILS OF THE AVIATION STREET INTERSECTION TO SPRINGBOK STREET LINK

This new single lane carriageway link will consist of:

- Access to the Aviation Street Intersection.
- A culvert across the eastern branch of the Arebbusch River.
- An intersection with Springbok Street which will give the New Military Base facility its main access to Auas Road via Blaubock Street.

This link was originally planned to replace Blackwood Street as the main access to the Suiderhof neighbourhood. The traffic conditions are now as such that both these links will be required during peak traffic periods.

The decision to use this link as the main entrance to new facilities at the Namibian Defence Force Base via Blaubock Street is considered beyond the control of the City of Windhoek. The City of Windhoek cannot dictate to the Namibian Defence Force how they arrange the transport flow to and from the base.

### 2.2.3 ROAD CROSS SECTION

Figure 5 shows the cross section of Auas Road, which will include two carriageways in both directions (north and southbound), a curbed median, and a pedestrian and bicycle lane on either side of the road.

The exception is that, northbound from Aviation Street, there will be three lanes and southbound there will be three lanes past Blackwood Street.

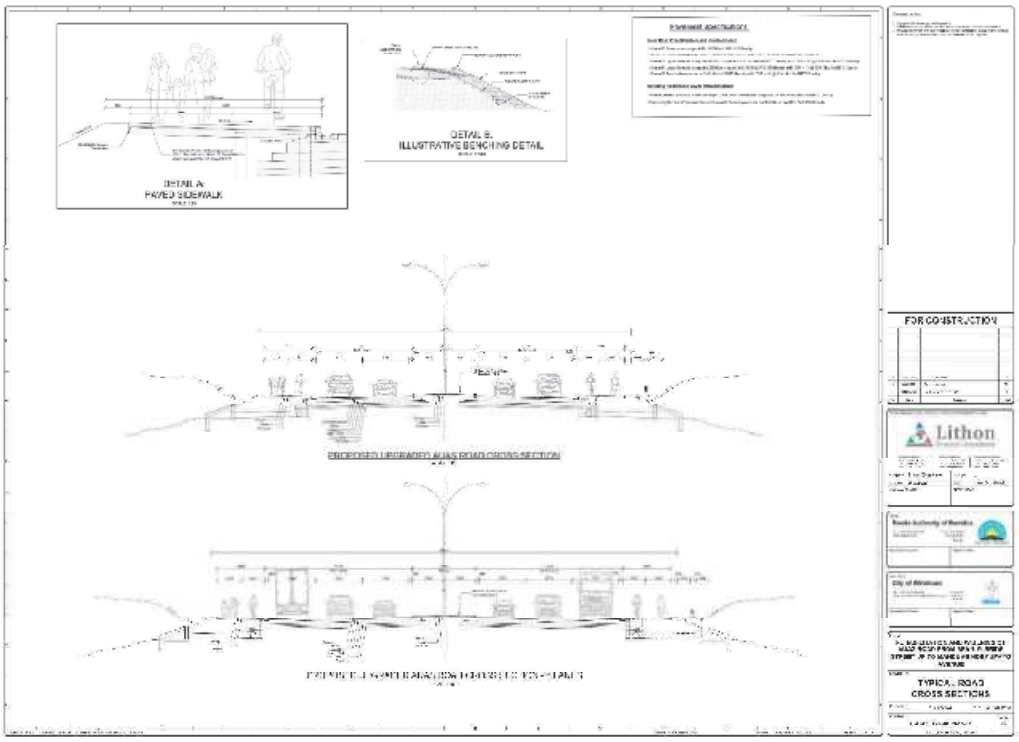


Figure 5: Cross section showing the two-lanes and three lanes scenarios, north-bound are left and south-bound are right in the drawing.

## 2.3 ACTIVITIES EXPECTED DURING CONSTRUCTION

### 2.3.1 ROAD WORKS

The following main road works shall be undertaken as part of the widening and rehabilitation of Auas Road which the supervision team will reflect in the bill of quantities and project specifications:

- Clearing and grubbing within defined road reserve.
- Opening and reinstatement of borrow areas[3] and the provision of haul roads (if not already done under original contract[4]).
- Construction of earthworks, including roadbed preparation, removal of unsuitable material, benching, cut and fill utilising materials in the existing road prism, deviations and material from borrow sources.
- Construction of pavement layers and sidewalks as per typical cross sections, utilising materials in the existing road prism as far as possible, deviations and materials from borrow and commercial sources.
- Application of a prime coat and construction of a bituminous Cape Seal and single seal for rehabilitation part.
- Provide paved sidewalks, kerb stones and channels for urban road design as per the City of Windhoek's standards and typical cross section
- Road marking and the supply and erection of road signs.
- Finishing the road and road reserve.

### 2.3.2 DRAINAGE WORKS

- The drainage works on this project shall comprise the following:
- Provision of erosion protection.
- Extension of two culverts and an additional culvert for the link to Springbok Road. These bridges and culverts would need to comply with the applicable return period, any major or minor identified repairs, extension works, whichever is applicable to the specific drainage structures.
- Construction and provision of urban drainage structures according to City of Windhoek's typical standards.
- Construction of inlet and outlet structures according to City of Windhoek's typical standards.

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[3] Should new borrow areas be opened, they will be subject to a separate EIA and application for an ECC.

[4] The contract of the Windhoek-Rehoboth Road upgrade will be extended to include the current works.

### 2.3.3 ACCOMMODATION OF TRAFFIC

Construction work on the project is to be carried out in such ways that traffic can be accommodated on one carriageway, while the other carriageway is under construction. Temporary bypasses might be required at crossovers or once intersections are upgraded.

Temporary road signs and traffic control measures will, however, be employed to ensure the safe passage of public traffic in accordance with the requirements of the specifications.

The traveling public shall have the right of way on the public roads and streets. The contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard to the public.

A Traffic Accommodation Plan will be compiled, and necessary notices will be published in the press, to inform the public of intended disruptions throughout the Construction period.

### 2.3.4 MAIN SERVICES OF THE ENGINEERING TEAM

From the Scope of Works, the following have been identified as the main services to be provided by the Consultant for this assignment:

- Mobilisation
- Preliminary Designs
- EIA
- Design of Structures
- Detailed Road Designs
- Construction Drawings
- Detail Site Supervision & Contract Administration
- Post Construction Stage

The approval bodies will be Roads Authority as the Client, and City of Windhoek as the infrastructure owner and operator of the network.

The work phases, within which the EIA fits, comprise the following:

- Topographical Survey
- FWD tests on the existing carriageway
- Geotechnical Investigation
- Traffic Impact Assessment
- Preliminary Design and Cost Estimate
- Detailed Design
- Contract Documents
- Construction Site Supervision

### 2.3.5 RELEVANT TECHNICAL STANDARDS

The project tasks will be carried out strictly in accordance with the ToR, the Technical Proposal, as well as the following procedures and guidelines of the Roads Authority, as follows:

- Procedures Manual
- Materials Manual
- Drainage Manual
- Structures Manual
- Survey Manual
- Economic Evaluation Manual
- Geometrics Manual
- Environmental Manual
- RA Design Standards
-

In addition to the above, the following guidelines and manuals will further guide the Consultant:

- Geometric Design Guidelines (SANRAL G2 Manual, 2002)
- Namibian Drainage Manual 2012
- The South African Pavement Engineering Manual (SAPEM), 2014
- South African TRH (Technical Recommendations for Highways) and TMH (Technical Methods for Highways) Manuals
- Ministry of Works and Transport Road Traffic Signs Policy
- Southern Africa Transport and Communications (SATCC) Geometric Design Manual
- Highway Capacity Manual
- South African Road Safety Manual
- Ministry of Environment, Forestry and Tourism Environmental Legislation

The RA's and CoW typical drawings for standard drainage structures and drains, intersection designs, signage, guardrails, rest places, bust stops, etc, as included in the Standard Book of Drawings will also be used where applicable and feasible.

### 2.3.6 RESOURCES REQUIRED

#### *2.3.6.1 Physical resources*

- Water (estimated at a total of 35404 $m^3$) is needed to wet the various layers of the project, for earthworks, concrete work and ancillary works, which will be sourced from municipal semi-purified water sources. Purified water will be required for domestic purposes at the site office (off-site), which are expected to be low volumes for household purposes.
- Borrow material will be sourced from a commercial source; no borrow pits will be made specifically for this road upgrade.

- Heavy vehicles and Machinery such as graders, compactors and tipper trucks will be used for the construction of the road.
- Bitumen will be sourced from a commercial source.
- Worker accommodation will not be allowed on this project. Rather, workers are required to find own accommodation in Windhoek.
- Waste generated will be the organic (vegetation cleared), including wood, office waste (general waste), hydrocarbons, paints, and sewage and are to be disposed of at approved waste disposal sites.

#### *2.3.6.2 Labour required*

An existing contractor will be used for the project, who already has a staff complement of local Namibians. The positions of these staff will be secured for another 18 months, due to this project. The total estimated number of staff required is 136, consisting of 22 management positions, 18 skilled labour, of which an Health, Safety and Environmental Officer (who will also control the Environmental and Social Management Plan), and a Traffic Safety Officer are included. There are also 36 semi-skilled and 60 general workers needed. These are all Namibian positions.

## 2.4 PROJECT TIME FRAME AND IMPLEMENTATION

The schedule of the project is urgent. It is anticipated that construction will commence once Environmental Clearance has been issued in the third quarter of 2024. The designs of the road are currently underway and the environmental assessment process runs parallel to it.

# 3 APPLICABLE LEGISLATION FOR THE PROJECT

The first part of this section provides a review summary (Table 1) of applicable environmental legislation pertaining to the project, both international and national.

A discussion follows on the key legal instruments that are of concern in the context of this project.

## 3.1 OVERVIEW OF LEGAL INSTRUMENTS

*Table 1: Relevant provisions from applicable legal instruments*

| LEGISLATION/ POLICY/ GUIDELINE | RELEVANT PROVISIONS | IMPLICATIONS FOR THIS PROJECT |
|---|---|---|
| INTERNATIONAL | | |
| Convention on Biological Diversity (1992) | Article 6 (b) provides for the explicit consideration of "the conservation and sustainable use of biological diversity into relevant… plans, programmes and policies" | General principle to be applied in the development, applicable to the protected tree species on the site, and the river ecology to be conserved. |
| NATIONAL | | |
| Namibian Constitution First Amendment Act 34 of 1998 | Chapter 11 Article 95: Promotion of the Welfare of the People | Ecological sustainability should inform and guide this project. Avoidance of ecologically sensitive areas should be a priority. River bed to be treated with respect during construction. |
| Environmental Management Act (No 7 of 2007) | • Requires that projects with significant environmental impact are subject to an environmental assessment process (Section 27).<br>• Details principles which are to guide all EAs. | The Environmental Management Act and its regulations should inform and guide this EIA process. |
| EIA Regulations GN No 28-30 (GG No 4878) | • Details requirements for public consultation within a given environmental assessment process (GN No 30 S21).<br>• Details the requirements for what should be included in a Scoping Report (GN No 30 S8) an EIA report (GN No 30 S15). | Public consultation is being conducted according to these requirements, see Section 5. |
| Forestry Act 12 of 2001<br>Nature Conservation Ordinance 4 of 1975 | • Tree species and any vegetation within 100m from a watercourse may not be removed without a permit (Forestry Act S22(1)).<br>• Prohibits the removal of and transport of various protected plant species. | Certain tree species occurring in the area are protected under this Act and require a permit from MEFT for removal. Protected trees to be identified and avoided. |
| Labour Act 11 of 2007 | • Details requirements regarding minimum wage and working conditions (S39-47). | Developer and eventual governing body should ensure that all |

| LEGISLATION/ POLICY/ GUIDELINE | RELEVANT PROVISIONS | IMPLICATIONS FOR THIS PROJECT |
|---|---|---|
| Health and Safety Regulations GN 156/1997 (GG 1617) | • Details various requirements regarding health and safety of labourers. | contractors involved during the construction, operation and maintenance of the estate comply with the provisions of these legal instruments. |
| Public Health Act 36 of 1919 | • Section 119 states that "no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health." | |
| Water Act 54 of 1956 | The Water Resources Management Act 24 of 2004 is presently without regulations; therefore the Water Act No 54 of 1956 is still in force:<br>• Prohibits the pollution of underground and surface water bodies.<br>• Liability of clean-up costs after closure/ abandonment of an activity. | The protection of ground and surface water resources should be a priority.<br>Groundwater protection area in the study area in terms of this legislation (see Figure 9) |
| Township and Division of Land Ordinance 18 of 1954[5] | The cadastral boundaries in the study area including the road reserve were created in terms of this legislation. | |
| Town Planning Ordinance (Ord 18 of 1954) | Provides for the establishment of Town Planning Schemes. The Windhoek Town Planning Scheme determines the zonings and appropriate land use restrictions of the erven in the study area. | The road reserve is zoned as "street", (Figure 10), and the taxi rand site is reserved as Public Open Space. |
| Windhoek Town Planning Scheme | • Various Town Planning regulations to be met, i.e. groundwater protection, closure of open space.<br>• Section 29 specifically deals with protection of groundwater and protection against pollution.<br><br>Public open space means any land used or reserved in this Scheme for use by the public as an open space, park, garden, playground, recreation ground or square. | Consider the implications of the land use (especially potentials, i.e. land not yet utilised) on the road traffic, consider the land use change on the public open space (Figure 10).<br>Section 29 to be included in the EMP as applicable.<br>Taxi rank area is reserved in terms of the Town Planning Scheme, as a Public Open Space. Consider the impacts and legal implications of changing the open space to a taxi rank. |

[5] This legislation and the Town Planning Ordinnance described in the follow row has been replaced by the Urban and Regional Planning Act (2018), which came into effect in 2020, but said legislation was applicable at the time when the current project cadastral boundaries and zonings came into effect.

| LEGISLATION/ POLICY/ GUIDELINE | RELEVANT PROVISIONS | IMPLICATIONS FOR THIS PROJECT |
|---|---|---|
| CITY OF WINDHOEK POLICIES | | |
| Solid Waste Management Policy | Set out the goals for waste management in Windhoek | Waste management solution to be in line with these goals. |
| General Health Regulations, 1969 | Provisions for setting standards for conditions that promote health in Windhoek, e.g. the provision of latrines for workers on construction sites, cooking food on site, etc. | Include applicable requirements in EMP. |
| Noise Control Regulations, 2006 | Defines noise nuisance under broadcasting from a property. Sets standards and makes provision for reporting such cases. | Noise regulations to be considered in the case of the construction activities causing noise, noise generated at the taxi rank. |
| Windhoek Structure Plan | To be released. | |

# 4 BIOPHYSICAL AND SOCIAL BASELINE

This section provides a brief description of those elements of the natural and social environment in the study area that are likely to be affected or which influence the nature and extent of potential project impacts.

## 4.1 THE BIOPHYSICAL ENVIRONMENT

### 4.1.1 CLIMATE AND WIND

Windhoek receives summer rainfall on average between 300 and 400 mm per annum, but it is highly variable and unreliable. Precipitation is often in the form of thunderstorms, with large water volumes received experienced in short periods.

The average temperature for the general Windhoek area is 18.3°C. The average maximum temperature for the summer months is 35°C, while the average minimum winter temperature recorded as 1.3°C (www.weather.namsearch.com, 2024).

Climate change trends suggest that Namibia's, including Windhoek's weather patterns are changing and that there has been a global gradual temperature rise of at least 1 °C since 1850 (the industrial revolution). Perhaps more importantly for the current project is that extreme weather events particularly droughts and floods are more frequent and intense. [6]

The two most prevailing winds (Figure 6) in Windhoek are south-westerly (mostly July-August) and north-easterly (mostly summer months). The south-westerly winds are the strongest.

Key climate sensitivities for the project :

- Wind directions from the south-west and north-east put different locations at greater risk as receptors of noise and dust during different seasons. Suiderhof will be more at risk during the late-winter months, while the tourism locations on the western side of the road will be more at risk during the summer months.
- Climate change has implications for the design considerations of the road as far as stormwater accommodation is concerned.
- The arid nature of the area calls for water conservation practices, i.e. conservation of water volumes and water quality during the project.

[6] https://www.metoffice.gov.uk/weather/climate-change/what-is-climate-change

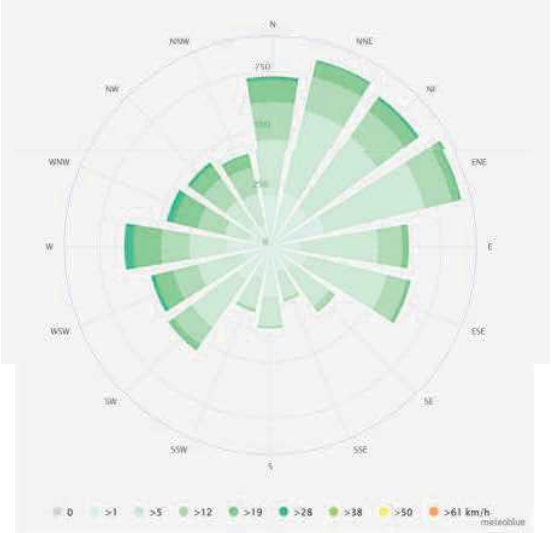


Figure 6: Wind directions for Windhoek. Source: Meteoblue

### 4.1.2 HABITAT AND TOPOGRAPHY

The project area is characterised by two physical features collectively namely the Windhoek Valley Habitat and the Arebbusch River, with its tributary winding through Suiderhof (Figure 7) (Enviro Dynamics, 2009). The valley is formed through erosion of alluvium and the mentioned rivers are recent geological features, formed by water eroding away its path through the alluvium.

The map shows that a large part of this habitat, including the project area, is developed. On the map, this area is labelled "semi-natural/unnatural" habitat. The development in the area surrounding the road is however mostly low density, which has caused some of the valley habitat to stay intact. The valley bottom, although less sensitive than the river bed, or higher lying mountainous areas, is under threat to be swallowed up by development, due to its favourable slopes. The valley and the river bed are important features for hosting biodiversity, flood attenuation, avoidance of erosion, and preventing and regulating pollution. This habitat also provides important relief for inhabitants from the heat and create a visually appealing landscape.

Key sensitivities :

- The valley and the river bed providing important ecological services is a key sensitivity of which its elements should not be destroyed but rather enhanced.

- The area as a receptor of surface and groundwater should be protected from pollutants.

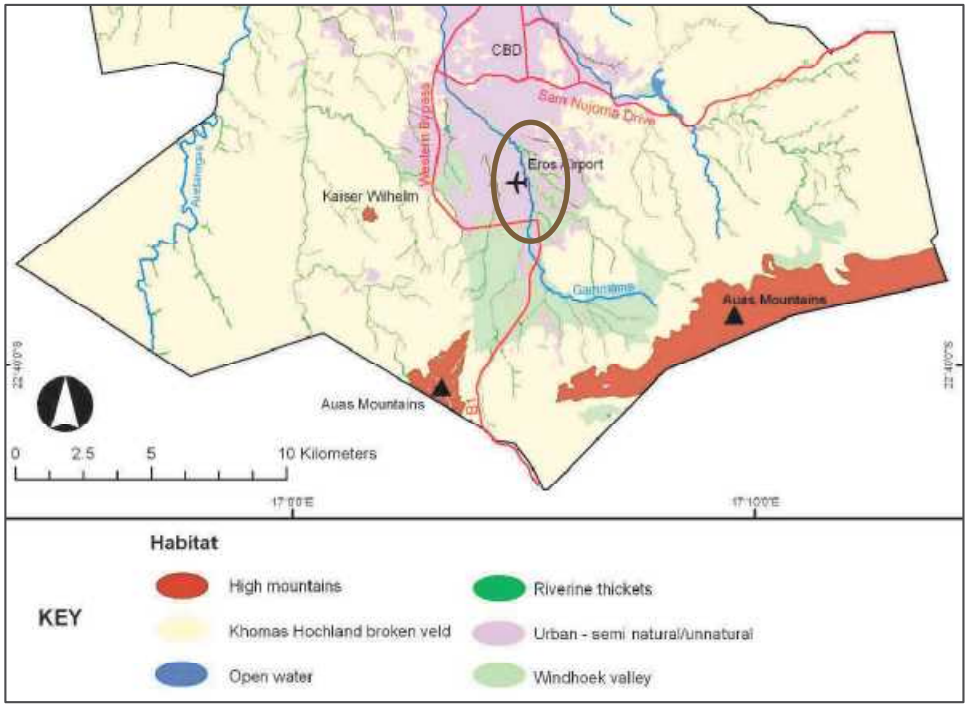


Figure 7: Habitats of the project area

### 4.1.3 SOIL

The State of the Environment Baseline Report (2008) classified topsoil in the Windhoek area in general, i.e surrounding the project area valley as only about 1m thick, which is very thin and prone to topsoil stripping in areas where new developments take place i.e. township establishments and associated soil intensive activities for example borrow pits. The dominant soil types in Windhoek are called biotite schists and quartzites, a fine coarse gravel material forming the topsoil overburden. This has a high sensitivity rating according to the ESP because the Windhoek aquifer is made up of these quartzites, which act as filtration material for surface water drainage into the aquifer.

The soils in the localised project area are sandy, relatively course in the riverbed and fine to becoming powdery, and clayey in areas on the plains.

Key sensitivities:

- The river banks and slopes (covered with a thin layer of material that is popular as aggregates), when disturbed, are prone to erosion.
- Increased groundwater pollution due to soil structure allowing easy infiltration of liquids.

- Dust as a risk is increased due to the powdery nature of the material in the project area.

### 4.1.4 VEGETATION

The habitats of the project area, namely riverine thicket along the Arebbusch River and the adjacent alluvial valley provide the structure for the vegetation occurring there.

The valley area, as described in the Windhoek Biodiversity Inventory (Enviro Dynamics, 2009), describes pristine valley areas of Windhoek as typically hosting mature trees of Camel thorn, (*Vachellia erioloba)*, Umbrella thorn (*Vachellia tortilis)*, and Karee (*Searsia lancea)* .

In Windhoek, riverine thicket vegetation is typically dominated by *Acacia karroo* (Sweet thorn). In the study area, this pattern is confirmed with clusters of *Ziziphus mucronata* (Buffalo thorn) also present.

The alluvial plains surrounding the riverbeds have large specimens of Camelthorns, and Shepherds trees (*Boscia albitrunca),* occurring throughout the area in large numbers. The road run-off has probably benefitted the growth of many of these specimens. Even though these species are both protected by Namibian legislation and endemic (naturally occurring in Namibia), they are widespread throughout Southern Africa. These species are however highly valuable culturally, visually, and ecologically, and as a wood resource, particularly the Camel thorn.

Three other tree species that proliferate on the plains surrounding the road are *Senegalia mellifera* (blackthorn) and *Vachelia reficiens* (red umbrella-thorn), and *Senegalia senegal* (three-hook acacia). These species are also wide spread and not of particular conservation concern. They do have an important ecological function such as protection of soils, fodder, soil erosion protection, dust prevention, etc.

The list of conservation worthy plant species occurring in the riverine thicket and valley habitats is provided in Appendix B.

All native vegetation in Namibia's arid climate have important ecological value to retain moisture and is to be protected as far as possible.

Key sensitivity: Damage/ and or Loss of specific flora species found in the project area. Tree and shrub species of most concern are:

- Vachellia erioloba (old name Acacia *erioloba*, Camethorn),
- Boscia *albitrunca* (Shepherds tree), and

Ziziphus mucronata (Buffalo thorn)

### 4.1.5 FAUNA

Appendix B provides the list of fauna species of conservation concern in the riverine and valley habitats.

The valley habitat is developed and therefore hosts fewer numbers of species than listed there. Species such as birds, bats, mice, shrew and a various of reptile species are expected to occur in the project area.

The riverine habitat is considered to be a refugia for birds, reptiles, amphibians and some smaller mammals. Many of the birds breed there and forage in neighbouring urban gardens. It thus acts as a source of garden birds and is therefore highly sensitive to further disturbance. The habitat itself is threatened by bush clearing and the encroachment of urbanisation, and the birds are threatened by domestic and feral cats. It can be regarded as highly sensitive.

### 4.1.6 HYDROLOGY AND GEOHYDROLOGY

The project area has two significant dry river beds, the Arebbusch River's main channel, and its tributary (Figure 8). The river run-off originates in the foothills of the Auas Mountains to the south-east of the site. The run-off produced in this riverbed flows to the Goreangab Dam. The riverbeds are considered crucial for accommodating and attenuating urban run-off. As may be seen on the google image below, the riverbed in the project area is still fairly intact, except for the north-western corner at the Movenpick Development and the Northport development across Mandume Ndemufayo Avenue where there is significant fill and channelling of the riverbed.

The ESP (2004) restricts any type of development to take place in this drainage line.

Road construction methods do allow culverts to be placed in river courses where a road intersects them, to prevent blocking off such a river, thereby keeping the ecosystem intact.

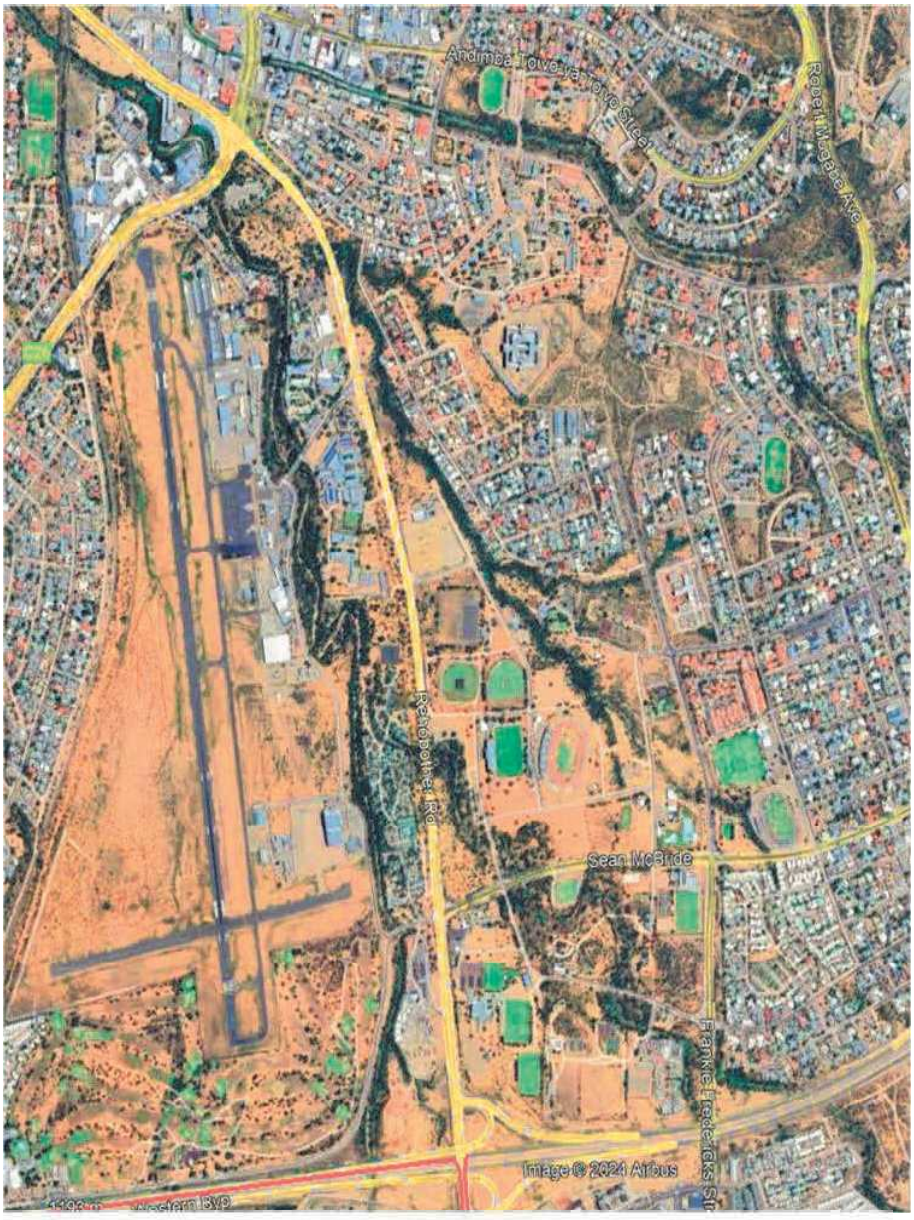


Figure 8: Arebbusch River and tributary winding through the project area

Figure 9 below indicates the area which is important for the recharge of the Windhoek aquifer and shows that the project area falls within it. There are boreholes in the Arebbusch River close to the project area.

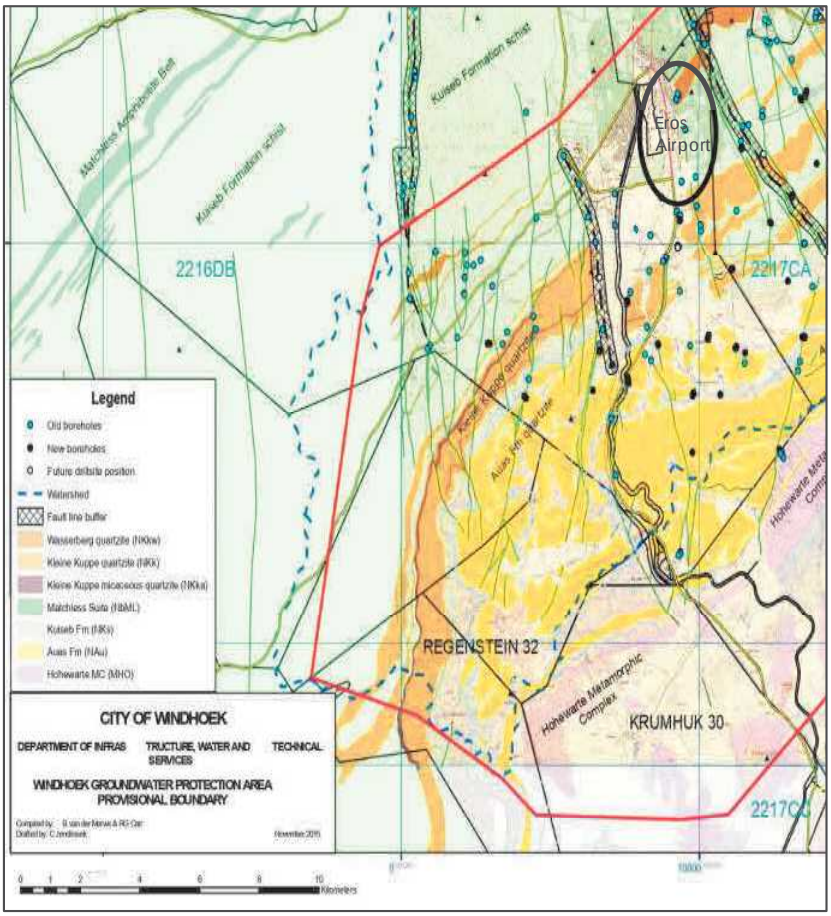


Figure 9: Aquifer protection area of the City of Windhoek indicated as area within the red line. Blue Circle: project area. Source: City of Windhoek

Key sensitivities:

- General construction activities and disturbances in the Arebbusch River during construction may cause pollution of the surface and groundwater resource.

## 4.2 THE SOCIAL LANDSCAPE

### 4.2.1 DEMOGRAPHICS

The recent 2023 census, of which only the basic data is available, indicates that the current population of the Khomas Region is 494605. In 2011, the Khomas Region had a population of 342 141, which means the population has grown by 70% since then. The annual growth rate for the Khomas Region has been 5.8% per year, which is almost double that of the national growth rate. This indicates that the Khomas Region, with the majority of its residents (98%, or 486 169 ) living in Windhoek, is one of the key growth nodes of Namibia.

The unemployment rate is currently at 33.4%, while the GDP growth is at 4.2%.

With this growth rate, pressures on infrastructure are increasing, including on the capacity of roads to carry traffic through the City.

### 4.2.2 TRAFFIC STATISTICS

An understanding of the traffic situation of the project area will assist in gaging the impact of the proposed road upgrade, with its proposed intersections and links. A Traffic Impact Assessment was undertaken for this project (ITS, 2024).

The study indicates that the total current vehicles on Auas Road is approximately 1200 during AM peak hour and between 1100 and 1350 PM peak hour, as a single carriageway. The traffic study indicates that the road is at capacity, and requires additional lanes as proposed.

Based on the traffic study, the expected growth rate along Auas Road would be about 3% per year over the next 10-year period, with a possible low growth scenario of 2,8% per year and a high growth rate scenario of about 3,4% per year. The 3% growth rate aligns with typical growth rates for traffic planning purposes.

Based on the traffic impact study, three (3) through lanes are proposed along Auas Road, between C26 and Aviation Road and two (2x) through lanes are proposed along Auas Road, between Aviation Road and the Western By-Pass terminals.

### 4.2.3 SURROUNDING LAND USES

#### *4.2.3.1 Introduction*

The land occupants surrounding Auas Road in the project area will be directly affected by the road upgrade. The City residents as a whole will also be affected as users of the road, in a positive way, save for the temporary traffic congestion that

will be experienced during construction. The surrounding land use and area characteristics is therefore described below (Figure 10).

#### *4.2.3.2 Area 1: Tacoma Street area*

The Tacoma/Perkin Street area includes light industrial facilities such as a filling station and related retail, car repairs, towards the edge of the area to the north-west, with high density residential and offices, lining Tacoma Street towards another business node to the east. There are some single residential properties remaining in between. At the westernmost end of the street, the activities are dominated by the two fuel stations in Mandume Ndemufayo Street, which are used by Rehoboth-Windhoek commuters to fill their vehicles, including sedan vehicle commuters and bus taxi's. The mini-buses dominate the transport scene there, where they congregate in Tacoma and Perkin Street to assemble customers. The Suiderhof Policy Area of the City of Windhoek indicates that high density residential and offices are supported in this area east of Mandume Ndemufayo Avenue.

Local residents and businesses in the area surrounding the taxi and high-traffic node at the fuel station are dissatisfied with the traffic, noise, crime, and anti-social behaviour which undermine the quality of the area. Occupiers realise that it is no longer a quiet low density residential block, and welcome business and movement, yet they find the current activity not to be conducive to their business and the area's general well-being. The southern edge of the node is marked by an attractive park actively used by the public as a recreational open space. It is owned and maintained by the City of Windhoek, which reports that it is an increasing burden to maintain. It is shaded with indigenous trees, palm trees and has a lawn, benches and ablution facilities that are in a poor shape. It is a welcome retreat and waiting area. It is also an attractive element that provides visual relief at one of Windhoek's most prominent entrances.

#### *4.2.3.3 Area 2: Suiderhof, known as "Bokkiesdorp"*

This area of Suiderhof, so named because of its street names after antelopes, is exclusively low density residential, with some minor home industries and higher density residential developments towards the edges of the area. The area is well established with older properties on single erven. Because of traffic congestion in Auas Road, Springbok Street is used as a thoroughfare by Windhoek-Rehoboth commuters, but also by local traffic. Residents complain about the exposure and noise this creates. The National Defence Force (NDF) complex is situated on the eastern edge of this area. This is the main base of the NDF, which is currently being drastically expanded with a new complex. At this stage it is unclear what activities are being planned on this site; the details which have not been publicly disclosed for security purposes. The main entrance to the new NDF complex has been built to connect with Blaublock Street.

#### *4.2.3.4 Area 3: Sport complex*

This is a low-density area characterised by various sports facilities, including two stadions, with open spaces and sports fields surrounding the buildings. A tributary of the Arebbusch River edged off by lush green trees provides welcome greenery

shade. The flat area with the availability of semi-purified water from the City of Windhoek makes the area ideal for these activities and facilities. Even though there are other nodes with sports facilities in Windhoek, this area is the main mode for hosting sports events, for outdoor club and related activities. There are practically no residences in this zone, and activity is mostly events-driven, including the traffic and parking associated with it.

It is anticipated that the land use of this area will intensify in future, as the pressure for land becomes more eminent, with a mixed land use of sports, recreational and high density residential. The implication of such land use changes have not been factored into the current traffic forecasts, but could be considered as part of the 3% growth estimates.

#### *4.2.3.5 Area 4: Tourism belt*

A large part of the western ribbon along the Auas Road is used for tourism accommodation catering for various markets (i.e. from high end hotels to self-catering and camping), conferencing, recreation, restaurants, and related purposes. Arebbusch Travel Lodge is a large tourist establishment which is built amidst indigenous vegetation lining the Arebbusch River and its flood area, which makes for an attractive and tranquil establishment. The Movenpick and Mercury Hotels with high level conference facilities, restaurant and spa facilities have a leisure area in the centre of the complex where guests relax around a large pool.

#### *4.2.3.6 Area 5: Aviation complex*

The area is zoned as Government and accommodate the Eros Airport and ancillary uses and support services, such as the Government Garage, Civil Aviation services, and complimentary businesses, and some large office complexes for the Ministry of Mines and Energy , and NamCor.

#### *4.2.3.7 Area 6: Windhoek truckport and fuel station*

In the southern part of the study area – due south of Arebbusch Travel Lodge, there is a truckport, fuel station with ancillary take-away and retail. This area attracts relatively large volumes of heavy and light traffic to this node.

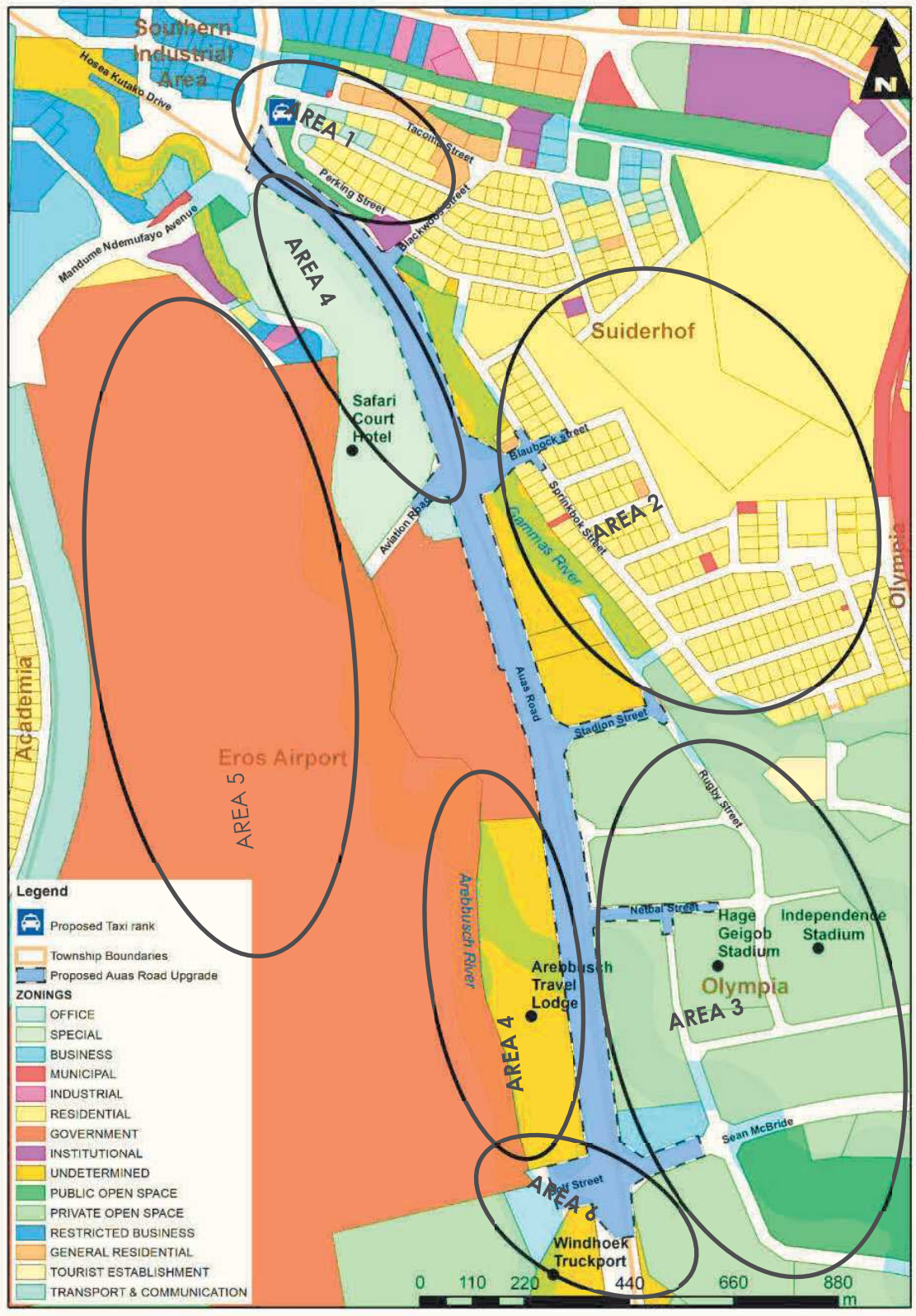


Figure 10: Surrounding land use per area

### 4.2.4 HERITAGE

The consultant is not aware of any archaeological data that is available for the study area.

Historically, people settled in areas that provided a source of food, water and shelter. Migration ensured that abandoned settlement sites by earlier pastoralists and nomads left behind remnants and traces of such human habitation in such areas. If found, such remnants, are analysed and preserved to determine the appropriate settlement period.

The particular site surrounding the road is highly disturbed and it is unlikely that any archaeological finds will be made there, especially if the construction team limits their activities to the road surface and immediate buffer area only. Therefore, the chance-find procedure (i.e. procedure required should an archaeological or historical find be made), is deemed adequate.

# 5 STAKEHOLDER CONSULTATION

## 5.1 STAHEHOLDER IDENTIFICATION

Appendix C explains how stakeholder consultation has been approached and implemented for this ESIA process.

The process commenced with the identification with the various stakeholders of the project, including those that will be mostly affected, which is mainly the band of properties surrounding the Auas Road upgrade area (Figure 11). It also includes the authorities involved, mainly the Ministry of Environment, Forestry and Tourism, the City of Windhoek, and the Roads Authority. The road users of Windhoek and those visiting will also affected by the road upgrade.

It is confirmed that there are no private properties directly affected by this project, through land take or resettlement. The proposed road reserve is owned by the City of Windhoek and the State. Potential socio-economic impacts are indirect, in the sense that land is not directly affected, but in a secondary manner through the location of sensitive receptors occupying and visiting the vicinity of the road.


Figure 11: Locality of key establishments and residences along the Auas Road Upgrade Project (indicated in red- residential and yellow-institutions).

## 5.2 CONSULTATION PLAN IMPLEMENTATION

In order to invite consultation from the above groups in a meaningful and resourceful way, while meeting legislative requirements, the following was implemented:

- A stakeholder list was compiled comprising the categories listed above. The list is being updated as stakeholders register and participate during the process.
- The project was advertised in the Namibian and Republikein and on social media on 5 and 11 March 2024 announcing the ESIA process and opportunity to participate, with an invitation to register as an Interested and Affected Party (I&AP).
- All the stakeholders in Figure 11 were directly invited by distributing an invitation to register and to attend the meetings described below. Invitations were hand delivered at 90 establishments including residences and businesses. Businesses with electronic contact details were sent the information electronically.
- A Background Information Document (BID)with the basic details of the project was distributed to the stakeholder database.
- Focal meetings were held with key stakeholders, as follows:
- An open meeting hosted at Arebbusch where stakeholders, on 18 March 2024, from 17h00-19h00 where stakeholders were free to enquire about the project, discuss ideas and alternatives.
- A focal meeting was held for key stakeholders along Aviation Road, on 18 March 2024, at 16h00 at Arebbusch.
- A focal meeting was held with City of Windhoek staff, to discuss their comments, alternatives and mitigation possibilities.
- Meetings are being held with some of the property owners who are being directly affected by the project in terms of access. Some of the properties currently have unofficial access directly from Auas Road, but because of the nature of the dual carriage way, direct access will no longer be possible. All properties do however have access from a service road in the area, but will have to construct new entrances via those streets to their facilities.
- A focal meeting was held with the City of Windhoek relevant departments and the exchange of information, notably how alternatives were considered for the taxi rank, how trees may be planted, etc. were incorporated into the document.

## 5.3 CONSULTATION OUTCOMES SO FAR

It was agreed by most the team and affected parties interacted with, that the need for the road upgrade, generally, is obvious. The single lane set-up at the relevant section of Auas Road needs to change to at least a dual carriageway, or as determined by the traffic impact assessment being carried out and this need is agreed and accepted. The issues raised, therefore, are matters to be addressed during the course of the design and construction phase.

Some additional proposals such as the taxi rank and the Aviation Road – Blaublock Street link were also received (See Appendix C and the discussions on alternatives, Sections 2.2 and 7.2.1.1).

The following table presents a list of the key issues raised during public consultation process so far and includes a summary of all communication during the meetings and received electronically.

Table 2: Comments on construction phase (mostly management issues)

| Aspect | Potential impact | Comments/Response |
|---|---|---|
| Works on lanes and at intersections. | Traffic disruption<br>Increased traffic into Suiderhof neighbourhood | Existing lanes to be kept open, but the public will likely use alternative routes such as Springbok Street to avoid the traffic.<br>Traffic accommodation plans are being compiled in consultation with City of Windhoek Traffic Management and plans will be published in the local media for the public's notice. |
| Materials transported and worked during construction. | Dust, causing constant inconvenience and potentially affecting visitors' numbers at Movenpick and Arebbusch. | Stockpiles will be limited as far as possible.<br>It is difficult to determine the exact nature of the dust, due to many variables. This has to be managed by the contractor. Water and chemical dust suppressants are available, and even though they do make a difference, they will not eliminate all dust. See Section 6.2 – Impact Assessment and ESMP. |
| Vehicles movement, compacting | Noise causing disturbance of rest, difficulty to work and concentrate, loss of guests at tourism and conference establishments. | There will be no blasting, such is not allowed in the municipal area.<br>Communication to the public of the construction schedule needs to be done. The work will be done is sections, therefore prohibiting work done everywhere at once.<br>Limit working hours.<br>See Section 6.2 and ESMP. |
| Vegetation clearance | Loss of protected tree species and damage to the ecological integrity of the Arebbusch River. | Some trees will have to be removed but can be replaced. Unnecessary removal of trees needs to be avoided.<br>See Section 6.2 and Section 6.3.1.2 |
| Workers and general construction activities. | Construction and general waste. Pollution. | Strict control via ESMP. No accommodation of workforce in the area. |
| Workers and general construction activities. | Increased crime risk due to more workers and movement in the area. | No accommodation in the area, limit the movement of people in the private areas. See ESMP. |

| Aspect | Potential impact | Comments/Response |
|---|---|---|
| Intersection at Arebbusch and truckport | This intersection is not aligned and traffic has increased due to the Country Club users also using this access. | The intersection will be properly aligned with more intersections added. |
| Project information and communication | Lack of communication leads to unpreparedness, uncertainly and lack of trust between stakeholders. | The need for proper communication about the phases of the project, as well as a grievance mechanism was discussed and it was confirmed that these are crucial elements of the project.<br>Included in ESMP. |

Table 3: Impacts expected during operation (when the road is functional, mostly design issues)

| Aspect | Potential impact | Comments |
|---|---|---|
| Taxi rank | Increase of vandalism, traffic, antisocial behaviour (sex-work, indecent language, alcohol, drugs, etc. vandalism, burglaries, etc. ) | Overwhelming concern about the taxi rank's current situation and how this may affect the businesses and residences in the area. Practically all the businesses and nearby residences are concerned. Various alternative solutions were provided. This matter requires further attention to alternatives and options.<br>City of Windhoek upon a follow-up meeting, explained the alternatives that have been considered and why this particular site was selected. See Sections 2.2.16.3.2.1 |
| Entrance at Aviation Road to link with Springbok Street via Blaublock Street | Increased traffic in Suiderhof, particularly if the NDF uses that entrance. | Alternatives were provided for reducing traffic into Suiderhof and deviating traffic onto roads away from the residential areas.<br>A follow up meeting was held with the City of Windhoek where it was explained how this matter was considered. See Section 2.2.2 and Section 6.3.2.1. |
| Lanes added to the west of the existing road | closer to some businesses increasing noise levels | Lanes cannot be added on the eastern side since the servitude is to the west. There are private properties to the east. Noise impact to be considered. See Section 6.3.1.2. |

| Aspect | Potential impact | Comments |
|---|---|---|
| Vegetation removal | Loss of trees | To be avoided in design. Trees lost to be marked. See Section 6.3.1.2 |
| | Increased security risk, anti-social behaviour for properties to the west (vandalism, crime, etc. ) | See Section 2.2.1 and Section 6.3.2.1. |
| Accesses | Reduced or loss of access | Some informal access from Auas Road will be lost. Formal access available from alternative service roads. City of Windhoek through the Engineering team to support these owners with advice and discussion. |

## 5.4 CONSULTATION BEYOND THE SCOPING PROCESS

- Further focal meetings will be arranged as required, possibly with some individual users to address access, etc.
- Electronic communication is ongoing and this report is being updated as new information is received.
- The Scoping Report was sent to the registered stakeholder list for review, for a two week period in May 2024 (Appendix C). The Mercury/Movenpick Hotel e-mailed a set of questions, attached in Appendix C. Responses were also given as indicated there.
- It is important that a consultation regime be included in the Environmental and Social Management Plan (ESMP) of the project, for implementation by the appointed Contractor and Lithon.
- This communication plan is crucial for the construction period, due to the expected socio-economic impacts during construction, e.g. dust, noise, traffic hindrances, security issues, etc.
- A grievance mechanism is considered crucial in order to address traffic flow grievances, but also with regard to incidents and conduct during construction.

# 6 IMPACT ASSESSMENT

This chapter provides an assessment of the potential impacts identified during the scoping process. It is divided into impacts expected during construction and operation separately. It combines socio-economic and biophysical impacts.

## 6.1 ASSESSMENT METHODOLOGY

The methodology used to assess the significance of each potential impact is provided below.

Table 4: Impact assessment criteria used

| DESCRIPTION | |
|---|---|
| Nature | Reviews the type of effect that the proposed activity will have on the relevant component of the environment and includes "what will be affected and how". |
| Extent | Geographic area. Indicates whether the impact will be within a limited area (on site where construction/operation is to take place); local (limited to within 15 km of the area); regional (limited to ~100 km radius); national (limited to the coastline of Namibia); or international (extending beyond Namibia's boarders). |
| Duration | Whether the impact will be temporary (during construction only), short term (1-5 years), medium term (5-10 years), long term (longer than 10 years, but will cease after operation) or permanent. |
| Intensity | Establishes whether the magnitude of the impact is destructive or innocuous and whether or not it exceeds set standards, and is described as none (no impact); low (where natural/ social environmental functions and processes are negligibly affected); medium (where the environment continues to function but in a noticeably modified manner); or high (where social and environmental functions and processes are altered such that they temporarily or permanently cease and/or exceed legal standards/requirements). |
| Probability | Considers the likelihood of the impact occurring and is described as uncertain, improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of prevention measures). |
| Significance | Significance is given before and after mitigation. Low if the impact will not have an influence on the decision or require to be significantly accommodated in the project design, Medium if the impact could have an influence on the environment which will require modification of the project design or alternative mitigation (the project continues, but with deviations or mitigation), High where it could have a "no-go" implication regardless of any possible mitigation (an alternative route/solution should be found). |
| Status of the impact | A statement of whether the impact is positive (a benefit), negative (a cost), or neutral. Indicate in each case who is likely to benefit and who is likely to bear the costs of each impact. |
| Degree of Confidence | Is based on the availability of specialist knowledge and other information. |

## 6.2 IMPACT ASSESSMENT

Table 5 below presents an evaluation matrix adopted for the impact assessment, including the key impacts identified and their final assessment, based on the criteria provided above.

Table 5: Impact assessment table

| PROJECT ASPECT | IMPACT STATUS/ NATURE | EXTENT | DURATION | INTENSITY | PROBABILITY | DEGREE OF CONFIDENCE | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT (ELABORATED ON IN THE ESMP) | POST-MITIGATION |
| CONSTRUCTION PHASE[7] | | | | | | | | | |
| Recruitment of workforce | Positive<br>Sustaining the jobs of local labourers for another 12 months, with limited job creation, leading to sustained jobs and accompanying livelihoods being sustained. | National – workforce supports families from across Namibia. | Temporary | Low | Definite | High | Low | Limited since workforce already exists. Locals first policy for new recruits. | Low |
| Sustained local spend | Positive<br>Utilisation of local service providers, supporting the local economy | Regional | Temporary | Low | Definite | High | Low | Local service providers already utilised where possible. | Low |

[7] The activities of the construction phase are similar to the decommissioning phase. Therefore, the impact assessment for the former also applies to the latter phase and the "Construction ESMP will be applicable to the decommissioning phase. Construction ESMP to be updated at the time of decommissioning.

| PROJECT ASPECT | IMPACT STATUS/ NATURE | EXTENT | DURATION | INTENSITY | PROBABILITY | DEGREE OF CONFIDENCE | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT (ELABORATED ON IN THE ESMP) | POST-MITIGATION |
| Construction works | Negative<br>Increased traffic congestion and disruption, leading to user dissatisfaction, frustration, delays. | Local | Temporary | Low | Definite | High | Low | Traffic Accommodation Plan being prepared.<br>Maintain the plan, constant feedback from users, grievance mechanism. | Low |
| Construction of base layers, transport of materials, stockpiles. | Negative<br>Dust especially during windy periods – blowing to the north-eastern side of the road during south-westerly winds after the winter, and blowing towards the south-west during north-easterly winds. Depends on the locality of stockpiles, works, time of year, etc.<br>Dust causes a nuisance and limit to nearby tourism activities, especially the outdoors leisure areas. Also a nuisance to nearby residences, and | Local | Temporary – specific periods depending on locality, wind direction, particle size,. Etc. | Medium | Definite | High | Medium | Consider dust in construction schedule<br>Conduct works according to prevailing wind direction – south-westerly winds – work to avoid the north-easterly residences from July onwards, i.e. conduct construction to the South of the road.<br>Similarly – conduct works to the northern side of the road when winds are predominantly from | Low |

| PROJECT ASPECT | IMPACT STATUS/ NATURE | EXTENT | DURATION | INTENSITY | PROBABILITY | DEGREE OF CONFIDENCE | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT (ELABORATED ON IN THE ESMP) | POST-MITIGATION |
| | businesses especially in Suiderhof. | | | | | | | the north-east, i.e. summer months.<br>No stockpiles at the side of the road<br>Materials transported to be closed. | |
| Construction vehicles, machinery ripping and applying bitumen, compacting of base layers, crushing | Negative<br>Noise causing disturbances especially to activities/receptors requiring a peaceful/quiet state.<br>Noise is particularly of concern to the tourism facilities to the west of Auas Road, and to businesses and residences who rely on or need the quiet environment.<br>Also affected by wind direction. | Local | Temporary | Medium | Definite | High | Medium | Consider noise in construction schedule<br>Similar to dust, conduct construction schedule according to prevailing wind directions.<br>Noisy construction activities only during working hours – Mondays to Saturdays 08h00-17h00.<br>Quiet activities on Sundays only upon consultation with stakeholders and community.<br>No crushing on site. | Low |

| PROJECT ASPECT | IMPACT STATUS/ NATURE | EXTENT | DURATION | INTENSITY | PROBABILITY | DEGREE OF CONFIDENCE | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT (ELABORATED ON IN THE ESMP) | POST-MITIGATION |
| The workforce in the area particularly manual labourers | Negative<br>Nuisances, disturbances and conflict caused by the workforce<br>Increase in safety risk for nearby businesses and residences, poaching of urban wildlife, food stalls made causing a nuisance, ablutions done in public areas or using nearby facilities causing conflict. | Local | Short term | Medium | Highly probable | High | Medium | No workers to be accommodated on site.<br>Workers taken to site via buses<br>Food stalls allowed only at designated spots away from residences and businesses.<br>Adequate ablution facilities to be provided that are reachable at any given time.<br>Workers trained and instructed not to move outside designated work areas. | Low |
| Concrete mixing, bitumen handling, paints and solvents, ablutions, hydro-carbons used, general waste | Negative<br>The use of mentioned substances and waste cause soil, surface water and groundwater pollution, visual pollution, | Local | Short term | High | Highly probable | High | Medium | Special attention needed due to groundwater protection area.<br>Awareness raising required. | Low |

| PROJECT ASPECT | IMPACT STATUS/ NATURE | EXTENT | DURATION | INTENSITY | PROBABILITY | DEGREE OF CONFIDENCE | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT (ELABORATED ON IN THE ESMP) | POST-MITIGATION |
| | ecological deterioration. | | | | | | | Management measures in the ESMP including waste management measures, no servicing of vehicles in the area, adequate ablutions to be provided that are disposed of at approved facilities. | |
| Vegetation clearance | Negative<br>Removal of riverbank stabilising vegetation, protected and other trees, causing erosion, biodiversity loss, loss of visual relief and shade. | Local | Long term (growth of trees such as camel thorns, takes several generations) | High | Definite | High | High | Remove only necessary trees with management measures in ESMP<br>Replace all removed trees with suitable indigenous trees along the road. | Medium |
| OPERATIONAL PHASE | | | | | | | | | |
| Existence of dual carriageway | Positive<br>Dual carriageway causes improved traffic flow with increased driver satisfaction, causing more traffic to use this road instead of | Local, but City-wide improvement | Long term | High | Definite | High | High | Continued traffic flow monitoring | High |

| PROJECT ASPECT | IMPACT STATUS/ NATURE | EXTENT | DURATION | INTENSITY | PROBABILITY | DEGREE OF CONFIDENCE | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT (ELABORATED ON IN THE ESMP) | POST-MITIGATION |
| | residential detours particularly Springbok Street, | | | | | | | | |
| New taxi rank – traffic flow | Positive<br>Improved traffic flow due to taxi's removed from street | Local | Long term | High | Probable | Moderate | Medium | Design to ensure taxi's are forced to park within the taxi rank (curbs, parking will become a traffic lane in Tacoma St)<br>Traffic policing | Medium – High |
| New taxi rank - social gathering | Negative<br>Increased anti-social behaviour, resulting in unsafe environment lacking tranquillity and detracting from business in the surrounding streets<br>See Section 2.2.1 and 6.3.2.1 | Local | Long term | High | Highly probable | High | Medium | Policing and management of anti-social behaviour<br>Close up public toilets, to be used only with money-system to pay cleaners<br>Design to discourage taxi's to overnight – only drive-through.<br>Rank to be as open as possible, so to discourage illicit behaviour. | Low |

| PROJECT ASPECT | IMPACT STATUS/ NATURE | EXTENT | DURATION | INTENSITY | PROBABILITY | DEGREE OF CONFIDENCE | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT (ELABORATED ON IN THE ESMP) | POST-MITIGATION |
| New taxi rank – open space | Negative<br>Loss of existing active park and open space | Site | Permanent | High | Definite | High | Medium<br>(negative) | Appoint landscape architect to design remaining space and utilise effectively.<br>Plan more trees in entire area (off-sett for trees lost)<br>Design as integrated space with taxi rank.<br>Complete legal planning procedures for the closure of a public open space. | Medium<br>(Positive) |
| Traffic flow Springbok Street and Blackwoord street and Suiderhof | Improved Traffic flow at Blackwood Street Intersection and Springbok Street | Local | Long term | High | Highly probable | High | High | Continued traffic counts and monitoring | High |
| Traffic flow – Springbok Street and Blaubock Street/Aviation Road intersection | Traffic congestion, noise, loss of tranquillity due to traffic increase from the NDF Base<br>See Section 6.3.2.22.2.2 | Local | Long term | High | Highly probable | Low, depends on exact NDF activities and traffic | High | Keep entrance to NDF for emergency traffic to airport.<br>Build another entrance/access road from an arterial road to direct traffic | Low |

| PROJECT ASPECT | IMPACT STATUS/ NATURE | EXTENT | DURATION | INTENSITY | PROBABILITY | DEGREE OF CONFIDENCE | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT (ELABORATED ON IN THE ESMP) | POST-MITIGATION |
| | | | | | | | | away from the neighbourhood | |
| Road Accesses | Change in informal access points to certain establishments along the route – formal accesses have always been from service roads. | Local | Long term | Medium | Definite | High | Moderate to low (low overall, but significant changes for individual properties). | Although no formal accesses are removed, communicate with the individual properties, their options and how they may be supported. | Low |
| Traffic lanes closer to some properties, e.g. Arebbusch, Hotel, etc. | Noise and nuisances such as pedestrians being closer to the adjoining properties to the west. | Local | Permanent – impact small in the beginning and increasing over time as traffic flow increases | Medium | Definite | High | Moderate | Screening with vegetation and trees on the western side of the road. This is less effective for high side buildings, e.g. the hotel. | Low |
| Stormwater | Increased flooding due to unpredictable whether events (flooding) | Local | Short term events | High | Probable | Medium | Low | Factor climate change into stormwater and culvert designs (engineering designs | Negligible |

| PROJECT ASPECT | IMPACT STATUS/ NATURE | EXTENT | DURATION | INTENSITY | PROBABILITY | DEGREE OF CONFIDENCE | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT (ELABORATED ON IN THE ESMP) | POST-MITIGATION |
| | | | | | | | | already include such a factor) | |

## 6.3 DISCUSSION

This section provides a discussion of some of the impacts, which require further information or clarity, from the table above.

### 6.3.1 IMPACTS EXPECTED DURING THE CONSTUCTION PHASE

#### *6.3.1.1 Construction impacts*

Most impacts expected during the construction phase are temporary and will be avoided or limited by implementing the recommended management measures in the ESMP. The exception to this finding is vegetation removal, which is considered an impact of high significance and requires careful design and implementation. See below.

Groundwater pollution can be considered a permanent impact, since the cleaning up of the groundwater is practically impossible. Activities which would contribute to groundwater pollution should be avoided in the project area, including the servicing of vehicles, pit latrines, disposal and storage of hazardous substances, etc.

#### *6.3.1.2 Vegetation removal*

The type of vegetation across the project area covers two vegetation zones namely: riverbed and river bank vegetation (less than 10%) and vegetation on sandy alluvial plains. Important tree species in the directly affected area are:

- *Vachellia erioloba* (Camelthorn) (protected).
- Vacheliia karroo (Sweet-thorn)
- *Boscia albitrunca* (Shepherd's tree) (protected)
- *Ziziphus mucronata* (Buffalo-thorn) (protected)

The sweet-thorn and buffalo-thorn are concentrated around the river banks in the project area and it is expected that only a limited number of specimens will be lost.

Camelthorn and Shepherd's tree species are dispersed through the project area, with significant clusters that will be lost. The Shepherd's trees are concentrated to the southern and central part of the project corridor, whereas Camelthorns occur throughout.

The following additional species also proliferate on the site but are not of conservation concern:

- *Senegalia mellifera* (blackthorn)
- *Vachellia reficiens* (red umbrella-thorn)
- *Senegalia Senegal* (three-hook acacia)
- *Prosopis spp*. (alien invasive)

The large trees to the west of the current road where the new road surface is planned have been marked by a surveyor. Of the 568 trees marked, 199 specimens are directly in the road alignment and will be removed, whereas another 118 trees are likely within the road shoulder (i.e. including the bicycle and pedestrian) should be removed only as a last resort. The remainder of the marked trees in the road reserve amount to 251, which will not have to be removed. Between 35% and 56 % (318) of the marked trees will therefore be lost. It is estimated that up to 50% (160) of these will be of the protected tree species list above.

Vegetation removal, especially large trees is considered a permanent impact, since some trees such as the Camel Thorn, and Sheperds Tree, will not grow back to their former state in a number of generations.

*Mitigation*

- It has been suggested that the proposed new traffic lanes be added to the eastern side of the road. However, the reserve on the eastern side is too narrow for this to be feasible. Planning an additional lane on either side of the existing lanes is also not feasible, since this would require expensive detours and additional culverts during construction to accommodate the traffic, also causing a loss of trees. An estimated 200 tree specimens will also be lost in this scenario, excluding trees lost for detours. Therefore, the amount of trees lost for this alternative could be similar.
- It is crucial that the trees in the shoulder of the road, be separately identified and that there is a dedicated process of deciding which of these trees can be conserved. The aim should be to conserve as many of them as possible.
- It is recommended that the pedestrian and cycling lanes ‘‘wind’’ around existing trees where needed.
- Trees lost should be replaced with the same species (if feasible) and other species that are endemic to the area. It is recommended that a landscape architect/urban design specialist be appointed to design the pedestrian walkways, cycling lane, remaining park and taxi rank area, median and significant intersections in an integrated way with trees, to become a functional and visually pleasing traffic experience and entrance to Windhoek.
- Trees lost should be marked beforehand and permits obtained for their removal.
- The method of how the team will go about to conserve the trees should be made public.
- The wood of trees removed, should be made available to the community in an ordered manner according to the procedure described in the ESMP.
- Remove all the existing Prosopis trees in the riverbed and the reserve in the area where the contractor will operate.

#### *6.3.1.3 Grievance mechanism*

A grievance mechanism is crucial for the receiving of complaints from the public and from nearby properties, not only in terms of traffic congestion, but also related to

construction nuisances and where certain restrictions and provisions in the ESMP are being violated by the Contractor, or nuisances are unbearable and action is needed. This grievance mechanism is provided in the ESMP.

The principle is that a tiered approach will be followed, resolving issues as soon as they emerge. The Contractor is responsible to receive complaints from the Public, to resolve them as soon as possible and to give feedback timeously. Matters of a more complicated nature, or those which persist are to be addressed by the Resident Engineer together with the Environmental Control Officer. Still if they cannot resolve the matter, a monthly committee consisting of public representatives, RA, CoW and the contractor will discuss and resolve the issue.

### 6.3.2 IMPACTS EXPECTED DURING THE OPERATIONAL PHASE

All stakeholders agree that the road upgrade is due, because of the current traffic congestion on the road, leading to significant user frustration. The overall traffic flow, including the Suiderhof neighbourhood is expected to improve. However, there are specific aspects about the road upgrade, which stakeholders are concerned about, and which deserve further consideration. These are summarised in the above table, and elaborated on below.

#### *6.3.2.1 Impacts related to the taxi rank*

It is expected that the current traffic situation at the taxi rank will improve. An additional lane is planned in Tacoma Street opposite the fuel station at the intersection. This lane is currently a parking area for minibuses and the intersection becomes congested especially during peak hours. The minibuses will be forced to park inside the taxi rank area, freeing up the space for another lane.

The current anti-social behaviour which results from taxi owners, customers waiting for their lifts and vendors selling goods, leading to accompanying illicit substance use and behaviour, will continue and may increase although the focal point of it will probably move to the taxi rank parking area if the vehicles are prohibited to park in the street.

*Mitigation*

Alternatives to the current taxi rank site have been considered and are discussed in Section 2.2.1. The reality is that a taxi rank organically emerges where there is a demand for customers to be transported on a certain route. The current site is a natural congregatory point for customers and transport providers alike, where there is a supply and demand. Because of the location which is close to a major employment area, at two filling stations, and at the entrance in and out of the City, this supply and demand currently exists. From experience it is a well-known fact in the planning fraternity, that such sites are not successfully relocated. The need for a parking area at that location will simply continue to exist, whether there is a facility for it or not.

It was suggested that a wall be erected between the proposed taxi rank and Perkin Street. However, an impenetrable wall will likely cause an increase in illicit behaviour.

It is rather suggested that the ‘‘eyes on the street’’ concept be maintained. Therefore a see-through palisade-type fence is recommended around the taxi rank to restrict the pedestrian traffic and social interaction inside the area.

A discussion with the City of Windhoek has confirmed that control by the City Police will be a prerequisite.

It is intended that the taxi rank be made available to a private operator. Should this be the case, then the ablution facilities and security should be made part of the contract.

*6.3.2.2 Traffic flow Springbok Street and Blaubock/Aviation Road intersection*

It has been explained by the City that the Blaubock Street link will relieve the current congestion at the Blackwood Street intersection. The link is being planned for this purpose. Creating the link for this purpose, coupled with the fact that some traffic currently using Springbok Street to avoid the congested Auas Road, will probably divert more traffic to Auas road as well as alternative routes including the Mandume Ndemufayo Street via the western bypass.

However, the National Defence Force (NDF) have also created a main entrance to their new facilities in Blaubock Street; the details of the facilities which have not been disclosed, save for the explanation that a direct and quick exit is needed in times of emergency.

The residents of this area are concerned that the additional traffic from the NDF, will be significant. This is confirmed by the magnitude of the development, and based on the traffic impact assessment. Furthermore, it is likely that the traffic will include taxi’s dropping off NDF staff members at the end of Blaubock Street. The traffic will not only negatively affect the current residents in Blaubock Street, but also create traffic congestion at Blaublock-Auas Road and Blaubock- Springbok Street intersections which are very close to each other. It should be mentioned, however, that the decisions of the NDF Base are outside of the control of the Roads Authority and the City of Windhoek and are not part of the scope of this EIA. The new road link was not initially planned for the NDF entrance, but rather to alleviate traffic congestion at Blackwood Street. Overall, the traffic congestion will be alleviated by the new link because it will remove traffic from the area to an arterial as quickly as possible.

The residents of the area are also concerned that the new link will destroy the existing security fence erected at the proposed new link.

Mitigation

- The reasonable mitigation would be for the NDF to only use this access as a quick emergency exit, which would imply a negligible impact on the neighbourhood. An alternative access away from the neighbourhood would have been reasonable. However, the new main entrance to the NDF complex is a reality, therefore an alternative route is not practically possible. The new link with however alleviate congestion in the area as a whole.

- It is suggested that the Contractor assist the Neighbourhood Watch to relocate the existing security fence, to block access from the river to the neighbourhood, from the riverbed.

#### *6.3.2.3 Road accesses*

There are a number of properties adjoining the road where informal accesses have been created directly from Auas Road. These accesses will no longer be available from the upgraded Auas Road. All the applicable properties have official access points from alternative service roads. The Movenpick Hotel complex which have an established, yet unofficial access point from Auas Road, when conference events are hosted, causing significant traffic congestion, will be significantly affected. It is recommended that the City and the consultants, communicate with the respective property owners, to support them in relocating their access points.

#### *6.3.2.4 Increased noise, and other disturbances*

The new lanes are to be constructed to the west of the existing road. The question arises - how will existing noise and nuisances caused by pedestrian and vehicular traffic increase due to the new lanes? The traffic will be approximately 10m closer to the existing facilities to the west of the road. The noise increase will not be as a result of increased traffic, in fact, it is argued that the anticipated smoother traffic flow will contribute to a noise reduction.

However, the traffic and pedestrians will be somewhat closer to the existing facilities to the west of the road, including the Arebbusch Travel Lodge, and the Movenpick Hotel.

*Mitigation*

This change is inevitable as a city grows. The planned widening of Auas Road has existed since the 60's and any establishment adjoining are aware of this plan. It is suggested that a vegetation screen be erected along the western side of the road. This will unfortunately not attenuate all the noise reaching higher rise buildings such as NamCor and the Movenpick Hotel.

# 7 CONCLUSIONS AND RECOMMENDATIONS

## 7.1 SUMMARY IMPACT ASSESSMENT

The Scoping process for the Auas Upgrade project, has, using experience, stakeholder inputs, primary and secondary data of the project area, identified and assessed the following key potential impacts:

Key to colours in table:

| | |
|---|---|
| | Positive impacts |
| | Negative impacts |

| IMPACT | SIGNICANCE RATING ASSUMING MITIGATION /ENHANCEMENT | SIGNIFICANCE RATING ASSUMING MITIGATION /ENHANCEMENT |
|---|---|---|
| DURING CONSTRUCTION | | |
| Employment - sustaining existing jobs for 12 months | Low | Low |
| Sustained local spend, supporting the local economy | Low | Low |
| Increased traffic congestion and disruption, leading to user dissatisfaction, frustration and delays | Low | Low |
| Dust causing nuisance, affecting receptor health, and limiting outdoor activities | Medium | Low |
| Noise affecting sensitive receptors who rely on the need for a quiet environment | Medium | Low |
| Nuisances, disturbances and conflict caused by the activities and movements of the workforce in the area, including safety risk, poaching, uncontrolled food stalls and ablutions. | Medium | Low |
| Soil, surface and groundwater pollution caused by polluting substances handled, spilled and discarded, concrete mixing, and waste. | Medium | Low |
| Loss of riverbank stabilising vegetation, protected and other trees, causing erosion, biodiversity loss, loss of visual relief and shade | High | Medium |
| OPERATIONAL PHASE | | |

| IMPACT | SIGNICANCE RATING ASSUMING MITIGATION /ENHANCEMENT | SIGNIFICANCE RATING ASSUMING MITIGATION /ENHANCEMENT |
|---|---|---|
| Improved traffic flow and increased driver satisfaction, causing more traffic to use the road, eliminating existing traffic flow problems in neighbourhoods, particularly Springbok Street | High | High |
| Improved pedestrian and cycling opportunities leading to an improved experience for these users and increased sustainability | Medium | Medium |
| Improved traffic flow in Tacoma/Perkin Street area | Medium | Medium to high |
| Increased anti-social behaviour at taxi rank area in Tacoma/Perking Street area, resulting in an unsafe environment lacking tranquillity and detracting from business in the surrounding streets | Medium | Low |
| Loss of existing portion of open space at proposed taxi rank | Medium | Medium |
| Improved traffic flow at Blackwood Street and Springbok Street Intersection | High | High |
| Traffic congestion, noise, loss of tranquillity, due to traffic from the NDF base | High | Low[8] |
| Change in informal access points to certain establishments along the route | Low [9] | Low |
| Noise and nuisances due to the new lanes being some 10m closer to the properties to the west | Medium | Low |

[8] Although an alternative route would be reasonable to avoid this impact, the reality is that the main entrance to the NDF via this route is already been implemented.

[9] Low overall, but highly significant change for one property, i.e. Movenpick Hotel.

The positive impacts of the project are considered to be highly beneficial to the Windhoek community, namely the obvious traffic relief that will result in Auas Road and surrounds.

Negative impacts nevertheless need to be addressed, including loss of biodiversity which should be off-set, and social concerns relating to construction nuisances, and concerns related to some of the sites and intersections in the area. Key mitigation measures are summarised below.

## 7.2 SUMMARY MITIGATION

#### *7.2.1.1 Alternatives*

1) The no-go alternative for this project would entail continued traffic congestion along Auas Road and into the surrounding Suiderhof, as well as the congestion of taxi's and uncontrolled parking in Tacoma and Perking Streets. The project going ahead will make a significant improvement to the traffic situation of Auas Road and surrounding area.

2) An alternative for the Auas Road upgrade is to place the lanes on the eastern side of the existing road to avoid trees loss. However, this would require the purchase of land from private land owners since there is not enough space for the new lanes there. Additional temporary detours would be needed to accommodate traffic during construction, including culverts at the riverbed, making this option expensive. Trees will also need to be removed for detours during construction. Approximately 30% less trees would be forfeited for this alternative, excluding trees to be removed for the temporary bypasses.

3) As explained in Section2.2.1 of this report, three alternative sites were considered for the taxi rank. Each of these sites have problems with parking and vehicle movement space, are too small, or are not well located. More importantly however, the demand for taxi's parking in the Tacoma Street area will remain a reality and regardless of the facility; the taxi's will most probably continue to wait for and pick up their customers at this site.

4) It was suggested that the Blaubock Street link proposal not be built. However, this link will ease the current congestion at Blackwood Street. The planning of this link exists. It is anticipated that the overall traffic flow in the area will improve when the Auas Road upgrade is completed.

5) The proposed NDF entrance in Blaubock Street, however, will significantly increase traffic to this street if it is used as access road to the new NDF headquarters currently under construction. It has been stated, that this link is necessary as a quick exit in case of emergency. It is therefore proposed that this access route be used in case of emergency and an alternative access route is required from an arterial road that would divert the daily traffic from the NDF headquarters out of the residential area. The latter though might not be practically possible. The NDF Base already

obtains access through a residential area and has already built its entrance towards Blaubock Street. The expansion of the NDF Base in itself is not part of this EIA and regardless whether the link with Auas Road will be provided or not, and with the base already enjoying access from Blaubock Street, the additional generated traffic will be inevitable. It is therefore advisable to mitigate impact within the residential area and redirect traffic to an arterial on the shortest possible way.

*7.2.1.2 Mitigation proposed*

1) Noise, dust, workforce issues and pollution expected during construction will need particular attention in this urban area with tourism facilities, which is also a protected groundwater area. However, with good management strategies, such as aligning construction activities with prevailing wind directions to avoid noise and dust, and other normal construction management strategies, these impacts can be largely controlled. The contractor will require a competent environmental control officer to ensure these matters receive the necessary attention.

2) The significant loss of trees, including protected Sheperds Trees and Camelthorn Trees, also culturally and ecologically valuable, need to be limited as far as possible and strictly enforced. It is recommended that lost trees be replaced with the species removed, including Camelthorn, Sweetthorn, Buffalo Thorn, and Sheperds Tree, as well as with other endemic species that will adapt well. These can be planted in the park area next to the proposed taxi rank, and along the road on the side verges and road median.

3) The replacement of trees should also be used to create a noise barrier along the western properties, especially where they are close to the road or where they have sensitive receptors such as the Arebbusch camping area, or the recreational facility of the hotel.

4) It is recommended that a landscape architect/urban designer or similarly qualified entity be appointed to assist in integrating the design of the taxi rank, pedestrian and cycling lanes, to form an integrated and pleasant corridor at Windhoek's entrance. This will turn the fact that a portion of the existing park, and a significant number of trees is being lost into a positive development, as off-set for those significant losses.

5) The expected increase in anti-social behaviour at the taxi rank requires policing and control, including cleaning and management of the ablution facility. It is proposed that the area be enclosed with a palisade fence. Poles and curbs should be used in Perkin Street to deter minibus taxi's from parking there. . The City of Windhoek's Public Transport Division has committed to appoint a service provider to manage the facility. This will include security and ensuring operations take place in an orderly way. This is a crucial step to ensure order at the site, and should be implemented.

6) The specific properties which need to change their informal accesses from Auas Road will be provided with alternative access points from Auas Road or an

alternative road. The consultant should consult the affected properties and inform them accordingly.

7) A dedicated grievance mechanism as part of the ESMP is crucial to field concerns and complaints from the public during construction in a constructive manner and to ensure they are timely addressed with feedback communicated.

If these mitigation measures are implemented, then the biophysical and social losses of the project will be successfully dealt with, save for the new NDF main entrance which is beyond the scope of this project. The specific mitigation measures are included in the Environmental and Social Management Plan.

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# APPENDIX A CV S VAN ZYL

# APPENDIX B

## RIVERINE THICKET HABITAT ALONG THE ARREBUSCH RIVER: SPECIES OF CONSERVATION CONCERN

### Vegetation

**Endemics:** Antiphiona pinnatisecta, Aspilia eenii, Chenopodium amboanum, Convolvolus argillicola, Crotalaria dinteri, Ondetia linearis, Peristrophe hereroensis.

**Near endemics:** *Jamesbritteria canescens, Plicosepalus undulatus Peristrophe hereroensis,* has a limited distribution, while the others are reasonably widespread in Namibia, and all occur in more than one habitat in the townlands. *Crotalaria dinteri* was recorded only in the riverine and valley habitats.

**Protected:** *Acacia erioloba* (camelthorn), *Albizia anthelmintica* (worm-cure Albizia), and *Combretum imberbe* (leadwood), *Maerua schinzii* (lammerdrol), *Faidherbia albida* (Ana boom).
Riverine Tickets are not sensitive in terms of conservation of protected species.

**Alien invasives:** Of concern, in order of importance, are Achyranthes aspera, Alternanthera sessilis, Argemone ochroleuca subsp. Ochroleuca, Arundo donax, Aster squamatus, Atriplex semibaccata, Bidens biternata, and Bromus catharticus.

**Arthropods:** No species list available for this habitat.

Birds

Specially protected
Rüppell's Parrot (Poicephalus rueppellii)
Endemics
Rüppell's Parrot (*Poicephalus rueppellii*); Damara (Red-billed) Hornbill (*Tockus damarensis*); Monteiro's Hornbill (*Tockus monteiri*) Carp's (Black) Tit (*Parus carpi*)

.IUCN

*Near threatened:* Verreaux's (Black) Eagle (*Aquila verreauxii*); Peregrine Falcon (*Falco peregrines*); Lesser Kestrel (*Falco naumanni*); Rüppell's Parrot (*Poicephalus rueppellii*)

Endangered

Eagle (Aquila pennatus)

These habitats act as refugia for birds, many of which breed there and forage in neighbouring urban gardens. It thus acts as a source of garden birds and is therefore highly sensitive to further disturbance. The habitat itself is threatened by bush clearing and the encroachment of urbanisation, and the birds are threatened by domestic and feral cats. It can be regarded as **highly sensitive**.

Amphibians

**Endemics:** Dombe toad (Bufo dombensis); Hoesch's toad (Bufo hoeschi); Marbled rubber frog (Phrynomantis annectens).
Reptiles

**Endemics:** Boyle's beaked blind snake (Rhinotyphlops boylei); Schinz's beaked blind snake (Rhinotyphlops shinzii); Anchieta's Dwarf Python (Python anchietae); Southern African Python (Python natalensis); Two-striped Shovel-snout (Prosymna bivittata); Dwarf Beaked Snake (Dipsina multimaculata); Sundevall's Garter Snake (Elapsoidea sunderwallii fitzsimonsi); Cape Cobra (Naja nivea); Black-necked Spitting Cobra (Naya nigricollis nigricincta); Namibian Rock Agama (Agama planiceps); Bradfield's Dwarf Gecko (Lygodactylus bradfieldi).

Mammals

**IUCN Red Data List:** (These species are also protected under national or international law)

**Near threatened:** South African hedgehog (*Atelerix frontalis*); Kaokoveld Ground Squirrel (*Xerus princeps*)
Vulnerable Pangolin (*Manis temminckii*)

**Cites Appendix II**: Pangolin (*Manis temminckii*)

**Alien invasive:** House mouse (*Mus musculus*)

## VALLEY HABITAT ADJACENT TO THE ARREBUSCH RIVER: SPECIES OF CONSERVATION CONCERN

Species of specific conservation concern

Vegetation
**Endemics:** Bulbostylis mucronata; Crinum carolo-schmidtii Crotalaria dinteri; Ondetia linearis; Peristrophe hereroensis; Senecio windhoekensis exhibits the most limited distribution, being restricted to the Windhoek district.
**Protected:** Camelthorn (Acacia erioloba); Shepherd's Tree (Boscia albitrunca); Searsia lancea.
The valley is the preferred habitat for *Acacia erioloba*, with the most important population along the alluvial plains of the Klein Windhoek River in the northern industrial area and Brakwater. *Harpagophytum* procumbens has rarely been recorded in the townlands, from a local biodiversity point of view it would be threatened by the rapid urban expansion southwards.
**Alien Invasives:** Prosopis glandulosa, Nicotiana glauca, Argemone ochroleuca, Datura spp., Arundo donax, and Pennisetum clandestinum.

Not a highly sensitive habitat, but it is extremely important for *Acacia erioloba (Camelthorn)*.

Arthropods
**Endemic:** Mantophasma zephyr.
*Mantophasmatidae* or gladiators. Although none of the species belonging to the order *Mantophasmatodea* are endangered or threatened on the IUCN red list, information on these nocturnal species is very limited (especially in Namibia) and therefore needs to be protected.

Birds
Endemic: Rüppell's Parrot *(Poicephalus rueppelli)*; Damara (Red-billed) Hornbill *(Tockus damarensis)*; Monteiro's Hornbill *(Tockus monteiri)*; Carp's (Black) Tit *(Parus carpi)*; White-tailed Shrike *(Lanioturdus torquatus)*.

IUCN Status
**Near threatened:** White-backed Vulture (Gyps africanus); Verreaux's (Black) Eagle (Aquila verreauxii); Peregrine Falcon (Falco peregrines); Lesser Kestrel (Falco naumanni); Rüppell's Parrot (Poicephalus rueppellii).
**Vulnerable:** Lappet-faced Vulture (Aegypius tracheliotus); African Fish Eagle (Haliaeetus vocifer).
**Endangered:**Tawny Eagle (Aquila rapax); Booted Eagle (Aquila pennatus); Martial Eagle (Polemaetus bellicosus).

The alluvial floodplains are unique in the area. They provide a habitat for large acacia trees, which in turn provide habitats for a number of bird species.

Amphibians
IUCN Red Data List (These species are also protected under national or international law):
**Endemic:** Dombe toad (Bufo dombensis); Hoesch's toad (Bufo hoeschi); Marbled rubber frog (Phrynomantis annectens).

Reptiles
***Endemic:*** Boyle's Beaked Blind Snake (*Rhinotyphlops boylei*); Anchieta's Dwarf Python (*Python anchietae*); Two-striped Shovel-snout (*Anchieta's Dwarf Python*); Dwarf Beaked Snake (*Dipsina multimaculata*); Sundevall's Garter Snake (*Elapsoidea sundervvallii fitzsimons*); Cape Cobra (*Naja nivea*); Black-necked Spitting Cobra (*Naya nigricollis nigricincta*); Spotted Sandveld Lizard (*Nucras intertexta*); Spotted Sand Lizard (*Pedioplanis lineoocellata lineoocellata*); Namibian Rock Agama (*Agama planiceps*); Bradfield's Dwarf Gecko (*Lygodactylus bradfield*); Festive Gecko (*Narudasia festiva*); Velvety Thick-toed Gecko (*Pachydactylus bicolour*); Cape Thick-toed Gecko (*Pachydactylus capens*); Turner's Thick-toed Gecko (*Pachydactylus turneri*); Rough Thick-toed Gecko

Mammals

***Vulnerable:*** Round-eared Elephant Shrew (*Macroscelides proboscideus*); Smith's Rock Elephant-shrew (*Elephantulus rupestris*); Angola Wing-gland Bat (*Myotis seabra*); Pangolin (*Manis temminckii*); Cheetah (*Acinonyx jubatus*).

***Near Threatened:*** South African Hedgehog (*Atelerix frontalis*); Rüppell's Horseshoe Bat (*Rhinolophus fumigates*); Geoffroy's Horseshoe Bat (*Rhinolophus clivosus*); Darling's Horseshoe Bat (*Rhinolophus darling*); Dent's Horseshoe Bat (*Rhinolophus denti*); Kaokoveld Ground Squirrel (*Xerus princeps*) (*Figure 2.2*); Ratel or Honey Badger (*Mellivora capensis*).

**Endangered:** Brown Hyaena (Hyaena brunnea)

CITES
**Appendix II:** Pangolin (Manis temminckii)
**Appendix I**: Cheetah (Acinonyx jubatus)

# APPENDIX C STAKEHOLDER ENGAGEMENT REPORT