VISUAL ASSESSMENT

For

Impact Assessment

Phase of the EIA for

Proposed N21 (R300) Cape Town Ring Road Toll Project

Draft Report
October 2002

Prepared by:

OvP Associates

Tel : (021) 462-1262
Fax : (021) 461-6162
E-mail : michelle@ovp.co.za

Contact : Michellé Robertson-Swift /
Johan van Papendorp

For:

CEJV
Chand Ecosense
Joint Venture

The South African National Roads Agency Limited **(SANRAL)** awarded Scheme Developer status to the ***Peninsula Expressway Consortium*** **(Penway)** in January 2000 to develop Penway's unsolicited proposal for the N21 (R300) Cape Town Ring Road Toll Project.

Penway and *SANRAL* have entered into a **Public - Private sector Partnership** to develop this scheme and concluded a formal agreement in January 2000.

The Initial Phase of Scheme Development was completed in December 2000 and included a **Scoping Study, undertaken by Chand / Ecosense Joint Venture (CEJV)**, from February to November 2000.

Upon confirmation of project feasibility, SANRAL in July 2001, approved that Penway could proceed with the Final Phase of Scheme Development.

The process for this Phase as agreed between SANRAL and Penway included the undertaking of an **Impact Assessment Phase of the EIA**.

Subsequently Chand / Ecosense Joint Venture (CEJV) were appointed to co-ordinate this Impact Assessment Phase.

As part of this assessment various specialist studies are required amongst which is a **Visual Assessment Study, for which OvP Associates were appointed**.

This report therefore describes the visual study conducted, which strives to address the following objectives provided within the **Study Brief**.

Ultimately the findings of this Study will be **included within the Project Construction Management Plan.**

1.0 STUDY AREA

Refer to Figure A.

The proposed N21 (R300) Cape Town Ring Road Toll Project measures approximately 67km in length and is based on the principle of:

- **utilising the existing R300**, between the N1 and Vanguard Drive;
- **extending it north** to meet up with the R27; and
- **south to the M5** and Prince George's Drive, via two separate routes (one being the so-called Philippi Link).

The **engineering proposa**l prepared by Penway describes the route in **five sectors** (simply portions of the road of uniform character). Sectors 1, 3 and 5 would be new roads (referred to as the southern and northern greenfields sections) while Sectors 2 and 4 would involve development proposals on and / upgrading of the existing R300.

Each of these **sectors are further divided into sections.**

This **visual study for ease of correlation with other specialist studies as well as the main report presents a sector by sector** (consistant with those used in the engineering proposal) **visual assessment** as well as in summation an overall assessment of the entire route.

3.0 STUDY BRIEF

1. Establish **existing context**, policy frameworks, metropolitan scenic route priorities and other relevant studies.
2. Familiarisation with **road proposals and issues** identified in the Scoping Report.
3. Prepare a **visual inventory** through mapping, aerial photographic interpretation and 'view from the road' photographic studies.
4. **Determine significant viewsheds**, natural and urban units **and components** that give structure to what is seen.
5. **Assimilate initial findings for discussion** and review with the study team.
6. Formulate **project-specific objectives** and **criteria for visual assessment**.
7. **Identify impacts of future changes to the visible landscape** and **evaluate their significance.**
8. Formulate **guidelines and mitigation measures to protect, enhance or minimise visual impacts** that may result from the future road developments.
9. Revise and submit **final report for inclusion into the construction management plan.**

4.0 REPORT FORMAT

Figure B – Report Format describes the various items of this report.

5.0 TERMINOLOGY AND ABBREVIATIONS

Within this section common and otherwise terminology and abbreviations are clarified and defined as used within context of this Study. An important example is that of defining:

A Significant Impact

A significant impact means an impact that by its magnitude, duration or intensity alters an important aspect of the environment (e.g. visual / scenic resource; 'sense of place' or landscape character).

6.0 EXISTING PLANNING & POLICY CONTEXT

This section reviews various relevant studies in terms of:

- visual assessment considerations;
- baseline information;
- existing visual assessments of various sections of the proposed route.

These studies include amongst others the following documents:

1. **Scenic Drive Network Management Plan: Volumes 3 – Assessment and Evaluation of S1 and S2 routes – identification of projects, programmes and management policies (February 2002)**

   The focus area of intervention in the above report is on the *Scenic Drive Envelope*, which refers to the carriageway, the road reserve, immediately adjacent public land and the first erven abutting any of these.

   Actions and policy guidelines identified, seek to *ensure that the existing natural and built form qualities of the scenic drives are maintained and enhanced.*

   Identified S1 and S2 Scenic Routes (Refer Figure D) include the following, which are relevant to the N21 (R300) proposal:

   - Boyes Drive;
   - N1;
   - Vissershok Road;
   - Durbanville Road;
   - R302 Wellington Road;
   - N7; and
   - Marine Drive R27.

   The report furthermore correlates and assesses existing policy guidelines and zoning schemes.

In terms of Management Policies the following landuse / issues are of specific interest to this report, they are however, due to the nature of the objective of protecting scenic routes, aimed at protecting the *visual experience of the road user moving along a scenic route and not so*

much those who view the road from adjacent positions:

- *Road aesthetics*;
- *Edge treatment*;
- *Appropriate treatment of embankments;*
- *Landscaping guidelines*;
- *Control of Alien and Intrusive Vegetation on Public Land*; and
- *Signage and Information Interpretation*.

Scenic Drive Zoning Scheme Regulations were then correlated and assessed. Similarly to the above issues these regulations were found to have as their main objective, the protection of the visual quality of scenic areas as experienced by tourists and motorists moving along scenic routes. The following items addressed in these regulations and by-laws are of interest here:

- *Fencing, railings, gates and similar structures* (e.g. maximum height of 1.2m; to be of a transparent nature etc);
- *Landscaping / vegetation* (emphasis on indigenous/ need to fit in with the predominant landscape character of the area);
- *Buffer Areas* (to be provided along any street boundary; width of buffer areas to not be less than 5m in urban areas, 10m in sub-urban areas and 30m in rural areas; any portion of fence or wall exceeding 1.2m to be visually permeable; berms and landscaping may be used to provide privacy and screening);
- *Exterior Lighting* (avoid direct illumination, glare or reflection onto adjoining property or scenic drive; non residential exterior lighting to be turned off during non business hours, except where necessary in terms of public safety); and
- *Earthworks and Grading* (not to adversely affect viewlines from scenic drive; graded slopes to be rounded to blend in with the existing topography, to fit in with natural colours of the land; cut and fill surfaces to be stabilised with low maintenance indigenous / appropriate planting).

With regard to *Scenic Drive prioritisation* the following relevant criteria were applied:

- *Planning Criteria:*
- Visual quality, views and gateways;
- *Environmental Criteria:*
- Conservation status;
- Cultural resources;
- Visual quality (aesthetic appeal of landscape); and
- Viewpoints / interpretative opportunity.
- *Economic criteria*; and
- *Transportation criteria.*

2. **False Bay Ecology Park – Phase One: Development and Action Plan for the area known as False Bay Coastal Park (*December 2001)***

The above report describes the various impacts of the three alignments (i.e. The False Bay Coastal Arterial through the center of the Park; Baden Powell Drive as an east-west link and The proposed R300 Freeway Extension) for an east-west linkage, will have on the Park.

The impacts in terms of the False Bay Coastal Arterial through the center of the Park (this studies Sector 1, sections 1 and 2) relevant to a visual assessment are as follows:

Visual Impact: This will be significant especially in conservation and overnight accommodation areas.

Light Pollution: Particularly if the road has streetlights, as well as from vehicle headlights will considerably reduce the quality of the outdoor experience at night.

The report concludes that order of preferred alignment with respect to the future False Bay Ecology Park is:

1. The False Bay Toll Road as an extension of the R300 Freeway;

2. An upgraded Baden Powell Drive; and lastly; and

3. The proposed False Bay Toll Road alignment through the center of the Study Area.

Should the third alignment be considered, the Report proposes the following mitigation measures:

- The most stringent noise attenuation measures must be followed;
- No street lighting should be permitted; and
- Where necessary long sections of the road should be elevated to minimise impacts on water flows, seed transport and faunal movement.

3. **The Proposed N21 (R300) Cape Town Ring Road Toll Project – Final Scoping Report *(approved by authorities in 2001)***

The above Scoping Study included specialist visual assessment which identified visual / scenic resources, Anticipated Impacts and Recommendations for the following phases of the road:

- Phase 1 – Stellenberg Interchange to Wellington Road;

- Phase 2 – Wellington Road to Melkbosstrand; and

- Phase 3 – Vanguard Drive to Westlake Interchange.

The following are key issues identified in the Scoping Study to be addressed within the Impact assessment as part of the Final Phase of Scheme Development:

- *Draft construction Environmental Management Plan (EMP) should include measures to mitigate against negative visual impacts;*

- *Planning and design to address*:

  - *Stormwater design* which should be such that water is not piped straight to a river canal or wetland, but run overland to allow for filtration and subsequent removal of pollutants;

  - *Road alignment* should be as far from the Kuils River as possible with gradients of cut and fill slopes being as close to existing natural gradients as possible;

  - *Planted earth berms or similar screen methods* should be used to screen the road from residential areas in selected sections;

  - Consider *aligning the road so that it does not intrude on farmsteads or exposed land forms*, Zeekoevlei and Sandvlei;

  - *Toll Plazas should be located adjacent to existing development if possible and not in a natural landscape.*

In conclusion the Scoping Study states that the main issues raised were:

- *Impacts of the road on residential areas*;

- The *destruction and / or alteration of the biophysically sensitive areas* in Phase 3 - Vanguard Drive to Westlake Interchange i.e. through Philippi Agricultural area and Zeekoevlei / Cape Flats Waste Water Treatment Works; and

- *Barrier effect of road in the farmlands* in Phase 2 - Wellington Road to Melkbosstrand.

Potential positive impacts arising out of this proposed road include enhanced tourism through accessibility.

Further investigation is required to assess the specific *design parameters required to mitigate the impacts anticipated e.g. in terms of visual.*

7.0 CRITERIA FOR VISUAL ASSESSMENT & EVALUATION

The view of the road and view from the road are two aspects of visual assessment, which are frequently incompatible.

Visual experience determinants of road user as well as the adjacent observer include:

- The ‘sense of place’;

- An understanding of the environment indicated by use, history, nature of the route and surrounding landscape;
- Legibility;
- Sensuality, etc.

This report ***focuses on the impact of proposed road developments as experienced by the adjacent observer and resident.***

In terms of the two primary road development activities that of firstly the *road location and alignment and secondly the location and characteristics* (built character, massing etc.) *of structures associated with the toll road*, the guiding key principle (which will inform assessment criteria) is:

- To **protect, enhance or minimize visual impacts** that may result from the proposed road developments including:
    - The protection and enhancement of the inherent '**sense of place', visual character and scenic quality of the existing environment** as defined by their varied natural and manmade landscape along the proposed route;
    - The protection of **visual / scenic resources (features);**
    - The **minimization and mitigation of visual impact on landscapes and townscapes** with a low visual absorption capacity;
    - The **minimization and mitigation of visual impact on** identified and especially high priority **scenic drives**;
    - The **minimization and mitigation of impact on visually sensitive areas** e.g. natures reserves etc.;
    - The **minimization and mitigation of impacts on adjacent observers and especially adjacent residents** in terms of visual obtrusion, invasion of privacy and light pollution.

Assessment criteria for the evaluation of the visual impact of the two primary activities will respectively include *environmental aspects,* such as (Refer Figure G – Overall development patterns which establish character, 'sense of place' etc.):

Activity One:
Construction, operation and maintenance of ***proposed road***.

Relevant environmental aspects include:

- If situated adjacent to or through **cultivated lands** (agricultural or rural landscape);
- If situated in close proximity to, adjacent to or through **nature reserve/s or other areas of conservation significance**;
- **Topography** (undulating, flat etc.) and landforms (ridges, higher elevations, steep slopes etc.);
- **Alignment**: straight versus curved;
- If situated on or in close proximity to the **urban edge**;
- Associated **infrastructure** e.g. lighting, signage etc.;
- Proximity to **scenic routes** i.e. linking, intersecting or in view of;
- If situated adjacent to or through **residential areas**; and
- **Land cover** such as ploughed fields or low vegetation, which offer a low visual absorption capacity compared to tall trees and shrubs.

Activity Two:
Construction, operation and maintenance of ***structures*** associated with the toll road (i.e. toll booths, buildings, structures and signage for both interchange toll plazas and mainline toll plazas)

Relevant environmental aspects include:

- **Elevation** i.e. interchange in valley or on rise as well as in terms of grade separation e.g. flyovers;
- **Built character and massing**;
- Associated **infrastructure** e.g. lighting, signage etc.;
- If **situated within a built environment** (and intensity and nature of this environment) **or within a natural / open landscape** (with low visual absorption capacity);
- **Affected communities**;
- Visibility from **scenic routes**;
- Visibility from sites of **conservation significance**;
- **Land cover** such as ploughed fields or low vegetation, which have a low visual absorption capacity compared to tall trees and shrubs.

In order to establish impacts it is known that the ***relationship between environmental aspects and environmental impacts is one of cause and effect*** **i.e. environmental aspects are in a sense the 'mechanisms' responsible for impacts.**

Furthermore the:

- *Extent* (spatial scale);
- *Duration*; and
- *Intensity* (severity);

Of these impacts will then determine the *degree of their overall significance.*

With this understanding, ***recommendations should aim at preventing impacts and not only mitigating them***. Recommendations should therefore focus on modifying 'mechanism' / environmental aspects responsible for impacts e.g. locate road, where possible, on the edge of nature reserves rather than through them.

8.0 SECTOR BY SECTOR: ANALYSIS, ASSESSMENT & MITIGATION RECOMMENDATIONS

In order to *apply the criteria for visual assessment*, as described in the previous section, it is *necessary to analyse* (i.e. understand and inventory) *the present and affected environment* (which includes environmental aspects) for each sector and section of the proposed road development in terms of:

- *Visual Character and Scenery* (i.e. scenic attributes which includes both natural and cultural landscape is described in order to establish inherent scenic qualities; and
- *Visual / Scenic Features* (resources).

The Figure presented on the opposite page of the sector by sector analysis (as set out in the main report), in each case, will depict:

- Development patterns;
- Visual / scenic features; and
- Photographs reflecting inherent visual character and scenery.

Each sector / section is then furthermore, assessed by firstly describing the proposed road developments envisaged for that sector and then identifying the following:

- *Relevant issues identified by Interested and Affected parties;*
- *Anticipated visual impacts* (i.e. visually sensitive as well as risky areas);
- *Affected parties*; and
- *Mitigation recommendations.*

Once again the Figure on the opposite page of this assessment (as set out in the main report) will depict:

- The proposed road development;
- Visually sensitive nodes and edges; and
- Photographs of the existing environment with sketch overlays of proposed road development both in terms of alignment and structures.

These sketch overlays are ***conceptual and are not based on engineering conceptual designs*** and as such merely serve to conceptualize / visualize the impact, which the proposed road development, will have on the existing environment.

In conclusion the environmental aspects, anticipated impacts identified for each sector / section as well as mitigation recommendations, relevant to each impact is

summarized in tabular form in Section 9.0 of this report (refer **TABLE 1**).

In formulating this table it became evident that although the landuse patterns, visual character and sector specific environmental aspects varies along the length of the route, there exist clear road developments which will have a generic / typical visual impact occurring in more than one sector.

It was therefore thought useful to:
- Summarise and describe these situations;
- Identify in which sectors these occur; and
- Ascribe typical mitigation measures.

This information is encapsulated in ***TABLE 2***.

It is however important to note, in terms of the typical mitigation measures ascribed, that although these visual impact situations are generic, varying environmental aspects e.g. high density residential versus low density residential adjacent road developments, imply a coincidental varying degree of visual impact, and subsequent varying intensities of mitigation measures required.

10.0 CONCLUSIONS AND GENERAL RECOMMENDATIONS

Overall Impact / 'No Go Option'

As previously mentioned the primary objective of this study, is to assess the visual impact of the proposed road developments on the adjacent observer / resident and not so much the visual experience of the road user.

By virtue of the nature of the proposed developments e.g. new high traffic roadway; tolled interchanges with grade separation; mainline toll plaza developments etc. the visual impact will almost exclusively be negative.

The only possible positive impact would be from a road user point of view, in terms of investigating the scenic drive potential of appropriate proposed sections, such as:

- that which passes nature areas e.g. Zandvlei, Zeekoevlei (False Bay Ecology Park) – sector 1, sections 1 and 2 etc.; and
- the northern greenfields section through farmlands towards the west coast – sector 3, sections 7 and 8.

This opportunity would enhance tourism through visual accessibility especially in the case of the False Bay Ecology Park.

It is however important to note that *to facilitate* ***a positive visual impact****, stringent mitigation measures are to be implemented* in terms of:
- road reserve planting;
- boundary treatment / visual permeability, noise attenuation (not to disrupt the 'sense of place' which forms part of the visual experience);
- lighting etc.

In item 6.0 of this report reference is made to guideline policies and regulations applicable to scenic drives, which would be of relevance to the above mentioned, instances.

Cumulative Visual Impact

In terms of the cumulative visual impact of the proposed road developments, the only increase in impact in the future will be due to road extensions e.g. additional lanes.

However as appropriate landscaping (i.e. planting and earthworks) of the road reserve is integral to visual impact mitigation, by virtue of the organic nature of planting and taking good maintenance and management for granted, over time, an increase in the visual absorption capacity of the surrounding landscape will be evident, thus reducing the visual impact.

Recommendations

In order to ensure successful mitigation of the visual impact of the proposed road developments it is essential that:

- First and foremost, a core design team, be established to address detail design components such as noise barriers, visual barriers, lighting etc. in an integrated manner. These outcomes are then to be incorporated within the Project Construction (and Operation) Management Plan.

With regards to visual impact and mitigation the following items / findings of this report should be considered within the above recommended process:

1. **TABLE 1**– which summarises on a Sector / section specific basis anticipated visual impacts, their significance and proposed mitigation recommendations;

2. **TABLE 2** based on the findings of Table 1, summarises typical / generic impact situations and associated proposed mitigation recommendations.

The findings of both Table 1 and 2 clearly show that it is imperative (within the proposal call / tender process and Construction / Operational Environmental Management Plans) to formulate clear:

a. ***Design*** *(including massing, scale, colour etc.)* ***and Placement Guidelines*** for all structures and infrastructural elements such as boundary treatment, signage, communication, lighting etc.; and

b. ***Landscape Guidelines*** for road reserves as well as at interchanges and surrounding / part of toll plazas (i.e. interchange plazas and mainline plazas);

In terms of looking at the detail design components in a truly integrated manner:

3. **TABLE 3** reviews other specialist studies prepared for this EIA process in terms of anticipated impacts and mitigation measures proposed, which are relevant to visual issues e.g. most relevant of these studies being that of noise impact assessment and proposed noise barriers which, in effect will also function as visual screening / barriers.

This table further identifies other specialist areas which are affected by a particular items e.g. road reserve landscaping which is integral to visual mitigation also affects botany in terms of appropriate material and mammals, amphibians and reptiles, entomology etc. in terms of habitat diversity.

In order to derive the optimum mitigation solution with regard to proposed road development on all environmental aspects, the holistic consideration of all specialist recommendations and requirements as far as possible within detail design is imperative.