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Transport and Public Works

# FREEWAY IMPROVEMENT SCHEMES FOR CAPE TOWN

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Western Cape Government

Thirty-Second Road Pavements Forum
CSIR International Conference Centre, Pretoria, RSA
7 November 2016

# Introduction

**Cape Town is serviced by three major arterials, namely the N1, N2 and N7:**


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# Ackowlegements

**This presentation is a summary of presentations made at a South African Road Federation Workshop held in Cape Town on 11 August 2016. Contributing authors are:**

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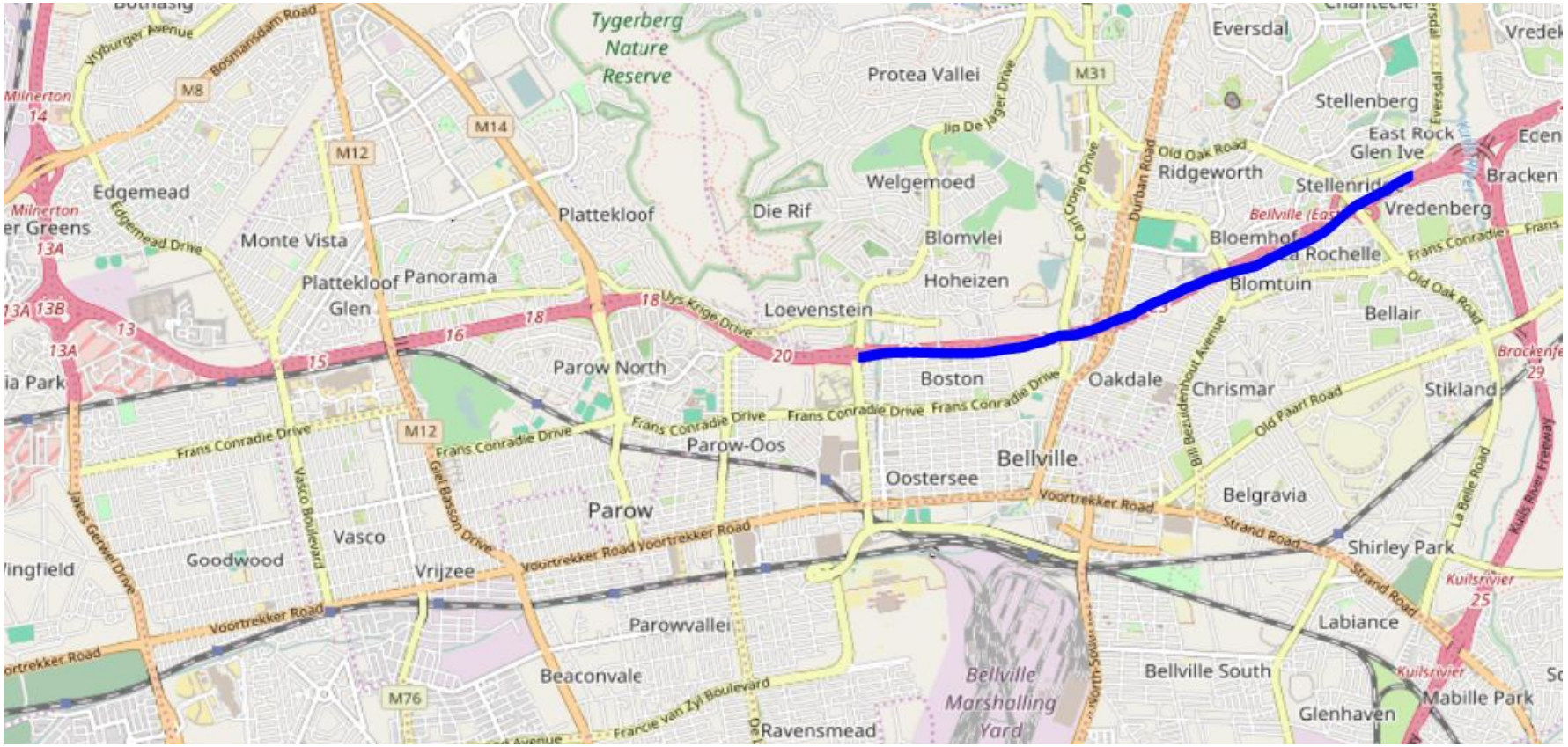
# N1 Between Old Oak Interchange and Jip de Jager

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## The project consists of the following aspects:


**The extension of the existing 3rd lane from west of Durban Road Interchange to the start of National RouteN1/1 east of Old Oak Interchange;**

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# N1 Between Old Oak Interchange and Jip de Jager – Project Description

**Extension of the existing concrete median barrier**

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# N1 Between Old Oak Interchange and Jip de Jager – Project Description

**Demolition and reconstruction of one of the Old Oak Interchange bridges – present bridge has insufficient vertical clearance**

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# N1 Between Old Oak Interchange and Jip de Jager – Project Description

- **Decommissioning of the existing 1 220mm Wemmershoek pipeline over a distance of 2,6km and construction of a new 1 525mm pipeline.**

- **The existing pipeline –**
  - **is 61 years old and at the end of its design life;**
  - **carries a volume of 230Ml/day with a head of 120m and a cover of 1m to 2m;**
  - **will be decommissioned and filled with concrete**

- **The new pipeline will be constructed along the southern road reserve boundary**

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## N1 Between Old Oak Interchange and Jip de Jager – Project Description

- New auxiliary lanes between interchanges to improve merging movements, exit movements and weaving;
- Intersection improvements at various interchanges;

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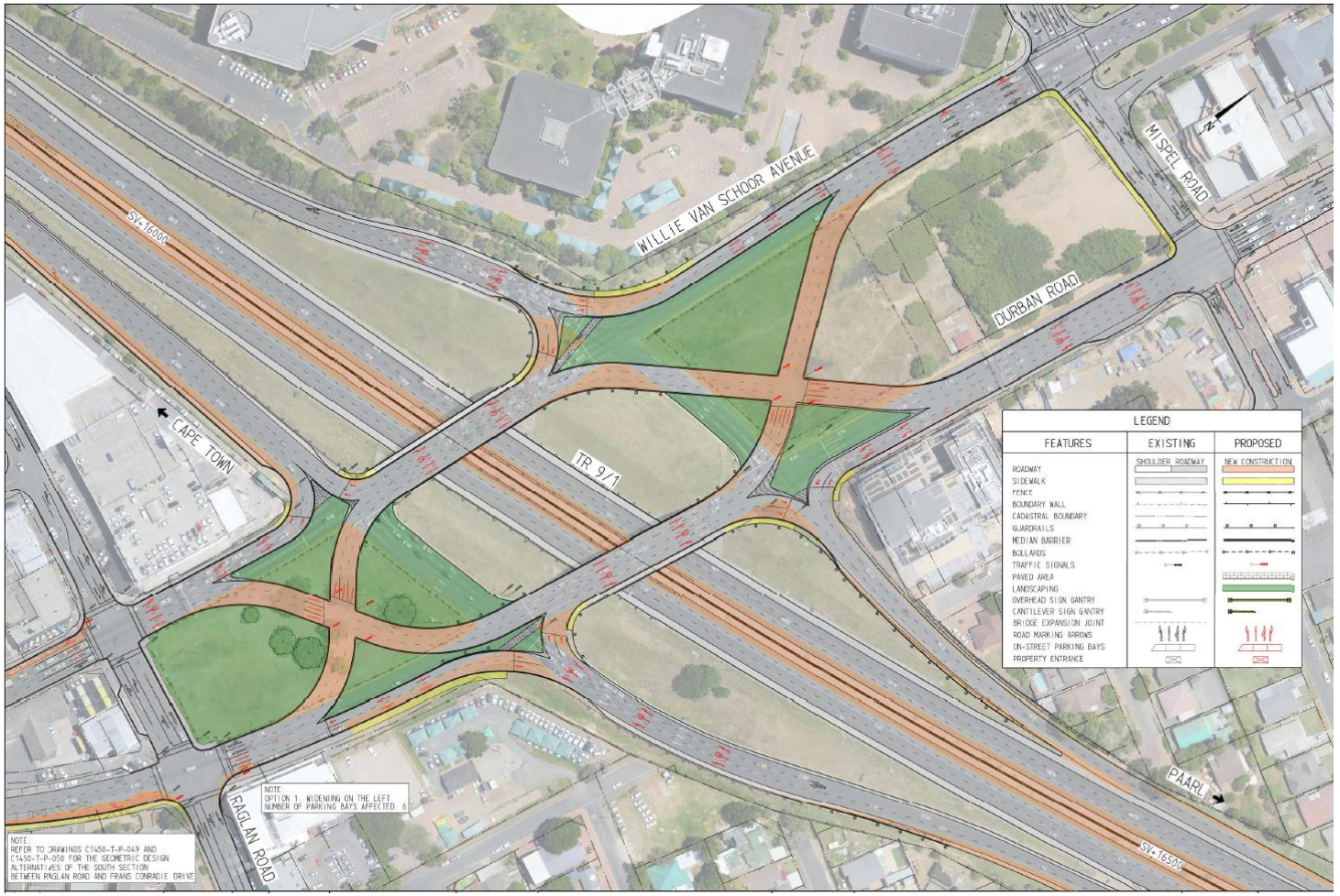
# Some Interesting Alternatives Investigated

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**Diverging Diamond Interchange at Durban Road**

# Traffic Volumes 2013 AADT

| Description | Private Cars | Heavy Vehicles | Buses | Taxis | Total (2013 AADT) |
|---|---|---|---|---|---|
| Plattekloof Road I/c to Jip de Jager Ave I/c | 112 090 | 4 198 | 382 | 191 | 116 861 |
| Jip de Jager Avenue I/c to Durban Road I/c | 115 752 | 3 983 | 469 | 234 | 120 438 |
| Durban Road I/c to Old Oak Road I/c | 99 176 | 5 497 | 568 | 253 | 105495 |
| Old Oak Road I/c to R300 I/c | 70 947 | 5 056 | 281 | 281 | 76566 |
| **% Vehicles** | **94.90%** | **4.47%** | **0.41%** | **0.23%** | **100%** |

# Contract Details

| | |
|---|---|
| **Contract period:** | **36 months** |
| **Closing date for tender:** | **September 2015** |
| **Consultant:** | **SMEC** |
| **Contractor:** | **Martin & East (Pty) Ltd** |
| **Contract value:** | **R600 000 000 inc of VAT** |
| **Contract commencement:** | **February 2016** |
| **Contract completion:** | **February 2019** |

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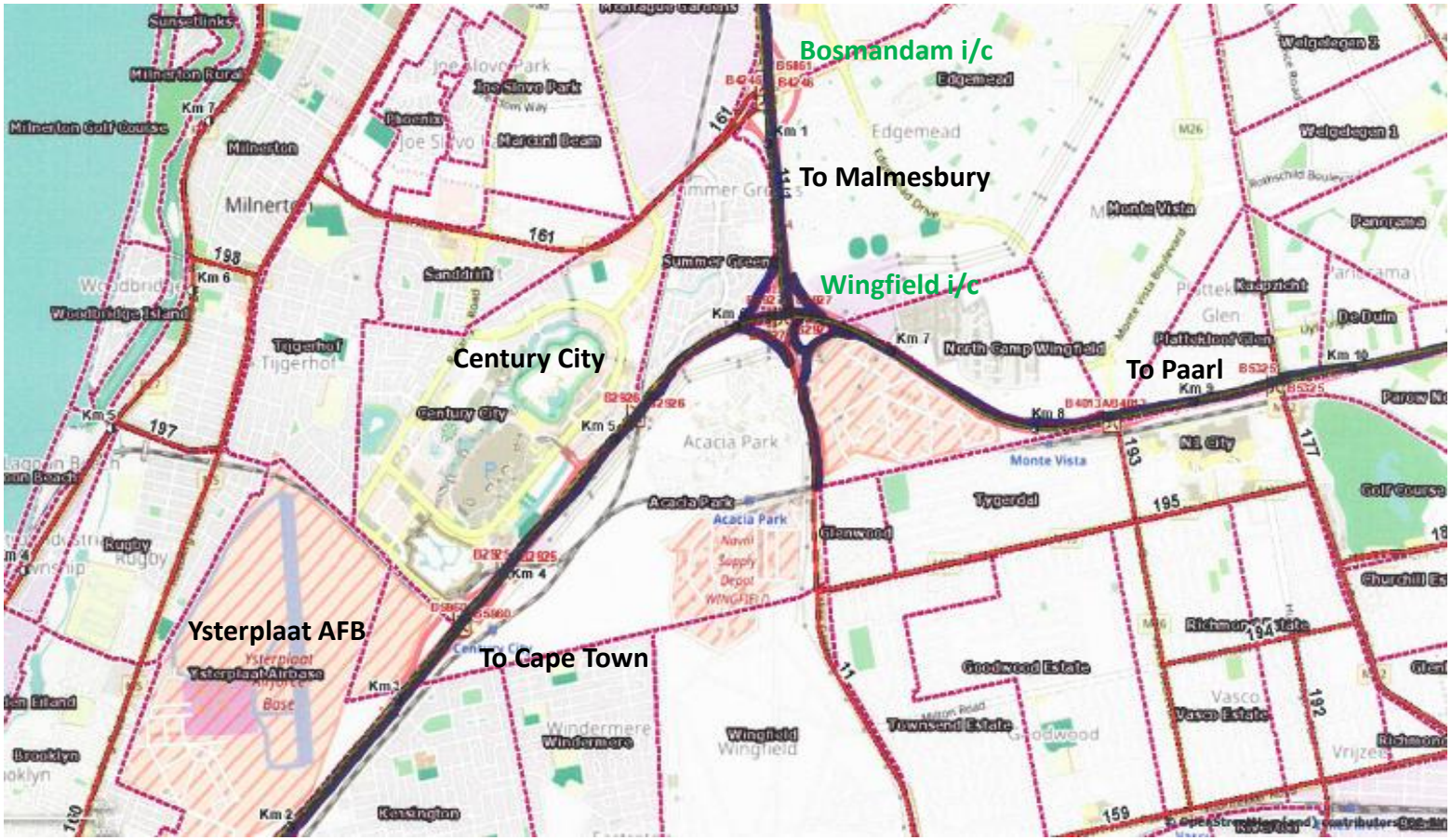
# Wingfield Interchange and Environs

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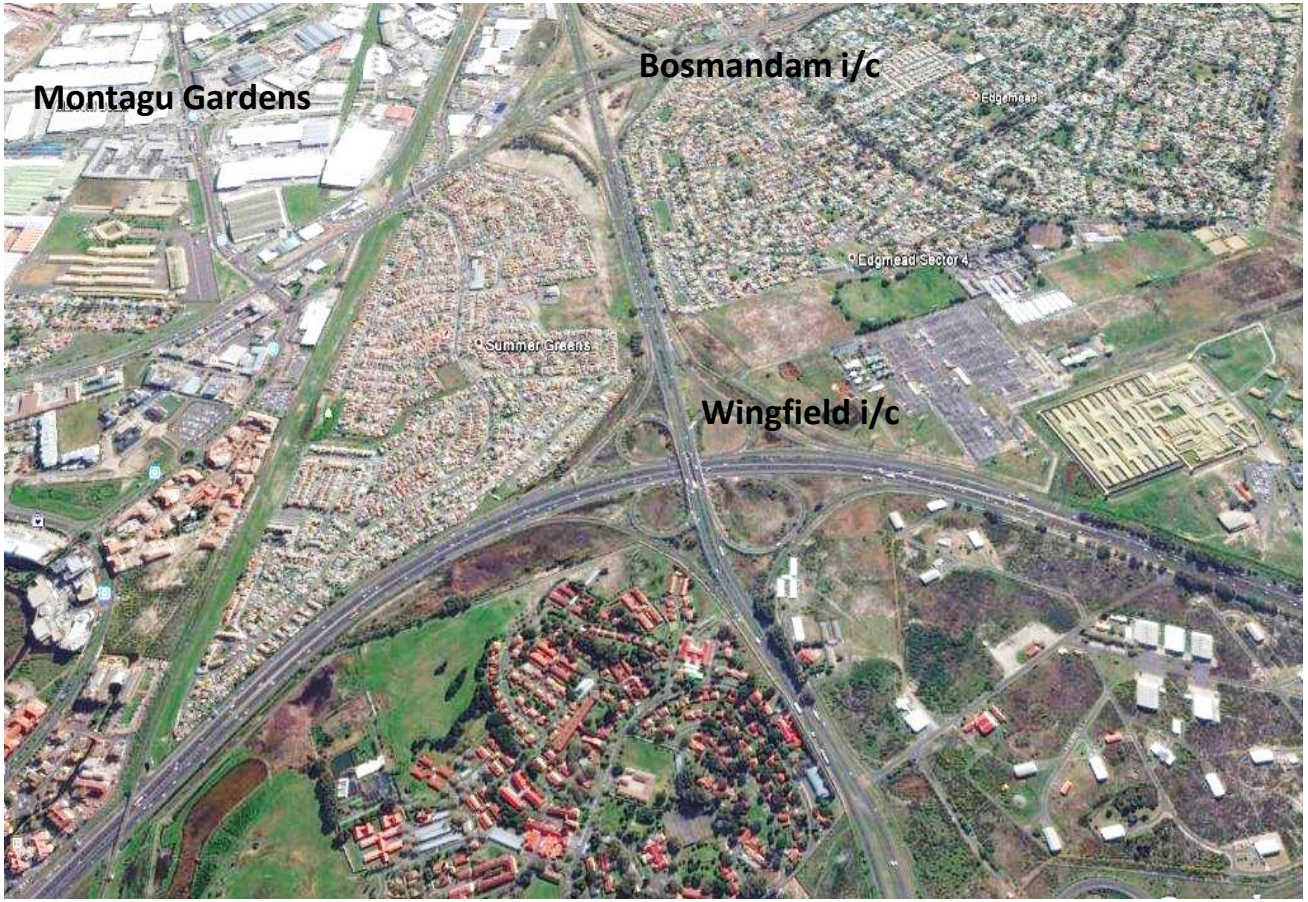
# Problem Identification




**The present link between the N1 and N7 North is via a CD road that is also a major ingress/egress road for Century City.**

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# Problem Identification cont.

**The present N7 bridges over the N1 at Wingfield Interchange are in very poor condition and require replacement**


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# Problem Identification cont.


**The spacing between Wingfield Interchange and Bosmandam Interchange is substandard – approx. 500m**

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# Challenges – Railway Crossings

**Windermere Rail –Over –Roadl Bridge**


- Bridge has substandard clearance
- Evidence of alkali silica reaction (ASR)
- Expansion joints and bearings require replacing

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**Bridge will be repaired**

# Challenges – Railway Crossings

**Kensington Rail-Over-Road Bridge**

- Current bridge has insufficient horizontal and vertical clearance
- Some of the piers are located within the future roadway
- Rail authorities intend duelling the track

Evidence of impacts on bridge deck

Corrosion near south abutment

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**Bridge to be replaced**

# Challenges – Powerline Crossings

There are several existing 66kV, 132kV and 400kV overhead powerlines crossing the road north and east of the interchange. These are situated in servitudes.

- The 66kV and 132kV lines will either be placed underground or relocated, depending on the most economical solution
- The 400kV line will be relocated


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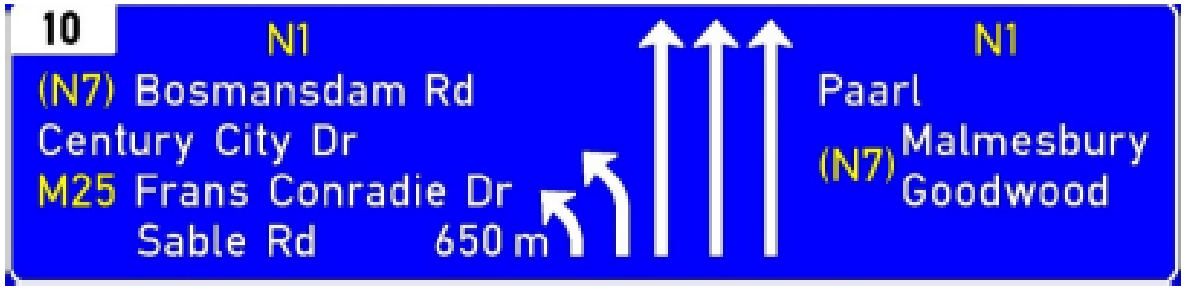
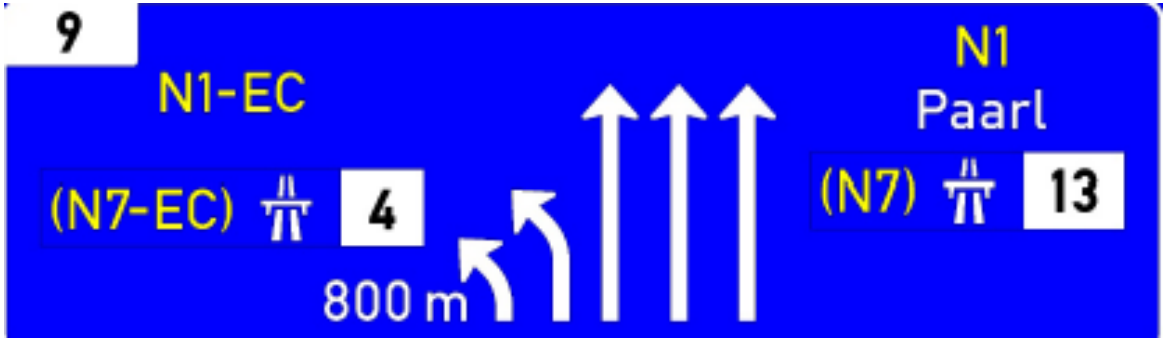
# Challenges - Signage

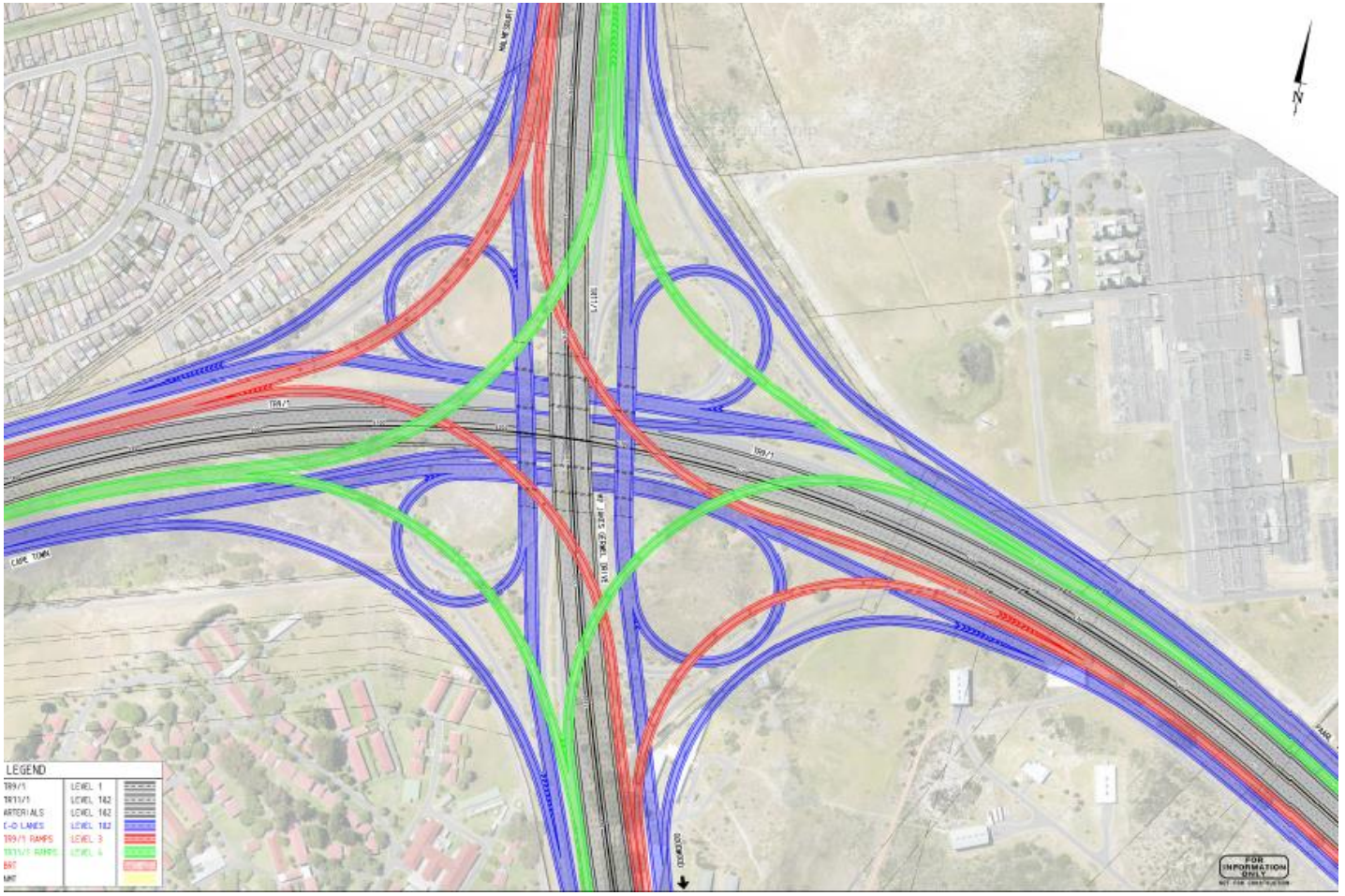



Example of cluttered directional sign




Example of revised signage concept

# Ultimate Solution

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# Project Costing

| ESTIMATED TOTAL PROJECT COST | | | |
|---|---|---|---|
| **Authority** | **Roads & Bridges** | **Land Acquisition** | **Total** |
| **WCG** | R 3 800 000 000 | R 700 000 000 | R 4 500 000 000 |
| **CoCT** | R 300 000 000 | R 220 000 000 | R 520 000 000 |
| **TOTAL** | **R 4 100 000 000** | **R 920 000 000** | **R 5 020 000000** |

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# High Level Economic Evaluation

| Indicator | Value |
|---|---|
| Net Present Value | R104 236 196 |
| Benefit-Cost Ratio (BCR = B/C) | 1.03 |
| Benefit-Cost Ratio (BCR = (B – C)/C) | 0.03 |
| Internal Rate of Return (IRR) | 9.06% |
| First Year Rate of Return (FYRR) | 16.57% |

These indicators are based road user costs during the peak am and pm periods (2.5 hrs am and 2.5 hrs pm)

# N2 Between R300 Interchange and Borcherd's Quarry Interchange


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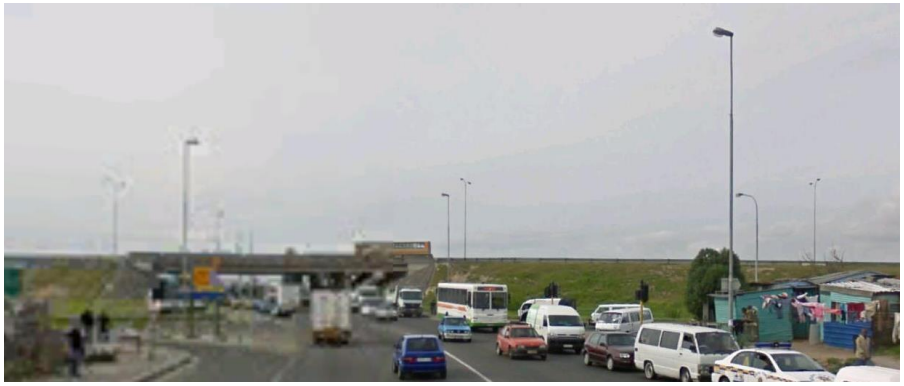
# N2 Between R300 Interchange and Borcherd's Quarry Interchange

**The planning objectives of this project are twofold, namely –**

- **Improve access to the Philippi Industria from the N2**
- **Improve access to Cape Town International Airport and adjacent industrial areas, and**
- **Improve public transport access on:**
  - **The proposed IRT corridor along Eisleben/Lansdowne/New Borcherd's Quarry Roads, and**
  - **Extension of the N2 Bus-Mini Bus Taxi Lane from Borcherds Quarry Interchange to Mew Way Interchange**



Borcherds Quarry Interchange


**ROUTE 1** – R300 access from North and N2 access from East
**ROUTE 2** – R300 access from West
**ROUTE 3** – N2 access from West

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# Present Infrastructure


Borcherd's Quarry Road

# Present Infrastructure cont

Eisleben Drive

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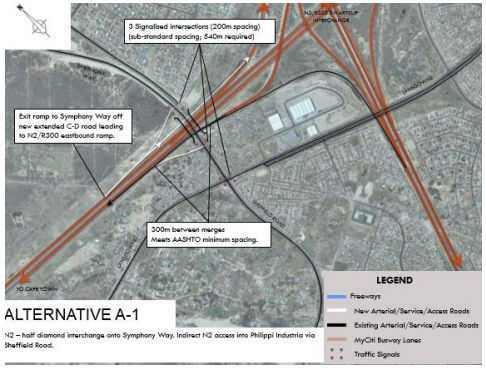
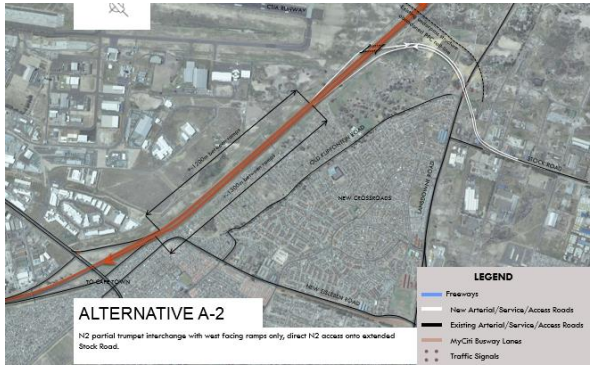
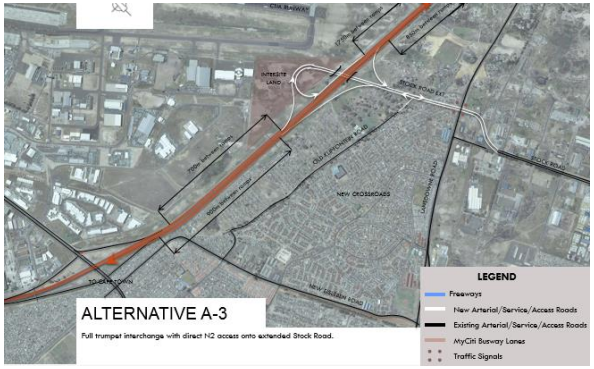
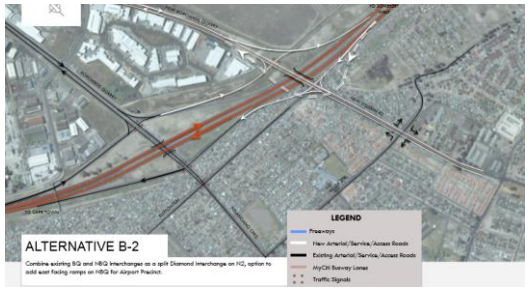
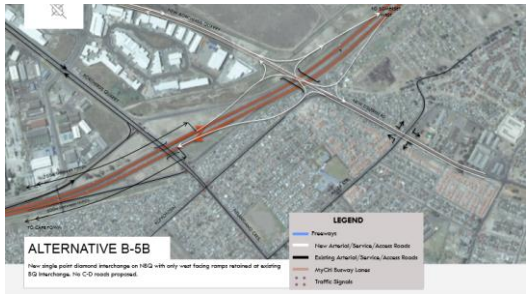
# Alternative New Interchange Layouts





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# Ultimate Solution

# Preferred Alternative


New diamond interchange and existing interchange decommissioned

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# Way Forward

- Phase 1: 3rd lane on N2 between Borcherd's Quarry i/c and R300 is presently under construction
- Remaining phases: Scheduled for 2018/19
  - Finalise detailed design
  - Relocation of Steenbras Water Main
  - Relocation of informal housing within road prism

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# Phase 1: Contract Details

| | |
|---|---|
| **Closing date for tender:** | **September 2015** |
| **Consultant:** | **HHO Africa** |
| **Contractor:** | **Power Construction** |
| **Contract value:** | **R171 000 000** |
| **Contract Commencement:** | **February 2016** |
| **Contract completion:** | **September 2017** |

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# Cape Town Drivers will have a Jol when all is completed

Thank you