

# Upgrading of the N3 from Durban to Cedara



Creating wealth through infrastructure

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SANRAL Eastern Region





# CONTENT

- NDP, PICC & SIP's
- Demand on KZN Network – N3
- Constraints on N3
- Predicted volumes
- Interchanges and Packages
- Conclusions



# NDP, PICC & SIPS

- National Planning Commission identified major constraints in mapping current issues facing SA
- NDP endorsed by Cabinet including National Infrastructure Plan
- Cabinet decision to establish a body to integrate and coordinate the long term infrastructure build, namely the Presidential Infrastructure Coordinating Commission (PICC) with its supporting management structures
- Through the PICC, Strategic Integrated Projects (SIP's) established.

# PICC Terms of reference

PICC's mandate is to ensure systematic selection, planning and monitoring of large projects and its Terms Of Reference include the objectives outlined below

✓ Identify 5 year priorities

✓ Develop 20 year project pipeline

✓ Development Objectives: skills, localisation, empowerment, research & development

✓ Expand maintenance: new and existing infrastructure

✓ Improve infrastructure links: rural areas and poorest provinces

✓ Address capacity constraints and improve coordination and integration

✓ Scale up investment in infrastructure

✓ Address impact of prices

✓ Support African development and integration

## Infrastructure is critical to:

- Promote balanced economic development
- Unlock economic opportunities
- Promote mineral extraction and beneficiation
- Address socio-economic needs
- Promote job creation
- Help integrate human settlements and economic development

## Overall approach

- An Infrastructure Book has been compiled, which contains more than 645 infrastructure projects across the country
- An Infrastructure Plan with identified Strategic Integrated Projects (SIPs) has been developed and adopted by Cabinet and the PICC

## Strategic Integrated Project 2 (SIP 2) – N2/N3

### SIP 2: Durban- Free State– Gauteng Logistics and Industrial Corridor

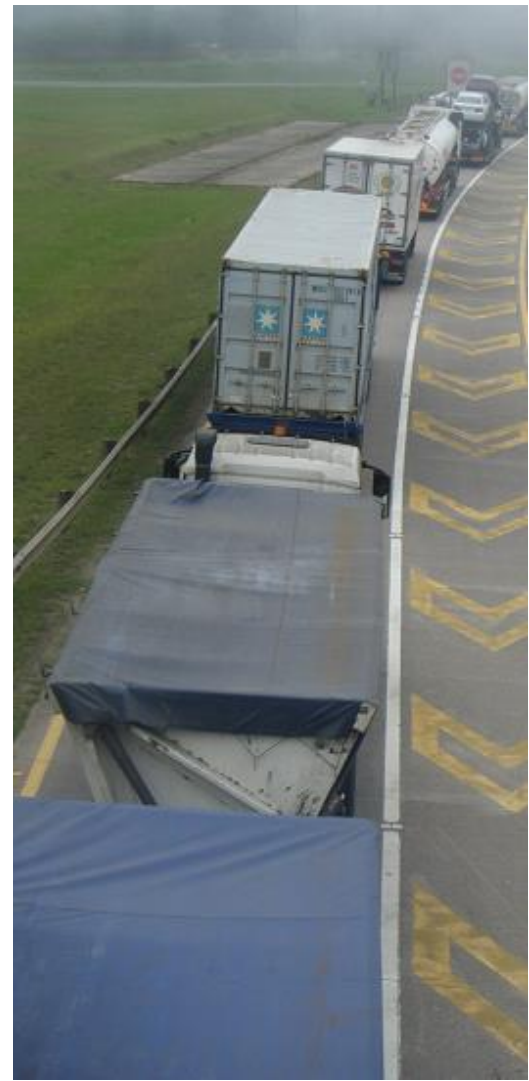
Strengthen the logistics and transport corridor between SA's main industrial hubs; improve access to Durban's export and import facilities, raise efficiency along the corridor and integrate the Free State Industrial Strategy activities into the corridor and integrate the currently disconnected industrial and logistics activities as well as marginalised rural production centres surrounding the corridor that are currently isolated from the main logistics system.





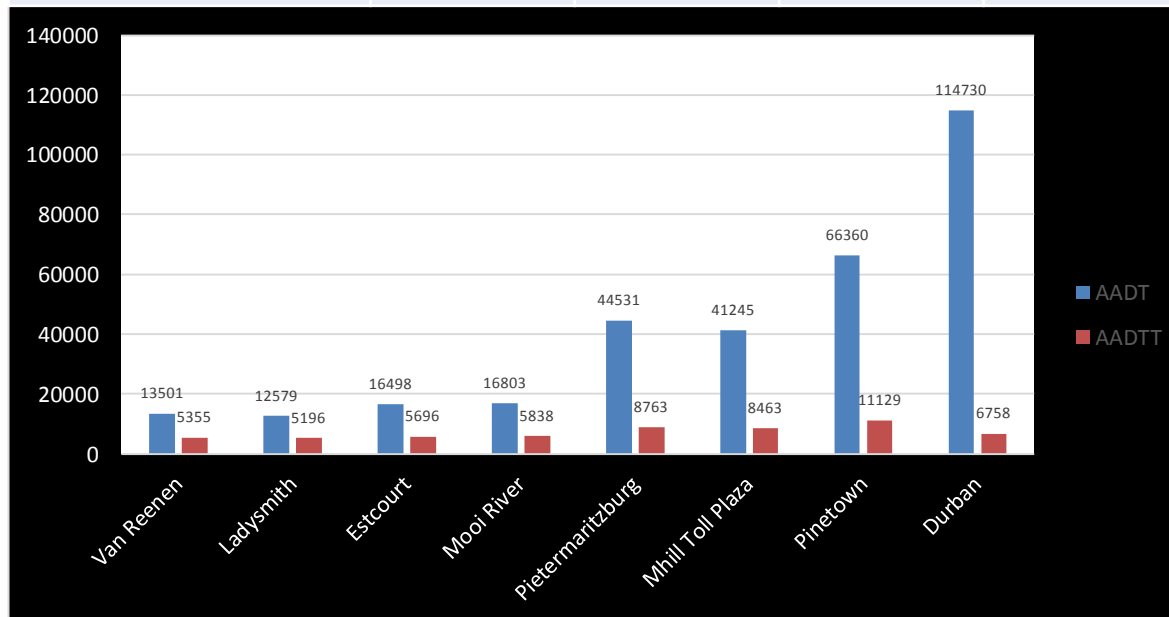
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# N3 Freight and Passenger Corridor



## Current Demands (2015 volumes) on the Road Network : N3

Town	AADT	AADTT	%HV	%night
Van Reenen	13501	5355	39.7%	24.5
Ladysmith	12579	5196	41.3%	26.4
Estcourt	16498	5696	34.5%	22.4
Mooi River	16803	5838	34.7%	20.6
Pietermaritzburg	44531	8763	19.7%	12.2
Mhill Toll Plaza	41245	8463	20.5%	12.7
Pinetown	66360	11129	16.8%	11.4
Durban	114730	6758	5.9%	5.1

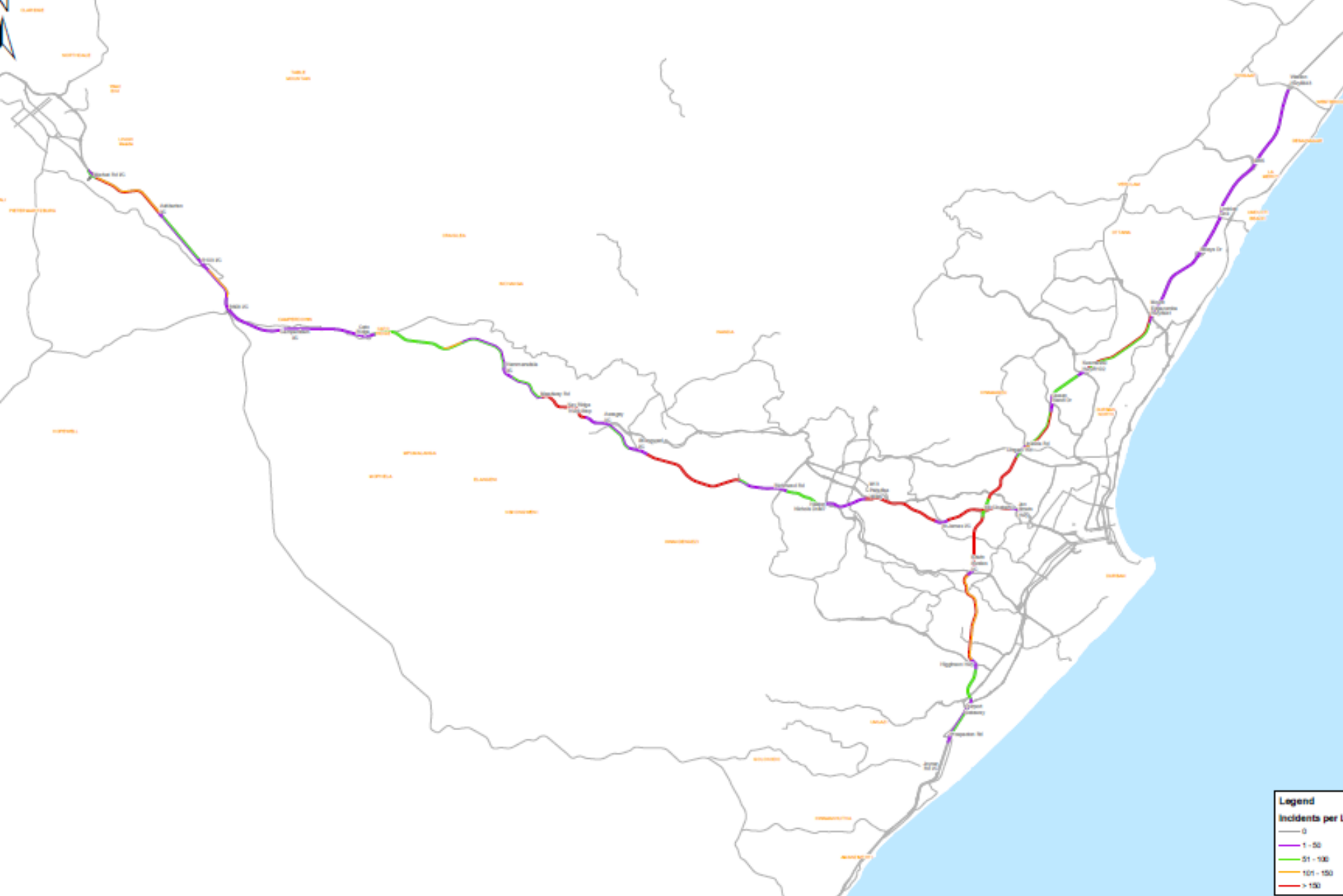




## **N3 Planning and Upgrading (SIP 2)**

- The N3 between Durban and Pietermaritzburg was completed between the late 70's and mid 80's-current toll section between Paradise Valley and Key Ridge (17km)
- Consists of a dual divided carriageway freeway with three lanes per direction between Durban and Cato Ridge, and thereafter two lanes per direction up to Pietermaritzburg
- Carries between 40,000 and 120,000 vehicles per day – mix of urban commuter traffic, long distance traffic and substantial heavy vehicles, with some sections in excess of 25% heavies
- The n3 corridor carries in excess of 40 million tons of freight per annum, with currently approx. 9000 heavy vehicles per day
- Substantial delay costs and safety concerns (Townhill, Key Ridge) especially sections with two lane capacity and steep grades, requiring major upgrading of freeway (add. of lanes) and interchanges and underpass/overpass bridges





**Legend**  
 Incidents per link  
 0  
 1 - 50  
 51 - 100  
 101 - 150  
 > 150

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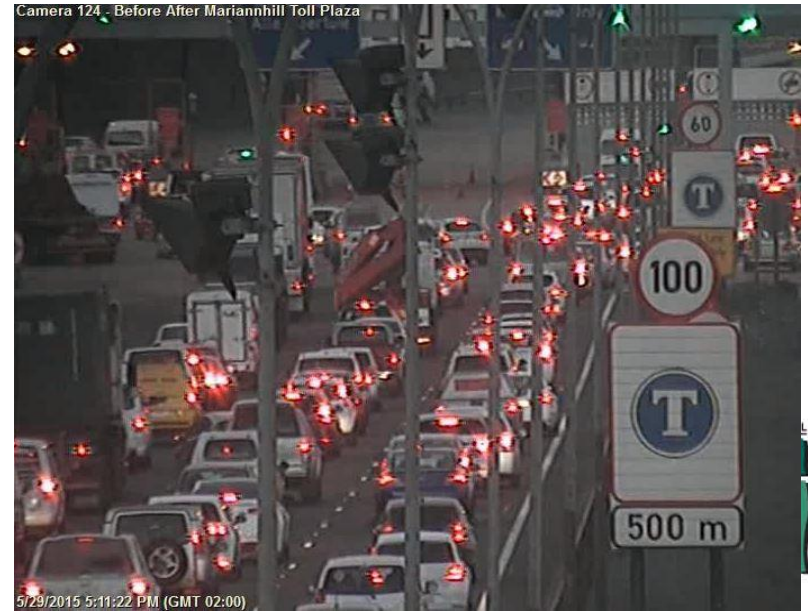
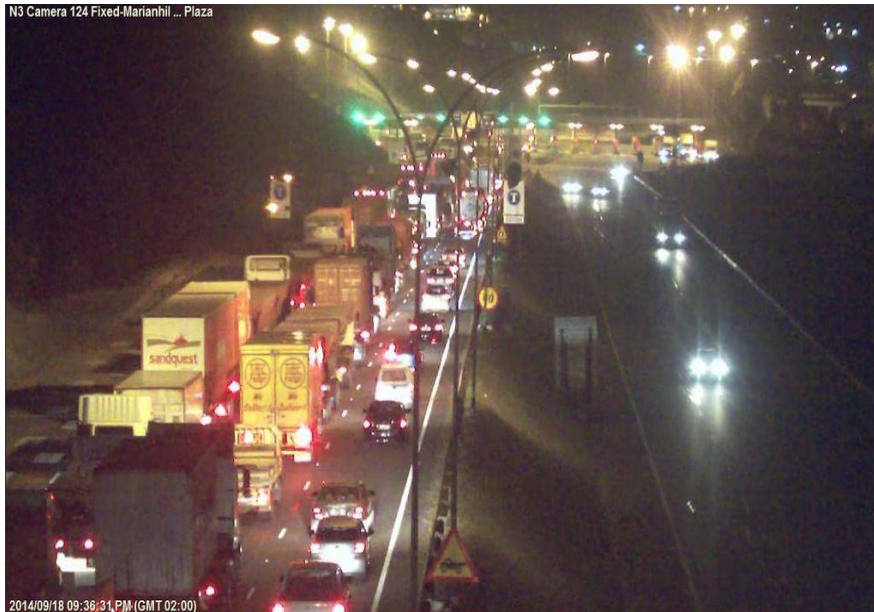
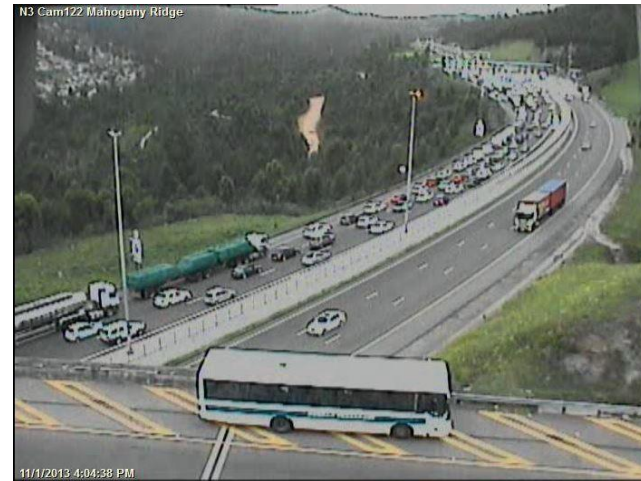
# CURRENT CONSTRAINTS ON N3

## Compulsory Truck Stop – Key Ridge



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# CURRENT CONSTRAINTS ON N3 Marianhill Toll Plaza – PM Peak

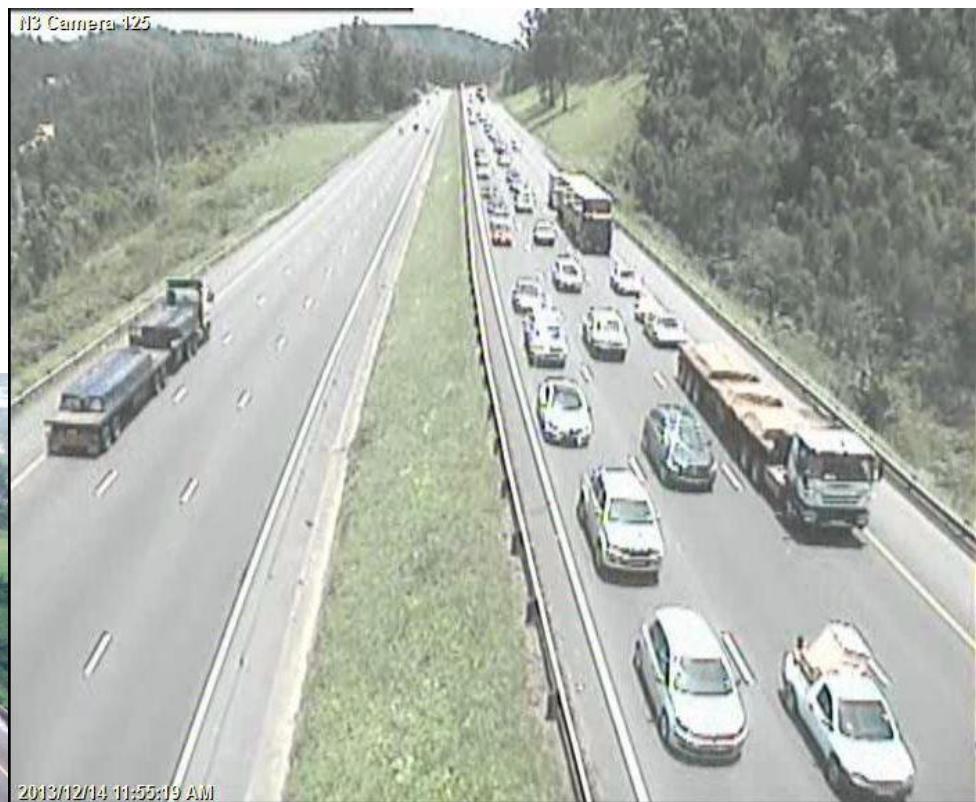




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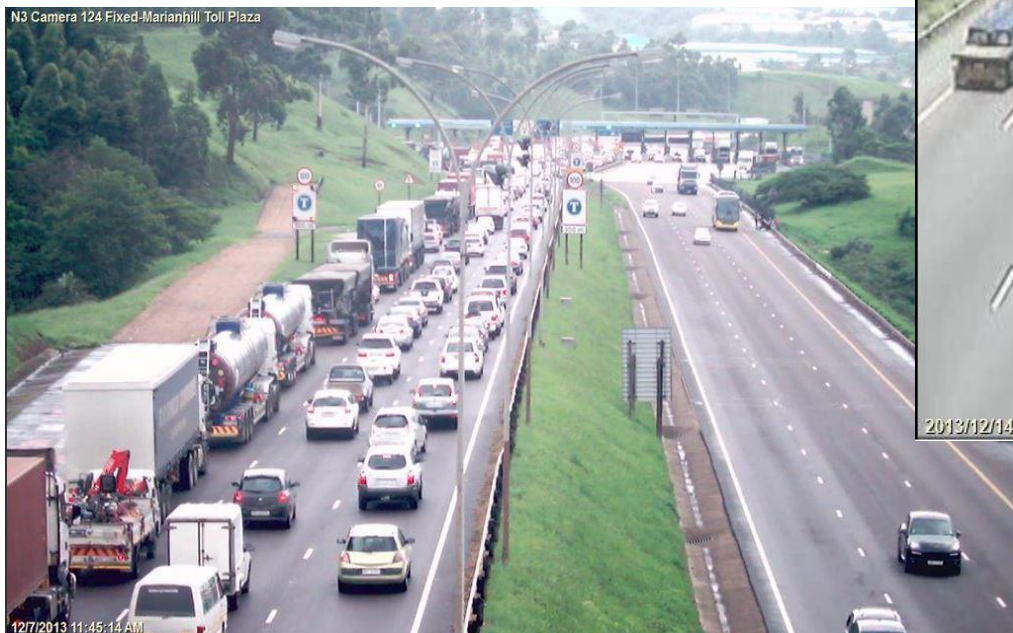
## CURRENT CONSTRAINTS ON N3

### Marianhill Toll Plaza – AM Peak



N3 Camera 125

2013/12/14 11:55:19 AM



N3 Camera 124 Fixed-Marianhill Toll Plaza

12/7/2013 11:45:14 AM

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# CURRENT CONSTRAINTS ON N3 Congestion – Two Lane sections

Camera 207



2015/10/07 12:30:49 PM (GMT 02:00)

N3 Cam155



2014/12/18 01:53:37 PM (GMT 02:00)

Camera 156



2015/08/10 12:27:18 PM (GMT 02:00)

Camera 208 - Recorded



2015/10/24 01:16:52 PM (GMT 02:00)

# CURRENT CONSTRAINTS ON N3

## Accidents – N3 Standstill



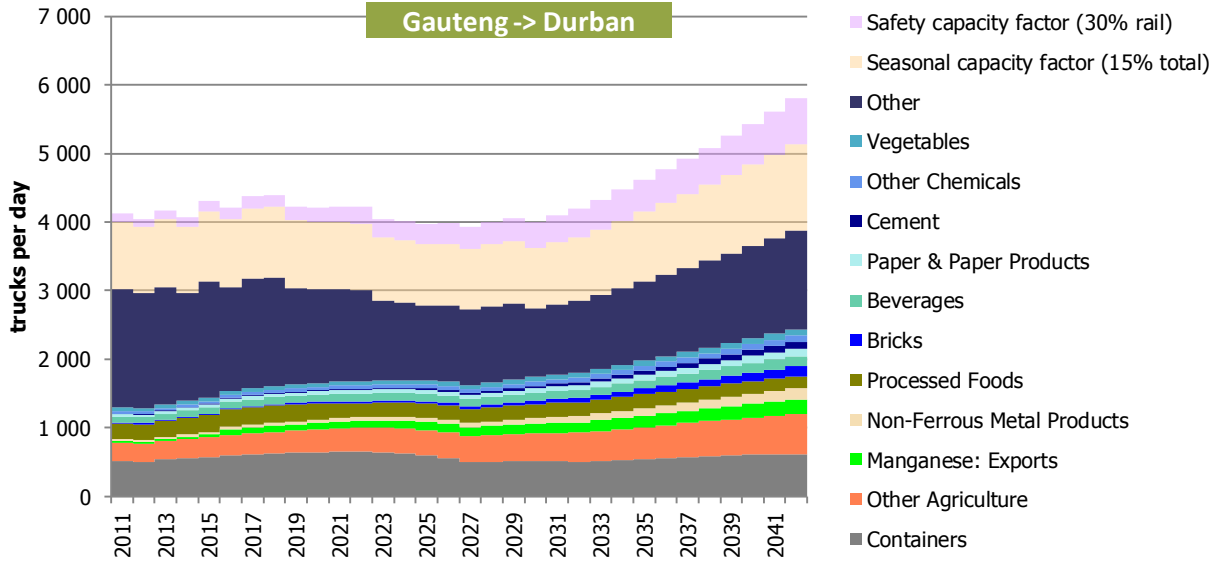


## **N3 Planning and Upgrading**

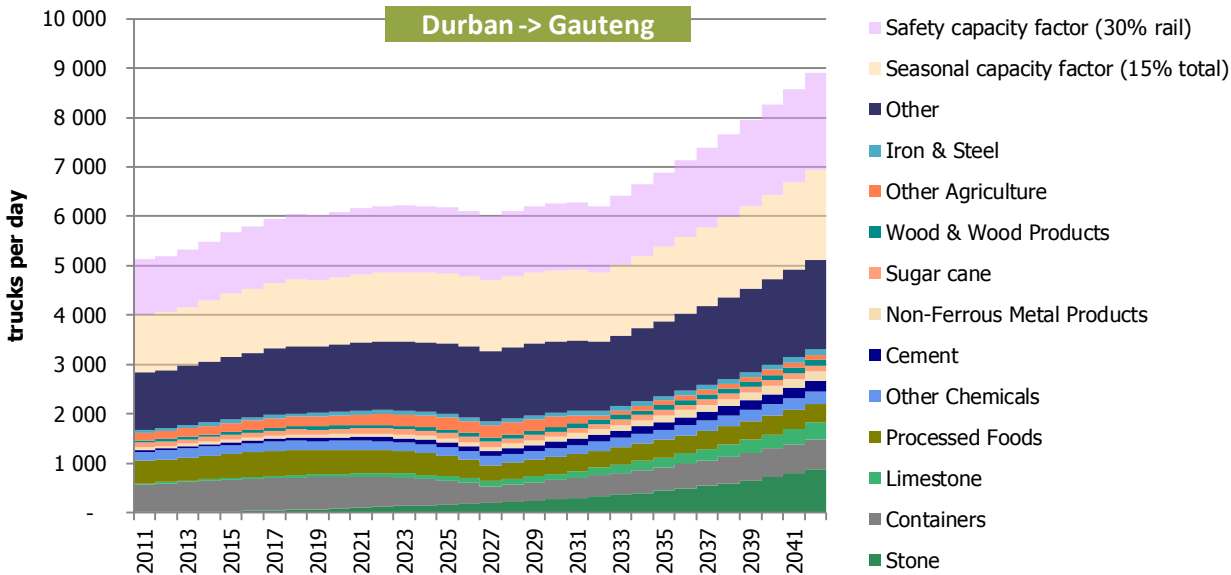
- Considering a 35 year planning horizon up to 2047 to tie in with port upgrade plans
- Need a phased approach – funding limitations
- Route being assessed holistically as the Durban-Free State – Gauteng Freight Corridor together with NDoT, Transnet, provinces, municipalities, and dept's
- Ensuring capacity meets future demands when required
- Consideration of a freight route out of port to N3 also being considered by others

# Transnet FDM Data

## Road flows per direction (trucks per day)



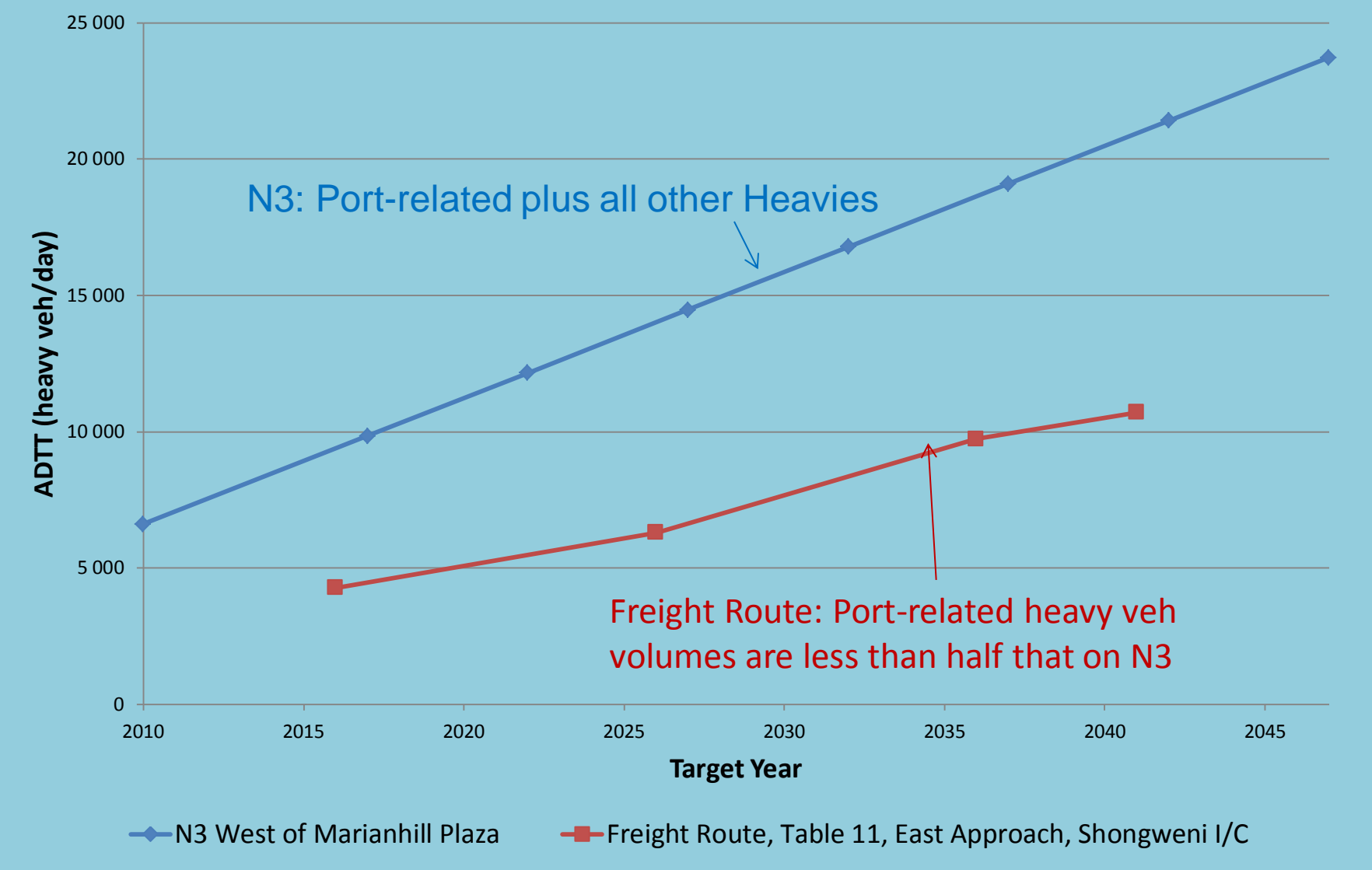
	2012	2020	2042
Containers	506	648	620
Other Agriculture	260	328	579
Manganese: Exports	25	98	211
Non-Ferrous Metal Products	29	45	172
Processed Foods	235	236	167
Bricks	15	26	148
Beverages	85	106	147
Paper & Paper Products	37	48	109
Cement	8	17	102
Other Chemicals	38	47	93
<b>Total</b>	<b>2,920</b>	<b>2,976</b>	<b>3,815</b>

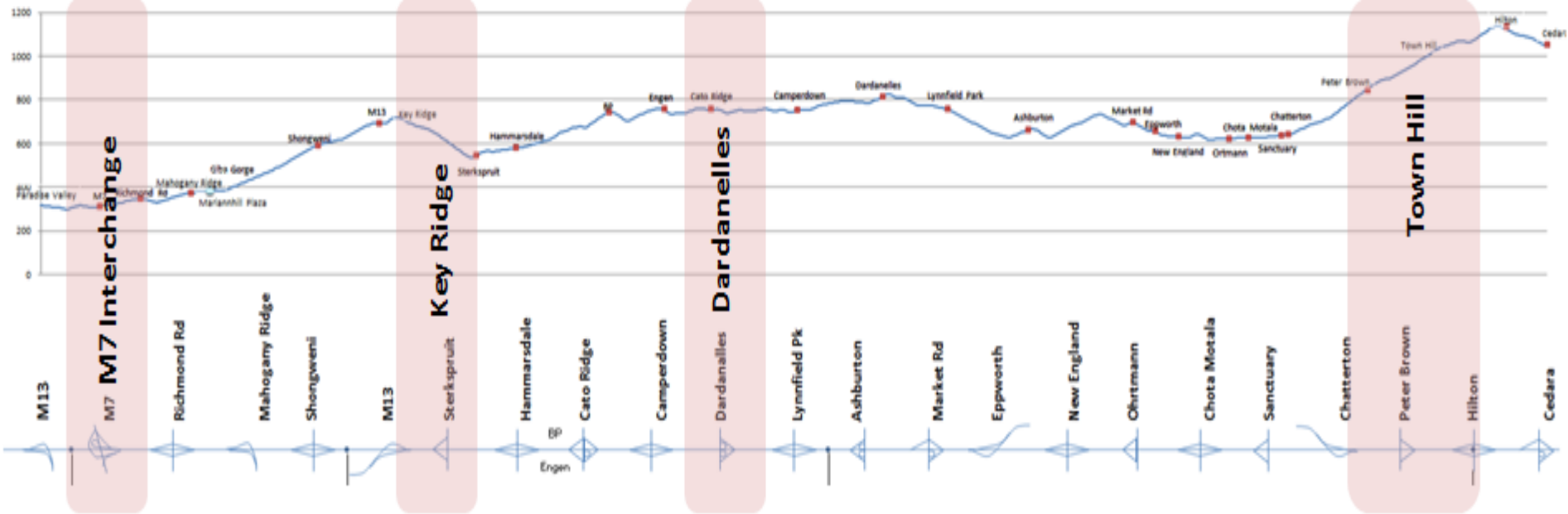


	2012	2020	2042
Stone	15	82	878
Containers	559	643	611
Limestone	23	61	335
Processed Foods	456	486	381
Other Chemicals	180	181	245
Cement	40	73	226
Non-Ferrous Metal Products	50	70	185
Sugar cane	95	104	115
Wood & Wood Products	48	65	112
Other Agriculture	153	210	111
<b>Total</b>	<b>2,789</b>	<b>3,344</b>	<b>5,046</b>



# Freight Corridor Comparison





Heavies join N3 from M7

Steep grades & low Hor. Standards

Freight Hub, Freight Route, Pmb Bypass

Steep grades & low Hor. Standards

AADT x 10 <sup>3</sup>				
2010	2017	2027	2037	2047
64	80	103	126	149

AADT x 10 <sup>3</sup>				
2010	2017	2027	2037	2047
44	56	72	89	105

AADT x 10 <sup>3</sup>				
2010	2017	2027	2037	2047
32	41	53	66	78

AADTT x 10 <sup>3</sup>				
2010	2017	2027	2037	2047
9	14	20	27	33

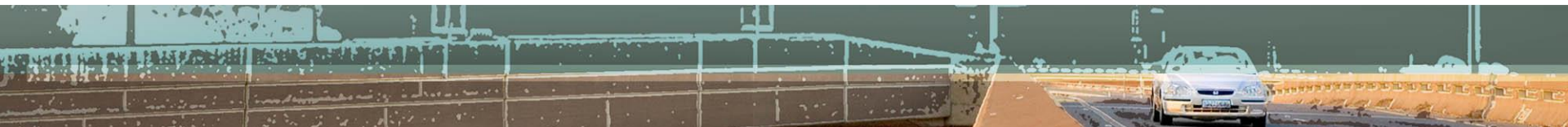
AADTT x 10 <sup>3</sup>				
2010	2017	2027	2037	2047
8	12	18	23	29

AADTT x 10 <sup>3</sup>				
2010	2017	2027	2037	2047
7	10	15	20	25

# Forecast Conditions (Cato Ridge-PMB)



	Existing Lanes		2010			2017			2022			2027		
			AADT (PCU)	Existing Lanes		AADT (PCU)	Existing Lanes		AADT (PCU)	Existing Lanes		AADT (PCU)	Existing Lanes	
	From Interchange	From Interchange		PH V/C	LOS		PH V/C	LOS		PH V/C	LOS		PH V/C	LOS
Chatterton Rd	Hilton	Cedara	52 800	0.43	B	72 400	0.59	C	86 400	0.71	C	100 400	0.82	D
Sanctuary Rd	Athlone	Hilton	56 400	0.46	B	77 100	0.63	C	91 800	0.75	D	106 500	0.87	D
Chota Motalla	Chatterton	Athlone	46 600	0.38	B	63 100	0.52	C	74 800	0.61	C	86 600	0.71	C
Orthmann Rd	Sanctuary Rd	Chatterton	32 300	0.27	A	43 600	0.36	B	51 700	0.42	B	59 700	0.49	B
New England	Chota Motalla	Sanctuary Rd	62 200	0.38	B	80 400	0.50	C	93 300	0.57	C	106 300	0.65	C
Epworth	Ohrtmann Rd	Chota Motalla	49 700	0.61	C	64 700	0.80	D	75 500	0.93	E	86 200	1.06	F
Market St	New England Rd	Ohrtmann Rd	66 800	0.82	D	86 900	1.07	F	101 300	1.25	F	115 700	1.43	F
Ashburton	Epworth	New England Rd	54 400	0.67	C	72 000	0.89	D	84 600	1.04	F	97 200	1.20	F
Lion Park	Market Rd	Epworth	66 300	0.82	D	86 600	1.07	F	101 000	1.24	F	115 500	1.42	F
Dardanelles	Ashburton	Market Rd	56 500	0.70	C	74 100	0.91	D	86 700	1.07	F	99 300	1.22	F
Camperdown	Lynnfield Park	Ashburton	56 800	0.70	C	74 700	0.92	E	87 500	1.08	F	100 300	1.24	F
	Dardanelles	Lynnfield Park	59 100	0.73	C	78 000	0.96	E	91 600	1.13	F	105 100	1.30	F
Cato Ridge	Camperdown	Dardanelles	55 100	0.68	C	72 400	0.90	E	84 700	1.04	F	97 000	1.20	F
	Cato Ridge	Camperdown	55 300	0.68	C	71 900	0.90	E	83 800	1.03	F	95 600	1.18	F





# N3 Planning and Upgrading – Safety Considerations





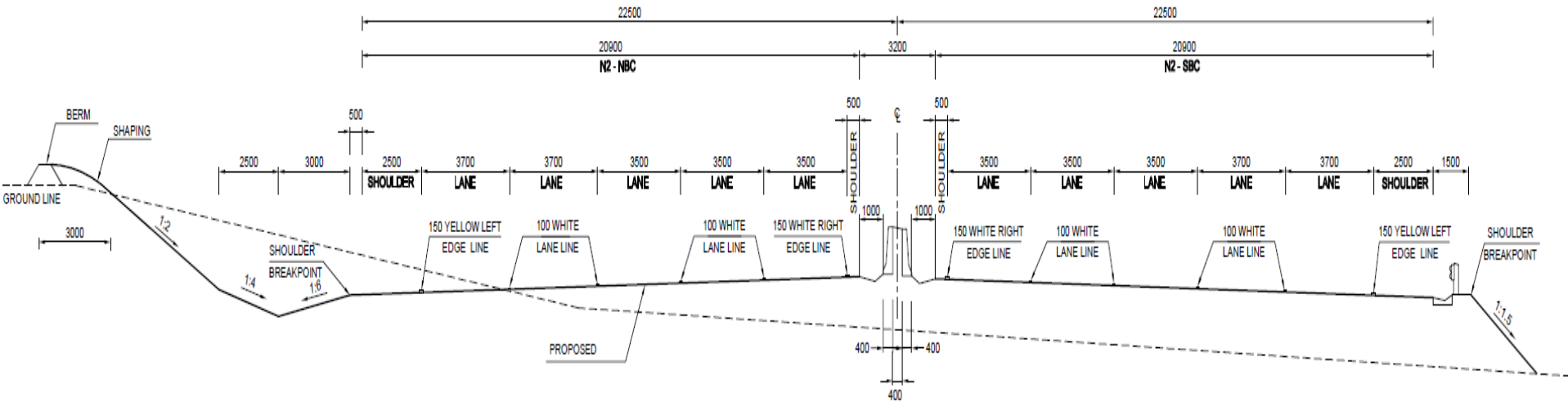
## N3 Planning and Upgrading

### Scope

- Addition of 2 and 3 lanes per direction resulting in a eight to ten lane freeway over a distance of 84km
- Existing Toll section between Paradise Valley and Key Ridge (18km) to be upgraded from 6 lanes to 8 lanes and 10 on some sections
- Median consisting of a concrete barrier with drainage
- Road surface of asphalt and/or concrete over most sections due to loading from heavy vehicles
- Upgrading of twenty seven interchanges
- Ninety five underpass/overpass bridges required to be upgraded
- Ring road around Pietermaritzburg is being investigated
- Key Ridge Re-alignment to reduce steep grades and straighter alignment
- M13 –N3 link being considered
- Tunnels on Pietermaritzburg Ringroad and at Townhill as options
- 36 -42 month construction duration on various packages

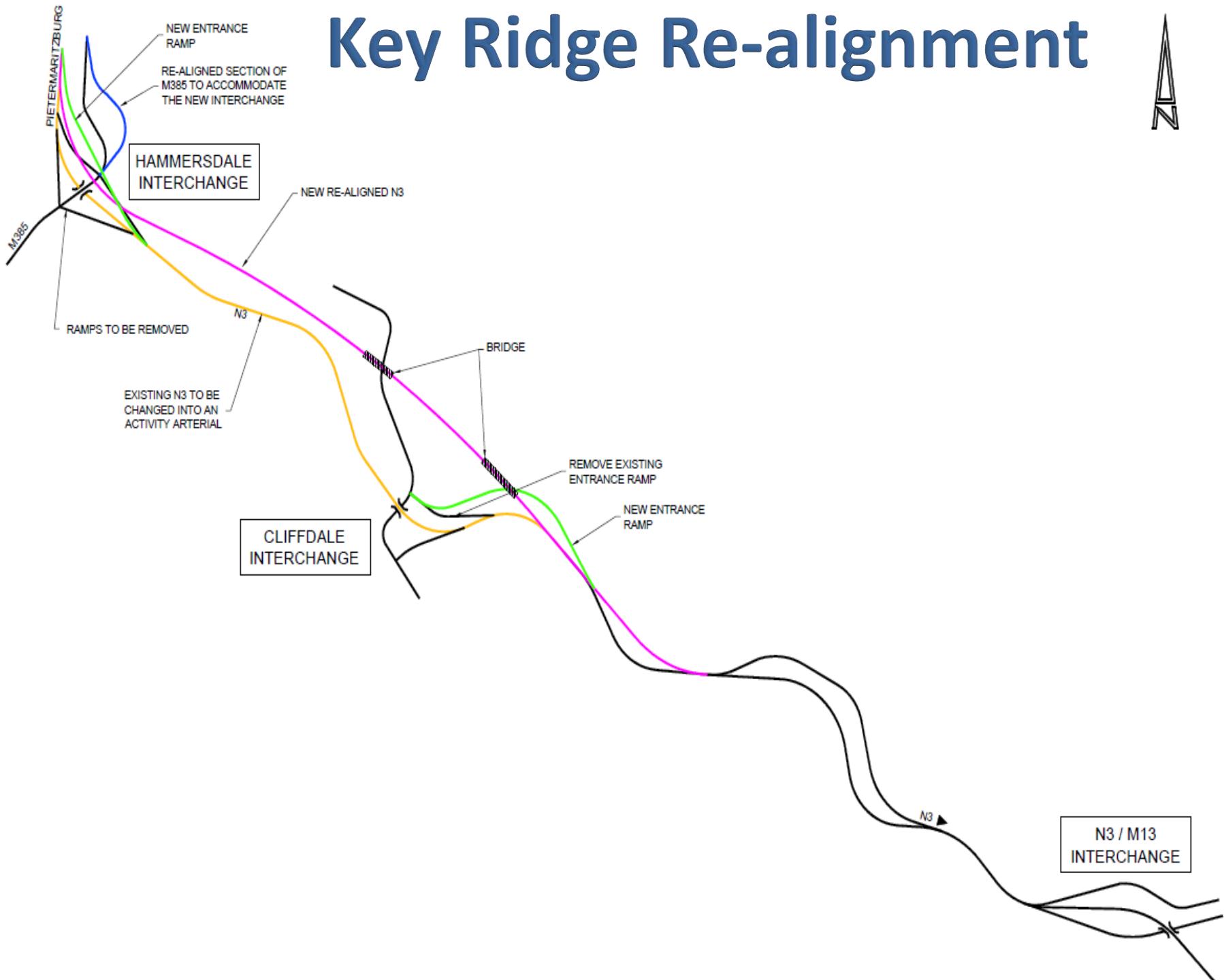


# N3 Typical Cross Section



CROSS SECTION ILLUSTRATING PROPOSED  
 FUTURE DEVELOPMENT ON N2 - SECTION B-B  
 SCALE 1 : 100

# Key Ridge Re-alignment



# N3 Planning and Upgrading – PMB Ringroad

- **Route Location Study:**

- Routes identified and analysed according to:

  - Length

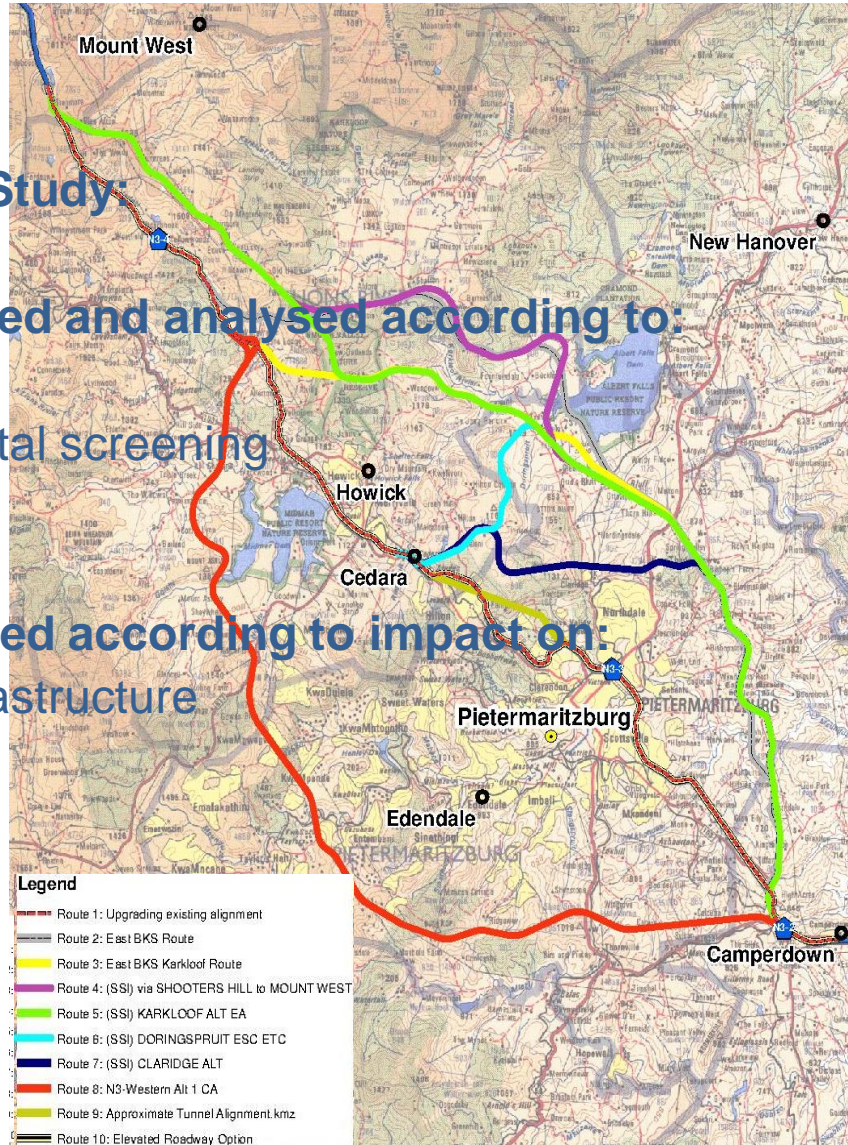
  - Environmental screening

  - Cost

- Routes assessed according to impact on:

  - existing infrastructure

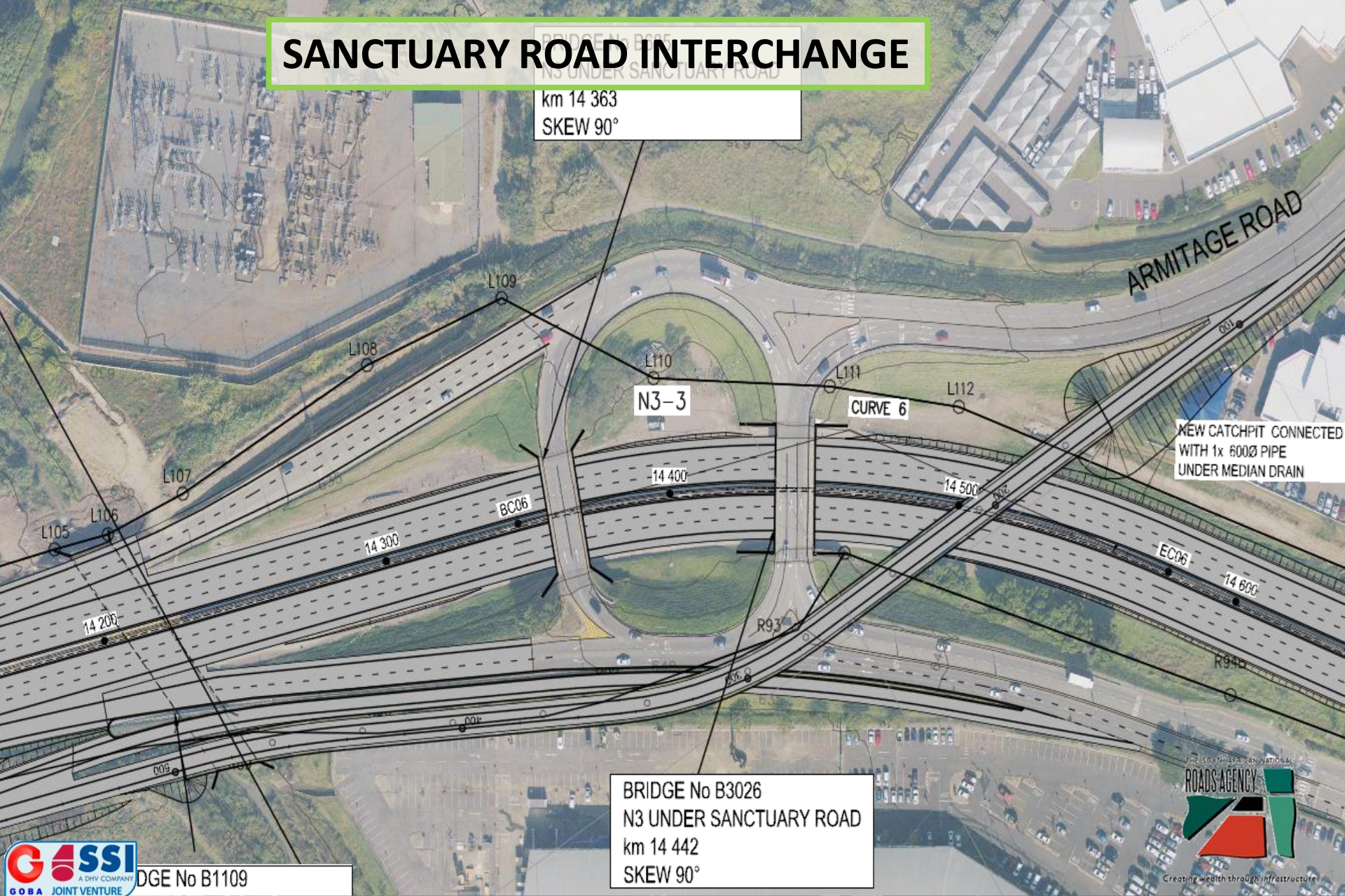
  - land use





# SANCTUARY ROAD INTERCHANGE

km 14 363  
SKEW 90°



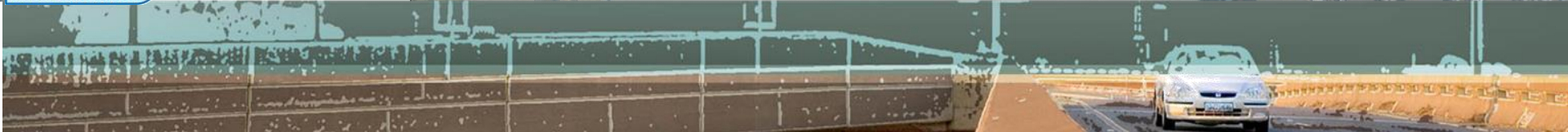
BRIDGE No B3026  
N3 UNDER SANCTUARY ROAD  
km 14 442  
SKEW 90°



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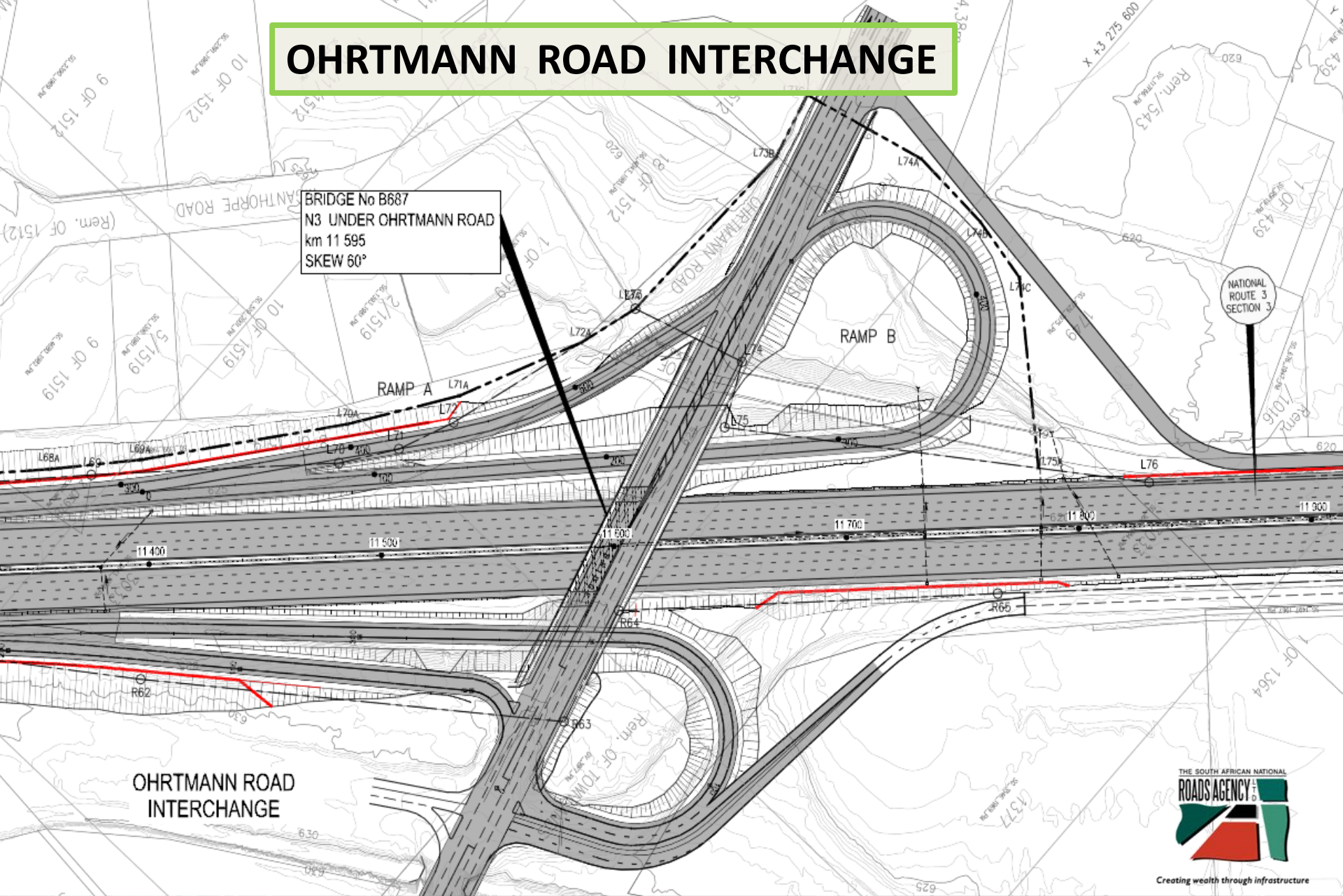
DGE No B1109





# OHRTMANN ROAD INTERCHANGE

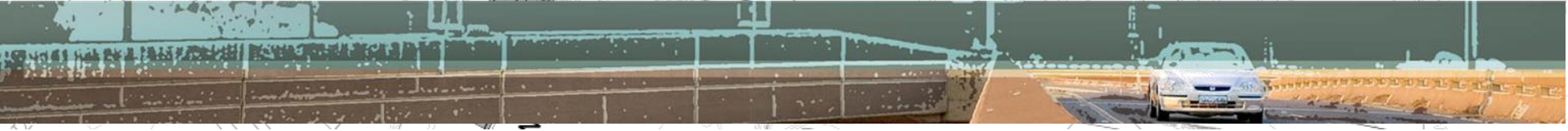
BRIDGE No B687  
N3 UNDER OHRTMANN ROAD  
km 11 595  
SKEW 60°



OHRTMANN ROAD  
INTERCHANGE



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# NEW ENGLAND ROAD INTERCHANGE

BRIDGE NO. 1688  
NEW ENGLAND ROAD  
km 9.200  
SKEW 91°

NEW CATCH-PIT CONNECTED WITH 1x 800Ø PIPE UNDER MEDIAN DRAIN

LIMIT OF PLANNING  
km 9.18 (N3)

NEW ENGLAND INTERCHANGE

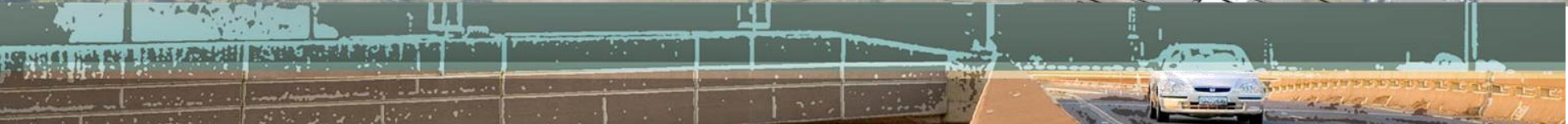
EXTEND EXISTING 900Ø CULVERT

EXTEND EXISTING 900Ø CULVERT

NEW CULVERT  
3x(3000x2500)



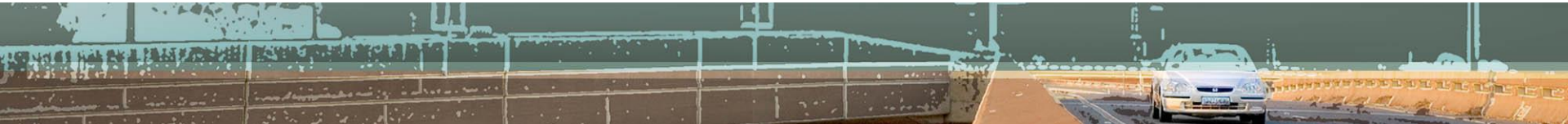
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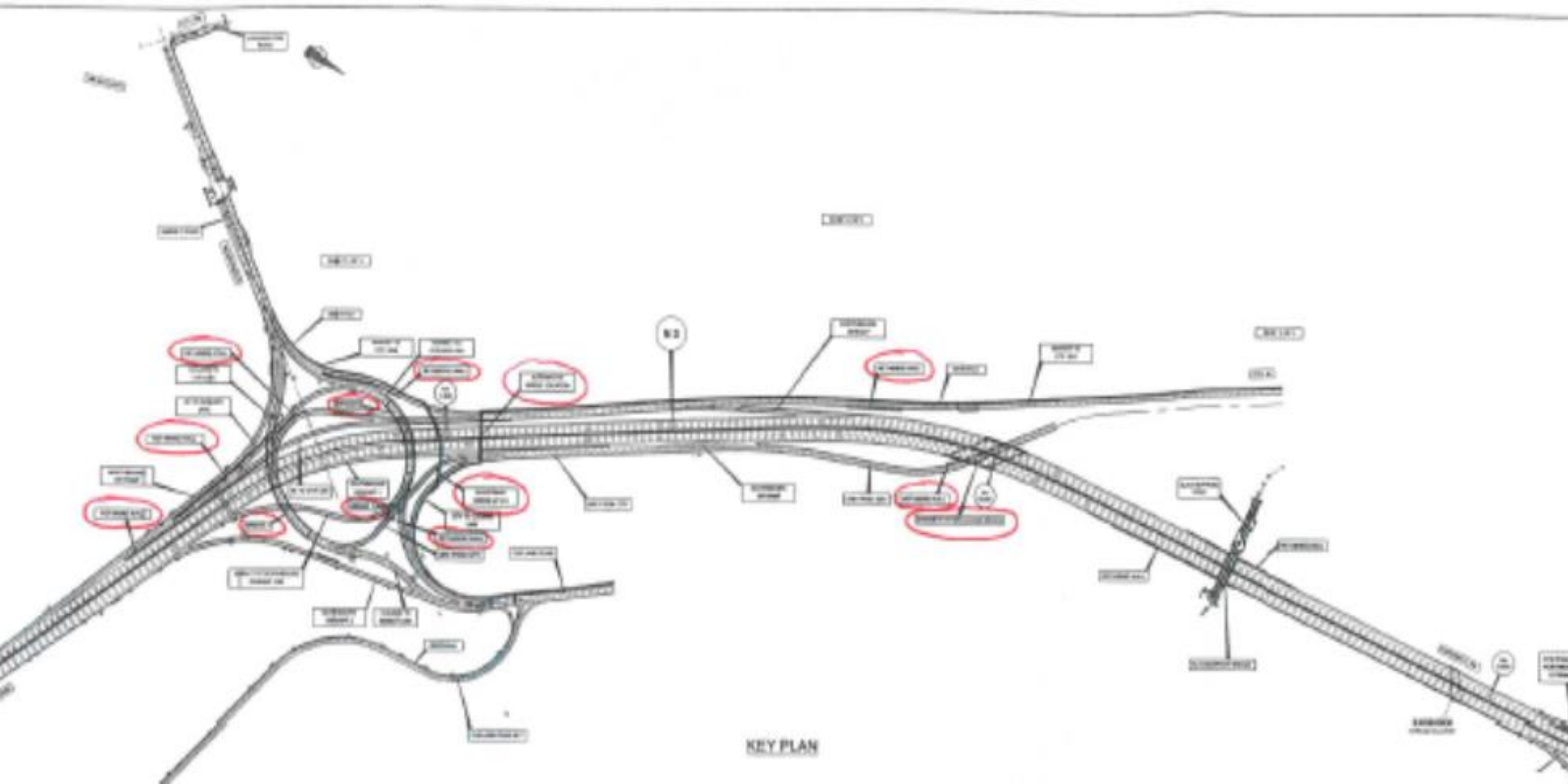
# MARKET – EPWORTH INTERCHANGE



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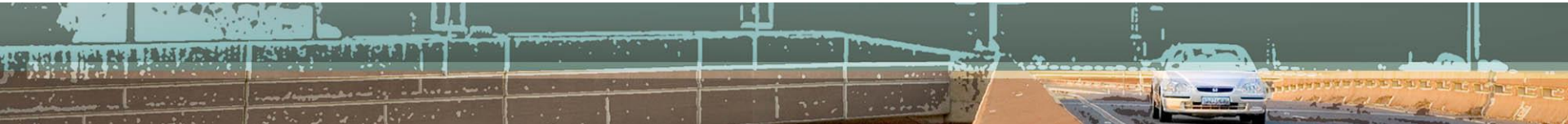
# MARKET – EPWORTH INTERCHANGE



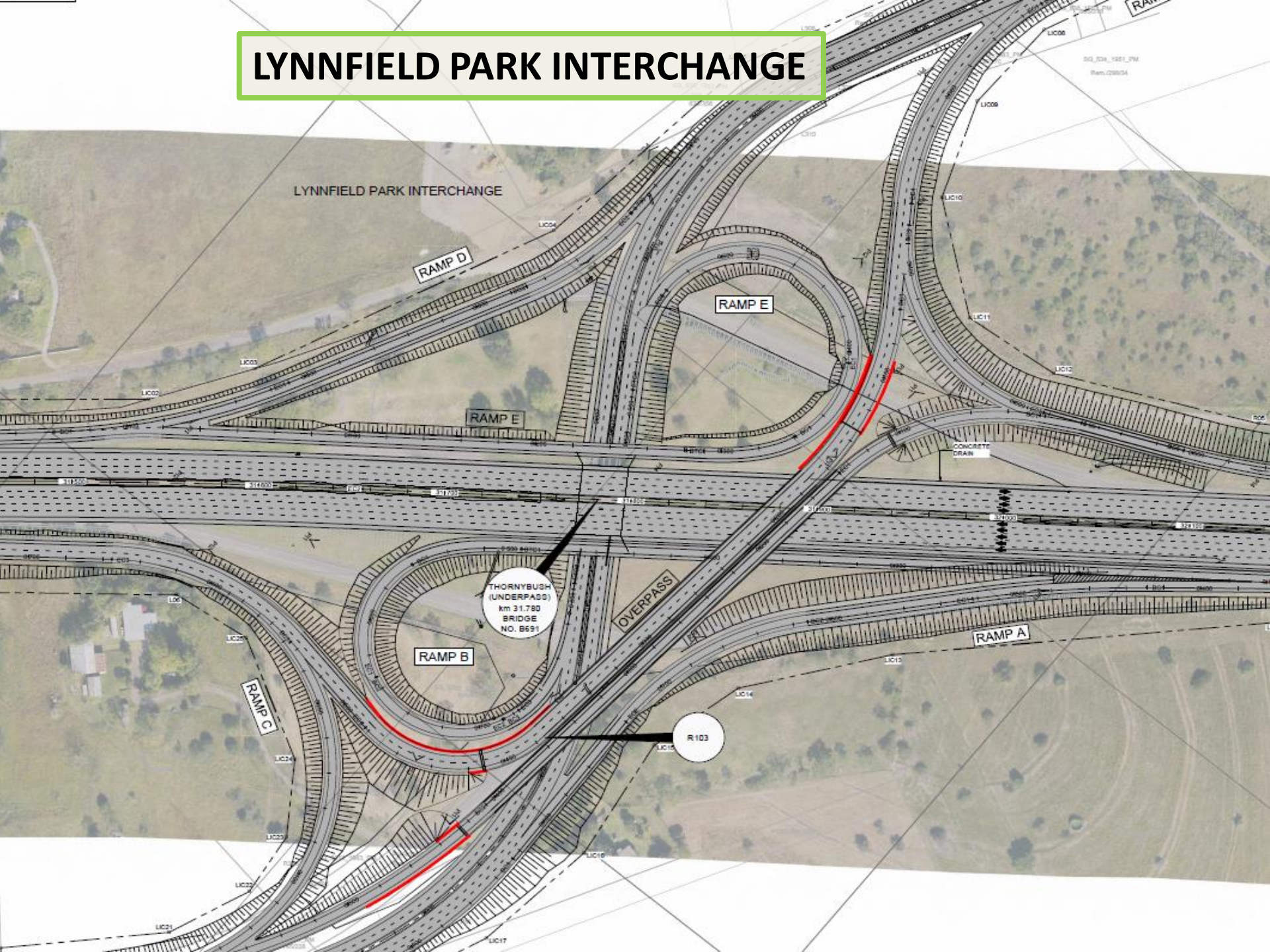
# ASHBURTON INTERCHANGE



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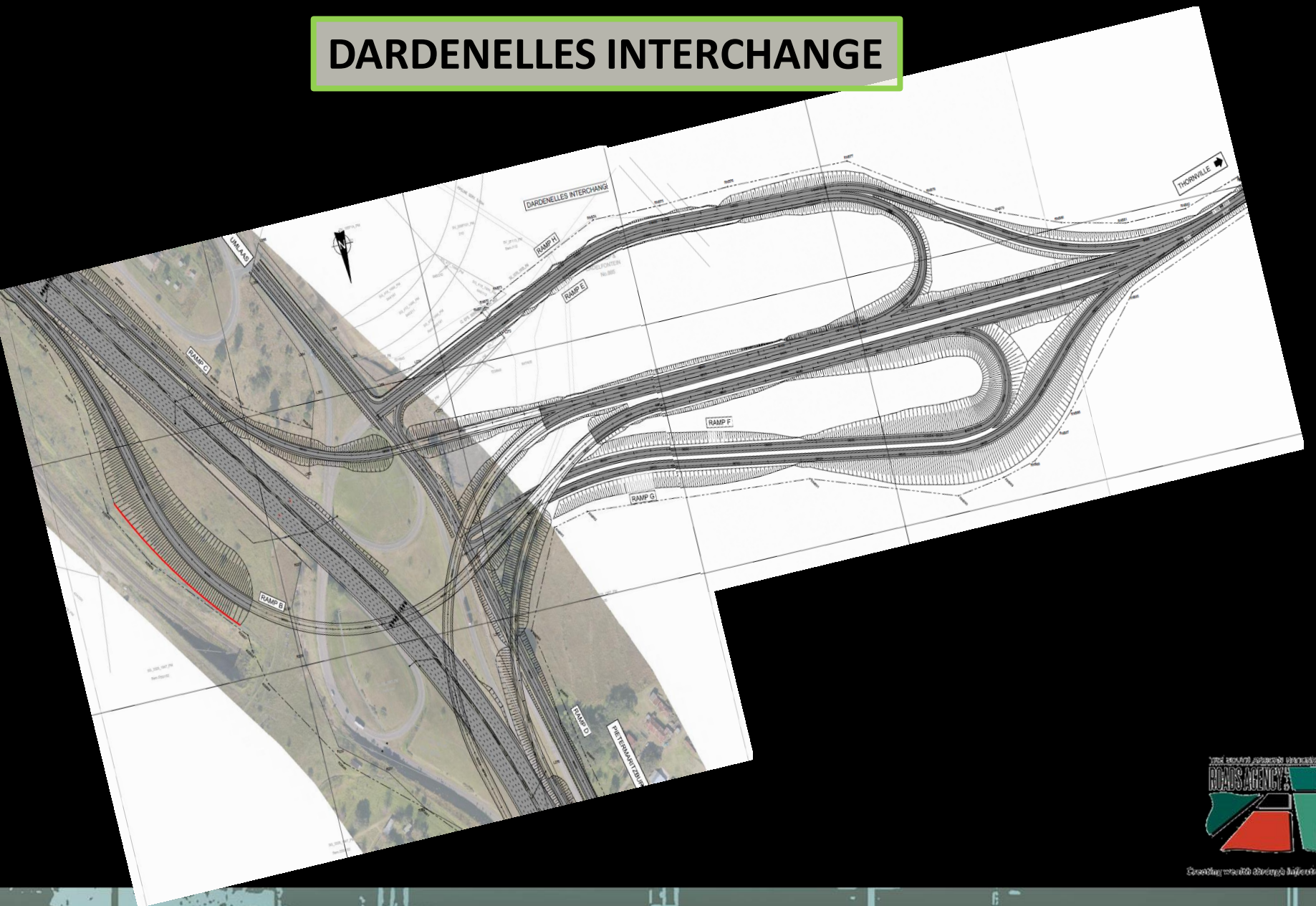


# LYNNFIELD PARK INTERCHANGE

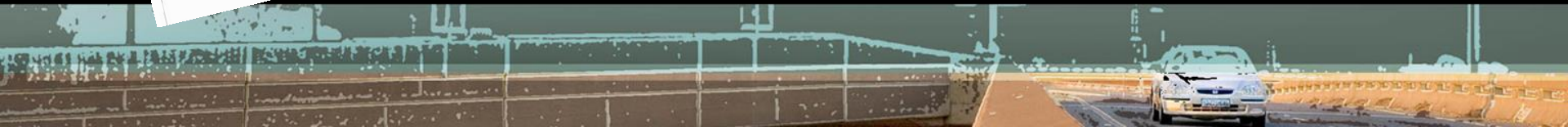




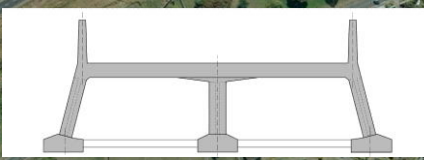
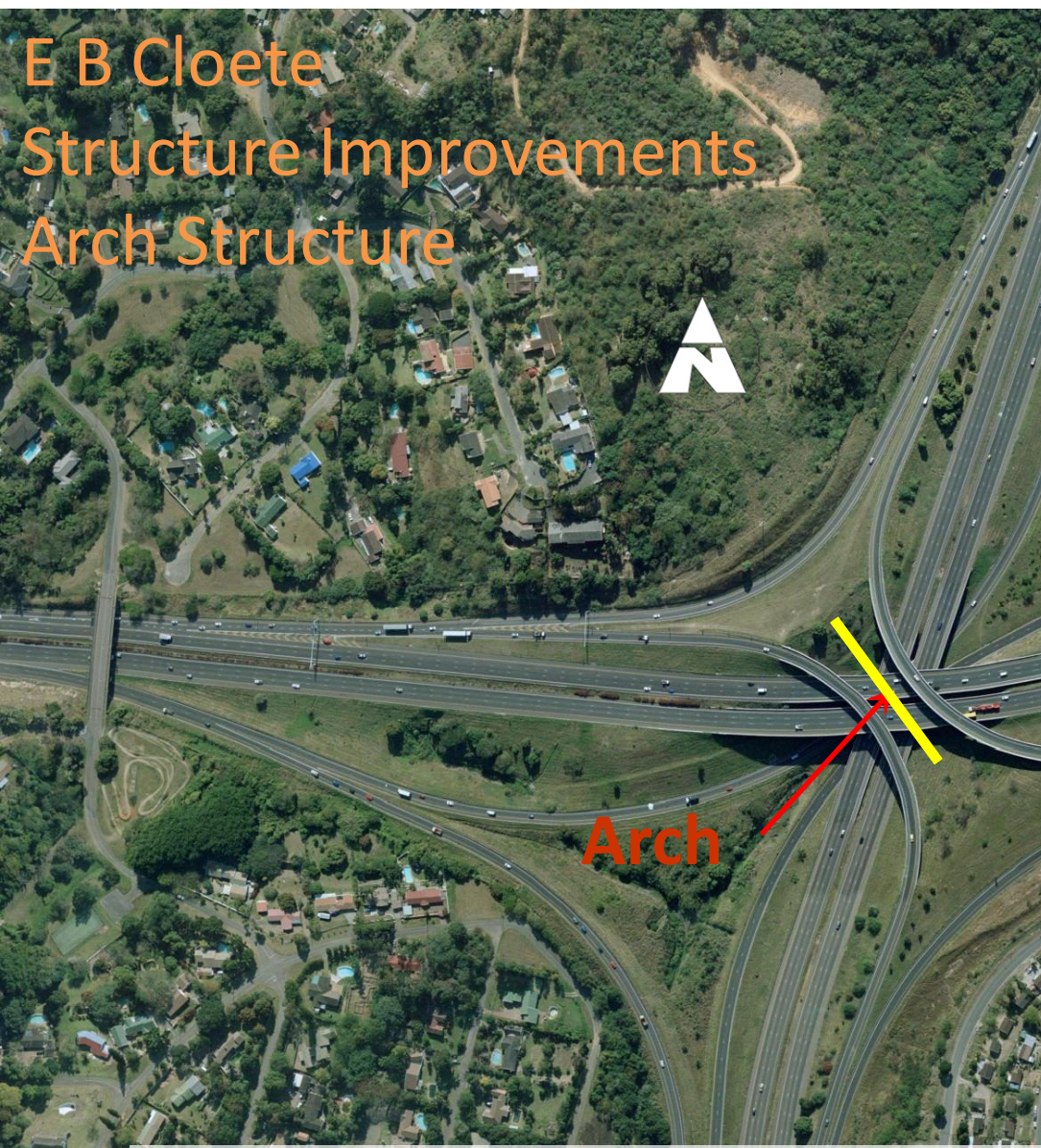
# DARDENELLES INTERCHANGE



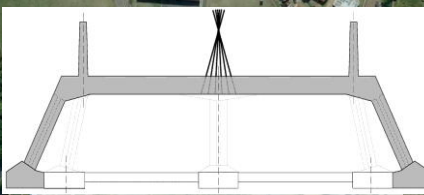
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E B Cloete  
Structure Improvements  
Arch Structure

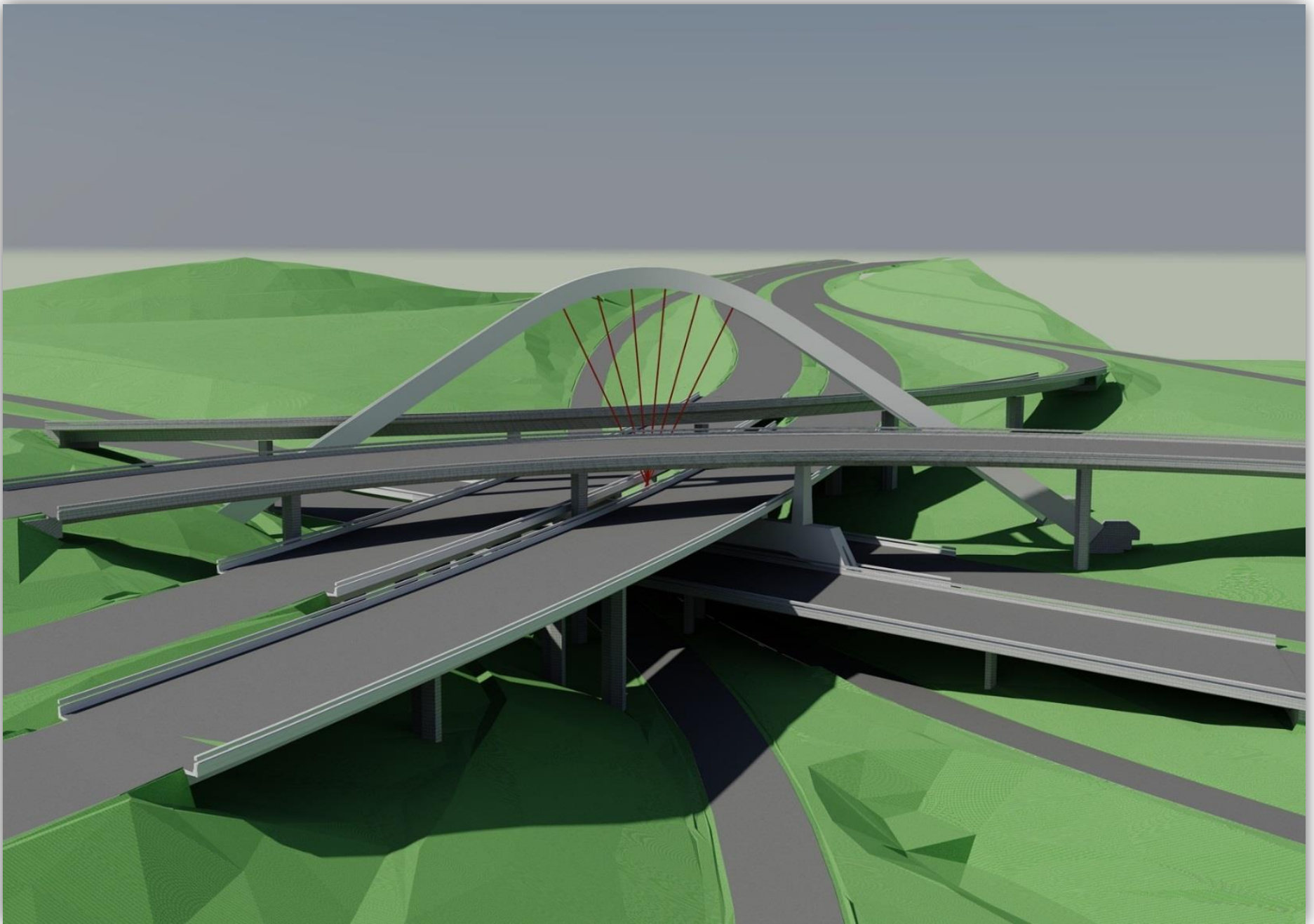


Existing Trestle



Proposed Trestle

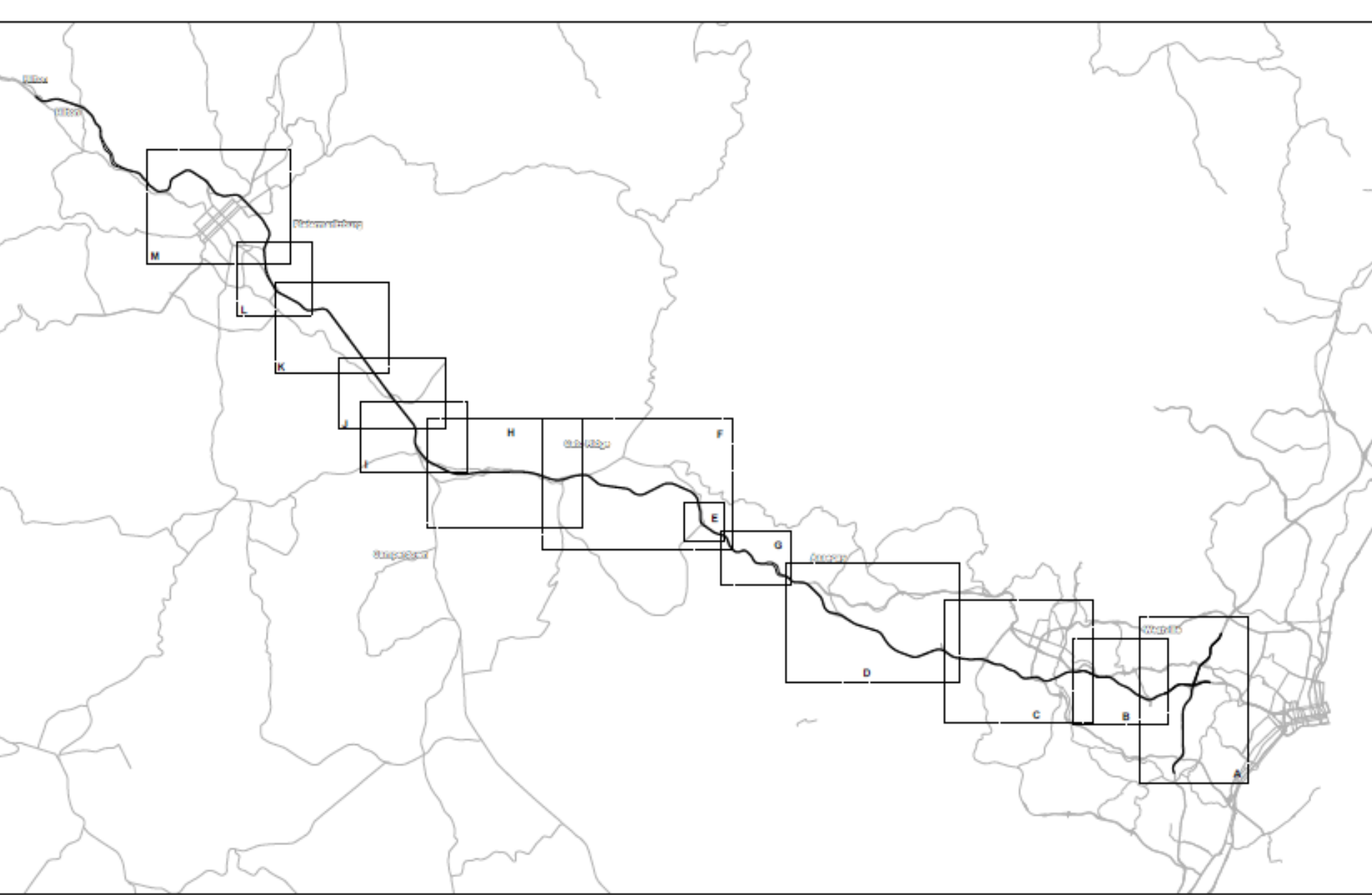
The central column to the trestle structure will be replaced with cable stays supported from an arch structure spanning the entire interchange.





## **N3 Program**

- Preliminary Designs Completed
- Detail designs currently in progress
- Land Acquisition commenced
- Environmental process with specialist studies commenced
- Public Participation on hold until funding sourced
- PMB Ringroad environmental screening process nearing completion



# INDEX OF PACKAGES





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# N3 Packages

PACKAGE	DESCRIPTION	LENGTH KM	NO. OF NEW BRIDGES/ WIDENINGS	I/Cs TO BE UPGRADED	ESTIMATED COST OF WORKS
<b>A</b>	EB Cloete (including portion of N2 North and N3 West)	6.3	10	1	1 920 000.00
<b>B</b>	Westville Viaduct (Km11.8) to Paradise Valley (Km17.5)	5.7	13	2	1 270 000.00
<b>C</b>	Paradise Valley (Km17.5)-Marianhill Toll Plaza	7.5	5	3	1 004 543.00
<b>D</b>	Marianhill Toll Plaza (25) to Key Ridge (2.8)	11.1	9	2	1 242 260.00
<b>E</b>	Hammarsdale I/C upgrade (Km 9.4)	0	1	1	276 448.00
<b>F</b>	Hammarsdale (9.1) to Cato Ridge (20.1)	11.3	3	-	1 217 868.00
<b>G</b>	Keyridge (Km2.8) to Hammarsdale (Km 8.1)	5.3	4	-	1 272 377.00
<b>H</b>	Cato Ridge (Km19.4) to Dardenelles I/C (Km26.6)	7.2	6	2	1 886 000.00
<b>I</b>	Dardenelles I/C (26.6) to Lynnfield Park (Km 30.6)	4	4	1	1 155 143.00
<b>J</b>	Lynnfield Park (Km 30.6) to Asburton I/C (Km 1.5)	5.3	4	1	994 529.00
<b>K</b>	Asburton I/C (Km 1.5) to Murray Road (Km6.1)	4.6	2	1	686 000.00
<b>L</b>	Murray Road (Km 6.1) to New England Rd I/C	2.9	9	2	951 100.00
<b>M</b>	New England Rd I/C to Twickenham Road (Km16.4)	7.5	8	4	1 100 000.00
<b>TOTAL</b>		<b>79.3</b>	<b>78</b>	<b>20</b>	<b>14 976 268.00</b>





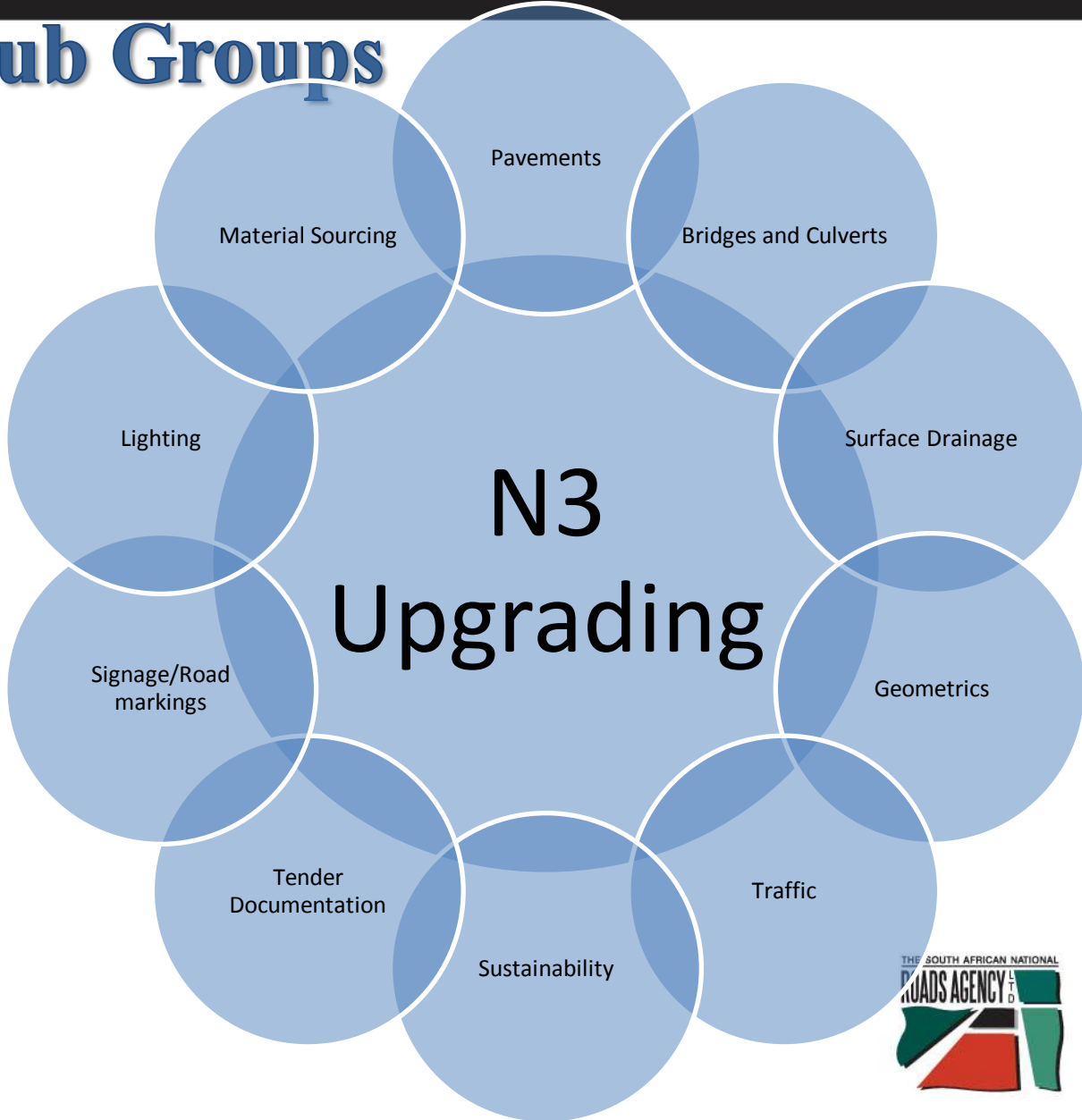
## **N3 Packages**

- Eighty kilometres of 8 to 10 lane freeway
- Construction cost of approx. R15 billion
- 78 New Bridges/ Widenings
- 20 Interchanges to be upgraded
- Design Fees of approx. R330 million (2,2% of construction)
- Supervision costs of approx. R1 billion (6,7% of construction)



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# N3 Regional Sub Groups







# Challenges

- FUNDING FOR CONSTRUCTION
  - Challenges :
  - Substantial Upgrade costs
  - PICC to make a decision on funding options
- INTERGRATED TRANSPORT PLANNING
- BALANCING OF RAIL VS ROAD
- PRESERVING MOBILITY AND SAFETY OF THE NATIONAL ROAD NETWORK
- LIMITING NEW ACCESSES WHERE POSSIBLE
- ENGAGING WITH OTHER ROADS AUTHORITES



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# THANK YOU

