

H D M - 4

Economic Analysis Summary

HIGHWAY DEVELOPMENT & MANAGEMENT

Study Name: **Republican_2020**

Run Date: **04-12-2020**

Currency: **US Dollar (millions)**

Discount: **12.00%**

Analysis Mode: **Analysis-by-Section**

Section: R-4 15.6 - 28.3

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	4.02	-0.45	0.00	12.17	3.40	0.00	0.00	0.00	11.99
Discounted	2.06	-0.19	0.00	2.64	0.74	0.00	0.00	0.00	1.51

Economic Internal Rate of Return (EIRR) = 20.3% (No. of solutions = 1)

Section: R-4 26.1 - 33.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.77	-0.31	0.00	6.65	2.04	0.00	0.00	0.00	5.23
Discounted	1.21	-0.13	0.00	1.32	0.39	0.00	0.00	0.00	0.63

Economic Internal Rate of Return (EIRR) = 19.0% (No. of solutions = 3)

Section: R-4 34.8 - 41.2

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.26	-0.27	0.00	7.19	1.94	0.00	0.00	0.00	6.13
Discounted	1.29	-0.11	0.00	1.54	0.42	0.00	0.00	0.00	0.78

Economic Internal Rate of Return (EIRR) = 19.9% (No. of solutions = 1)

Section: R-8 0 - 11.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	7.29	-0.47	0.00	53.55	18.66	0.00	0.00	0.00	65.39
Discounted	2.34	-0.20	0.00	11.83	4.04	0.00	0.00	0.00	13.74

Economic Internal Rate of Return (EIRR) = 46.9% (No. of solutions = 2)

Section: R-8 11.5 - 21.2

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	6.15	-0.40	0.00	41.89	14.81	0.00	0.00	0.00	50.94
Discounted	2.02	-0.17	0.00	9.47	3.32	0.00	0.00	0.00	10.94

Economic Internal Rate of Return (EIRR) = 48.0% (No. of solutions = 2)

Section: R-10 0 - 15.8

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	9.44	-0.65	0.00	38.25	12.48	0.00	0.00	0.00	41.95
Discounted	3.17	-0.28	0.00	8.73	2.82	0.00	0.00	0.00	8.67

Economic Internal Rate of Return (EIRR) = 37.9% (No. of solutions = 2)

Section: R-10 15.8 - 30.2

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	6.46	-0.62	0.00	18.98	5.34	0.00	0.00	0.00	18.48
Discounted	2.95	-0.26	0.00	4.12	1.16	0.00	0.00	0.00	2.59

Economic Internal Rate of Return (EIRR) = 22.9% (No. of solutions = 2)

Section: R-10 30.2 - 41.4

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	5.02	-0.48	0.00	15.11	4.20	0.00	0.00	0.00	14.77
Discounted	2.70	-0.20	0.00	3.33	0.93	0.00	0.00	0.00	1.76

Economic Internal Rate of Return (EIRR) = 19.5% (No. of solutions = 1)

Section: R-19 0 - 9.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.47	-0.40	0.00	12.20	3.47	0.00	0.00	0.00	13.59
Discounted	1.24	-0.17	0.00	2.16	0.59	0.00	0.00	0.00	1.68

Economic Internal Rate of Return (EIRR) = 21.9% (No. of solutions = 2)

Section: R-20 0 - 8.3

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.97	-0.35	0.00	8.53	2.69	0.00	0.00	0.00	8.60
Discounted	1.59	-0.15	0.00	1.83	0.57	0.00	0.00	0.00	0.97

Economic Internal Rate of Return (EIRR) = 19.6% (No. of solutions = 2)

Section: R-20 8.3 - 20.3

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	5.74	-0.43	0.00	10.03	3.12	0.00	0.00	0.00	7.84
Discounted	3.61	-0.13	0.00	2.69	0.83	0.00	0.00	0.00	0.04

Economic Internal Rate of Return (EIRR) = 12.2% (No. of solutions = 1)

Section: R-20 20.3- 31.4

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	4.29	-0.39	0.00	8.72	2.66	0.00	0.00	0.00	7.49
Discounted	3.24	-0.12	0.00	2.61	0.77	0.00	0.00	0.00	0.25

Economic Internal Rate of Return (EIRR) = 13.1% (No. of solutions = 1)

Section: R-20-1 0 - 5.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.28	-0.21	0.00	1.57	0.50	0.00	0.00	0.00	1.00
Discounted	0.96	-0.08	0.00	0.40	0.11	0.00	0.00	0.00	-0.37

Economic Internal Rate of Return (EIRR) = 6.4% (No. of solutions = 1)

Section: R-23 0 - 13.4

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	5.83	-0.43	0.00	0.40	0.08	0.00	0.00	0.00	-4.93

Discounted	4.33	-0.14	0.00	0.12	0.02	0.00	0.00	0.00	-4.06
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Economic Internal Rate of Return (EIRR) = -60.3% (No. of solutions = 1)

Section: R-24 0 - 21.1

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	6.89	-0.71	0.00	19.45	5.62	0.00	0.00	0.00	18.89
Discounted	5.21	-0.21	0.00	6.10	1.74	0.00	0.00	0.00	2.84

Economic Internal Rate of Return (EIRR) = 19.0% (No. of solutions = 1)

Section: R-30 11.0 - 32.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	5.26	-0.89	0.00	9.14	3.04	0.00	0.00	0.00	7.80
Discounted	2.21	-0.37	0.00	1.56	0.50	0.00	0.00	0.00	0.23

Economic Internal Rate of Return (EIRR) = 13.5% (No. of solutions = 2)

Section: R-30 35.0 - 48.9

No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.48	-0.59	0.00	6.80	2.24	0.00	0.00	0.00	6.15
Discounted	1.60	-0.25	0.00	1.19	0.37	0.00	0.00	0.00	0.22

Economic Internal Rate of Return (EIRR) = 13.7% (No. of solutions = 2)

Section: R-30 48.9 - 55.2

No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.38	-0.27	0.00	5.21	1.53	0.00	0.00	0.00	4.63
Discounted	1.27	-0.11	0.00	1.10	0.32	0.00	0.00	0.00	0.26

Economic Internal Rate of Return (EIRR) = 14.8% (No. of solutions = 2)

Section: R-34 0 - 5.0

No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating	Reduction in Accident Costs	Net Social / Exogenous	Net Economic Benefits
	Capital	Recurrent	Special						

						Costs		Benefits	(NPV)
Undiscounted	1.61	-0.19	0.00	2.85	0.71	0.00	0.00	0.00	2.13
Discounted	1.20	-0.07	0.00	0.75	0.17	0.00	0.00	0.00	-0.21

Economic Internal Rate of Return (EIRR) = 9.7% (No. of solutions = 1)

Section: R-35 0 - 7.7

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.10	-0.28	0.00	5.74	1.86	0.00	0.00	0.00	4.79
Discounted	0.97	-0.13	0.00	1.11	0.35	0.00	0.00	0.00	0.61

Economic Internal Rate of Return (EIRR) = 19.9% (No. of solutions = 3)

Section: R-35 7.7 - 14.8

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.42	-0.29	0.00	2.97	0.94	0.00	0.00	0.00	2.78
Discounted	0.65	-0.12	0.00	0.51	0.15	0.00	0.00	0.00	0.13

Economic Internal Rate of Return (EIRR) = 14.6% (No. of solutions = 2)

Section: R-37 0 - 15.4

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	6.92	-0.62	0.00	19.90	4.83	0.00	0.00	0.00	18.43
Discounted	3.50	-0.27	0.00	4.67	1.12	0.00	0.00	0.00	2.55

Economic Internal Rate of Return (EIRR) = 20.9% (No. of solutions = 1)

Section: R-37 15.4 - 23.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.57	-0.32	0.00	9.59	2.37	0.00	0.00	0.00	9.71
Discounted	1.38	-0.13	0.00	2.19	0.54	0.00	0.00	0.00	1.49

Economic Internal Rate of Return (EIRR) = 23.9% (No. of solutions = 1)

Section: R-37-1 0 - 3.2

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						

Undiscounted	1.29	-0.12	0.00	2.26	0.51	0.00	0.00	0.00	1.61
Discounted	0.65	-0.05	0.00	0.50	0.11	0.00	0.00	0.00	0.02

Economic Internal Rate of Return (EIRR) = 12.4% (No. of solutions = 2)

Section: R-40 0 - 11.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.33	-0.45	0.00	12.77	3.56	0.00	0.00	0.00	13.46
Discounted	2.00	-0.19	0.00	2.90	0.80	0.00	0.00	0.00	1.89

Economic Internal Rate of Return (EIRR) = 21.2% (No. of solutions = 1)

Section: R-40 11.0 - 23.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	6.06	-0.39	0.00	16.81	4.86	0.00	0.00	0.00	16.01
Discounted	3.48	-0.12	0.00	4.99	1.47	0.00	0.00	0.00	3.10

Economic Internal Rate of Return (EIRR) = 24.7% (No. of solutions = 1)

Section: R-40 47.0 - 66.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	9.27	-0.74	0.00	27.92	7.65	0.00	0.00	0.00	27.04
Discounted	7.71	-0.33	0.00	9.24	2.53	0.00	0.00	0.00	4.39

Economic Internal Rate of Return (EIRR) = 19.8% (No. of solutions = 1)

Section: R-40 66.0 - 70.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.62	-0.14	0.00	5.10	1.45	0.00	0.00	0.00	5.07
Discounted	1.10	-0.04	0.00	1.44	0.41	0.00	0.00	0.00	0.79

Economic Internal Rate of Return (EIRR) = 20.9% (No. of solutions = 1)

Section: R-42 0 - 9.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.90	-0.40	0.00	3.09	0.89	0.00	0.00	0.00	2.48

Discounted	0.87	-0.17	0.00	0.52	0.14	0.00	0.00	0.00	-0.05
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Economic Internal Rate of Return (EIRR) = 11.3% (No. of solutions = 2)

Section: R-43 0 - 7.9

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.39	-0.32	0.00	10.67	2.74	0.00	0.00	0.00	11.34
Discounted	1.80	-0.14	0.00	2.87	0.68	0.00	0.00	0.00	1.88

Economic Internal Rate of Return (EIRR) = 21.7% (No. of solutions = 1)

Section: R-43 7.9 - 15.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.58	-0.21	0.00	9.42	2.59	0.00	0.00	0.00	8.64
Discounted	1.88	-0.07	0.00	2.60	0.70	0.00	0.00	0.00	1.48

Economic Internal Rate of Return (EIRR) = 21.7% (No. of solutions = 1)

Section: R-43 15.0 - 26.0

Alternative: Programme Alternative vs Base Alternative

No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.33	-0.42	0.00	14.20	3.64	0.00	0.00	0.00	14.93
Discounted	2.51	-0.16	0.00	3.69	0.86	0.00	0.00	0.00	2.21

Economic Internal Rate of Return (EIRR) = 20.1% (No. of solutions = 1)

Section: R-45 0 - 7.7

Alternative: Programme Alternative vs Base Alternative

No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.10	-0.30	0.00	7.81	2.28	0.00	0.00	0.00	7.29
Discounted	1.26	-0.13	0.00	1.73	0.51	0.00	0.00	0.00	1.11

Economic Internal Rate of Return (EIRR) = 23.2% (No. of solutions = 1)

Section: R-45 7.7 - 14.5

Alternative: Programme Alternative vs Base Alternative

No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.36	-0.27	0.00	4.92	1.45	0.00	0.00	0.00	5.28
Discounted	0.62	-0.12	0.00	0.90	0.25	0.00	0.00	0.00	0.65

Economic Internal Rate of Return (EIRR) = 21.9% (No. of solutions = 2)

Section: R-46 0 - 12.9

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.59	-0.54	0.00	3.24	0.87	0.00	0.00	0.00	2.07
Discounted	1.33	-0.23	0.00	0.53	0.13	0.00	0.00	0.00	-0.43

Economic Internal Rate of Return (EIRR) = 7.1% (No. of solutions = 2)

Section: R-46 12.9 -25.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.42	-0.51	0.00	2.71	0.68	0.00	0.00	0.00	1.48
Discounted	1.11	-0.21	0.00	0.42	0.10	0.00	0.00	0.00	-0.38

Economic Internal Rate of Return (EIRR) = 6.4% (No. of solutions = 2)

Section: R-48 0 - 10.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.26	-0.30	0.00	26.03	7.05	0.00	0.00	0.00	30.12
Discounted	2.49	-0.09	0.00	8.26	2.21	0.00	0.00	0.00	8.07

Economic Internal Rate of Return (EIRR) = 44.7% (No. of solutions = 1)

Section: R-48 10.0 -17.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.66	-0.24	0.00	20.08	5.47	0.00	0.00	0.00	22.12
Discounted	3.06	-0.12	0.00	6.64	1.81	0.00	0.00	0.00	5.51

Economic Internal Rate of Return (EIRR) = 34.0% (No. of solutions = 1)

Section: R-51 0 - 6.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.81	-0.26	0.00	1.94	0.66	0.00	0.00	0.00	1.05
Discounted	0.87	-0.11	0.00	0.38	0.13	0.00	0.00	0.00	-0.25

Economic Internal Rate of Return (EIRR) = 6.7% (No. of solutions = 2)

Section: R-56 0 -5.3

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.14	-0.18	0.00	11.91	3.15	0.00	0.00	0.00	13.09
Discounted	1.46	-0.05	0.00	3.43	0.92	0.00	0.00	0.00	2.95

Economic Internal Rate of Return (EIRR) = 33.6% (No. of solutions = 1)

Section: R-59 0 - 8.2

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.64	-0.33	0.00	3.10	0.76	0.00	0.00	0.00	2.54
Discounted	0.63	-0.14	0.00	0.52	0.12	0.00	0.00	0.00	0.15

Economic Internal Rate of Return (EIRR) = 15.8% (No. of solutions = 2)

Section: R-60 0 - 8.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.22	-0.32	0.00	7.77	1.83	0.00	0.00	0.00	6.70
Discounted	1.75	-0.14	0.00	1.80	0.41	0.00	0.00	0.00	0.59

Economic Internal Rate of Return (EIRR) = 16.4% (No. of solutions = 1)

Section: R-60 8.0 - 12.8

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.57	-0.16	0.00	3.36	0.81	0.00	0.00	0.00	2.76
Discounted	1.16	-0.05	0.00	1.02	0.24	0.00	0.00	0.00	0.15

Economic Internal Rate of Return (EIRR) = 13.7% (No. of solutions = 1)

Section: R-61 0 - 3.8

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	0.76	-0.16	0.00	0.34	0.07	0.00	0.00	0.00	-0.20
Discounted	0.26	-0.07	0.00	0.05	0.01	0.00	0.00	0.00	-0.14

Economic Internal Rate of Return (EIRR) = -6.2% (No. of solutions = 2)

Section: R-62 0 - 3.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.41	-0.14	0.00	0.36	0.10	0.00	0.00	0.00	-0.81
Discounted	0.76	-0.06	0.00	0.07	0.02	0.00	0.00	0.00	-0.61

Economic Internal Rate of Return (EIRR) = -73.6% (No. of solutions = 1)

Section: R-63 0 - 9.2

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.78	-0.39	0.00	4.95	1.27	0.00	0.00	0.00	3.82
Discounted	1.13	-0.16	0.00	0.99	0.25	0.00	0.00	0.00	0.27

Economic Internal Rate of Return (EIRR) = 16.0% (No. of solutions = 2)

Section: R-63 9.2 - 18.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.66	-0.35	0.00	5.43	1.34	0.00	0.00	0.00	4.45
Discounted	1.64	-0.15	0.00	1.29	0.29	0.00	0.00	0.00	0.09

Economic Internal Rate of Return (EIRR) = 12.7% (No. of solutions = 2)

Section: R-64 0 - 11.9

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.60	-0.47	0.00	15.37	3.69	0.00	0.00	0.00	15.94
Discounted	1.73	-0.20	0.00	3.35	0.81	0.00	0.00	0.00	2.63

Economic Internal Rate of Return (EIRR) = 28.5% (No. of solutions = 2)

Section: R-64 11.9 - 19.4

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.27	-0.30	0.00	10.85	2.51	0.00	0.00	0.00	11.39
Discounted	1.71	-0.13	0.00	2.83	0.60	0.00	0.00	0.00	1.85

Economic Internal Rate of Return (EIRR) = 21.6% (No. of solutions = 1)

Section: R-64 19.4 - 32.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	5.27	-0.46	0.00	17.04	4.11	0.00	0.00	0.00	16.34
Discounted	1.96	-0.21	0.00	3.78	0.91	0.00	0.00	0.00	2.94

Economic Internal Rate of Return (EIRR) = 30.3% (No. of solutions = 2)

Section: R-71 0 - 2.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	0.40	-0.08	0.00	0.05	0.01	0.00	0.00	0.00	-0.25
Discounted	0.13	-0.04	0.00	0.01	0.00	0.00	0.00	0.00	-0.09

Economic Internal Rate of Return (EIRR) = -37.5% (No. of solutions = 2)

Section: R-74 0 - 4.6

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	0.92	-0.19	0.00	1.49	0.57	0.00	0.00	0.00	1.33
Discounted	0.35	-0.08	0.00	0.24	0.08	0.00	0.00	0.00	0.06

Economic Internal Rate of Return (EIRR) = 14.7% (No. of solutions = 2)

Section: R-81 0 - 12.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.78	-0.53	0.00	3.12	0.73	0.00	0.00	0.00	0.59
Discounted	1.93	-0.22	0.00	0.54	0.12	0.00	0.00	0.00	-1.06

Economic Internal Rate of Return (EIRR) = 1.8% (No. of solutions = 1)

Section: R-81 12.5 - 26.3

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.77	-0.58	0.00	1.90	0.45	0.00	0.00	0.00	0.16
Discounted	1.04	-0.25	0.00	0.28	0.06	0.00	0.00	0.00	-0.45

Economic Internal Rate of Return (EIRR) = 1.0% (No. of solutions = 2)

Section: R-85 0 - 7.6

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	3.06	-0.06	0.00	21.43	6.29	0.00	0.00	0.00	24.72
Discounted	1.26	-0.07	0.00	4.23	1.23	0.00	0.00	0.00	4.26

Economic Internal Rate of Return (EIRR) = 30.3% (No. of solutions = 1)

Section: R-86 0 - 10.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	5.30	-0.40	0.00	2.15	1.18	0.00	0.00	0.00	-1.58
Discounted	2.74	-0.16	0.00	0.55	0.29	0.00	0.00	0.00	-1.75

Economic Internal Rate of Return (EIRR) = -12.8% (No. of solutions = 1)

Section: R-88 0 - 2.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	1.01	-0.10	0.00	2.39	1.03	0.00	0.00	0.00	2.52
Discounted	0.51	-0.04	0.00	0.53	0.22	0.00	0.00	0.00	0.28

Economic Internal Rate of Return (EIRR) = 18.4% (No. of solutions = 1)

Section: R-89 0 - 9.6

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.90	-0.40	0.00	7.61	2.94	0.00	0.00	0.00	8.05
Discounted	1.64	-0.17	0.00	1.61	0.61	0.00	0.00	0.00	0.75

Economic Internal Rate of Return (EIRR) = 17.2% (No. of solutions = 1)

Section: R-89 9.6 - 20.5

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	2.90	-0.40	0.00	8.38	3.17	0.00	0.00	0.00	9.04
Discounted	1.95	-0.17	0.00	2.06	0.71	0.00	0.00	0.00	0.98

Economic Internal Rate of Return (EIRR) = 17.4% (No. of solutions = 1)

Section: R-90 0 - 4.4

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	0.88	-0.19	0.00	0.05	0.01	0.00	0.00	0.00	-0.64
Discounted	0.33	-0.08	0.00	0.01	0.00	0.00	0.00	0.00	-0.24

Economic Internal Rate of Return (EIRR) = -42.4% (No. of solutions = 2)

Section: R-94 0 - 11.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	4.45	-0.39	0.00	1.71	0.54	0.00	0.00	0.00	-1.81
Discounted	3.03	-0.12	0.00	0.45	0.14	0.00	0.00	0.00	-2.32

Economic Internal Rate of Return (EIRR) = -6.1% (No. of solutions = 1)

Section: R-94-1 0 - 1.0

Alternative: Programme Alternative vs Base Alternative
No Sensitivity Analysis Conducted

	Increase in Road Agency Costs			Savings in MT VOC	Savings in MT Travel Time Costs	Savings in NMT Travel & Operating Costs	Reduction in Accident Costs	Net Social / Exogenous Benefits	Net Economic Benefits (NPV)
	Capital	Recurrent	Special						
Undiscounted	5.55	-0.37	0.00	0.20	0.05	0.00	0.00	0.00	-4.94
Discounted	2.91	-0.11	0.00	0.05	0.01	0.00	0.00	0.00	-2.74

Economic Internal Rate of Return (EIRR) = -55.0% (No. of solutions = 1)