

APPENDIX 15

COST ESTIMATE

THE UNIVERSITY OF CHICAGO

PHILOSOPHY DEPARTMENT

Table 1 Construction Cost

Work Items	Unit	Unit Cost (EC\$)	Grand Etang Road		Morne-Jaloux		St. David's to Permontemps		Mt. Gay to Springs Road		Eastern Main Road		Total		Remarks	
			Quantity	Unit Cost (EC\$)	Quantity	Unit Cost (EC\$)	Quantity	Unit Cost (EC\$)	Quantity	Unit Cost (EC\$)	Quantity	Unit Cost (EC\$)	Quantity	Unit Cost (EC\$)		
1. Roadway																
1) Earth Work																
Excavation/ Embankment	Common Soil	m ³	36.00	565.00	20,340.00	0.00	0.00			590.00	21,240.00	0.00	0.00	1,195.00	41,580.00	
	Hard Rock	m ³	175.00	3,268.00	571,900.00	0.00	0.00			671.00	117,425.00	0.00	0.00	3,029.00	689,325.00	
Excavation/ Waste	Common Soil	m ³	36.00	2,493.00	94,734.00	893.00	26,334.00			0.00	0.00	0.00	0.00	3,186.00	121,058.00	
	Hard Rock	m ³	117.00	24,250.00	2,837,250.00	261.00	30,537.00			2,153.00	251,901.00	0.00	0.00	26,664.00	3,119,688.00	
Borrow Material		m ³	46.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00	0.00	0.00	
Structural Excavation	Common Soil	m ³	56.00	1,690.00	94,640.00	0.00	0.00			665.00	49,560.00	0.00	0.00	2,575.00	144,200.00	
Backfill		m ³	66.00	647.00	56,936.00	0.00	0.00			535.00	47,060.00	0.00	0.00	1,182.00	104,016.00	
Scarification	l = 15cm	m ²	1.60	10,600.00	16,200.00	5,508.00	8,262.00			11,683.00	17,374.50	0.00	0.00	27,891.00	41,836.50	
	Sub Total				3,692,000.00		65,133.00				604,560.50		0.00		4,261,713.50	
2) Pavement																
Subbase Course		m ³	90.00	4,537.00	408,330.00	25.00	2,070.00			0.00	0.00	1,630.00	148,700.00	6,190.00	557,100.00	
Base Course		m ³	152.00	4,349.00	661,048.00	35.00	5,320.00			407.00	81,104.00	2,271.00	345,192.00	7,057.00	1,072,984.00	
Asphalt Concrete Hot Mix		tone	426.00	27,335.00	11,644,710.00	1,830.00	779,560.00			5,914.00	2,519,364.00	11,992.00	5,108,692.00	47,071.00	20,052,246.00	
Prime Coat		m ²	6.00	23,200.00	139,200.00	6,508.00	33,048.00			9,738.00	58,428.00	4,400.00	26,400.00	42,646.00	257,076.00	
Tack Coat		m ²	1.40	129,635.00	181,769.00	17,134.00	23,967.80			38,503.00	53,904.20	93,200.00	130,480.00	278,672.00	390,140.80	
	Sub Total				13,035,057.00		844,006.60				2,692,800.20		5,757,364.00		22,329,228.80	
3) Drainage																
Side Ditch	Do(M) - 0.5 x 0.5	m	66.00	21,749.00	1,670,414.00	500.00	43,000.00			1,650.00	141,900.00	6,050.00	520,300.00	29,949.00	2,676,614.00	
	Do(C) - A - 0.5 x 0.5	m	285.00	0.00	0.00	1,200.00	342,000.00			0.00	0.00	0.00	0.00	1,200.00	342,000.00	
	Do(C) - A - 1.0 x 0.6	m	639.00	474.00	302,868.00									474.00	302,868.00	
RCPC	600 dia	m	624.30	18.00	11,237.40	6.00	3,745.80			26.00	18,231.60	0.00	0.00	50.00	31,215.00	
	1,000 dia	m	1,971.40	50.00	98,570.00	0.00	0.00			0.00	0.00	0.00	0.00	50.00	98,570.00	
RCBC	1.80 x 1.80	m	2,592.00	0.00	0.00	0.00	0.00			15.00	36,880.00	0.00	0.00	15.00	36,880.00	
Under Drain		m	184.00	290.00	47,640.00	0.00	0.00			0.00	0.00	0.00	0.00	260.00	47,640.00	
	Sub Total				2,330,947.40		368,745.80				197,011.80		520,300.00		3,437,005.00	
4) Retaining Wall																
Rw - M, H = 2.0m		m	300.00	60.00	18,000.00	75.00	22,500.00			0.00	0.00	0.00	0.00	135.00	40,500.00	
Rw - M, H = 3.0m		m	510.00	60.00	30,600.00	135.00	66,850.00			215.00	109,650.00	0.00	0.00	410.00	209,100.00	
Rw - M, H = 4.0m		m	640.00	263.00	212,620.00	0.00	0.00			22.00	18,486.00	0.00	0.00	275.00	231,000.00	
Rw - M, H = 5.0m		m	1,150.00	441.00	507,150.00	60.00	57,500.00			0.00	0.00	0.00	0.00	491.00	564,650.00	
Rw - C, H = 2.0m		m	770.00	35.00	26,950.00	0.00	0.00			0.00	0.00	0.00	0.00	35.00	26,950.00	
Rw - C, H = 3.5m		m	1,550.00	70.00	106,500.00	0.00	0.00			0.00	0.00	0.00	0.00	70.00	106,500.00	
	Sub Total				903,720.00		148,850.00				128,136.00		0.00		1,180,700.00	
5) Incidental Construction																
Concrete Block		m	44.00	11,000.00	484,000.00	3,300.00	145,200.00			2,400.00	105,600.00	10,500.00	462,000.00	27,200.00	1,196,600.00	
Guard Rail		m	375.00	1,835.00	613,125.00	466.00	174,375.00			240.00	90,000.00	0.00	0.00	2,340.00	877,500.00	
Road Sign		Pieces	450.00	217.00	97,650.00	41.00	18,460.00			60.00	27,000.00	160.00	72,000.00	478.00	215,100.00	
Lane Marking	w = 10cm	m	2.75	17,520.00	48,180.00	0.00	0.00			3,315.00	9,116.25	11,500.00	31,625.00	32,335.00	88,621.25	
Pedestrian Crossing	w = 4.0m	m	66.00	30.00	1,980.00	5.00	330.00			18.00	1,168.00	30.00	1,980.00	63.00	5,478.00	
Seeding		m ²	11.00	1,350.00	14,850.00										14,850.00	
Other miscellaneous construction		Ls			998,086.22		72,338.72				176,126.13		313,863.20		1,560,432.27	
	Sub Total				2,267,871.22		410,681.72				409,030.36		881,488.20		3,958,081.52	
Total					22,210,505.62		1,857,426.12				3,931,662.88		7,159,152.20		35,167,726.82	
2) Bridge Construction and Rehabilitation																
1) Super Structure		Ls		5.00	904,184.53	0.00	0.00	1.00	62,607.71	1.00	36,578.82	3.00	275,229.42	10.00	1,278,600.48	
2) Substructure		Ls		5.00	1,722,706.71	0.00	0.00	1.00	424,754.53	1.00	182,165.90	3.00	1,121,395.23	10.00	3,451,022.37	
3) Approach		Ls		5.00	973,916.00	0.00	0.00	1.00	81,952.00	1.00	0.00	3.00	701,706.00	10.00	1,757,578.00	
	Sub Total				3,600,807.24		0.00		569,314.24		218,744.72		2,098,332.65		6,487,198.65	
3) Mobilization, Demobilization		Ls			1,201,020.14		92,871.31		28,465.71		207,514.88		402,874.24		2,042,746.28	
Grand Total					27,111,423.00		1,950,297.43		567,779.95		4,367,812.47		9,720,359.09		43,737,671.95	

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Table 2 Quantity and Construction Cost of Bridges (1)

Work Item	Unit	Unit Cost (EC \$)	Beaulieu Bridge (R-1)		St. Margaret Bridge (R-1)		Birch Grove Bridge (R-1)		Balthazar Bridge (R-1)		St. Syr. Greatriver (R-1)		Sub Total Road No.1
			Quantity	Cost (EC \$)	Quantity	Cost (EC \$)	Quantity	Cost (EC \$)	Quantity	Cost (EC \$)	Quantity	Cost (EC \$)	
1. Super Structure													
PC Girder U-Type, L = 16 m	Piece	6,060.00	0.00	0.00	0.00	0.00	12.00	72,720.00	0.00	0.00	11.00	66,660.00	139,380.00
PC Girder U-Type, L = 13.2 m	Piece	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PC Girder U-Type, L = 13 m	Piece	5,420.00	0.00	0.00	3.00	16,260.00	0.00	0.00	33.00	178,860.00	22.00	119,240.00	314,360.00
Structural Concrete	m ³	331.00	1.20	397.20	8.88	2,939.28	12.93	4,279.83	29.80	9,863.80	32.09	10,621.79	28,101.90
Cement Mortar	m ³	350.00	0.00	0.00	0.00	0.00	5.60	1,960.00	15.84	5,544.00	17.06	5,971.00	13,475.00
Reinforcing Steel	kg	1.30	1,818.00	2,363.40	590.00	767.00	2,099.00	2,728.70	2,558.00	3,325.40	2,755.00	3,581.50	12,766.00
Form Work	m ²	36.80	36.70	1,350.56	15.12	556.42	52.82	1,943.78	97.58	3,590.94	104.54	3,847.07	11,288.77
Hot Asphalt Concrete Pavement	tone	426.00	0.00	0.00	0.00	0.00	13.44	5,725.44	30.42	12,958.92	32.76	13,955.76	32,640.12
Asphalt Tack Coat	m ²	1.40	0.00	0.00	0.00	0.00	112.00	156.80	253.60	354.90	273.00	382.20	893.90
Concrete Railing	m	100.00	44.00	4,400.00	18.00	1,800.00	64.00	6,400.00	78.00	7,800.00	84.00	8,400.00	28,800.00
H - Beam	m	5,000.00	0.00	0.00	0.00	0.00	66.00	330,000.00	0.00	0.00	0.00	0.00	330,000.00
Removal of Concrete	m ³	66.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	990.00	990.00
Sub Total				8,511.16		22,322.70		425,914.55		222,297.96		233,649.32	912,695.69
2. Substructure													
Excavation / Embankment Hard Rock	m ³	272.00	0.00	0.00	889.00	241,808.00	197.49	53,717.28	649.93	176,780.96	558.55	151,925.60	624,231.84
Excavation / Waste Hard Rock	m ³	172.00	0.00	0.00	125.00	21,500.00	115.02	19,783.44	272.23	46,823.56	206.24	35,817.28	123,924.28
Structural Concrete	m ³	331.00	0.00	0.00	129.60	42,897.60	229.72	76,037.32	439.98	145,633.38	418.55	138,540.05	403,108.35
Lean Concrete	m ³	274.00	0.00	0.00	4.62	1,265.88	9.57	2,622.18	18.84	5,162.16	16.52	4,526.48	13,576.70
Reinforcing Steel	kg	1.30	0.00	0.00	9,100.00	11,830.00	16,080.00	20,904.00	30,800.00	40,040.00	29,300.00	36,090.00	110,864.00
Form Work	m ²	36.80	0.00	0.00	229.00	8,427.20	380.61	14,006.45	932.41	34,312.69	681.50	25,079.20	81,825.54
H - Pile	m	100.00	0.00	0.00	210.00	21,000.00	180.00	18,000.00	840.00	84,000.00	600.00	60,000.00	183,000.00
H - Pile Driven	m	85.00	0.00	0.00	210.00	17,850.00	180.00	15,300.00	840.00	71,400.00	600.00	51,000.00	155,550.00
Gabion	m ³	138.00	14.00	1,932.00	14.00	1,932.00	41.00	5,658.00	41.00	5,658.00	41.00	5,658.00	20,838.00
Cofferdam	m	40.00	0.00	0.00	0.00	0.00	40.00	1,600.00	51.00	2,040.00	102.00	4,080.00	7,720.00
Sub Total				1,932.00		368,510.68		227,628.67		611,850.75		514,716.61	1,724,638.71
3. Approach Road													
Excavation / Embankment Hard Rock	m ³	272.00	0.00	0.00	380.00	103,360.00	672.00	182,784.00	378.00	102,816.00	672.00	182,784.00	571,744.00
Borrow Material	m ³	46.00	0.00	0.00	295.00	13,570.00	1,596.00	73,416.00	429.00	19,734.00	1,596.00	73,416.00	180,136.00
Backfill	m ³	88.00	0.00	0.00	50.00	4,400.00	123.00	10,824.00	51.00	4,488.00	123.00	10,824.00	30,536.00
Rw - M, H = 3.0m	m	510.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rw - M, H = 4.0m	m	840.00	0.00	0.00	0.00	0.00	30.00	25,200.00	20.00	16,800.00	0.00	0.00	42,000.00
Rw - M, H = 5.0m	m	1,150.00	0.00	0.00	40.00	46,000.00	30.00	34,500.00	0.00	0.00	60.00	69,000.00	149,500.00
Sub Total				0.00		167,330.00		326,724.00		143,838.00		336,024.00	973,916.00
Total				10,443.16		558,163.38		980,267.21		977,986.71		1,084,389.93	3,611,250.39

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Table 3 Quantity and Construction Cost of Bridges (2)

Work Item	Unit	Unit Cost (EC \$)	Vineyard Bridge (R - 3)		Tempe Bridge (R - 4)		Dunfermline Bridge (R - 5)		Point Field Bridge (R - 5)		Madeys Bridge (R - 5)		Sub Total of Road No.5	Remarks
			Quantity	Cost (EC \$)	Quantity	Cost (EC \$)	Quantity	Cost (EC \$)	Quantity	Cost (EC \$)	Quantity	Cost (EC \$)		
1. Super Structure														
PC Girder U-Type, L = 16 m	Piece	6,060.00	8.00	48,480.00		0.00	0.00	0.00	0.00	0.00	11.00	66,660.00	66,660.00	
PC Girder U-Type, L = 13.2 m	Piece	5,500.00	0.00	0.00		0.00	6.00	33,000.00	0.00	0.00	0.00	0.00	33,000.00	
PC Girder U-Type, L = 13 m	Piece	5,420.00	0.00	0.00	5.00	27,100.00	0.00	0.00	22.00	119,240.00	0.00	0.00	119,240.00	
Structural Concrete	m ³	331.00	7.04	2,330.24	17.00	5,627.00	5.34	1,767.54	19.86	6,573.66	12.22	4,044.82	12,386.02	
Cement Mortar	m ³	350.00	4.92	1,722.00		0.00	2.31	808.50	10.56	3,696.00	6.50	2,275.00	6,779.50	
Reinforcing Steel	kg	1.30	1,050.00	1,365.00	538.00	699.40	866.00	1,125.80	1,706.00	2,217.80	1,050.00	1,365.00	4,708.60	
Form Work	m ²	36.80	26.41	971.89	21.37	786.42	21.89	805.55	65.05	2,393.84	39.49	1,453.23	4,652.62	
Hot Asphalt Concrete Pavement	tone	426.00	10.37	4,417.62		0.00	5.54	2,360.04	20.28	8,639.28	12.48	5,316.48	16,316.80	
Asphalt Tack Coat	m ²	1.40	86.40	120.96		0.00	46.20	64.68	169.00	236.60	104.00	145.60	446.88	
Concrete Railing	m	100.00	32.00	3,200.00	16.40	1,640.00	26.40	2,640.00	52.00	5,200.00	32.00	3,200.00	11,040.00	
H - Beam	m	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Removal of Concrete	m ³	66.00	0.00	0.00	11.00	726.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sub Total				62,607.71		36,578.82		42,572.11		148,197.18		84,460.13	275,229.42	
2. Substructure														
Excavation / Embankment Hard Rock	m ³	272.00	776.30	211,153.60	158.82	43,199.04	889.22	241,867.84	522.12	142,016.64	436.16	118,635.52	502,520.00	
Excavation / Waste Hard Rock	m ³	172.00	475.68	81,816.96	81.57	14,030.04	125.32	21,555.04	176.02	30,275.44	131.93	22,691.96	74,522.44	
Structural Concrete	m ³	331.00	153.10	50,876.10	89.90	29,756.90	141.58	46,862.98	306.40	101,418.40	247.13	81,800.03	230,081.41	
Lean Concrete	m ³	274.00	6.38	1,748.12	3.63	994.62	4.62	1,265.88	12.95	3,548.30	9.37	2,567.38	7,381.56	
Reinforcing Steel	kg	1.30	10,700.00	13,910.00	6,300.00	8,190.00	9,100.00	11,830.00	21,500.00	27,950.00	17,300.00	22,490.00	62,270.00	
Form Work	m ²	36.80	248.58	9,147.74	164.22	6,043.30	229.10	8,430.88	483.36	17,787.65	380.47	14,001.30	40,219.82	
H - Pile	m	100.00	290.00	29,000.00	420.00	42,000.00	210.00	21,000.00	540.00	54,000.00	300.00	30,000.00	105,000.00	
H - Pile Driven	m	85.00	290.00	24,650.00	420.00	35,700.00	210.00	17,850.00	540.00	45,900.00	300.00	25,500.00	89,250.00	
Gabion	m ³	138.00	14.00	1,932.00	14.00	1,932.00	14.00	1,932.00	27.00	3,726.00	14.00	1,932.00	7,590.00	
Cofferdam	m	40.00	18.00	720.00	8.00	320.00	22.00	880.00	24.00	960.00	18.00	720.00	2,560.00	
Sub Total				424,754.52		182,165.90		373,474.62		427,582.43		320,338.19	1,121,395.23	
3. Approach Road														
Excavation / Embankment Hard Rock	m ³	272.00	165.00	44,880.00	0.00	0.00	0.00	0.00	724.00	196,928.00	996.00	270,912.00	467,840.00	
Borrow Material	m ³	46.00	260.00	11,960.00	0.00	0.00	0.00	0.00	805.00	37,030.00	1,030.00	47,380.00	84,410.00	
Backfill	m ³	88.00	24.00	2,112.00	0.00	0.00	0.00	0.00	112.00	9,856.00	154.00	13,552.00	23,408.00	
Rw - M, H = 3.0m	m	510.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rw - M, H = 4.0m	m	840.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	16,800.00	0.00	0.00	16,800.00	
Rw - M, H = 5.0m	m	1,150.00	20.00	23,000.00	0.00	0.00	0.00	0.00	20.00	23,000.00	75.00	86,250.00	109,250.00	
Sub Total				81,952.00		0.00		0.00		283,614.00		418,094.00	701,708.00	
Total				569,314.23		218,744.71		416,046.73		859,393.61		822,892.32	2,098,332.66	

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Table 4 R.O.W Acquisition Cost

Road No.	Road Name	Length (km)	Residential			Plantation			Forest			Number of Affected House			Plantation				Total (EC\$)	Remarks
			Area (m ²)	Unit Cost (EC\$)	Cost (EC\$)	Area (m ²)	Unit Cost (EC\$)	Cost (EC\$)	Area (m ²)	Unit Cost (EC\$)	Cost (EC\$)	No. of House (m ²)	Unit Cost (EC\$)	Cost (EC\$)	Area (m ²)	No. of Tree (pos)	Unit Cost (EC\$)	Cost (EC\$)		
1	Grand Etang Road		1,135	12	13,620	2,646	9	23,814	14,391	5	71,955	1,100	1,500	1,650,000	2,646	254	100	26,400	1,785,789	
2	Morne Jaloux Road		0	0	0	60	9	540	1,126	5	5,630	0	0	0	60	6	100	600	6,770	
3	St David's to Pedmontemps		540	5	2,700	0		0	0		0	0	0	0	0	0	100	0	2,700	
4	Mt Gay to Springs Road		172	12	2,064	108	9	972	1,536	5	7,680	0	0	0	108	11	100	1,100	11,816	
5	Eastern Main Roads		0		0	1,020	6	6,120	0		0	0	0	0	1,020	102	100	10,200	16,320	
	Total		1,847		18,384			31,446			85,265	1,100		1,650,000				38,300	1,823,395	

Table 5 Land Acquisition Cost (1)

Road No.	Road name	Station	Length (m)	Width (m)	Residential			Plantation			Forest			House			Total Cost (EC\$)	Remarks			
					Area (m ²)	Unit Cost (EC\$)	Cost (EC\$)	Area (m ²)	Unit Cost (EC\$)	Cost (EC\$)	Area (m ²)	Unit Cost (EC\$)	Cost (EC\$)	Number (Ls)	Unit Cost (EC\$)	Cost (EC\$)					
R-1	Grand Etang Road	0 + -900 ~ 0 + -880	20	3.0														River Side			
		0 + -830 ~ 0 + -800	30	3.0														River Side			
		0 + -780 ~ 0 + -760	20	3.0														River Side			
		0 + -300 ~ 0 + -200	100	3.0															River Side		
		0 + -250 ~ 0 + -100	150	4.0						600		5	3000						River Side		
		0 + 67 ~ 0 + 120	53	3.0															River Side		
		0 + 250 ~ 0 + 270	20	3.0															River Side		
		0 + 320 ~ 0 + 375	55	3.0															River Side		
		0 + 250 ~ 0 + 378	128	3.0							384		5	1920					River Side		
		3 + 5 ~ 4 + 445	1440	3.5							5,040.00		5	25200	1						
		3 + 455 ~ 3 + 495	40	7.0							280		5	1400							
		3 + 665 ~ 3 + 685	20	6.5							130		5	650							
		3 + 715 ~ 3 + 750	35	1.0	35		5	175			35		5	175							
		3 + 760 ~ 4 + 110	350	3.5							1,225.00		5	6125	2						
		4 + 110 ~ 4 + 490	380	3.0							1,140.00		5	5700	1						
		4 + 585 ~ 4 + 610	25	2.5							62.5		5	312.5							
		5 + 55 ~ 5 + 80	25	3.0							75		5	375							
		6 + 540 ~ 6 + 580	40	3.0							120		5	600					600 Grand Etang		
		6 + 690 ~ 6 + 735	45	3.0							135		5	675					675 Grand Etang		
		6 + 750 ~ 6 + 785	35	3.0							105		5	525					525 Grand Etang		
		6 + 880 ~ 6 + 920	40	3.0							120		5	600					600 Grand Etang		
		7 + 50 ~ 7 + 80	30	3.0							90		5	450					450 Grand Etang		
		7 + 230 ~ 7 + 280	50	3.0							150		5	750					750 Grand Etang		
		7 + 350 ~ 7 + 390	40	3.0							120		5	600					600 Grand Etang		
		7 + 510 ~ 7 + 540	30	3.0							90		5	450					450 Grand Etang		
		7 + 920 ~ 7 + 970	50	3.0							150		5	750					750 Grand Etang		
		8 + 605 ~ 8 + 630	25	2.0							50		5	250					250 Grand Etang		
		8 + 640 ~ 8 + 665	25	2.0							50		5	250					250 Grand Etang		
		9 + 290 ~ 9 + 320	30	3.0							90		5	450					450 Grand Etang		
		9 + 615 ~ 9 + 650	35	3.0							105		5	525					525 Grand Etang		
		9 + 675 ~ 9 + 715	40	3.0							120		5	600					600 Grand Etang		
		9 + 779 ~ 9 + 805	26	3.0							78		5	390					390 Grand Etang		
		10 + 0 ~ 10 + 30	30	3.0							90		5	450					450 Grand Etang		
		10 + 210 ~ 10 + 245	35	3.0							105		5	525					525 Grand Etang		
		10 + 340 ~ 10 + 390	50	3.0							150		5	750					750 Grand Etang		
		10 + 493 ~ 10 + 507	14	3.0							42		5	210					210 Grand Etang		
		10 + 560 ~ 10 + 585	25	3.0							75		5	375					375 Grand Etang		
		10 + 625 ~ 10 + 670	45	3.0							135		5	675					675 Grand Etang		
10 + 810 ~ 11 + 120	310	3.5							1,085.00		5	5425					5,425 St. Margaret Br.				
11 + 80 ~ 11 + 200	120	10.8						1,296.00	9	11664							11,664				
11 + 246 ~ 11 + 316	70	4.0							280		5	1400					1,400				
11 + 480 ~ 11 + 525	45	2.0							90		5	450					450				
11 + 740 ~ 11 + 755	15	2.0							30		5	150					150				
12 + 220 ~ 12 + 250	30	3.0							90		5	450					450				
12 + 400 ~ 12 + 430	30	3.0							90		5	450					450				
12 + 540 ~ 12 + 600	60	3.0							180		5	900					900				
12 + 655 ~ 12 + 750	95	3.0							285		5	1425					1,425				
12 + 880 ~ 12 + 990	110	4.0							440		5	2200					2,200 Birch Grove Br.				
13 + 320 ~ 13 + 420	100	3.0									5	1500	2				1,500				
13 + 925 ~ 13 + 955	30	3.0							90		5	450					450				
14 + 130 ~ 14 + 150	20	3.0							60		5	300					300				
14 + 395 ~ 14 + 435	40	3.0							120		5	600					600				
14 + 605 ~ 14 + 630	25	3.0							75		5	375					375				
14 + 950 ~ 15 + 20	70	5.0							350		9	3150					3,150				
15 + 20 ~ 15 + 50	30	3.0							90		5	450					450				
15 + 975 ~ 16 + 15	40	4.0							160		9	1440					1,440 Balthazar Br.				
16 + 50 ~ 16 + 125	75	4.0							300		5	1500					1,500 Balthazar Br.				
17 + 225 ~ 17 + 425	200	5.0									5	5000					5,000				
17 + 420 ~ 17 + 450	30	4.0									5	5000					5,000				
17 + 900 ~ 18 + 39	139	12.0							1,668.00		9	15012	1				15,012 River Side				
18 + 61 ~ 18 + 125	44	12.0							528		9	4752					4,752 St. Cry Greatnver Br.				
18 + 490 ~ 18 + 525	35	3.0							105		9	945					945				
Subtotal						1,420.00		7,100.00	4,107.00			86,963.00	13,761.50				58,807.50	7		0	112,871

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Table 6 Land Acquisition Cost (2)

No.	Road name	Station	Length (m)	Width (m)	Area (m ²)	Unit Cost (ECS)	Cost (ECS)	Area (m ²)	Unit Cost (ECS)	Cost (ECS)	Area (m ²)	Unit Cost (ECS)	Cost (ECS)	Number (Ls)	Unit Cost (ECS)	Cost (ECS)	Cost (ECS)	Remarks	
R-2	Morne Jaloux Road	L 0 + 710 ~ 0 + 730	20	3.0				60	9	540								540	
		R 1 + 510 ~ 1 + 530	20	4.9								98	5	490				490	
		L 1 + 665 ~ 1 + 675	10	1.5								15	5	75				75	
		L 2 + 340 ~ 2 + 370	30	4.0								120	5	600				600	
		R 3 + 400 ~ 3 + 760	360	1.0								360	5	1800				1,800	
		R 3 + 760 ~ 3 + 780	20	1.4								28	5	140				140	
		R 3 + 825 ~ 3 + 875	50	2.9								145	5	725				725	
		R 3 + 900 ~ 4 + 50	150	1.9								285	5	1425				1,425	
		R 4 + 50 ~ 4 + 100	50	1.5								75	5	375				375	
				Subtotal			0		0	60		540	1126		5630	0		0	6,170
R-4	Mt Gav/Springs Road	R 0 + 350 ~ 0 + 383	32.5	5.3	172.3	12	2067											2,067	Tempe Br
		R 0 + 391 ~ 0 + 425	34	3.5								119	5	595				595	
		L 1 + 430 ~ 1 + 550	120	2.1								252	5	1260	1			1,260	Doghhouse
		L 1 + 618 ~ 1 + 703	85	1.8								153	5	765				765	
		L 1 + 772 ~ 1 + 830	58	1.8								104.4	5	522				522	
		L 1 + 908 ~ 2 + 4	96	0.9								86.4	5	432				432	
		R 3 + 60 ~ 3 + 154	94	0.9								84.6	5	423				423	
		R 4 + 815 ~ 4 + 900	85	1.9								161.5	5	807.5				808	
		R 4 + 900 ~ 5 + 15	115	5.0								575	5	2875				2,875	
		R 5 + 890 ~ 5 + 950	60	1.8					108	9	972							972	
		Subtotal			172.3		2,067.00	108		972	1,535.90		7,679.50	1		0	10,719		
R-5	Eastern Main Road	L 2 230 ~ 2 + 290	60	4.0				240	6	1440								1,440	Duntermine Br.
		L 7 + 350 ~ 7 + 410	60	4.0				240	6	1440								1,440	Pointe Field Br.
		L 14 + 750 ~ 14 + 810	60	9.0				540	6	3240								3,240	Madeys Br.
		Subtotal			0		0	1020		6120	0		0	0	0	0	5,120		
R-3	St David's Perdmontemps	L 6 + 20 ~ 6 + 80	60	9.0	540	5	2700											2,700	Madeys Br.
				Subtotal			540		2700	0		0		0	0	0	0	2,700	
Total					2,132.30		11,867.00	5,295.00		44,595.00	16,423.40		82,117.00	8		0	138,579		

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Table 7 Resettlement Cost

Items	Grand Etang Road					Total	Remarks
	STA 3+185(L)	STA 3+800(R)	STA 4+450(R)	STA.12+900(L) STA.12+975(L)	STA 18+000(L)		
Affected Houses	1	2	1	2	1	7	
Affected Population	5	5	0	0	5	15	
Land Area	200	2 x 400	200	400+200	600	2,400	
Building(m ²)	100	2 x 200	100	300	200	1,100	
Others(m ²)	0	0	0	0	0	0	
House Classification	one storied	2 x two storied wooden house	one storied shed	Police Station Woodworking Plant	RC two storied house		
Location	Beside of existing	Beside of existing	Beside of existing	Beside of existing	Beside of existing		
Area(m2)	100	400	100	500	600	1,700	
Construction Cost of Infra.	31,580	126,320	21,960	127,260	150,260	457,380	
Land Development	100m ² x 230 =23,000	400m ² x 230 =92,000	100m ² x 117 =11,700	500m ² x230 =115,000	600m ² x230 =138,000		
Road	5m x 736 = 3,680	20m x 736 =14,720	10m x 736 = 7,360	10m x 736 = 7,360	10m x 736 = 7,360		
Water Supply	10mx 290 = 2,900	40m x 290=11,600		10m x 290 = 2,900	10m x 290 = 2,900		
Electricity	10mx 200 = 2,000	40m X 200= 8,000	10mx 200 = 2,900	10m x 200 = 2,000	10m x 200 = 2,000		

Note : Land Area and House measured by survey data.
Cost of infrastructure based on MOW recommendation

Appendix 8 Land Acquisition Cost (Case 2)

Road No.	Road Name	Length (km)	Residential			Plantation			Forest			Total Cost (MECS)	Remarks
			Area (m ²)	Unit Cost	Cost (MECS)	Area (m ²)	Unit Cost	Cost (MECS)	Area (m ²)	Unit Cost	Cost (MECS)		
1	Grand Etang Road	20.5	12,150.0	12.0	0.15	1,240.0	9.0	0.01	10,495.0	5.00	0.05	0.21	
2	Morne Jaloux Road	3.2	2,750.0	12.0	0.03	1,600.0	9.0	0.01	350.0	5.00	0.00	0.05	
3	St. David's / Perdmontemps	7.2	4,350.0	5.0	0.02	9,400.0	6.0	0.06	150.0	2.00	0.00	0.08	
4	Mt. Gay / Springs	5.8	10,765.0	12.0	0.13	3,000.0	9.0	0.03	500.0	5.00	0.00	0.16	
5	Eastern Main Road (Grenville / Sauteurs)	16.0	8,600.0	5.0	0.04	5,200.0	6.0	0.03	300.0	2.00	0.00	0.07	
6	Paraclete / Mt. Horne	3.2	350.0	4.0	0.00	1,400.0	2.0	0.00	0.0	2.00	0.00	0.00	
7	Dover (Windward / Cherryhill)	3.1	0.0	4.0	0.00	0.0	2.0	0.00	0.0	2.00	0.00	0.00	
	Total	59.0	38,965.0		0.4	21,840.0		0.1	11,795.0		0.1	0.57	

Land Acquisition Cost (Case 3)

Road No.	Road Name	Length (km)	Residential			Plantation			Forest			Total Cost (MECS)	Remarks
			Area (m ²)	Unit Cost	Cost (MECS)	Area (m ²)	Unit Cost	Cost (MECS)	Area (m ²)	Unit Cost	Cost (MECS)		
1	Grand Etang Road	20.5	36,925.0	12.0	0.44	26,385.0	9.0	0.24	32,000.0	5.00	0.16	0.84	
2	Morne Jaloux Road	3.2	7,600.0	12.0	0.09	2,100.0	9.0	0.02	1,500.0	5.00	0.01	0.12	
3	St. David's / Perdmontemps	7.2	8,150.0	5.0	0.04	10,150.0	6.0	0.06	600.0	2.00	0.00	0.10	
4	Mt. Gay / Springs	5.8	21,225.0	12.0	0.25	3,300.0	9.0	0.03	1,250.0	5.00	0.01	0.29	
5	Eastern Main Road (Grenville / Sauteurs)	16.0	19,000.0	5.0	0.1	19,200.0	6.0	0.12	550.0	2.00	0.00	0.21	
6	Paraclete / Mt. Horne	3.2	3,050.0	4.0	0.01	5,400.0	2.0	0.01	0.0	2.00	0.00	0.02	
7	Dover (Windward / Cherryhill)	3.1	1,700.0	4.0	0.01	3,200.0	2.0	0.01	0.0	2.00	0.00	0.02	
	Total	59.0	97,650.0		0.94	69,735.0		0.49	35,900.0		0.18	1.60	

Appendix 10 ROAD RIGHT OF WAY (CASE 3)

Road No.	Road Name	Station	LEFT SIDE										RIGHT SIDE										Total Area				Remarks	
			Residence			Plantation			Forest / Slope			Subtotal	Residence			Plantation			Forest / Slope			Subtotal	Residence m ²	Plantation m ²	Forest / Slope m ²	Total Area m ²		
			Length	Width	Area	Length	Width	Area	Length	Width	Area		Length	Width	Area	Length	Width	Area	Length	Width	Area							
1	Grand Etang Road	0+000 - 1+300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200.0	3.5	700.0	700.0	0.0	0.0	700.0	700.0				
		1+300 - 2+800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200.0	4.5	900.0	0.0	0.0	300.0	4.5	1,350.0	2,250.0	0.0	1,350.0	2,250.0				
		2+800 - 5+000	1,700.0	4.0	6,800.0	0.0	0.0	0.0	200.0	5.5	1,100.0	7,900.0	1,700.0	2.0	3,400.0	0.0	0.0	0.0	0.0	0.0	3,400.0	10,200.0	0.0	1,100.0	11,300.0			
		5+000 - 6+500	750.0	1.5	1,125.0	450.0	3.0	1,350.0	300.0	3.0	900.0	3,375.0	800.0	4.0	3,200.0	700.0	4.0	2,800.0	0.0	0.0	6,000.0	4,325.0	4,150.0	900.0	9,375.0			
		6+500 - 6+560	0.0	0.0	0.0	90.0	5.0	300.0	0.0	0.0	0.0	300.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	300.0	0.0	300.0			
		6+560 - 7+000	150.0	3.0	450.0	290.0	3.0	870.0	0.0	0.0	0.0	1,320.0	300.0	3.5	1,050.0	140.0	3.5	490.0	0.0	0.0	0.0	0.0	0.0	0.0	300.0	0.0	300.0	
		7+000 - 9+000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,400.0	3.0	4,200.0	4,200.0	0.0	0.0	0.0	0.0	0.0	1,400.0	3.5	4,900.0	4,900.0	0.0	0.0	9,100.0		
		9+000 - 11+500	0.0	0.0	0.0	800.0	3.0	2,400.0	1,700.0	3.0	5,100.0	7,500.0	0.0	0.0	200.0	3.0	600.0	2,300.0	3.0	9,000.0	7,500.0	0.0	3,000.0	12,000.0	1,700.0	15,000.0		
		11+500 - 12+300	100.0	2.0	200.0	400.0	2.0	800.0	300.0	2.0	600.0	1,600.0	100.0	6.5	650.0	500.0	6.5	3,250.0	200.0	5.5	1,100.0	5,000.0	850.0	4,050.0	1,700.0	6,800.0		
		12+300 - 15+000	1,450.0	2.5	3,625.0	950.0	2.5	2,375.0	300.0	2.5	750.0	6,750.0	2,150.0	2.5	5,375.0	400.0	2.5	1,000.0	150.0	2.5	375.0	6,750.0	9,000.00	3,375.0	1,125.0	13,500.0		
		15+000 - 16+300	0.0	0.0	0.0	250.0	3.0	750.0	0.0	0.0	0.0	750.0	150.0	3.5	525.0	750.0	4.0	2,800.0	800.0	4.0	3,200.0	700.0	4.0	2,800.0	3,625.0	6,075.0	3,500.0	13,500.0
		16+300 - 18+500	450.0	2.5	1,125.0	1,150.0	2.5	2,875.0	350.0	2.0	700.0	4,700.0	700.0	4.0	2,800.0	800.0	4.0	3,200.0	700.0	4.0	2,800.0	8,600.0	3,625.0	6,075.0	3,500.0	13,500.0		
		18+500 - 19+700	1.0	1,200.0	1,200.0	0.0	0.0	0.0	0.0	0.0	0.0	1,200.0	850.0	2.0	1,700.0	350.0	2.0	700.0	0.0	0.0	0.0	2,400.0	2,900.0	700.0	0.0	3,600.0		
		19+700 - 20+500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	800.0	3.5	2,800.0	0.0	0.0	0.0	0.0	0.0	0.0	2,800.0	2,800.0	0.0	0.0	2,800.0		
Subtotal				14,525.0			11,720.0			13,350.0	39,595.0				22,400.0			14,665.0		18,660.0	56,715.0	36,925.0	26,385.0	32,000.0	95,310.0			
2	Norne Jaloux Road	0+000 - 0+800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	500.0	2.5	1,250.0	0.0	0.0	0.0	300.0	2.5	750.0	2,000.0	1,250.0	0.0	750.0	2,000.0			
		0+800 - 2+850	800.0	1.5	1,200.0	0.0	0.0	0.0	0.0	0.0	1,200.0	1,050.0	2.0	2,100.0	0.0	0.0	0.0	0.0	0.0	0.0	2,100.0	3,300.0	0.0	0.0	3,300.0			
		2+850 - 3+000	150.0	3.0	300.0	0.0	0.0	0.0	200.0	2.0	400.0	700.0	0.0	0.0	350.0	1.0	350.0	0.0	0.0	0.0	350.0	300.0	350.0	400.0	1,050.0			
		3+000 - 3+050	0.0	0.0	0.0	60.0	2.5	150.0	0.0	0.0	0.0	150.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	150.0	0.0	150.0		
		3+050 - 4+000	800.0	2.5	2,000.0	0.0	0.0	0.0	140.0	2.5	350.0	2,350.0	300.0	2.5	750.0	640.0	2.5	1,600.0	0.0	0.0	0.0	2,350.0	2,750.0	1,600.0	350.0	4,700.0		
Subtotal				3,500.0			150.0			750.0	4,400.0			4,100.0		1,950.0			750.0	6,800.0	7,600.0	2,100.0	1,600.0	1,200.0	11,200.0			
3	St. David's / Perdomeras	0+000 - 1+800	200.0	2.5	500.0	0.0	0.0	0.0	0.0	0.0	500.0	600.0	3.0	1,800.0	300.0	3.0	900.0	0.0	0.0	0.0	2,700.0	2,300.0	900.0	0.0	3,200.0			
		1+800 - 3+400	0.0	0.0	0.0	200.0	2.5	500.0	0.0	0.0	0.0	500.0	150.0	3.0	450.0	850.0	3.0	2,550.0	0.0	0.0	0.0	3,000.0	450.0	3,050.0	0.0	3,500.0		
		3+400 - 6+100	300.0	2.5	750.0	200.0	2.5	500.0	0.0	0.0	0.0	1,250.0	850.0	3.0	2,550.0	850.0	3.0	2,550.0	200.0	3.0	900.0	6,000.0	3,300.0	3,350.0	600.0	7,250.0		
		6+100 - 7+200	0.0	0.0	0.0	900.0	2.5	2,250.0	0.0	0.0	0.0	2,250.0	700.0	3.0	2,100.0	200.0	3.0	600.0	0.0	0.0	0.0	2,700.0	2,100.0	2,850.0	0.0	4,950.0		
Subtotal				1,250.0			3,250.0			0.0	4,500.0			6,900.0		6,600.0			600.0	14,400.0	8,150.0	10,150.0	600.0	18,900.0				
4	Mt. Gay / Springs	0+000 - 0+500	500.0	1.0	500.0	0.0	0.0	0.0	0.0	0.0	500.0	500.0	2.5	1,250.0	0.0	0.0	0.0	0.0	0.0	0.0	1,250.0	1,750.0	0.0	0.0	1,750.0			
		0+500 - 3+050	2,450.0	3.0	7,350.0	100.0	3.0	300.0	0.0	0.0	0.0	7,650.0	700.0	2.5	1,750.0	0.0	0.0	0.0	300.0	2.5	750.0	2,600.0	9,100.0	300.0	750.0	10,150.0		
		3+050 - 4+800	1,300.0	2.0	2,600.0	200.0	2.0	400.0	250.0	2.0	500.0	3,500.0	1,750.0	3.5	6,125.0	0.0	0.0	0.0	0.0	0.0	6,125.0	6,725.0	400.0	900.0	9,825.0			
		4+800 - 5+800	100.0	2.5	250.0	900.0	2.5	2,250.0	0.0	0.0	0.0	2,500.0	400.0	3.5	1,400.0	100.0	3.5	350.0	0.0	0.0	0.0	1,750.0	1,650.0	2,600.0	0.0	4,250.0		
Subtotal				10,700.0			2,950.0			600.0	14,150.0			10,525.0		350.0			750.0	11,625.0	21,225.0	3,300.0	1,250.0	25,775.0				
5	Eastern Main Road (Grenville / Sauteurs)	0+000 - 1+700	1,000.0	1.0	1,000.0	0.0	0.0	0.0	0.0	0.0	1,000.0	200.0	3.0	600.0	0.0	0.0	0.0	0.0	0.0	0.0	600.0	1,800.0	0.0	0.0	1,800.0			
		1+700 - 3+000	100.0	2.5	250.0	500.0	2.5	1,250.0	0.0	0.0	0.0	1,500.0	600.0	4.5	2,700.0	100.0	4.5	450.0	0.0	0.0	0.0	3,150.0	2,950.0	1,700.0	0.0	4,850.0		
		3+000 - 5+000	400.0	1.5	600.0	400.0	1.5	600.0	0.0	0.0	0.0	1,200.0	300.0	1.5	450.0	300.0	1.5	450.0	200.0	1.5	300.0	1,200.0	1,050.0	1,050.0	300.0	2,400.0		
		5+000 - 6+500	1,150.0	2.0	2,300.0	350.0	2.0	700.0	0.0	0.0	0.0	3,000.0	200.0	3.5	700.0	500.0	3.5	1,750.0	0.0	0.0	0.0	2,450.0	3,000.0	2,450.0	0.0	5,450.0		
		6+500 - 9+200	1,050.0	2.0	2,100.0	1,550.0	2.0	3,100.0	0.0	0.0	0.0	5,200.0	400.0	2.5	1,000.0	1,100.0	2.5	2,750.0	100.0	2.5	250.0	4,000.0	3,100.0	5,850.0	250.0	9,200.0		
		9+200 - 10+200	750.0	2.5	1,875.0	250.0	2.5	625.0	0.0	0.0	0.0	2,500.0	600.0	3.5	2,600.0	200.0	3.5	700.0	0.0	0.0	0.0	3,600.0	4,675.0	1,325.0	0.0	6,000.0		
Subtotal				10,750.0			13,100.0			0.0	23,650.0			8,250.0		6,100.0			550.0	14,900.0	19,000.0	19,200.0	550.0	36,750.0				
6	Paraclete / Mt. Home	0+000 - 1+500	1,200.0	2.0	2,400.0	300.0	2.0	600.0	0.0	0.0	0.0	3,000.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,400.0	600.0	0.0	0.0	3,000.0			
		1+500 - 2+000	100.0	3.5	350.0	400.0	3.5	1,400.0	0.0	0.0	0.0	1,750.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	350.0	1,400.0	0.0	0.0	1,750.0			
		2+000 - 3+000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	3.0	300.0	900.0	3.0	2,700.0	0.0	0.0	0.0	3,000.0	300.0	2,700.0	0.0	3,000.0			
		3+000 - 3+200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200.0	3.5	700.0	0.0	0.0	0.0	700.0	0.0	700.0	0.0	700.0			
Subtotal				2,750.0			2,000.0			0.0	4,750.0			300.0		3,400.0			0.0	3,700.0	3,050.0	5,400.0	0.0	8,450.0				
7	Dover (Windward / Cherry)	0+000 - 0+400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
		0+400 - 0+900	0.0	0.0																								

APPENDIX 16

ECONOMIC EVALUATION OF PROJECT ROADS

15. 1/15/2014

16. 1/15/2014

Road Length (km) R-1 20.5 Improvement Option II (Unit: EC\$)

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	2,626,685								2,626,685		-2,626,685	3,690,303	
1999	3,392,697								3,392,697		-3,392,697	4,255,799	
2000	15,095,640								15,095,640		-15,095,640	16,907,117	
2001	8,328,629	66,000	3,458,824	1,110,412	1,861,761	192,975	102,534	171,913	8,394,629	6,898,420	-1,496,209	8,394,629	6,898,420
2002		66,000	3,574,646	1,149,820	1,927,834	235,858	125,320	210,116	66,000	7,223,594	7,157,594	58,929	6,449,637
2003		66,000	3,690,564	1,189,228	1,993,907	287,034	152,511	255,706	66,000	7,568,951	7,502,951	52,615	6,033,921
2004		66,000	3,806,388	1,228,638	2,059,980	347,671	184,730	309,725	66,000	7,937,128	7,871,128	46,977	5,649,491
2005		66,000	3,922,208	1,268,044	2,126,053	418,717	222,479	373,017	66,000	8,330,517	8,264,517	41,944	5,294,194
2006		133,000	3,936,137	1,318,893	2,211,308	501,437	266,431	446,708	133,000	8,682,913	8,549,913	75,468	4,926,918
2007		133,000	3,953,970	1,369,106	2,295,497	595,729	316,531	530,709	133,000	9,061,542	8,928,542	67,382	4,590,859
2008		133,000	3,969,899	1,419,955	2,380,753	701,744	372,861	625,153	133,000	9,470,364	9,337,364	60,162	4,283,912
2009		133,000	3,985,732	1,470,168	2,464,942	818,442	434,866	729,114	133,000	9,903,264	9,770,264	53,716	3,999,762
2010		3,321,000	4,001,661	1,521,017	2,550,197	943,797	501,472	840,787	3,321,000	10,358,931	7,037,931	1,197,586	3,735,534
2011		109,000	4,017,590	1,571,230	2,634,387	1,074,427	570,880	957,160	109,000	10,825,676	10,716,676	35,095	3,485,578
2012		109,000	4,033,424	1,622,079	2,719,642	1,205,198	640,363	1,073,658	109,000	11,294,364	11,185,364	31,335	3,246,860
2013		109,000	4,049,353	1,672,293	2,803,832	1,330,971	707,191	1,185,704	109,000	11,749,343	11,640,343	27,978	3,015,764
2014		109,000	4,065,186	1,723,141	2,889,087	1,444,423	767,472	1,286,773	109,000	12,176,082	12,067,082	24,980	2,790,444
2015		109,000	4,081,115	1,773,355	2,973,276	1,539,106	817,780	1,371,122	109,000	12,555,754	12,446,754	22,304	2,569,156
2016		217,000	4,086,297	1,908,104	3,199,203	1,608,570	854,689	1,433,005	217,000	13,089,869	12,872,869	39,645	2,391,470
2017		217,000	4,091,574	2,042,854	3,425,129	1,648,034	875,658	1,468,182	217,000	13,551,411	13,334,411	35,397	2,210,529
2018		217,000	4,096,756	2,177,603	3,651,056	1,654,855	879,281	1,474,238	217,000	13,933,789	13,716,789	31,605	2,029,378
2019		217,000	4,102,034	2,312,353	3,876,982	1,628,889	865,379	1,450,928	217,000	14,236,364	14,019,364	28,219	1,851,291
2020		5,436,000	4,107,216	2,447,738	4,103,974	1,572,342	835,439	1,400,731	5,436,000	14,467,439	9,031,439	631,156	1,679,768
2021		109,000	4,112,397	2,582,487	4,328,901	1,490,230	791,811	1,327,581	109,000	14,634,407	14,525,407	11,300	1,517,102
2022		109,000	4,117,675	2,717,237	4,555,827	1,388,475	737,745	1,236,932	109,000	14,753,891	14,644,891	10,089	1,365,614
2023		109,000	4,122,857	2,851,987	4,781,753	1,272,850	676,309	1,133,927	109,000	14,839,684	14,730,684	9,008	1,226,389
2024		109,000	4,128,135	2,986,736	5,007,680	1,150,544	611,323	1,024,989	109,000	14,909,387	14,800,387	8,043	1,100,133
2025	-14,721,826	109,000	4,133,316	3,121,488	5,233,606	1,026,562	545,448	914,519	-14,612,826	14,974,937	29,587,763	-962,724	986,580

34,886,057 83,328,704

Definitions:

B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment
 NPV: Net Present Value of a series of cash flows.

B / C 2.3886
 EIRR % 28.74
 NPV (EC\$) 48,442,647

A16-1

Road Length (km) R-2 3.2
 Improvement Option I
 (Unit: EC\$)

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			SECOND-LANE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost	Dis. Benefit
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	127,018							127,018		-127,018	113,409		
1999	1,591,442							1,591,442		-1,591,442	1,268,688		
2000	280,843							280,843		-280,843	199,899		
2001	0	9,000	0	65,468	109,766	0	6,650	11,150	9,000	193,035	184,035	5,720	122,677
2002		9,000	0	64,197	107,635	0	8,217	13,776	9,000	202,824	193,824	5,107	115,088
2003		9,000	0	62,925	105,503	0	10,103	16,940	9,000	204,472	195,472	4,560	103,592
2004		9,000	0	61,019	102,306	0	12,359	20,722	9,000	205,406	196,406	4,071	92,915
2005		9,000	0	59,747	100,175	0	15,026	25,194	9,000	209,143	200,143	3,635	84,469
2006		18,000	0	62,290	104,438	0	18,159	30,446	18,000	233,332	215,332	6,491	84,142
2007		18,000	0	65,468	109,766	0	21,762	36,487	18,000	251,483	233,483	5,796	80,971
2008		18,000	0	68,010	114,029	0	25,850	43,340	18,000	269,229	251,229	5,175	77,397
2009		18,000	0	70,553	118,292	0	30,391	50,955	18,000	288,191	270,191	4,620	73,971
2010		459,000	0	73,731	123,620	0	35,317	59,215	459,000	750,883	291,883	105,191	172,083
2011		15,000	0	76,273	127,883	0	40,505	67,913	15,000	327,574	312,574	3,069	67,028
2012		15,000	0	78,816	132,146	0	45,761	76,725	15,000	348,448	333,448	2,740	63,660
2013		15,000	0	81,358	136,408	0	50,887	85,318	15,000	368,972	353,972	2,447	60,187
2014		15,000	0	84,536	141,737	0	55,593	93,209	15,000	390,074	375,074	2,185	56,812
2015		15,000	0	87,079	146,000	0	59,618	99,958	15,000	407,654	392,654	1,951	53,011
2016		30,000	0	83,265	139,605	0	62,696	105,119	30,000	420,685	390,685	3,483	48,844
2017		30,000	0	80,087	134,277	0	64,620	108,344	30,000	417,328	387,328	3,110	43,263
2018		30,000	0	76,273	127,883	0	65,264	109,424	30,000	408,845	378,845	2,777	37,843
2019		30,000	0	72,460	121,489	0	64,593	108,299	30,000	396,841	366,841	2,479	32,796
2020		747,000	0	69,282	116,160	0	62,697	105,121	747,000	1,100,260	353,260	55,120	81,136
2021		15,000	0	65,468	109,766	0	59,736	100,156	15,000	350,126	335,126	988	23,067
2022		15,000	0	61,654	103,372	0	55,941	93,793	15,000	329,760	314,760	882	19,392
2023		15,000	0	57,841	96,978	0	51,536	86,408	15,000	307,762	292,762	788	16,164
2024		15,000	0	54,663	91,649	0	46,808	78,480	15,000	286,599	271,599	703	13,440
2025	-999,652	15,000	0	50,849	85,255	0	41,958	70,349	-984,652	-736,241	248,411	-41,227	-30,826

1,773,856 1,593,179

Definitions:

B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 0.90
 EIRR % 10.70
 NPV (EC\$) -180,677

A16-2

Road Length (km): R-4
 Improvement Option: 5.8
 (Unit: EC\$) II

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	271,469								271,469		-271,469	381,394	
1999	1,087,710								1,087,710		-1,087,710	1,364,423	
2000	3,095,790								3,095,790		-3,095,790	3,467,285	
2001	0	22,000	0	84,536	141,737	21,680	42,056	70,512	22,000	360,521	338,521	22,000	360,521
2002		22,000	0	88,350	148,131	26,587	51,574	86,471	22,000	401,112	379,112	19,643	358,136
2003		22,000	0	91,528	153,459	32,460	62,967	105,573	22,000	445,988	423,988	17,538	355,539
2004		22,000	0	95,342	159,854	39,440	76,507	128,274	22,000	499,415	477,415	15,659	355,474
2005		22,000	0	98,520	165,182	47,642	92,417	154,950	22,000	558,710	536,710	13,981	355,070
2006		43,000	0	110,596	185,430	57,219	110,994	186,098	43,000	650,337	607,337	24,399	369,019
2007		43,000	0	122,673	205,678	68,168	132,234	221,709	43,000	750,463	707,463	21,785	380,208
2008		43,000	0	134,114	224,861	80,515	156,186	261,868	43,000	857,545	814,545	19,451	387,910
2009		43,000	0	146,191	245,109	94,150	182,634	306,212	43,000	974,294	931,294	17,367	393,501
2010		1,080,000	0	158,267	265,357	108,843	211,137	354,001	1,080,000	1,097,605	17,605	389,459	395,807
2011		35,000	0	170,344	285,605	124,210	240,946	403,979	35,000	1,225,084	1,190,084	11,269	394,444
2012		35,000	0	182,420	305,853	139,656	270,909	454,216	35,000	1,353,054	1,318,054	10,062	398,971
2013		35,000	0	193,861	325,036	154,582	299,863	502,763	35,000	1,476,105	1,441,105	8,984	379,880
2014		35,000	0	205,938	345,284	168,130	326,143	546,824	35,000	1,592,319	1,557,319	8,021	364,918
2015		35,000	0	218,015	365,532	179,535	348,267	583,918	35,000	1,695,266	1,660,266	7,162	346,885
2016		71,000	0	240,897	403,897	188,028	364,742	611,541	71,000	1,809,103	1,738,103	12,971	330,516
2017		71,000	0	263,779	442,262	193,029	374,444	627,807	71,000	1,901,320	1,830,320	11,582	310,146
2018		71,000	0	286,661	480,626	194,207	376,729	631,639	71,000	1,969,863	1,898,863	10,341	286,899
2019		71,000	0	309,543	518,991	191,500	371,477	622,834	71,000	2,014,345	1,943,345	9,233	261,945
2020		1,764,000	0	332,425	557,356	185,216	359,288	602,396	1,764,000	2,036,680	272,680	204,812	236,472
2021		35,000	0	354,671	594,655	175,859	341,136	571,962	35,000	2,038,283	2,003,283	3,628	211,202
2022		35,000	0	377,553	633,020	164,137	318,397	533,838	35,000	2,026,945	1,991,945	3,240	187,613
2023		35,000	0	400,435	671,385	150,724	292,378	490,213	35,000	2,005,135	1,970,135	2,892	165,709
2024		35,000	0	423,317	709,750	136,466	264,721	443,841	35,000	1,978,094	1,943,094	2,583	145,960
2025	-2,227,485	35,000	0	446,199	748,115	121,956	236,574	396,650	-2,192,485	1,949,494	4,141,978	-144,445	128,437
												5,936,719	7,850,283

A16-3

Definitions:

B/C: Benefit - Cost ratio

IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.

NPV: Net Present Value of a series of cash flows.

B / C

EIRR %

NPV (EC\$)

1,3223

15.12

1,913,563

Road Length (km) R-5 18.0 Improvement Option II (Unit: EC\$)

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	583,222							583,222		-583,222	819,385		
1999	20,000							20,000		-20,000	25,088		
2000	4,852,403							4,852,403		-4,852,403	5,434,691		
2001	4,479,141	35,000	0	74,366	124,686	19,499	115,085	192,922	4,514,141	526,538	-3,987,603	4,514,141	526,538
2002		35,000	7,965	102,989	172,642	19,818	140,428	235,447	35,000	679,268	644,268	31,250	606,489
2003		35,000	15,833	132,207	221,664	26,849	170,654	286,126	35,000	853,333	818,333	27,902	680,272
2004		35,000	23,798	160,810	269,620	34,082	208,421	346,094	35,000	1,040,835	1,005,835	24,912	740,845
2005		35,000	31,666	189,412	317,576	41,548	248,272	416,263	35,000	1,244,737	1,209,737	22,243	791,053
2006		71,000	29,939	196,404	329,298	49,216	296,936	497,854	71,000	1,399,647	1,328,647	40,287	794,197
2007		71,000	28,116	204,031	342,087	64,234	352,331	590,733	71,000	1,581,532	1,510,532	35,971	801,253
2008		71,000	26,389	211,023	353,809	79,677	414,529	695,015	71,000	1,780,441	1,709,441	32,117	805,381
2009		71,000	24,565	218,015	365,532	102,894	482,895	809,841	71,000	2,003,542	1,932,542	28,676	809,197
2010		1,764,000	22,838	225,642	378,320	126,748	556,221	932,583	1,764,000	2,242,353	478,353	636,116	808,615
2011		58,000	21,015	232,634	390,043	151,240	632,506	1,060,485	58,000	2,487,924	2,429,924	18,674	801,045
2012		58,000	19,288	239,625	401,765	191,706	708,727	1,188,279	58,000	2,749,390	2,691,390	16,674	790,384
2013		58,000	17,464	246,617	413,488	233,235	781,871	1,310,915	58,000	3,003,590	2,945,590	14,887	770,947
2014		58,000	15,737	254,244	426,276	291,587	847,655	1,421,211	58,000	3,256,711	3,198,711	13,292	746,354
2015		58,000	13,914	261,236	437,999	358,413	902,327	1,512,877	58,000	3,487,765	3,429,765	11,868	713,666
2016		116,000	35,697	309,543	518,991	445,125	942,145	1,579,638	116,000	3,831,138	3,715,138	21,193	699,935
2017		116,000	57,363	357,213	598,918	549,361	964,356	1,616,878	116,000	4,144,110	4,028,110	18,922	675,994
2018		116,000	79,166	405,520	679,911	672,758	987,465	1,622,090	116,000	4,426,910	4,310,910	16,895	644,754
2019		116,000	100,852	453,191	759,837	832,777	951,324	1,595,027	116,000	4,693,008	4,577,008	15,085	610,277
2020		2,898,000	122,635	501,497	840,830	1,030,693	917,617	1,538,514	2,898,000	4,951,785	2,053,785	336,477	574,936
2021		58,000	144,418	549,804	921,822	1,267,780	868,965	1,456,941	58,000	5,209,729	5,151,729	6,013	540,076
2022		58,000	166,104	597,474	1,001,749	1,582,775	808,966	1,356,345	58,000	5,493,414	5,435,414	5,368	508,468
2023		58,000	187,887	645,781	1,082,742	1,926,427	741,006	1,242,400	58,000	5,826,242	5,768,242	4,793	481,495
2024		58,000	209,573	693,452	1,162,668	2,369,909	669,281	1,122,142	58,000	6,227,025	6,169,025	4,280	459,479
2025	-4,967,383	58,000	231,356	741,758	1,243,661	2,904,821	596,704	1,000,458	-4,909,383	6,718,759	11,628,142	-323,440	442,646

11,653,760 16,824,297

Definitions: B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 1.4193
 EIRR % 15.78
 NPV (EC\$) 4,970,537

A16-4

Roads R-1 / Option II
 R-2 / Option I
 R-4 / Option II
 R-5 / Option II

(Unit: EC\$)

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	3,608,393								3,608,393		-3,608,393	5,069,532	
1999	6,091,849								6,091,849		-6,091,849	7,641,615	
2000	23,324,676								23,324,676		-23,324,676	26,123,637	
2001	12,807,771	123,300	4,658,401	1,624,622	2,723,905	224,862	266,305	446,497	12,931,071	9,944,593	-2,986,478	12,931,071	9,944,593
2002		123,300	4,724,709	1,662,123	2,786,781	270,868	325,538	545,810	123,300	10,315,828	10,192,528	110,089	9,210,561
2003		123,300	4,791,016	1,699,624	2,849,656	332,431	396,236	664,345	123,300	10,733,309	10,610,009	98,294	8,556,528
2004		123,300	4,857,323	1,736,489	2,911,466	404,300	480,017	804,815	123,300	11,194,411	11,071,111	87,763	7,967,961
2005		123,300	4,923,631	1,773,990	2,974,342	487,489	578,194	969,423	123,300	11,707,070	11,583,770	78,359	7,440,054
2006		246,600	5,008,458	1,857,891	3,115,013	583,349	692,520	1,161,106	246,600	12,418,337	12,171,737	139,927	7,046,498
2007		246,600	5,093,381	1,941,792	3,255,684	698,916	822,859	1,379,638	246,600	13,192,270	12,945,670	124,935	6,683,614
2008		246,600	5,178,209	2,025,692	3,396,356	827,429	969,425	1,625,377	246,600	14,022,488	13,775,888	111,549	6,243,061
2009		246,600	5,263,132	2,109,593	3,537,027	975,135	1,130,787	1,895,921	246,600	14,911,594	14,664,994	99,598	6,022,543
2010		6,165,000	5,347,959	2,193,494	3,677,698	1,132,741	1,304,148	2,186,585	6,165,000	15,842,624	9,677,624	2,223,161	5,713,009
2011		201,960	5,432,786	2,277,394	3,818,369	1,296,645	1,484,838	2,489,538	201,960	16,799,570	16,597,610	65,026	5,409,012
2012		201,960	5,517,710	2,361,295	3,959,040	1,476,707	1,665,760	2,792,879	201,960	17,773,390	17,571,430	58,059	5,109,425
2013		201,960	5,602,537	2,445,196	4,099,711	1,652,539	1,839,812	3,084,701	201,960	18,724,495	18,522,535	51,838	4,806,111
2014		201,960	5,687,460	2,529,096	4,240,382	1,832,083	1,996,862	3,348,018	201,960	19,633,902	19,431,942	46,284	4,499,584
2015		201,960	5,772,288	2,612,997	4,381,054	2,001,110	2,127,992	3,567,875	201,960	20,463,314	20,261,354	41,325	4,187,200
2016		403,920	5,755,879	2,792,875	4,662,644	2,161,140	2,224,272	3,729,302	403,920	21,346,111	20,942,191	73,795	3,899,855
2017		403,920	5,739,470	2,972,117	4,983,169	2,307,698	2,279,077	3,821,191	403,920	22,102,722	21,698,802	65,888	3,605,433
2018		403,920	5,722,965	3,151,995	5,284,759	2,438,588	2,288,740	3,837,392	403,920	22,724,440	22,320,520	58,829	3,309,686
2019		403,920	5,706,556	3,331,237	5,585,284	2,570,894	2,252,773	3,777,088	403,920	23,223,832	22,819,912	52,526	3,020,018
2020		10,099,000	5,690,147	3,511,115	5,886,874	2,708,872	2,175,042	3,646,761	10,099,000	23,618,812	13,520,812	1,172,446	2,742,304
2021		201,960	5,673,738	3,690,357	6,187,399	2,858,501	2,061,647	3,456,639	201,960	23,928,282	23,726,322	20,937	2,480,568
2022		201,960	5,657,329	3,870,235	6,488,989	3,045,043	1,921,050	3,220,908	201,960	24,203,554	24,001,594	18,693	2,240,272
2023		201,960	5,640,824	4,049,478	6,789,514	3,285,405	1,761,230	2,952,948	201,960	24,479,399	24,277,439	16,690	2,023,039
2024		201,960	5,624,416	4,229,356	7,091,105	3,588,433	1,592,132	2,669,432	201,960	24,804,873	24,602,913	14,902	1,830,301
2025	-22,916,345	201,960	5,608,007	4,408,598	7,391,629	4,001,072	1,420,685	2,381,976	-22,714,385	25,211,967	47,926,351	-1,496,471	1,661,017
												55,100,297	125,752,246

A16-5

Definition: B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 2.28
 EIRR % 25.25
 NPV (EC\$) 70,651,948

Road Length (km) R-1 20.5
 Improvement Option II
 (Unit: EC\$)

Sensitivity Analysis:
 Cost +10%
 Benefit -10%

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	2,889,354								2,889,354		-2,889,354	4,059,334	
1999	3,731,966								3,731,966		-3,731,966	4,681,378	
2000	16,605,204								16,605,204		-16,605,204	18,597,828	
2001	9,161,492	66,000	3,112,942	999,371	1,675,585	173,677	92,281	154,722	9,227,492	6,208,578	-3,018,914	9,227,492	6,208,578
2002		66,000	3,217,181	1,034,838	1,735,051	212,272	112,788	189,104	66,000	6,501,234	6,435,234	58,929	5,804,674
2003		66,000	3,321,508	1,070,305	1,794,516	258,331	137,260	230,136	66,000	6,812,056	6,746,056	52,615	5,430,529
2004		66,000	3,425,747	1,105,772	1,853,982	312,904	166,257	278,753	66,000	7,143,415	7,077,415	46,977	5,084,542
2005		66,000	3,529,987	1,141,240	1,913,447	376,846	200,231	335,715	66,000	7,497,466	7,431,466	41,944	4,764,775
2006		133,000	3,544,323	1,187,004	1,990,177	451,293	239,788	402,037	133,000	7,814,622	7,681,622	75,468	4,434,226
2007		133,000	3,558,573	1,232,195	2,065,948	536,156	284,878	477,638	133,000	8,155,388	8,022,388	67,382	4,131,773
2008		133,000	3,572,909	1,277,959	2,142,677	631,569	335,575	562,638	133,000	8,523,328	8,390,328	60,162	3,855,521
2009		133,000	3,587,159	1,323,151	2,218,448	736,597	391,380	656,203	133,000	8,912,938	8,779,938	53,716	3,589,786
2010		3,321,000	3,601,495	1,368,915	2,295,178	849,417	451,325	756,708	3,321,000	9,323,038	6,002,038	1,197,586	3,361,981
2011		109,000	3,615,831	1,414,107	2,370,948	966,985	513,792	861,444	109,000	9,743,108	9,634,108	35,095	3,137,020
2012		109,000	3,630,081	1,459,871	2,447,678	1,084,678	576,327	966,292	109,000	10,164,927	10,055,927	31,335	2,922,174
2013		109,000	3,644,417	1,505,063	2,523,449	1,197,874	636,472	1,067,134	109,000	10,574,409	10,465,409	27,978	2,714,187
2014		109,000	3,658,667	1,550,827	2,600,178	1,299,980	690,724	1,158,096	109,000	10,958,473	10,849,473	24,980	2,511,399
2015		109,000	3,673,004	1,596,019	2,675,949	1,385,195	736,002	1,234,010	109,000	11,300,179	11,191,179	22,304	2,312,240
2016		217,000	3,677,667	1,717,294	2,879,283	1,447,713	769,220	1,289,705	217,000	11,780,882	11,563,882	39,645	2,152,323
2017		217,000	3,682,417	1,838,568	3,082,616	1,483,231	788,092	1,321,346	217,000	12,196,270	11,979,270	35,397	1,989,476
2018		217,000	3,687,081	1,959,843	3,285,950	1,489,369	791,353	1,326,814	217,000	12,540,410	12,323,410	31,605	1,826,440
2019		217,000	3,691,831	2,081,118	3,489,284	1,465,820	778,841	1,305,835	217,000	12,812,728	12,595,728	28,219	1,666,162
2020		5,436,000	3,696,494	2,202,964	3,693,577	1,415,107	751,895	1,260,658	5,436,000	13,020,696	7,584,696	631,156	1,511,791
2021		109,000	3,701,158	2,324,239	3,896,910	1,341,207	712,630	1,194,823	109,000	13,170,966	13,061,966	11,300	1,385,391
2022		109,000	3,705,908	2,445,513	4,100,244	1,249,628	663,970	1,113,239	109,000	13,278,502	13,169,502	10,089	1,229,053
2023		109,000	3,710,571	2,566,788	4,303,578	1,145,565	608,678	1,020,534	109,000	13,355,715	13,246,715	9,008	1,103,750
2024		109,000	3,715,321	2,688,062	4,506,912	1,035,489	550,191	922,472	109,000	13,418,448	13,309,448	8,043	990,120
2025	-16,194,008	109,000	3,719,985	2,809,337	4,710,245	923,906	490,903	823,067	-16,085,008	13,477,444	29,562,452	-1,059,714	887,922

A16-6

Definitions:

B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 1.9680
 EIRR % 22.50
 NPV (EC\$) 36,888,582

38,107,251 74,995,833

Road Length (km) 3.2
 Improvement Option I
 (Unit: EC\$)

Sensitivity Analysis:
 Cost +10%
 Benefit -10%

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			SECOND-LANE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost	Dis. Benefit
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	139,720							139,720		-139,720	124,750		
1999	1,750,587							1,750,587		-1,750,587	1,395,557		
2000	308,927							308,927		-308,927	219,888		
2001	0	9,000	0	58,921	98,790	0	5,985	10,035	9,000	173,731	164,731	5,720	110,409
2002		9,000	0	57,777	96,871	0	7,395	12,399	9,000	183,442	174,442	5,107	104,090
2003		9,000	0	56,633	94,953	0	9,093	15,246	9,000	184,925	175,925	4,560	93,639
2004		9,000	0	54,917	92,076	0	11,123	18,650	9,000	185,766	176,766	4,071	84,031
2005		9,000	0	53,773	90,157	0	13,524	22,674	9,000	189,128	180,128	3,635	76,386
2006		18,000	0	56,061	93,994	0	16,343	27,401	18,000	211,799	193,799	6,491	76,377
2007		18,000	0	58,921	98,790	0	19,586	32,838	18,000	228,135	210,135	5,796	73,453
2008		18,000	0	61,209	102,626	0	23,265	39,006	18,000	244,106	226,106	5,175	70,175
2009		18,000	0	63,498	106,462	0	27,352	45,859	18,000	261,172	243,172	4,620	67,036
2010		459,000	0	66,358	111,258	0	31,786	53,293	459,000	721,695	262,695	105,191	165,394
2011		15,000	0	68,646	115,095	0	36,455	61,122	15,000	296,317	281,317	3,069	60,632
2012		15,000	0	70,934	118,931	0	41,185	69,053	15,000	315,103	300,103	2,740	57,568
2013		15,000	0	73,222	122,768	0	45,798	76,787	15,000	333,575	318,575	2,447	54,413
2014		15,000	0	76,083	127,563	0	50,033	83,888	15,000	352,567	337,567	2,185	51,349
2015		15,000	0	78,371	131,400	0	53,656	89,962	15,000	368,389	353,389	1,951	47,905
2016		30,000	0	74,939	125,645	0	56,426	94,607	30,000	381,617	351,617	3,483	44,308
2017		30,000	0	72,078	120,849	0	58,158	97,510	30,000	378,595	348,595	3,110	39,248
2018		30,000	0	68,646	115,095	0	58,738	98,482	30,000	370,960	340,960	2,777	34,336
2019		30,000	0	65,214	109,340	0	58,134	97,469	30,000	360,157	330,157	2,479	29,764
2020		747,000	0	62,353	104,544	0	56,428	94,609	747,000	1,064,934	317,934	55,120	78,579
2021		15,000	0	58,921	98,790	0	53,762	90,140	15,000	316,613	301,613	988	20,859
2022		15,000	0	55,489	93,035	0	50,347	84,414	15,000	298,284	283,284	882	17,546
2023		15,000	0	52,057	87,280	0	46,383	77,767	15,000	278,486	263,486	788	14,626
2024		15,000	0	49,196	82,484	0	42,127	70,632	15,000	259,439	244,439	703	12,166
2025	-1,099,617	15,000	0	45,764	76,730	0	37,762	63,314	-1,084,617	-861,047	223,570	-45,412	-36,051

1,927,870 1,448,289

Definitions:
 B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 0.75
 EIRR % 8.69
 NPV (EC\$) -479,581

A16-7

Road Length (km) Improvement Option (Unit: EC\$)

R-4
5.8
II

Sensitivity Analysis:
Cost +10%
Benefit -10%

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	298,616								298,616		-298,616	419,534	
1999	1,196,481								1,196,481		-1,196,481	1,500,866	
2000	3,405,369								3,405,369		-3,405,369	3,814,013	
2001	0	22,000	0	76,083	127,563	19,512	37,850	63,461	22,000	324,468	302,468	22,000	324,468
2002		22,000	0	79,515	133,318	23,928	46,416	77,824	22,000	361,001	339,001	19,643	322,322
2003		22,000	0	82,375	138,113	29,214	56,670	95,016	22,000	401,389	379,389	17,538	319,985
2004		22,000	0	85,807	143,868	35,496	68,856	115,446	22,000	449,474	427,474	15,659	319,927
2005		22,000	0	88,668	148,664	42,878	83,175	139,455	22,000	502,839	480,839	13,981	319,563
2006		43,000	0	99,537	166,887	51,497	99,895	167,488	43,000	585,304	542,304	24,399	332,117
2007		43,000	0	110,406	185,110	61,351	119,011	199,538	43,000	675,416	632,416	21,785	342,187
2008		43,000	0	120,703	202,375	72,464	140,568	235,681	43,000	771,790	728,790	19,451	349,119
2009		43,000	0	131,571	220,598	84,735	164,371	275,590	43,000	878,865	833,865	17,367	354,151
2010		1,080,000	0	142,440	238,821	97,959	190,023	318,601	1,080,000	987,845	-92,155	389,459	356,227
2011		35,000	0	153,309	257,045	111,789	216,851	363,581	35,000	1,102,575	1,067,575	11,269	355,000
2012		35,000	0	164,178	275,268	125,690	243,818	408,795	35,000	1,217,749	1,182,749	10,062	350,074
2013		35,000	0	174,475	292,532	139,124	269,877	452,487	35,000	1,328,495	1,293,495	8,984	340,992
2014		35,000	0	185,344	310,755	151,317	293,529	492,142	35,000	1,433,087	1,398,087	8,021	328,427
2015		35,000	0	196,213	328,979	161,581	313,440	525,526	35,000	1,525,740	1,490,740	7,162	312,197
2016		71,000	0	216,807	363,507	189,225	328,268	550,386	71,000	1,628,193	1,557,193	12,971	297,465
2017		71,000	0	237,401	398,035	173,726	336,999	585,026	71,000	1,711,188	1,640,188	11,582	279,132
2018		71,000	0	257,995	432,564	174,787	339,056	568,475	71,000	1,772,877	1,701,877	10,341	258,209
2019		71,000	0	278,588	467,092	172,350	334,330	580,550	71,000	1,812,910	1,741,910	9,233	235,750
2020		1,764,000	0	299,182	501,621	166,694	323,359	542,156	1,764,000	1,833,012	69,012	204,812	212,825
2021		35,000	0	319,204	535,190	158,273	307,022	514,766	35,000	1,834,455	1,799,455	3,628	190,172
2022		35,000	0	339,798	569,718	147,723	286,558	480,454	35,000	1,824,250	1,789,250	3,240	168,852
2023		35,000	0	360,391	604,247	135,651	263,141	441,192	35,000	1,804,622	1,769,622	2,892	149,138
2024		35,000	0	380,985	638,775	122,819	238,248	399,457	35,000	1,780,285	1,745,285	2,583	131,364
2025	-2,450,233	35,000	0	401,579	673,303	109,761	212,917	356,985	-2,415,233	1,754,544	4,169,777	-159,121	115,593

6,443,355 7,065,254

Definitions:
B/C: Benefit - Cost ratio
IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
NPV: Net Present Value of a series of cash flows.

B / C 1.0965
EIRR % 12.98
NPV (EC\$) 621,900

Road Length (km) Improvement Option (Unit: EC\$) R-5 16.0 II Sensivity Analysis: Cost +10% Benefit -10%

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	641,544							641,544		-641,544	901,323		
1999	22,000							22,000		-22,000	27,597		
2000	5,337,644							5,337,644		-5,337,644	5,978,161		
2001	4,927,056	35,000	0	66,930	112,217	17,549	103,558	173,630	4,962,056	473,884	4,962,056	473,884	
2002		35,000	7,168	92,672	155,378	17,836	126,385	211,902	35,000	611,341	31,250	545,840	
2003		35,000	14,250	118,988	199,497	24,164	153,589	257,513	35,000	768,000	27,902	612,245	
2004		35,000	21,418	144,729	242,658	30,683	185,779	311,485	35,000	936,751	24,912	666,761	
2005		35,000	28,500	170,471	285,818	37,393	223,445	374,636	35,000	1,120,263	22,243	711,947	
2006		71,000	26,945	176,783	296,369	44,294	267,242	448,069	71,000	1,259,682	40,287	714,778	
2007		71,000	25,304	183,628	307,878	57,810	317,098	531,660	71,000	1,423,379	35,971	721,128	
2008		71,000	23,750	189,921	318,428	71,709	373,076	625,514	71,000	1,602,397	32,117	724,843	
2009		71,000	22,109	196,213	328,979	92,604	434,606	728,877	71,000	1,803,187	28,676	728,277	
2010		1,764,000	20,554	203,078	340,488	114,074	500,599	839,324	1,764,000	2,018,117	636,116	727,753	
2011		58,000	18,913	209,370	351,038	136,116	566,256	954,437	58,000	2,239,131	18,674	720,940	
2012		58,000	17,359	215,663	361,589	172,536	637,854	1,069,451	58,000	2,474,451	16,674	711,246	
2013		58,000	15,718	221,955	372,139	209,911	703,684	1,179,824	58,000	2,703,231	14,887	693,252	
2014		58,000	14,163	228,820	383,649	262,428	762,889	1,279,090	58,000	2,931,040	13,292	671,719	
2015		58,000	12,523	235,113	394,199	323,472	812,094	1,361,589	58,000	3,138,989	11,868	642,299	
2016		116,000	32,127	278,588	467,092	400,613	847,931	1,421,674	116,000	3,448,025	21,193	629,941	
2017		116,000	51,645	321,492	539,026	494,425	867,921	1,455,190	116,000	3,729,699	18,922	608,295	
2018		116,000	71,249	364,968	611,919	605,482	870,719	1,459,881	116,000	3,984,219	16,895	580,279	
2019		116,000	90,767	407,872	683,954	749,499	856,191	1,435,524	116,000	4,223,707	15,085	549,249	
2020		2,898,000	110,371	451,347	756,747	927,623	825,856	1,384,862	2,898,000	4,456,607	336,477	517,442	
2021		58,000	129,976	494,823	829,640	1,141,002	782,088	1,311,247	58,000	4,688,756	6,013	486,068	
2022		58,000	149,494	537,727	901,574	1,406,498	728,070	1,220,710	58,000	4,944,072	5,368	457,621	
2023		58,000	169,098	581,203	974,467	1,733,784	666,905	1,118,160	58,000	5,243,618	4,793	433,346	
2024		58,000	188,616	624,106	1,046,402	2,132,918	602,352	1,009,928	58,000	5,604,323	4,280	413,532	
2025	-5,464,122	58,000	208,220	667,582	1,119,295	2,614,339	537,034	900,412	-5,406,122	6,046,883	-356,167	398,381	
											12,896,865	15,141,867	

Definitions: B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 1.1741
 EIRR % 13.64
 NPV (EC\$) 2,245,001

Roads R-1 / Option II
 R-2 / Option I
 R-4 / Option II
 R-5 / Option II

Sensitivity Analysis:
 Cost +10%
 Benefit -10%

(Unit: EC\$)

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	3,969,233								3,969,233		-3,969,233	5,576,487	
1999	6,701,034								6,701,034		-6,701,034	8,405,777	
2000	25,657,144								25,657,144		-25,657,144	28,736,001	
2001	14,088,548	123,300	4,192,561	1,462,160	2,451,514	202,376	239,674	401,848	14,211,848	8,950,133	-5,261,715	14,211,848	8,950,133
2002		123,300	4,252,238	1,495,910	2,508,103	243,781	292,984	491,229	123,300	9,284,245	9,160,945	110,089	8,289,505
2003		123,300	4,311,914	1,529,661	2,564,691	299,188	356,612	597,911	123,300	9,659,978	9,536,678	98,294	7,700,875
2004		123,300	4,371,591	1,562,840	2,620,320	363,870	432,015	724,334	123,300	10,074,970	9,951,670	87,763	7,171,165
2005		123,300	4,431,268	1,596,591	2,676,908	438,740	520,375	872,481	123,300	10,536,363	10,413,063	78,359	6,696,049
2006		246,600	4,507,612	1,672,102	2,803,512	525,014	623,268	1,044,995	246,600	11,176,503	10,929,903	139,927	6,341,848
2007		246,600	4,584,043	1,747,612	2,930,116	629,024	740,573	1,241,674	246,600	11,873,043	11,626,443	124,935	6,015,253
2008		246,600	4,660,388	1,823,123	3,056,720	744,686	872,483	1,462,839	246,600	12,620,239	12,373,639	111,549	5,708,755
2009		246,600	4,736,819	1,898,634	3,183,324	877,622	1,017,708	1,706,329	246,600	13,420,435	13,173,835	99,598	5,420,289
2010		6,165,000	4,813,163	1,974,144	3,309,928	1,019,467	1,173,733	1,967,927	6,165,000	14,258,362	8,093,362	2,223,161	5,141,708
2011		201,960	4,889,508	2,049,655	3,436,532	1,166,980	1,336,354	2,240,584	201,960	15,119,613	14,917,653	65,026	4,868,111
2012		201,960	4,965,939	2,125,165	3,563,136	1,329,037	1,499,184	2,513,591	201,960	15,996,051	15,794,091	58,059	4,598,483
2013		201,960	5,042,283	2,200,676	3,689,740	1,487,285	1,655,830	2,776,231	201,960	16,852,045	16,650,085	51,838	4,325,500
2014		201,960	5,118,714	2,276,187	3,816,344	1,648,875	1,797,176	3,013,216	201,960	17,670,512	17,468,552	46,284	4,049,625
2015		201,960	5,195,059	2,351,697	3,942,948	1,800,999	1,915,192	3,211,087	201,960	18,416,983	18,215,023	41,325	3,768,480
2016		403,920	5,180,291	2,513,587	4,214,380	1,945,026	2,001,845	3,356,372	403,920	19,211,500	18,807,580	73,795	3,509,869
2017		403,920	5,165,523	2,674,905	4,484,852	2,076,928	2,051,170	3,439,072	403,920	19,892,450	19,488,530	65,888	3,244,889
2018		403,920	5,150,668	2,836,795	4,756,283	2,194,730	2,059,866	3,453,653	403,920	20,451,996	20,048,076	58,829	2,978,717
2019		403,920	5,135,900	2,998,114	5,026,756	2,313,805	2,027,495	3,399,379	403,920	20,901,449	20,497,529	52,526	2,718,016
2020		10,098,000	5,121,132	3,160,004	5,298,187	2,437,985	1,957,538	3,282,085	10,098,000	21,256,930	11,158,930	1,172,446	2,468,074
2021		201,960	5,106,364	3,321,322	5,568,659	2,572,651	1,855,483	3,110,975	201,960	21,535,454	21,333,494	20,937	2,232,511
2022		201,960	5,091,596	3,483,212	5,840,091	2,740,539	1,728,945	2,898,817	201,960	21,783,199	21,581,239	18,693	2,016,244
2023		201,960	5,076,742	3,644,530	6,110,563	2,956,865	1,585,107	2,657,653	201,960	22,031,459	21,829,499	16,690	1,820,735
2024		201,960	5,061,974	3,806,420	6,381,994	3,238,590	1,432,919	2,402,489	201,960	22,324,386	22,122,426	14,902	1,647,271
2025	-25,207,980	201,960	5,047,206	3,967,738	6,652,466	3,600,965	1,278,616	2,143,778	-25,006,020	22,690,770	47,696,790	-1,647,449	1,434,916

A16-10

60,113,577 113,177,021

Definition:
 B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 1.88
 EIRR % 21.34
 NPV (EC\$) 53,063,444

Road Length (km) Improvement Option (Unit: ECS)

R-1
20.5
II

Sensitivity Analysis:
Cost +20 %
Benefit +20 %

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	3,152,022								3,152,022		-3,152,022	4,428,364	
1999	4,071,236								4,071,236		-4,071,236	5,106,958	
2000	18,114,768								18,114,768		-18,114,768	20,288,540	
2001	9,994,355	66,000	2,767,059	888,330	1,489,409	154,380	82,027	137,530	10,060,355	5,518,736	-4,541,619	10,060,355	5,518,736
2002		66,000	2,859,717	919,856	1,542,267	188,686	100,256	168,093	66,000	5,778,875	5,712,875	58,929	5,159,710
2003		66,000	2,952,451	951,383	1,595,126	229,627	122,009	204,565	66,000	6,055,160	5,989,160	52,615	4,827,137
2004		66,000	3,045,109	982,909	1,647,984	278,137	147,784	247,780	66,000	6,349,702	6,283,702	46,977	4,519,593
2005		66,000	3,137,766	1,014,435	1,700,842	334,974	177,983	298,414	66,000	6,664,414	6,598,414	41,944	4,235,356
2006		133,000	3,150,509	1,055,114	1,769,046	401,150	213,145	357,367	133,000	6,946,331	6,813,331	75,468	3,941,535
2007		133,000	3,163,176	1,095,285	1,836,398	476,583	253,225	424,567	133,000	7,249,234	7,116,234	67,392	3,672,687
2008		133,000	3,175,919	1,135,964	1,904,602	561,395	298,289	500,122	133,000	7,576,291	7,443,291	60,162	3,427,129
2009		133,000	3,188,586	1,176,135	1,971,954	654,753	347,893	583,291	133,000	7,922,611	7,789,611	53,716	3,199,810
2010		3,321,000	3,201,329	1,216,814	2,040,158	755,037	401,177	672,830	3,321,000	8,287,145	4,966,145	1,197,586	2,988,428
2011		109,000	3,214,072	1,256,984	2,107,510	859,542	456,704	765,728	109,000	8,660,541	8,551,541	35,095	2,738,462
2012		109,000	3,226,739	1,297,663	2,175,714	964,158	512,290	858,926	109,000	9,035,491	8,926,491	31,335	2,597,488
2013		109,000	3,239,482	1,337,834	2,243,065	1,064,777	565,753	948,563	109,000	9,399,475	9,290,475	27,978	2,412,611
2014		109,000	3,252,149	1,378,513	2,311,270	1,155,538	613,977	1,029,419	109,000	9,740,865	9,631,865	24,980	2,232,355
2015		109,000	3,264,892	1,418,684	2,378,621	1,231,285	654,224	1,096,898	109,000	10,044,603	9,935,603	22,304	2,055,325
2016		217,000	3,269,037	1,526,483	2,559,362	1,286,856	683,751	1,146,404	217,000	10,471,895	10,254,895	39,645	1,913,176
2017		217,000	3,273,260	1,634,283	2,740,193	1,318,427	700,526	1,174,530	217,000	10,841,129	10,624,129	35,397	1,768,423
2018		217,000	3,277,405	1,742,083	2,920,845	1,323,884	703,425	1,179,390	217,000	11,147,031	10,930,031	31,605	1,623,502
2019		217,000	3,281,627	1,849,882	3,101,586	1,302,951	692,303	1,160,742	217,000	11,389,092	11,172,092	28,219	1,481,032
2020		5,436,000	3,285,773	1,958,190	3,283,179	1,257,873	688,352	1,120,585	5,436,000	11,573,952	6,137,952	631,156	1,343,814
2021		109,000	3,289,918	2,065,990	3,463,920	1,192,184	633,449	1,062,065	109,000	11,707,526	11,598,526	11,300	1,213,681
2022		109,000	3,294,140	2,173,790	3,644,662	1,110,780	590,196	989,546	109,000	11,803,113	11,694,113	10,089	1,092,492
2023		109,000	3,298,286	2,281,589	3,825,403	1,018,280	541,047	907,142	109,000	11,871,747	11,762,747	9,008	981,111
2024		109,000	3,302,508	2,389,389	4,006,144	920,435	489,059	819,975	109,000	11,927,509	11,818,509	8,043	880,107
2025	-17,666,191	109,000	3,306,653	2,497,188	4,186,885	821,250	436,358	731,616	-17,557,191	11,979,950	29,537,140	-1,156,705	789,264
												41,328,446	66,662,963

A16-11

Definitions:

B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 1.6130
 EIRR % 18.82
 NPV (ECS) 25,334,513

Road Length (km) R-2 3.2
 Improvement Option 1
 (Unit: EC\$)

Sensitivity Analysis:
 Cost +20 %
 Benefit +20 %

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			SECOND-LANE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost	Dis. Benefit
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	152,421							152,421		-152,421		136,090	
1999	1,909,731							1,909,731		-1,909,731		1,522,426	
2000	337,011							337,011		-337,011		239,878	
2001	0	9,000	0	52,374	87,813	0	5,320	8,920	9,000	154,428	145,428	5,720	98,142
2002		9,000	0	51,357	86,108	0	6,573	11,021	9,000	164,060	155,060	5,107	93,092
2003		9,000	0	50,340	84,403	0	8,083	13,552	9,000	165,378	156,378	4,560	83,785
2004		9,000	0	48,815	81,845	0	9,887	16,578	9,000	166,125	157,125	4,071	75,147
2005		9,000	0	47,798	80,140	0	12,021	20,155	9,000	169,114	160,114	3,635	68,302
2006		18,000	0	49,832	83,550	0	14,527	24,357	18,000	190,266	172,266	6,491	68,612
2007		18,000	0	52,374	87,813	0	17,410	29,190	18,000	204,786	186,786	5,796	65,936
2008		18,000	0	54,408	91,223	0	20,680	34,672	18,000	218,983	200,983	5,175	62,952
2009		18,000	0	56,442	94,633	0	24,313	40,764	18,000	234,152	216,152	4,620	60,101
2010		459,000	0	58,985	98,896	0	28,254	47,372	459,000	692,506	233,506	105,191	158,705
2011		15,000	0	61,019	102,306	0	32,404	54,330	15,000	265,059	250,059	3,069	54,236
2012		15,000	0	63,053	105,716	0	36,609	61,380	15,000	281,759	266,759	2,740	51,476
2013		15,000	0	65,087	109,127	0	40,709	68,255	15,000	298,177	283,177	2,447	48,639
2014		15,000	0	67,629	113,389	0	44,474	74,567	15,000	315,059	300,059	2,185	45,887
2015		15,000	0	69,663	116,800	0	47,694	79,966	15,000	329,123	314,123	1,951	42,799
2016		30,000	0	66,612	111,684	0	50,157	84,095	30,000	342,548	312,548	3,483	39,772
2017		30,000	0	64,070	107,422	0	51,696	86,875	30,000	339,863	309,863	3,110	35,232
2018		30,000	0	61,019	102,306	0	52,211	87,540	30,000	333,076	303,076	2,777	30,829
2019		30,000	0	57,968	97,191	0	51,674	86,639	30,000	323,472	293,472	2,479	26,733
2020		747,000	0	55,425	92,928	0	50,158	84,097	747,000	1,029,608	282,608	55,120	75,973
2021		15,000	0	52,374	87,813	0	47,789	80,125	15,000	283,101	268,101	988	18,651
2022		15,000	0	49,323	82,698	0	44,753	75,034	15,000	266,808	251,808	882	15,695
2023		15,000	0	46,272	77,582	0	41,229	69,126	15,000	249,210	234,210	788	13,089
2024		15,000	0	43,730	73,320	0	37,446	62,784	15,000	232,279	217,279	703	10,892
2025	-1,199,582	15,000	0	40,679	68,204	0	33,566	56,279	-1,184,582	-985,853	198,729	-49,598	-41,277
												2,081,883	1,303,400

A16-12

Definitions:

B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 0.63
 EIRR % 8.81
 NPV (EC\$) -778,483

Road Length (km) 5.8
 Improvement Option II
 (Unit: EC\$)

Sensitivity Analysis:
 Cost +20 %
 Benefit +20 %

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	325,762							325,762			-325,762	457,672	
1999	1,305,252							1,305,252			-1,305,252	1,637,308	
2000	3,714,948							3,714,948			-3,714,948	4,160,742	
2001	0	22,000	0	67,629	113,389	17,344	33,644	56,410	22,000	288,416	266,416	22,000	288,416
2002		22,000	0	70,680	118,505	21,269	41,259	69,177	22,000	320,890	298,890	19,643	286,509
2003		22,000	0	73,222	122,768	25,968	50,374	84,458	22,000	356,790	334,790	17,538	284,431
2004		22,000	0	76,273	127,883	31,552	61,205	102,619	22,000	399,532	377,532	15,659	284,379
2005		22,000	0	78,816	132,146	38,113	73,934	123,960	22,000	446,968	424,968	13,981	284,056
2006		43,000	0	88,477	148,344	45,775	88,796	148,878	43,000	520,270	477,270	24,399	295,215
2007		43,000	0	98,138	164,543	54,534	105,787	177,367	43,000	600,370	557,370	21,785	304,166
2008		43,000	0	107,291	179,889	64,412	124,949	209,495	43,000	686,036	643,036	19,451	310,328
2009		43,000	0	116,952	196,087	75,320	146,107	244,969	43,000	779,436	736,436	17,367	314,801
2010		1,080,000	0	126,614	212,286	87,074	168,910	283,201	1,080,000	878,084	-201,916	389,459	316,646
2011		35,000	0	136,275	228,484	99,368	192,757	323,183	35,000	990,067	945,067	11,269	315,555
2012		35,000	0	145,936	244,683	111,725	216,727	363,373	35,000	1,082,444	1,047,444	10,062	311,177
2013		35,000	0	155,089	260,028	123,666	239,891	402,210	35,000	1,180,884	1,145,884	8,984	303,104
2014		35,000	0	164,750	276,227	134,504	260,915	437,460	35,000	1,273,855	1,238,855	8,021	291,935
2015		35,000	0	174,412	292,425	143,628	278,614	467,134	35,000	1,356,213	1,321,213	7,162	277,508
2016		71,000	0	192,717	323,117	150,422	291,793	489,232	71,000	1,447,283	1,376,283	12,971	264,413
2017		71,000	0	211,023	353,809	154,423	299,555	502,246	71,000	1,521,056	1,450,056	11,582	248,117
2018		71,000	0	229,328	384,501	155,366	301,383	505,311	71,000	1,575,890	1,504,890	10,341	229,520
2019		71,000	0	247,634	415,193	153,200	297,182	498,267	71,000	1,611,476	1,540,476	9,233	209,556
2020		1,764,000	0	265,940	445,885	148,173	287,430	481,917	1,764,000	1,629,344	-134,656	204,812	189,178
2021		35,000	0	283,737	475,724	140,687	272,909	457,570	35,000	1,630,626	1,595,626	3,628	169,042
2022		35,000	0	302,042	506,416	131,309	254,718	427,070	35,000	1,621,556	1,586,556	3,240	150,091
2023		35,000	0	320,348	537,108	120,579	233,903	392,171	35,000	1,604,108	1,569,108	2,892	132,568
2024		35,000	0	338,654	567,800	109,173	211,776	355,073	35,000	1,582,475	1,547,475	2,583	116,768
2025	-2,672,981	35,000	0	356,959	598,492	97,565	189,259	317,320	-2,637,981	1,559,595	4,197,576	-173,796	102,749
												6,949,988	6,280,226

Definitions:
 B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B/C 0.9036
 IRR % 10.98
 NPV (EC\$) -669,762

A16-13

Road Length (km)
Improvement Option
(Unit: EC\$)

R-5
18.0
II

Sensitivity Analysis:
Cost +20 %
Benefit +20 %

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	699,866								699,866		-699,866	983,261	
1999	24,000							24,000		-24,000	30,106		
2000	5,822,884							5,822,884		-5,822,884	6,521,630		
2001	5,374,970	35,000	0	59,493	99,749	15,599	92,052	154,338	5,409,970	421,231	-4,988,739	5,409,970	421,231
2002		35,000	6,372	82,375	138,113	15,854	112,342	188,357	35,000	543,414	508,414	31,250	485,191
2003		35,000	12,667	105,766	177,331	21,479	136,524	228,901	35,000	682,666	647,666	27,902	544,217
2004		35,000	19,038	128,648	215,696	27,274	165,137	276,875	35,000	832,668	797,668	24,912	592,676
2005		35,000	25,333	151,530	254,061	33,238	198,618	333,010	35,000	995,789	960,789	22,243	632,842
2006		71,000	23,951	157,123	263,439	39,373	237,549	398,283	71,000	1,119,718	1,048,718	40,287	635,358
2007		71,000	22,493	163,225	273,669	51,387	281,865	472,586	71,000	1,265,225	1,194,225	35,971	641,003
2008		71,000	21,111	168,818	283,047	63,741	331,623	556,012	71,000	1,424,353	1,353,353	32,117	644,305
2009		71,000	19,652	174,412	292,425	82,315	386,316	647,713	71,000	1,602,833	1,531,833	28,676	647,357
2010		1,764,000	18,270	180,514	302,656	101,399	444,977	748,066	1,764,000	1,793,882	29,882	636,116	646,892
2011		58,000	16,812	186,107	312,034	120,992	506,005	848,388	58,000	1,990,339	1,932,339	18,674	640,836
2012		58,000	15,430	191,700	321,412	153,365	566,981	950,623	58,000	2,199,512	2,141,512	16,674	632,307
2013		58,000	13,972	197,294	330,790	186,588	625,497	1,048,732	58,000	2,402,872	2,344,872	14,887	616,757
2014		58,000	12,590	203,396	341,021	233,269	678,124	1,138,969	58,000	2,605,368	2,547,368	13,292	597,083
2015		58,000	11,131	208,989	350,399	287,530	721,861	1,210,301	58,000	2,790,212	2,732,212	11,868	570,933
2016		116,000	28,557	247,634	415,193	356,100	753,716	1,263,710	116,000	3,064,911	2,948,911	21,193	559,948
2017		116,000	45,907	285,771	479,134	439,489	771,485	1,293,502	116,000	3,315,288	3,199,288	18,922	540,795
2018		116,000	63,333	324,416	543,928	538,206	773,972	1,297,672	116,000	3,541,528	3,425,528	16,895	515,803
2019		116,000	80,682	362,553	607,870	666,222	761,059	1,276,021	116,000	3,754,406	3,638,406	15,085	488,221
2020		2,898,000	98,108	401,198	672,664	824,554	734,094	1,230,811	2,898,000	3,961,428	1,063,428	336,477	459,949
2021		58,000	115,534	439,843	737,458	1,014,224	695,172	1,165,553	58,000	4,167,783	4,109,783	6,013	432,061
2022		58,000	132,883	477,979	801,399	1,250,220	647,173	1,085,076	58,000	4,394,731	4,336,731	5,368	406,775
2023		58,000	150,309	516,625	866,193	1,541,142	592,805	993,920	58,000	4,660,994	4,602,994	4,793	385,196
2024		58,000	167,659	554,761	930,135	1,895,927	535,424	897,714	58,000	4,981,620	4,923,620	4,280	367,584
2025	-5,960,360	58,000	185,085	593,406	994,929	2,323,857	477,364	800,367	-5,902,860	5,375,007	11,277,867	-388,893	354,117
												13,939,969	13,459,437

A16-14

Definitions:
 B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 0.9655
 EIRR % 11.66
 NPV (EC\$) -480,532

Roads R-1 / Option II
 R-2 / Option I
 R-4 / Option II
 R-5 / Option II

Sensitivity Analysis:
 Cost +20 %
 Benefit +20 %

(Unit: EC\$)

Year	Econ. Cost	Maint. Cost	ROAD BENEFIT			BRIDGE BENEFIT			COST TOTAL	BENEFIT TOTAL	B-C	Dis. Cost (12%)	Dis. Benefit (12%)
			VOC - km	VOC - hr	Time	VOC - km	VOC - hr	Time					
1998	4,330,072								4,330,072		-4,330,072	6,083,439	
1999	7,310,219								7,310,219		-7,310,219	9,169,939	
2000	27,989,611								27,989,611		-27,989,611	31,348,364	
2001	15,369,325	123,300	3,726,721	1,299,697	2,179,124	179,890	213,044	357,198	15,492,625	7,955,674	-7,536,951	15,492,625	7,955,674
2002		123,300	3,779,767	1,329,698	2,229,425	216,695	260,430	436,648	123,300	8,252,662	8,129,362	110,089	7,368,448
2003		123,300	3,832,813	1,359,699	2,279,725	265,945	316,989	531,476	123,300	8,586,647	8,463,347	98,294	6,845,222
2004		123,300	3,885,859	1,389,191	2,329,173	323,440	384,013	643,852	123,300	9,955,529	8,832,229	87,763	6,374,369
2005		123,300	3,938,905	1,419,192	2,379,474	389,991	462,555	775,539	123,300	9,365,656	9,242,356	78,359	5,952,044
2006		246,600	4,006,766	1,486,313	2,492,011	466,679	554,016	928,885	246,600	9,934,670	9,688,070	139,927	5,637,198
2007		246,600	4,074,705	1,553,433	2,604,548	559,133	658,287	1,103,710	246,600	10,553,816	10,307,216	124,935	5,346,892
2008		246,600	4,142,567	1,620,554	2,717,084	661,943	775,540	1,300,301	246,600	11,217,990	10,971,390	111,549	5,074,449
2009		246,600	4,210,505	1,687,674	2,829,621	780,108	904,629	1,516,737	246,600	11,929,275	11,682,675	99,598	4,818,034
2010		6,165,000	4,278,367	1,754,795	2,942,158	906,193	1,043,318	1,749,268	6,165,000	12,674,100	6,509,100	2,223,161	4,570,407
2011		201,960	4,346,229	1,821,915	3,054,695	1,037,316	1,187,870	1,991,630	201,960	13,439,656	13,237,696	65,026	4,327,210
2012		201,960	4,414,168	1,889,036	3,167,232	1,181,366	1,332,608	2,234,303	201,960	14,218,712	14,016,752	58,059	4,087,540
2013		201,960	4,482,030	1,956,156	3,279,769	1,322,031	1,471,849	2,467,781	201,960	14,979,596	14,777,636	51,838	3,844,889
2014		201,960	4,549,968	2,023,277	3,392,306	1,465,667	1,597,490	2,678,414	201,960	15,707,122	15,505,162	46,284	3,599,667
2015		201,960	4,617,830	2,090,397	3,504,843	1,600,888	1,702,393	2,854,300	201,960	16,370,652	16,168,692	41,325	3,349,760
2016		403,920	4,604,703	2,234,300	3,746,115	1,728,912	1,779,417	2,983,442	403,920	17,076,889	16,672,969	73,795	3,119,884
2017		403,920	4,591,576	2,377,694	3,936,535	1,846,158	1,823,262	3,056,953	403,920	17,682,178	17,278,258	65,888	2,884,346
2018		403,920	4,578,372	2,521,596	4,227,807	1,950,871	1,830,992	3,069,914	403,920	18,179,552	17,775,632	58,829	2,647,749
2019		403,920	4,565,245	2,664,990	4,468,227	2,056,716	1,802,218	3,021,670	403,920	18,579,066	18,175,146	52,526	2,416,014
2020		10,098,000	4,552,118	2,808,892	4,709,499	2,167,098	1,740,033	2,917,409	10,098,000	18,895,049	8,797,049	1,172,446	2,193,843
2021		201,960	4,538,991	2,952,296	4,949,919	2,286,801	1,649,319	2,765,312	201,960	19,142,626	18,940,666	20,937	1,984,454
2022		201,960	4,525,863	3,096,188	5,191,192	2,436,034	1,536,840	2,576,726	201,960	19,362,843	19,160,883	18,693	1,792,217
2023		201,960	4,512,660	3,239,582	5,431,611	2,628,324	1,408,984	2,362,353	201,960	19,583,520	19,381,560	16,690	1,618,431
2024		201,960	4,499,532	3,383,484	5,672,884	2,878,747	1,273,706	2,135,545	201,960	19,843,898	19,641,938	14,902	1,464,241
2025	-27,499,614	201,960	4,486,405	3,526,878	5,913,303	3,200,858	1,136,548	1,905,581	-27,297,654	20,169,573	47,467,227	-1,798,427	1,328,814

65,126,854 100,601,797

Definition B/C: Benefit - Cost ratio
 IRR: Internal Rate of Return, which is the percentage rate that equates the present value of an expected future series of cash flows to the initial investment.
 NPV: Net Present Value of a series of cash flows.

B / C 1.54
 EIRR % 17.92
 NPV (EC\$) 35,474,943

A16-15

JICA