

Spot No. Bs-62

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U6-2	H-Pile Bent	l.m.	40	1,051.68	42,067
U6-3	Bailey Bridg	l.m.	12	13,555.83	162,669
TOTAL					204,736

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P6-2	Grouted Riprap	cu.m.	35	1,326.00	46,410
P15-1(1)	Surplus Common Excavation	sq.m.	490	58.30	28,567
P15-1(2)	Struc. Excavation	cu.m.	63	89.79	5,656
P15-1(4)	Concrete Piling	cu.m.	120	2,157.86	258,943
P15-1(3)	Railing	l.m.	38	1,325.70	50,376
P15-1(5)	Rainforcing Steel Bar	kg.	10400	33.60	349,440
P15-1(6)	Struc. Conc. (Class A)	cu.m.	80	3,475.81	278,064
P16-2	Gabion Foot Protection	cu.m.	26	1,424.71	37,042
P1-3	Refilling/Embankment	cu.m.	120	68.42	8,210
P19-1	Gravel Surfacing	cu.m.	36	315.50	11,358
TOTAL					1,074,066

Spot No. Bs-66

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-5	Selected Material Fill	cu.m.	63	368.94	23,243
U4-2	Gabion Wall	cu.m.	72	1,424.71	102,579
TOTAL					125,822

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P2-4	R.C.P.C. 0.60 m ϕ	l.m.	54	1,410.17	76,149
P6-6	Supported Type Conc. Wall	cu.m.	40	2,942.21	117,688
P19-3	Concrete Pavement	cu.m.	25	2,942.21	73,555
TOTAL					267,392

Spot No. L-4

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-4	Refilling/Embankment	cu.m.	360	68.42	24,631
U6-2	H-Pile Bent	l.m.	288	1,051.68	302,883
U6-3	Bailey Bridge	l.m.	168	13,555.83	2,277,379
U7-1	Gravel Surfacing	cu.m.	36	315.50	11,358
TOTAL					2,616,251

PERMANENT RESTORATION MEASURES:

None

Spot No. L-6

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-4	Refilling/Embankment	cu.m.	360	68.42	24,631
U6-2	H-Pile Bent	l.m.	108	1,051.68	113,581
U6-3	Bailey Bridge	l.m.	60	13,555.83	813,349
U7-1	Gravel Surfacing	cu.m.	36	315.50	11,358
TOTAL					962,919

PERMANENT RESTORATION MEASURES:

None

Spot No. L-13

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-4	Refilling/Embankment	cu..	120	68.42	8,210
U3-1	Sheet Covering	sq.m.	72	28.11	2,024
U3-2	Sand Bag Covering	sq.m.	72	112.17	8,076
U4-3	Wooden Fence	l.m.	12	185.17	2,222
TOTAL					20,532

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P2-1	Slope Ditch	l.m.	10	250.30	2,503
P2-4	R.C.P.C. 0.6 m ϕ	l.m.	2	1,410.17	2,820
P2-5	Catch Basin	ea.	1	5,751.17	5,751
P6-2	Grouted Riprap	cu.m.	63	1,326.00	83,538
P16-3	Grouted Riprap (Apron)	cu.m.	5	1,326.00	6,630
TOTAL					101,242

Spot No. L-16

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of dep. mat'ls	cu.m.	90	34.78	3,130
TOTAL					3,130

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P8-2	Catch Gabion Wall	cu.m.	192	1,424.71	273,544
TOTAL					273,544

Spot No. L-19

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-5	Selected Material Fill	cu.m.	286	368.94	105,517
U4-2	Gabion Wall	cu.m.	134	1,424.71	190,911
TOTAL					296,428

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P6-6	Supported Type Conc. Wall	cu.m.	100	2,942.21	294,221
P19-3	Concrete Pavement	cu.m.	80	2,942.21	235,377
TOTAL					529,598

Spot No. L-21

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of deposit mat'l	cu.m.	10	34.78	348
U1-2	Removal of unst. mat'l	cu.m.	4	72.15	289
TOTAL					637

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P1-1	Recutting	cu.m.	2000	58.30	116,600
P2-2	Side Ditch	l.m.	35	250.30	8,760
P6-2	Grouted Riprap	cu.m.	24	1,326.00	31,824
TOTAL					157,184

Spot No. L-23

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U2-2	Temporary Side Ditch	l.m.	52	10.99	571
U7-1	Gravel Surfacing	cu.m.	48	315.50	15,144
TOTAL					15,715

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P2-2	Side Ditch	l.m.	52	318.76	16,576
P2-3(1)	Struc. Concrete (Class A)	cu.m.	35	2,942.21	102,977
P2-3(2)	Structural Steel Bar	kgs.	2100	33.60	70,560
P2-4	R.C.P.C. 1.2 m ϕ	l.m.	11	2,950.85	32,459
P2-5	Catch Basin	ea.	1	11,200.73	11,201
TOTAL					233,773

Spot No. L-26

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U4-1	Sand Bag Wall	sq.m.	60	112.17	6,730
TOTAL					6,730

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P1-3	Refilling/Embankment	cu.m.	378	68.42	25,863
P6-2	Grouted Riprap	cu.m.	32	1,326.00	42,432
P2-4	R.C.P.C. 0.60 m ϕ	l.m.	10	1,410.17	14,102
P18-1	Concrete Spillway	cu.m.	216	2,942.21	635,517
P2-2	Side Ditch(Grouted Riprap)	cu.m.	62	1,326.00	82,212
TOTAL					800,126

Spot No. L-38

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-4	Refilling/Embankment	cu.m.	15	87.89	1,318
U3-2	Sand Bag Covering	sq.m.	15	112.17	1,683
TOTAL					3,001

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P6-2	Grouted Riprap	cu.m.	9	1,326.00	11,934
P16-2	Gabion Foot Protection	cu.m.	11	1,424.71	15,672
TOTAL					27,606

Spot No. L-39

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of dep. mat'l	cu.m.	170	34.78	5,913
TOTAL					5,913

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P15-1(7)	Pre-Stressed Girder	l.m.	3	245,109.53	735,328
P15-1(5)	Reinforcing Steel	kg.	14700	33.60	493,920
P15-1(6)	Struc. Concrete (Class A)	cu.m.	158	3,475.61	549,146
P15-1(2)	Structural Excavation	cu.m.	50	89.79	4,490
P1-3	Embankment	cu.m.	430	68.42	29,421
P19-1	Gravel Surfacing	cu.m.	54	315.50	17,037
TOTAL					1,829,342

Spot No. L-45

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-4	Refilling/Embankment	cu.m.	48	68.42	3,284
U2-2	Temporary Side Ditch	l.m.	120	10.99	1,318
U3-2	Sand Bag Covering	sq.m.	80	112.17	8,974
U4-3	Wooden Fence	l.m.	20	185.17	3,703
TOTAL					17,279

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P1-3	Refilling/Embankment	cu.m.	242	68.42	16,558
P2-2	Side Ditch	l.m.	120	500.60	60,072
P4-2	Hand Seeding with Mat	sq.m.	70	44.01	3,081
P16-2	Gabion Foot Protection	cu.m.	36	1,424.71	51,290
TOTAL					131,001

Spot No. L-47

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of Dep. Mat'l	cu.m.	16	34.78	556
U2-2	Temporary Side Ditch	l.m.	30	10.99	330
TOTAL					886

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P1-1	Recutting	cu.m.	160	58.30	9,328
P1-3	Refilling/Embankment	cu.m.	2	68.42	137
P2-2	Side Ditch	l.m.	43	500.60	21,526
P3-2	Horizontal Drain Hole	l.m.	60	267.35	46,041
P4-2	Hand Seeding with Mat	sq.m.	180	44.01	7,922
P16-2	Gabion Foot Protection	cu.m.	32	1,424.71	45,591
TOTAL					130,545

Spot No. L-50

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of Dep. Mat'l	cu.m.	110	34.78	3,826
TOTAL					3,826

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P2-2	Side Ditch	l.m.	22	500.60	11,013
P3-2	Horizontal Drain Hole	l.m.	130	767.35	99,755
P16-2	Gabion Foot Protection	cu.m.	40	1,424.71	56,988
TOTAL					167,756

Spot No. L-65

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U-1-1	Removal of Dep. Mat'l	cu.m.	31	34.78	1,078
U1-2	Removal of Unst. Mat'l	cu.m.	10	72.15	722
TOTAL					1,800

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P1-1	Recutting	cu.m.	1140	358.53	408,724
P2-2	Side Ditch	l.m.	34	250.30	8,510
P6-2	Grouted Riprap	cu.m.	34	1,326.00	45,084
TOTAL					462,318

Spot No. L-68

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of Dep. Mat'l	cu.m.	18	34.78	626
U1-2	Removal of Unst. Mat'l	cu.m.	9	72.15	649
TOTAL					1,275

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P1-1	Recutting	cu.m.	750	58.30	43,725
P2-2	Side Ditch	l.m.	30	250.30	7,509
P4-6	Pick Hole Seeding	sq.m.	490	161.20	78,988
P6-2	Grouted Riprap	cu.m.	50	1,326.00	66,300
TOTAL					196,522

Spot No. L-76

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U6-3	Bailey Bridge	l.m.	30	13,555.83	406,674
TOTAL					406,674

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P6-2	Grouted Riprap	cu.m.	380	1,326.00	503,880
P15-1(4)	R.C. Pile	l.m.	240	2,157.86	517,886
P15-1(3)	R.C. Railings	l.m.	64	1,325.70	84,845
P15-1(5)	Reinforcing Steel	kg.	30000	33.60	1,008,000
P15-1(6)	Structural Concrete	cu.m.	230	3,475.61	799,390
P15-1(2)	Structural Excavation	cu.m.	230	89.79	20,652
TOTAL					2,934,653

Spot No. L-78

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of Dep. Mat'l	cu.m.	90	34.78	3,130
TOTAL					3,130

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P4-8	Wattling	m.	380	391.55	148,789
P8-2	Catch Gabion Wall	cu.m.	500	1,424.71	712,355
TOTAL					861,144

Spot No. L-80

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of Dep. Mat'l	cu.m.	20	34.78	696
TOTAL					696

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P4-6	Pick Hole Seeding	sq.m.	1100	161.20	177,320
TOTAL					177,320

Spot No. L-81

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U3-1	Sheet Covering	sq.m.	45	28.11	1,265
U4-1	Sand Bag Wall	sq.m.	80	112.17	8,974
TOTAL					10,239

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P1-3	Refilling/Embankment	cu.m.	13	68.42	889
P2-5	Catch Basin	ea.	1	8,791.07	8,791
P4-2	Hand Seeding with Mat	sq.m.	14	44.01	616
P6-2	Grouted Riprap	cu.m.	19	1,326.00	25,194
P16-3	Grouted Riprap (Apron)	cu.m.	6	1,326.00	7,956
TOTAL					43,446

Spot No. L-82

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U2-2	Temporary Side Ditch	m.	50	10.99	550
U4-3	Wooden Fence	m.	32	185.17	5,925
TOTAL					6,475

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P2-1	Slope Ditch	l.m.	18	318.76	5,738
P2-2	Side Ditch	l.m.	80	318.76	25,501
P2-4	R.C.P.C. 0.6 m ϕ	l.m.	7	1,410.17	9,871
P2-5	Catch Basin	ea.	2	5,751.17	11,502
TOTAL					52,612

Spot No. L-84

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of Dep. Mat'l	cu.m.	80	34.78	2,782
TOTAL					2,782

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P1-1	Recutting	cu.m.	240	58.30	13,992
P2-2	Side Ditch	l.m.	19	250.30	4,756
P4-2	Hand Seeding with Mat	sq.m.	290	44.01	12,763
P6-2	Grouted Riprap	cu.m.	19	1,326.00	25,194
TOTAL					56,705

Spot No. L-87

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-1	Removal of Dep. Mat'l	cu.m.	100	34.78	3,478
TOTAL					3,478

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P1-1	Recutting	cu.m.	1030	58.30	60,049
P1-3	Refilling/Embankment	cu.m.	100	68.42	6,842
P2-2	Side Ditch	l.m.	32	250.30	8,010
P4-2	Hand Seeding with Mat	sq.m.	638	44.01	28,078
P6-2	Grouted Riprap	cu.m.	50	1,326.00	66,300
TOTAL					169,279

Spot No. L-90

URGENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
U1-5	Selected Material Fill	cu.m.	25	368.94	9,223
U4-2	Gabion Wall	cu.m.	29	1,424.71	41,316
TOTAL					50,539

PERMANENT RESTORATION MEASURES:

TYPE OF WORK		UNIT	QUAN- TITY	UNIT COST (P)	TOTAL COST (P)
P6-6	Supported Type Conc. Wall	cu.m.	25	2,942.21	73,555
P19-3	Concrete Pavement	cu.m.	20	2,942.21	58,844
P16-2	Gabion Foot Protection	cu.m.	18	1,424.71	25,645
P2-4	R.C.P.C. 0.60 m ϕ	l.m.	45	1,410.17	65,457
TOTAL					221,501

APPENDIX 15-1

**ECONOMIC EVALUATION OF SELECTED
SPOTS**

Economic Evaluation (Benguet)

Spot No.	Bt-1 (Evaluation of Permanent Measures)																																																																																																																				
Road Name	Baguio-Itogon Rd																																																																																																																				
Condition	1-lane			Surface Type=Gravel		Surface Condition=Bad																																																																																																															
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>340</td> <td>638</td> <td>7</td> <td>57</td> <td>0</td> <td>16</td> <td>1058</td> </tr> <tr> <td>2000</td> <td>518</td> <td>991</td> <td>12</td> <td>82</td> <td>0</td> <td>25</td> <td>1628</td> </tr> <tr> <td>2010</td> <td>811</td> <td>1592</td> <td>19</td> <td>122</td> <td>0</td> <td>41</td> <td>2585</td> </tr> <tr> <td>2020</td> <td>1220</td> <td>2456</td> <td>30</td> <td>174</td> <td>0</td> <td>67</td> <td>3947</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total	1992	340	638	7	57	0	16	1058	2000	518	991	12	82	0	25	1628	2010	811	1592	19	122	0	41	2585	2020	1220	2456	30	174	0	67	3947																																																																						
Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total																																																																																																														
1992	340	638	7	57	0	16	1058																																																																																																														
2000	518	991	12	82	0	25	1628																																																																																																														
2010	811	1592	19	122	0	41	2585																																																																																																														
2020	1220	2456	30	174	0	67	3947																																																																																																														
Disaster Type	C-F (Cut Slope Failure)																																																																																																																				
Traffic Interruption	Full Width																																																																																																																				
Disaster Pattern	Pattern-1 (5 times a year)																																																																																																																				
Speed Reduction Length	0.150 km																																																																																																																				
Detour	Original Road : L=15.000 km (Gravel,Bad) Detour Road : L=17.000 km (Gravel,Bad)																																																																																																																				
Urgent Measures	U1-1 : Removal of Deposit Materials U1-2 : Removal of Unstable Materials Cost=0.044 Mp Completed within 12 days after Disaster Occurrence																																																																																																																				
Permanent Measures	P1-1 : Recutting P2-2 : Side Ditch P4-8 : Watling P6-2 : Grouted Riprap P6-9 : Gabion Wall Cost=0.531 Mp																																																																																																																				
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>1.126</td><td>0.158</td><td>1.285</td><td>1.285</td></tr> <tr><td>1993</td><td>1.486</td><td>0.198</td><td>1.684</td><td>1.464</td></tr> <tr><td>1994</td><td>1.568</td><td>0.198</td><td>1.766</td><td>1.335</td></tr> <tr><td>1995</td><td>1.655</td><td>0.198</td><td>1.853</td><td>1.218</td></tr> <tr><td>1996</td><td>1.746</td><td>0.198</td><td>1.944</td><td>1.112</td></tr> <tr><td>1997</td><td>1.843</td><td>0.198</td><td>2.041</td><td>1.015</td></tr> <tr><td>1998</td><td>1.945</td><td>0.198</td><td>2.143</td><td>0.927</td></tr> <tr><td>1999</td><td>2.053</td><td>0.198</td><td>2.251</td><td>0.846</td></tr> <tr><td>2000</td><td>2.167</td><td>0.198</td><td>2.365</td><td>0.773</td></tr> <tr><td>2001</td><td>2.269</td><td>0.198</td><td>2.467</td><td>0.701</td></tr> <tr><td>2002</td><td>2.376</td><td>0.198</td><td>2.574</td><td>0.636</td></tr> <tr><td>2003</td><td>2.488</td><td>0.198</td><td>2.686</td><td>0.577</td></tr> <tr><td>2004</td><td>2.606</td><td>0.198</td><td>2.804</td><td>0.524</td></tr> <tr><td>2005</td><td>2.729</td><td>0.198</td><td>2.927</td><td>0.476</td></tr> <tr><td>2006</td><td>2.857</td><td>0.198</td><td>3.055</td><td>0.432</td></tr> <tr><td>2007</td><td>2.992</td><td>0.198</td><td>3.190</td><td>0.392</td></tr> <tr><td>2008</td><td>3.134</td><td>0.198</td><td>3.332</td><td>0.356</td></tr> <tr><td>2009</td><td>3.282</td><td>0.198</td><td>3.480</td><td>0.323</td></tr> <tr><td>2010</td><td>3.437</td><td>0.198</td><td>3.635</td><td>0.294</td></tr> <tr><td>2011</td><td>3.585</td><td>0.198</td><td>3.783</td><td>0.266</td></tr> <tr> <td>Total</td> <td>47.344</td> <td>3.920</td> <td>51.264</td> <td>14.952</td> </tr> </tbody> </table>							Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	1.126	0.158	1.285	1.285	1993	1.486	0.198	1.684	1.464	1994	1.568	0.198	1.766	1.335	1995	1.655	0.198	1.853	1.218	1996	1.746	0.198	1.944	1.112	1997	1.843	0.198	2.041	1.015	1998	1.945	0.198	2.143	0.927	1999	2.053	0.198	2.251	0.846	2000	2.167	0.198	2.365	0.773	2001	2.269	0.198	2.467	0.701	2002	2.376	0.198	2.574	0.636	2003	2.488	0.198	2.686	0.577	2004	2.606	0.198	2.804	0.524	2005	2.729	0.198	2.927	0.476	2006	2.857	0.198	3.055	0.432	2007	2.992	0.198	3.190	0.392	2008	3.134	0.198	3.332	0.356	2009	3.282	0.198	3.480	0.323	2010	3.437	0.198	3.635	0.294	2011	3.585	0.198	3.783	0.266	Total	47.344	3.920	51.264	14.952
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Economic Evaluation	Total Discounted Benefit = 14.952 Mp Total Discounted Cost = 0.478 Mp Net Present Value (NPV) = 14.474 Mp Benefit/Cost Ratio (B/C) = 31.287 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-2 (Evaluation of Permanent Measures)								
Road	Name	Baguio-Itogon Rd							
	Condition	2-lane	Surface Type=Gravel			Surface Condition=Bad			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	340	638	7	57	0	16	1058
		2000	518	991	12	82	0	25	1628
		2010	811	1592	19	122	0	41	2585
		2020	1220	2456	30	174	0	67	3947
Disaster Type	Rd-D (Scour/Washout of Roadbed)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-4								
Detour	Original Road : L=15.000 km (Gravel,Bad)								
	Detour Road : L=17.000 km (Gravel,Bad)								
Urgent Measures	None								
Permanent Measures	P1-3 : Refilling/Embankment								
	P6-9 : Gabion Wall								
	P19-1 : Gravel Surfacing								
	Cost=11.257 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	-	-	-	-			
		1993	4.860	-	4.860	4.226			
		1994	5.128	-	5.128	3.877			
		1995	5.410	-	5.410	3.557			
		1996	5.708	-	5.708	3.264			
		1997	6.022	-	6.022	2.994			
		1998	6.354	-	6.354	2.747			
		1999	6.704	-	6.704	2.520			
		2000	7.074	-	7.074	2.312			
		2001	7.406	-	7.406	2.105			
		2002	7.754	-	7.754	1.917			
		2003	8.118	-	8.118	1.745			
		2004	8.500	-	8.500	1.589			
		2005	8.899	-	8.899	1.446			
		2006	9.317	-	9.317	1.317			
		2007	9.755	-	9.755	1.199			
		2008	10.213	-	10.213	1.091			
		2009	10.694	-	10.694	0.994			
		2010	11.196	-	11.196	0.905			
		2011	11.676	-	11.676	0.820			
		Total	150.789	-	150.789	40.626			
Economic Evaluation	Total Discounted Benefit		= 40.626 Mp						
	Total Discounted Cost		= 10.131 Mp						
	Net Present Value (NPV)		= 30.495 Mp						
	Benefit/Cost Ratio (B/C)		= 4.010						
	Internal Rate of Return (IRR)		= 53.4 %						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-7 (Evaluation of Permanent Measures)								
Road	Name	Baguio-Itogon Rd							
	Condition	2-lane	Surface Type=Gravel			Surface Condition=Bad			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	340	638	7	57	0	16	1058
		2000	518	991	12	82	0	25	1628
		2010	811	1592	19	122	0	41	2585
		2020	1220	2456	30	174	0	67	3947
Disaster Type	CLV-D (Culvert Damage)								
Traffic Interruption	One-lane								
Disaster Pattern	Pattern-1 (5 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-1 : Removal of Deposit Materials U3-1 : Sheet Covering Cost=0.004 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P6-2 : Grouted Riprap P6-9 : Gabion Wall P16-3 : Grouted Riprap Apron P18-1 : Concrete Spillway Cost=0.125 Mp								
Benefit (Mp)									
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit					Disc'd Benefit
	1992	0.457	0.014	0.472					0.472
	1993	0.603	0.018	0.621					0.540
	1994	0.637	0.018	0.655					0.495
	1995	0.672	0.018	0.690					0.454
	1996	0.710	0.018	0.728					0.416
	1997	0.749	0.018	0.767					0.381
	1998	0.791	0.018	0.809					0.350
	1999	0.835	0.018	0.853					0.321
	2000	0.881	0.018	0.899					0.294
	2001	0.923	0.018	0.941					0.267
	2002	0.967	0.018	0.985					0.243
	2003	1.013	0.018	1.031					0.222
	2004	1.061	0.018	1.079					0.202
	2005	1.111	0.018	1.129					0.183
	2006	1.163	0.018	1.181					0.167
	2007	1.219	0.018	1.237					0.152
	2008	1.276	0.018	1.294					0.138
	2009	1.337	0.018	1.355					0.126
	2010	1.400	0.018	1.418					0.115
	2011	1.461	0.018	1.479					0.104
	Total	19.265	0.356	19.622					5.642
Economic Evaluation	Total Discounted Benefit = 5.642 Mp								
	Total Discounted Cost = 0.112 Mp								
	Net Present Value (NPV) = 5.529 Mp								
	Benefit/Cost Ratio (B/C) = 50.150								
	Internal Rate of Return (IRR) = infinite								
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-11 (Evaluation of Permanent Measures)							
Road	Name	Baguio-Itogon Rd						
Condition	2-lane	Surface Type=Bitum's			Surface Condition=Fair			
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	340	638	7	57	0	16	1058
	2000	518	991	12	82	0	25	1628
	2010	811	1592	19	122	0	41	2585
	2020	1220	2456	30	174	0	67	3947
Disaster Type	L-SL (Landslide)							
Traffic Interruption	Speed Reduction (10 km/hr)							
Disaster Pattern	Pattern-3 (1 times a year)							
Speed Reduction Length	0.100 km							
Urgent Measures	U7-1 : Gravel Surfacing Cost=0.008 Mp Completed within 12 days after Disaster Occurrence							
Permanent Measures	P1-4 : Counterweight Fill P2-1 : Slope Ditch P2-5 : Catch Basin P3-2 : Horizontal Drain Hole P6-9 : Gabion Wall P19-2 : Bituminous Pavement Cost=0.492 Mp							
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	-	-	-	-			
	1993	0.296	0.007	0.303	0.264			
	1994	0.312	0.007	0.320	0.242			
	1995	0.330	0.007	0.337	0.222			
	1996	0.348	0.007	0.355	0.203			
	1997	0.367	0.007	0.375	0.186			
	1998	0.388	0.007	0.395	0.171			
	1999	0.409	0.007	0.417	0.157			
	2000	0.432	0.007	0.439	0.144			
	2001	0.453	0.007	0.460	0.131			
	2002	0.474	0.007	0.481	0.119			
	2003	0.497	0.007	0.504	0.108			
	2004	0.520	0.007	0.527	0.099			
	2005	0.545	0.007	0.552	0.090			
	2006	0.571	0.007	0.578	0.082			
	2007	0.598	0.007	0.605	0.074			
	2008	0.626	0.007	0.633	0.068			
	2009	0.656	0.007	0.663	0.062			
	2010	0.687	0.007	0.694	0.056			
	2011	0.717	0.007	0.724	0.051			
	Total	9.225	0.137	9.362	2.526			
Economic Evaluation	Total Discounted Benefit = 2.526 Mp							
	Total Discounted Cost = 0.443 Mp							
	Net Present Value (NPV) = 2.083 Mp							
	Benefit/Cost Ratio (B/C) = 5.704							
	Internal Rate of Return (IRR) = 73.9 %							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-14 (Evaluation of Permanent Measures)								
Road	Name	Baguio-Bokod Rd							
	Condition	2-lane	Surface Type=Bitum's			Surface Condition=Fair			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	57	120	0	3	109	54	343
		2000	71	151	0	3	137	68	430
		2010	91	200	0	3	181	92	567
		2020	118	265	0	3	241	123	750
Disaster Type	C-F (Cut Slope Failure)								
Traffic Interruption	One-lane								
Disaster Pattern	Pattern-1 (5 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-1 : Removal of Deposit Materials U3-1 : Sheet Covering Cost=0.023 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P1-1 : Recutting P2-2 : Side Ditch P4-2 : Hand Seeding with Mat P5-3 : Stone Pitching P6-2 : Grouted Riprap Cost=0.170 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.106	0.083	0.189	0.189			
		1993	0.136	0.104	0.240	0.209			
		1994	0.140	0.104	0.244	0.184			
		1995	0.144	0.104	0.248	0.163			
		1996	0.148	0.104	0.252	0.144			
		1997	0.153	0.104	0.256	0.127			
		1998	0.157	0.104	0.260	0.113			
		1999	0.161	0.104	0.265	0.100			
		2000	0.166	0.104	0.270	0.088			
		2001	0.171	0.104	0.274	0.078			
		2002	0.175	0.104	0.279	0.069			
		2003	0.180	0.104	0.284	0.061			
		2004	0.185	0.104	0.289	0.054			
		2005	0.190	0.104	0.294	0.048			
		2006	0.196	0.104	0.299	0.042			
		2007	0.201	0.104	0.304	0.037			
		2008	0.207	0.104	0.310	0.033			
		2009	0.212	0.104	0.316	0.029			
		2010	0.218	0.104	0.322	0.026			
		2011	0.224	0.104	0.328	0.023			
		Total	3.471	2.049	5.521	1.817			
Economic Evaluation	Total Discounted Benefit = 1.817 Mp								
	Total Discounted Cost = 0.153 Mp								
	Net Present Value (NPV) = 1.664 Mp								
	Benefit/Cost Ratio (B/C) = 11.876								
	Internal Rate of Return (IRR) = infinite								
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-20 (Evaluation of Permanent Measures)								
Road	Name	Baguio-Bokod Rd							
	Condition	2-lane	Surface Type=Bitum's			Surface Condition=Fair			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	57	120	0	3	109	54	343
		2000	71	151	0	3	137	68	430
		2010	91	200	0	3	181	92	567
		2020	118	265	0	3	241	123	750
Disaster Type	E-F (Embankment Slope Failure)								
Traffic Interruption	Shoulder								
Disaster Pattern	Pattern-3 (5 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-4 : Refilling/Embankment U3-2 : Sand Bag Covering U4-3 : Wooden Fence Cost=0.015 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P6-2 : Grouted Riprap P16-3 : Grouted Riprap Apron Cost=0.049 Mp								
Benefit (Mp)									
		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.048	0.054	0.102	0.102			
		1993	0.062	0.067	0.130	0.113			
		1994	0.064	0.067	0.132	0.099			
		1995	0.066	0.067	0.133	0.088			
		1996	0.068	0.067	0.135	0.077			
		1997	0.070	0.067	0.137	0.068			
		1998	0.072	0.067	0.139	0.060			
		1999	0.074	0.067	0.141	0.053			
		2000	0.076	0.067	0.143	0.047			
		2001	0.078	0.067	0.145	0.041			
		2002	0.080	0.067	0.147	0.036			
		2003	0.082	0.067	0.150	0.032			
		2004	0.084	0.067	0.152	0.028			
		2005	0.087	0.067	0.154	0.025			
		2006	0.089	0.067	0.157	0.022			
		2007	0.092	0.067	0.159	0.020			
		2008	0.094	0.067	0.162	0.017			
		2009	0.097	0.067	0.164	0.015			
		2010	0.099	0.067	0.167	0.013			
		2011	0.102	0.067	0.170	0.012			
		Total	1.584	1.336	2.920	0.971			
Economic Evaluation	Total Discounted Benefit = 0.971 Mp								
	Total Discounted Cost = 0.044 Mp								
	Net Present Value (NPV) = 0.927 Mp								
	Benefit/Cost Ratio (B/C) = 22.017								
	Internal Rate of Return (IRR) = infinite								
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-24 (Evaluation of Permanent Measures)								
Road	Name	Baguio-Bokod Rd							
	Condition	2-lane	Surface Type=Gravel			Surface Condition=Bad			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	57	120	0	3	109	54	343
		2000	71	151	0	3	137	68	430
		2010	91	200	0	3	181	92	567
		2020	118	265	0	3	241	123	750
Disaster Type	D-FL (Debris Flow)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-1 (5 times a year)								
Speed Reduction Length	0.100 km								
Substitutive Transport	Original Road	: L=1.000 km							
	Carabao Sledge/Horse	: L=1.000 km							n= 506 (in 1992)
	Walking/Head Loading	: L=1.000 km							n=2036 (in 1992)
Urgent Measures	U1-1 : Removal of Deposit Materials								
	Cost=0.006 Mp								
	Completed within 12 days after Disaster Occurrence								
Permanent Measures	P1-1 : Recutting								
	P2-2 : Side Ditch								
	P8-2 : Catch Gabion Wall								
	Cost=0.164 Mp								
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit				
	1992	0.575	0.022	0.597	0.597				
	1993	0.738	0.027	0.765	0.665				
	1994	0.757	0.027	0.784	0.593				
	1995	0.777	0.027	0.804	0.529				
	1996	0.798	0.027	0.825	0.472				
	1997	0.819	0.027	0.846	0.421				
	1998	0.841	0.027	0.868	0.375				
	1999	0.863	0.027	0.890	0.335				
	2000	0.886	0.027	0.913	0.299				
	2001	0.909	0.027	0.936	0.266				
	2002	0.933	0.027	0.960	0.237				
	2003	0.957	0.027	0.984	0.212				
	2004	0.982	0.027	1.009	0.189				
	2005	1.008	0.027	1.035	0.168				
	2006	1.034	0.027	1.061	0.150				
	2007	1.062	0.027	1.089	0.134				
	2008	1.090	0.027	1.117	0.119				
	2009	1.118	0.027	1.145	0.106				
	2010	1.148	0.027	1.175	0.095				
	2011	1.178	0.027	1.205	0.085				
	Total	18.475	0.535	19.010	6.045				
Economic Evaluation	Total Discounted Benefit	= 6.045 Mp							
	Total Discounted Cost	= 0.148 Mp							
	Net Present Value (NPV)	= 5.898 Mp							
	Benefit/Cost Ratio (B/C)	= 40.957							
	Internal Rate of Return (IRR)	= infinite (1st year benefit > cost)							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-25 (Evaluation of Permanent Measures)								
Road	Name	Baguio-Bokod Rd			Surface Condition=Bad				
	Condition	2-lane	Surface Type=Gravel,						
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	57	120	0	3	109	54	343
		2000	71	151	0	3	137	68	430
		2010	91	200	0	3	181	92	567
		2020	118	265	0	3	241	123	750
Disaster Type	E-F (Embankment Slope Failure)								
Traffic Interruption	One-lane								
Disaster Pattern	Pattern-3 (5 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U3-1 : Sheet Covering Cost=0.007 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P1-3 : Refilling/Embankment P2-2 : Side Ditch P6-2 : Grouted Riprap P16-1 : Concrete Foot Protection Cost=0.331 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.099	0.025	0.124	0.124			
		1993	0.127	0.032	0.159	0.138			
		1994	0.131	0.032	0.162	0.123			
		1995	0.135	0.032	0.166	0.109			
		1996	0.138	0.032	0.170	0.097			
		1997	0.142	0.032	0.174	0.086			
		1998	0.146	0.032	0.178	0.077			
		1999	0.151	0.032	0.182	0.068			
		2000	0.155	0.032	0.186	0.061			
		2001	0.159	0.032	0.191	0.054			
		2002	0.164	0.032	0.195	0.048			
		2003	0.168	0.032	0.200	0.043			
		2004	0.173	0.032	0.204	0.038			
		2005	0.177	0.032	0.209	0.034			
		2006	0.182	0.032	0.214	0.030			
		2007	0.187	0.032	0.219	0.027			
		2008	0.193	0.032	0.224	0.024			
		2009	0.198	0.032	0.229	0.021			
		2010	0.203	0.032	0.235	0.019			
		2011	0.209	0.032	0.241	0.017			
		Total	3.238	0.624	3.862	1.240			
Economic Evaluation	Total Discounted Benefit = 1.240 Mp								
	Total Discounted Cost = 0.298 Mp								
	Net Present Value (NPV) = 0.942 Mp								
	Benefit/Cost Ratio (B/C) = 4.162								
	Internal Rate of Return (IRR) = 93.8 %								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-33 (Evaluation of Permanent Measures)						
Road Name	Kapangan-Acop Rd						
Condition	2-lane			Surface Type=Gravel		Surface Condition=Bad	
Traffic	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc Total
	1992	44	81	0	2	78	39 244
	2000	54	102	0	2	98	50 306
	2010	70	135	0	2	130	67 404
	2020	90	179	0	2	173	90 534
Disaster Type	FALL (Rock Fall/Debris Fall)						
Traffic Interruption	Full Width						
Disaster Pattern	Pattern-1 (5 times a year)						
Speed Reduction Length	0.100 km						
Substitutive Transport	Original Road : L=1.000 km						
	Carabao Sledge/Horse : L=1.000 km n= 352 (in 1992)						
	Walking/Head Loading : L=1.000 km n=1425 (in 1992)						
Urgent Measures	U1-1 : Removal of Deposit Materials						
	U1-2 : Removal of Unstable Materials						
	Cost=0.003 Mp						
	Completed within 12 days after Disaster Occurrence						
Permanent Measures	P1-1 : Recutting						
	P2-2 : Side Ditch						
	P4-6 : Pick Hole Seeding						
	P6-2 : Grouted Riprap						
	Cost=0.133 Mp						
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit		
	1992	0.401	0.011	0.412	0.412		
	1993	0.514	0.013	0.528	0.459		
	1994	0.528	0.013	0.541	0.409		
	1995	0.542	0.013	0.555	0.365		
	1996	0.556	0.013	0.570	0.326		
	1997	0.571	0.013	0.584	0.290		
	1998	0.586	0.013	0.599	0.259		
	1999	0.601	0.013	0.615	0.231		
	2000	0.617	0.013	0.631	0.206		
	2001	0.634	0.013	0.647	0.184		
	2002	0.650	0.013	0.664	0.164		
	2003	0.667	0.013	0.681	0.146		
	2004	0.685	0.013	0.698	0.131		
	2005	0.703	0.013	0.716	0.116		
	2006	0.722	0.013	0.735	0.104		
	2007	0.741	0.013	0.754	0.093		
	2008	0.760	0.013	0.774	0.083		
	2009	0.780	0.013	0.794	0.074		
	2010	0.801	0.013	0.815	0.066		
	2011	0.823	0.013	0.836	0.059		
	Total	12.882	0.267	13.150	4.177		
Economic Evaluation	Total Discounted Benefit = 4.177 Mp						
	Total Discounted Cost = 0.120 Mp						
	Net Present Value (NPV) = 4.057 Mp						
	Benefit/Cost Ratio (B/C) = 34.895						
	Internal Rate of Return (IRR) = infinite						
	(1st year benefit > cost)						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-38 (Evaluation of Permanent Measures)						
Road Name	Kapangan-Acop Rd		Surface Type=Gravel		Surface Condition=Bad		
Condition Traffic	2-lane						
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc Total
	1992	44	81	0	2	78	39 244
	2000	54	102	0	2	98	50 306
	2010	70	135	0	2	130	67 404
	2020	90	179	0	2	173	90 534
Disaster Type	E-F (Embankment Slope Failure)						
Traffic Interruption	One-lane						
Disaster Pattern	Pattern-3 (5 times a year)						
Speed Reduction Length	0.100 km						
Urgent Measures	U3-1 : Sheet Covering Cost=0.009 Mp Completed within 12 days after Disaster Occurrence						
Permanent Measures	P1-3 : Refilling/Embankment P2-2 : Side Ditch P4-2 : Hand Seeding with Mat P6-2 : Grouted Riprap Cost=0.087 Mp						
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit		
	1992	0.070	0.032	0.102	0.102		
	1993	0.089	0.040	0.130	0.113		
	1994	0.092	0.040	0.132	0.100		
	1995	0.094	0.040	0.135	0.089		
	1996	0.097	0.040	0.138	0.079		
	1997	0.100	0.040	0.140	0.070		
	1998	0.103	0.040	0.143	0.062		
	1999	0.106	0.040	0.146	0.055		
	2000	0.109	0.040	0.149	0.049		
	2001	0.112	0.040	0.152	0.043		
	2002	0.115	0.040	0.155	0.038		
	2003	0.118	0.040	0.158	0.034		
	2004	0.121	0.040	0.162	0.030		
	2005	0.125	0.040	0.165	0.027		
	2006	0.128	0.040	0.169	0.024		
	2007	0.132	0.040	0.172	0.021		
	2008	0.135	0.040	0.176	0.019		
	2009	0.139	0.040	0.180	0.017		
	2010	0.143	0.040	0.183	0.015		
	2011	0.147	0.040	0.187	0.013		
	Total	2.273	0.802	3.075	0.999		
Economic Evaluation	Total Discounted Benefit = 0.999 Mp						
	Total Discounted Cost = 0.078 Mp						
	Net Present Value (NPV) = 0.921 Mp						
	Benefit/Cost Ratio (B/C) = 12.758						
	Internal Rate of Return (IRR) = infinite						
	(1st year benefit > cost)						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-39 (Evaluation of Permanent Measures)								
Road	Name	Kapangan-Acop Rd							
	Condition	2-lane	Surface Type=Gravel			Surface Condition=Bad			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	44	81	0	2	78	39	244
		2000	54	102	0	2	98	50	306
		2010	70	135	0	2	130	67	404
		2020	90	179	0	2	173	90	534
Disaster Type	D-FL (Debris Flow)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-1 (5 times a year)								
Speed Reduction Length	0.100 km								
Substitutive Transport	Original Road	: L=1.000 km							
	Carabao Sledge/Horse	: L=1.000 km							n= 352 (in 1992)
	Walking/Head Loading	: L=1.000 km							n=1425 (in 1992)
Urgent Measures	U1-1 : Removal of Deposit Materials								
	Cost=0.005 Mp								
	Completed within 12 days after Disaster Occurrence								
Permanent Measures	P6-2 : Grouted Riprap								
	P8-2 : Catch Gabion Wall								
	P16-3 : Grouted Riprap Apron								
	P18-1 : Concrete Spillway								
	Cost=0.270 Mp								
Benefit (Mp)									
	Year	Traffic Benefit	Maintenance Benefit		Total Benefit		Disc'd Benefit		
	1992	0.401	0.018		0.419		0.419		
	1993	0.514	0.022		0.537		0.467		
	1994	0.528	0.022		0.550		0.416		
	1995	0.542	0.022		0.564		0.371		
	1996	0.556	0.022		0.579		0.331		
	1997	0.571	0.022		0.593		0.295		
	1998	0.586	0.022		0.608		0.263		
	1999	0.601	0.022		0.624		0.235		
	2000	0.617	0.022		0.640		0.209		
	2001	0.634	0.022		0.656		0.187		
	2002	0.650	0.022		0.673		0.166		
	2003	0.667	0.022		0.690		0.148		
	2004	0.685	0.022		0.707		0.132		
	2005	0.703	0.022		0.725		0.118		
	2006	0.722	0.022		0.744		0.105		
	2007	0.741	0.022		0.763		0.091		
	2008	0.760	0.022		0.783		0.084		
	2009	0.780	0.022		0.803		0.075		
	2010	0.801	0.022		0.824		0.067		
	2011	0.823	0.022		0.845		0.059		
	Total	12.882	0.446		13.328		4.240		
Economic Evaluation	Total Discounted Benefit		=		4.240 Mp				
	Total Discounted Cost		=		0.243 Mp				
	Net Present Value		(NPV)		= 3.997 Mp				
	Benefit/Cost Ratio		(B/C)		= 17.448				
	Internal Rate of Return		(IRR)		= infinite				
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-43 (Evaluation of Permanent Measures)							
Road Name	Kibungan-Kapangan Rd							
Condition	1-lane Surface Type=Bitum's Surface Condition=Bad							
Traffic	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	39	56	0	2	56	28	181
	2000	48	70	0	2	70	35	225
	2010	61	93	0	2	93	47	296
	2020	79	123	0	2	124	63	391
Disaster Type	C-F (Cut Slope Failure)							
Traffic Interruption	Shoulder							
Disaster Pattern	Pattern-1 (5 times a year)							
Speed Reduction Length	0.100 km							
Urgent Measures	U1-1 : Removal of Deposit Materials Cost=0.007 Mp Completed within 12 days after Disaster Occurrence							
Permanent Measures	P1-1 : Recutting P2-2 : Side Ditch P4-6 : Pick Hole Seeding P6-2 : Grouted Riprap Cost=0.154 Mp							
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.052	0.025	0.077	0.077			
	1993	0.066	0.032	0.098	0.085			
	1994	0.068	0.032	0.100	0.075			
	1995	0.070	0.032	0.101	0.067			
	1996	0.072	0.032	0.103	0.059			
	1997	0.074	0.032	0.105	0.052			
	1998	0.076	0.032	0.107	0.046			
	1999	0.078	0.032	0.109	0.041			
	2000	0.080	0.032	0.112	0.036			
	2001	0.082	0.032	0.114	0.032			
	2002	0.084	0.032	0.116	0.029			
	2003	0.087	0.032	0.118	0.025			
	2004	0.089	0.032	0.121	0.023			
	2005	0.092	0.032	0.123	0.020			
	2006	0.094	0.032	0.126	0.018			
	2007	0.097	0.032	0.128	0.016			
	2008	0.099	0.032	0.131	0.014			
	2009	0.102	0.032	0.134	0.012			
	2010	0.105	0.032	0.136	0.011			
	2011	0.108	0.032	0.139	0.010			
	Total	1.675	0.624	2.299	0.749			
Economic Evaluation	Total Discounted Benefit = 0.749 Mp							
	Total Discounted Cost = 0.139 Mp							
	Net Present Value (NPV) = 0.611 Mp							
	Benefit/Cost Ratio (B/C) = 5.405							
	Internal Rate of Return (IRR) = 160.6 %							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-54 (Evaluation of Permanent Measures)								
Road	Name	Kibungan-Kapangan Rd							
Condition	Condition	1-lane	Surface Type=Bitum's			Surface Condition=Bad			
Traffic	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motoreyc	Total
		1992	39	56	0	2	56	28	181
		2000	48	70	0	2	70	35	225
		2010	61	93	0	2	93	47	296
		2020	79	123	0	2	124	63	391
Disaster Type	E-F (Embankment Slope Failure)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-3 (5 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-4 : Refilling/Embankment U4-3 : Wooden Fence Cost=0.003 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P1-3 : Refilling/Embankment P6-9 : Gabion Wall Cost=0.244 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit				Disc'd Benefit
		1992	0.052	0.011	0.062				0.062
		1993	0.066	0.013	0.080				0.069
		1994	0.068	0.013	0.082				0.062
		1995	0.070	0.013	0.083				0.055
		1996	0.072	0.013	0.085				0.049
		1997	0.074	0.013	0.087				0.043
		1998	0.076	0.013	0.089				0.039
		1999	0.078	0.013	0.091				0.034
		2000	0.080	0.013	0.094				0.031
		2001	0.082	0.013	0.096				0.027
		2002	0.084	0.013	0.098				0.024
		2003	0.087	0.013	0.100				0.022
		2004	0.089	0.013	0.103				0.019
		2005	0.092	0.013	0.105				0.017
		2006	0.094	0.013	0.108				0.015
		2007	0.097	0.013	0.110				0.014
		2008	0.099	0.013	0.113				0.012
		2009	0.102	0.013	0.116				0.011
		2010	0.105	0.013	0.118				0.010
		2011	0.108	0.013	0.121				0.009
		Total	1.675	0.267	1.942				0.623
Economic Evaluation	Total Discounted Benefit = 0.623 Mp Total Discounted Cost = 0.220 Mp Net Present Value (NPV) = 0.404 Mp Benefit/Cost Ratio (B/C) = 2.838 Internal Rate of Return (IRR) = 53.1 %								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-55. (Evaluation of Permanent Measures)																																																																																																																	
Road Name	Kibungan-Kapangan Rd																																																																																																																	
Condition	2-lane	Surface Type=Bitum's	Surface Condition=Bad																																																																																																															
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>39</td> <td>56</td> <td>0</td> <td>2</td> <td>56</td> <td>28</td> <td>181</td> </tr> <tr> <td>2000</td> <td>48</td> <td>70</td> <td>0</td> <td>2</td> <td>70</td> <td>35</td> <td>225</td> </tr> <tr> <td>2010</td> <td>61</td> <td>93</td> <td>0</td> <td>2</td> <td>93</td> <td>47</td> <td>296</td> </tr> <tr> <td>2020</td> <td>79</td> <td>123</td> <td>0</td> <td>2</td> <td>124</td> <td>63</td> <td>391</td> </tr> </tbody> </table>				Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total	1992	39	56	0	2	56	28	181	2000	48	70	0	2	70	35	225	2010	61	93	0	2	93	47	296	2020	79	123	0	2	124	63	391																																																																						
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Traffic Interruption	One-lane																																																																																																																	
Disaster Pattern	Pattern-3 (5 times a year)																																																																																																																	
Speed Reduction Length	0.100 km																																																																																																																	
Urgent Measures	U4-1 : Sand Bag Wall Cost=0.013 Mp Completed within 12 days after Disaster Occurrence																																																																																																																	
Permanent Measures	P1-3 : Refilling/Embankment P6-2 : Grouted Riprap P15-1 : Concrete Bridge Cost=0.743 Mp																																																																																																																	
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>0.052</td><td>0.047</td><td>0.098</td><td>0.098</td></tr> <tr><td>1993</td><td>0.066</td><td>0.058</td><td>0.125</td><td>0.109</td></tr> <tr><td>1994</td><td>0.068</td><td>0.058</td><td>0.127</td><td>0.096</td></tr> <tr><td>1995</td><td>0.070</td><td>0.058</td><td>0.128</td><td>0.084</td></tr> <tr><td>1996</td><td>0.072</td><td>0.058</td><td>0.130</td><td>0.075</td></tr> <tr><td>1997</td><td>0.074</td><td>0.058</td><td>0.132</td><td>0.066</td></tr> <tr><td>1998</td><td>0.076</td><td>0.058</td><td>0.134</td><td>0.058</td></tr> <tr><td>1999</td><td>0.078</td><td>0.058</td><td>0.136</td><td>0.051</td></tr> <tr><td>2000</td><td>0.080</td><td>0.058</td><td>0.139</td><td>0.045</td></tr> <tr><td>2001</td><td>0.082</td><td>0.058</td><td>0.141</td><td>0.040</td></tr> <tr><td>2002</td><td>0.084</td><td>0.058</td><td>0.143</td><td>0.035</td></tr> <tr><td>2003</td><td>0.087</td><td>0.058</td><td>0.145</td><td>0.031</td></tr> <tr><td>2004</td><td>0.089</td><td>0.058</td><td>0.148</td><td>0.028</td></tr> <tr><td>2005</td><td>0.092</td><td>0.058</td><td>0.150</td><td>0.024</td></tr> <tr><td>2006</td><td>0.094</td><td>0.058</td><td>0.153</td><td>0.022</td></tr> <tr><td>2007</td><td>0.097</td><td>0.058</td><td>0.155</td><td>0.019</td></tr> <tr><td>2008</td><td>0.099</td><td>0.058</td><td>0.158</td><td>0.017</td></tr> <tr><td>2009</td><td>0.102</td><td>0.058</td><td>0.161</td><td>0.015</td></tr> <tr><td>2010</td><td>0.105</td><td>0.058</td><td>0.163</td><td>0.013</td></tr> <tr><td>2011</td><td>0.108</td><td>0.058</td><td>0.166</td><td>0.012</td></tr> <tr> <td>Total</td> <td>1.675</td> <td>1.158</td> <td>2.833</td> <td>0.938</td> </tr> </tbody> </table>				Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	0.052	0.047	0.098	0.098	1993	0.066	0.058	0.125	0.109	1994	0.068	0.058	0.127	0.096	1995	0.070	0.058	0.128	0.084	1996	0.072	0.058	0.130	0.075	1997	0.074	0.058	0.132	0.066	1998	0.076	0.058	0.134	0.058	1999	0.078	0.058	0.136	0.051	2000	0.080	0.058	0.139	0.045	2001	0.082	0.058	0.141	0.040	2002	0.084	0.058	0.143	0.035	2003	0.087	0.058	0.145	0.031	2004	0.089	0.058	0.148	0.028	2005	0.092	0.058	0.150	0.024	2006	0.094	0.058	0.153	0.022	2007	0.097	0.058	0.155	0.019	2008	0.099	0.058	0.158	0.017	2009	0.102	0.058	0.161	0.015	2010	0.105	0.058	0.163	0.013	2011	0.108	0.058	0.166	0.012	Total	1.675	1.158	2.833	0.938
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1997	0.074	0.058	0.132	0.066																																																																																																														
1998	0.076	0.058	0.134	0.058																																																																																																														
1999	0.078	0.058	0.136	0.051																																																																																																														
2000	0.080	0.058	0.139	0.045																																																																																																														
2001	0.082	0.058	0.141	0.040																																																																																																														
2002	0.084	0.058	0.143	0.035																																																																																																														
2003	0.087	0.058	0.145	0.031																																																																																																														
2004	0.089	0.058	0.148	0.028																																																																																																														
2005	0.092	0.058	0.150	0.024																																																																																																														
2006	0.094	0.058	0.153	0.022																																																																																																														
2007	0.097	0.058	0.155	0.019																																																																																																														
2008	0.099	0.058	0.158	0.017																																																																																																														
2009	0.102	0.058	0.161	0.015																																																																																																														
2010	0.105	0.058	0.163	0.013																																																																																																														
2011	0.108	0.058	0.166	0.012																																																																																																														
Total	1.675	1.158	2.833	0.938																																																																																																														
Economic Evaluation	Total Discounted Benefit = 0.938 Mp Total Discounted Cost = 0.669 Mp Net Present Value (NPV) = 0.269 Mp Benefit/Cost Ratio (B/C) = 1.403 Internal Rate of Return (IRR) = 22.8 %																																																																																																																	

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-57 (Evaluation of Permanent Measures)						
Road Name	Atok-Provincial Rd						
Condition	1-lane Surface Type=Gravel Surface Condition=Bad						
Traffic							
Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
1992	47	95	0	3	88	44	277
2000	58	118	0	3	111	56	346
2010	75	156	0	3	148	76	458
2020	96	207	0	3	196	102	604
Disaster Type	C-F (Cut Slope Failure)						
Traffic Interruption	Shoulder						
Disaster Pattern	Pattern-1 (5 times a year)						
Speed Reduction Length	0.100 km						
Urgent Measures	U1-1 : Removal of Deposit Materials U1-2 : Removal of Unstable Materials Cost=0.007 Mp Completed within 12 days after Disaster Occurrence						
Permanent Measures	P1-1 : Recutting P2-2 : Side Ditch P4-8 : Wattling P6-2 : Grouted Riprap Cost=0.097 Mp						
Benefit (Mp)							
Year	Traffic Benefit	Maintenance Benefit	Total Benefit		Disc'd Benefit		
1992	0.080	0.025	0.105		0.105		
1993	0.102	0.032	0.134		0.116		
1994	0.105	0.032	0.137		0.103		
1995	0.108	0.032	0.139		0.092		
1996	0.111	0.032	0.142		0.081		
1997	0.114	0.032	0.145		0.072		
1998	0.117	0.032	0.149		0.064		
1999	0.120	0.032	0.152		0.057		
2000	0.124	0.032	0.155		0.051		
2001	0.127	0.032	0.158		0.045		
2002	0.131	0.032	0.162		0.040		
2003	0.134	0.032	0.166		0.036		
2004	0.138	0.032	0.169		0.032		
2005	0.142	0.032	0.173		0.028		
2006	0.146	0.032	0.177		0.025		
2007	0.150	0.032	0.181		0.022		
2008	0.154	0.032	0.185		0.020		
2009	0.158	0.032	0.190		0.018		
2010	0.163	0.032	0.194		0.016		
2011	0.167	0.032	0.199		0.014		
Total	2.589	0.624	3.213		1.037		
Economic Evaluation	Total Discounted Benefit = 1.037 Mp						
	Total Discounted Cost = 0.087 Mp						
	Net Present Value (NPV) = 0.950 Mp						
	Benefit/Cost Ratio (B/C) = 11.877						
	Internal Rate of Return (IRR) = infinite (1st year benefit > cost)						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-58 (Evaluation of Permanent Measures)								
Road	Name Condition Traffic	Atok-Provincial Rd 1-lane			Surface Type=Gravel		Surface Condition=Bad		
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	47	95	0	3	88	44	277
		2000	58	118	0	3	111	56	346
		2010	75	156	0	3	148	76	458
		2020	96	207	0	3	196	102	604
Disaster Type	E-F (Embankment Slope Failure)								
Traffic Interruption	Shoulder								
Disaster Pattern	Pattern-3 (5 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U3-1 : Sheet Covering Cost=0.004 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P6-2 : Grouted Riprap P16-2 : Gabion Foot Protection P16-3 : Grouted Riprap Apron Cost=0.149 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.080	0.014	0.094	0.094			
		1993	0.102	0.018	0.120	0.105			
		1994	0.105	0.018	0.123	0.093			
		1995	0.108	0.018	0.126	0.083			
		1996	0.111	0.018	0.129	0.074			
		1997	0.114	0.018	0.132	0.066			
		1998	0.117	0.018	0.135	0.058			
		1999	0.120	0.018	0.138	0.052			
		2000	0.124	0.018	0.142	0.046			
		2001	0.127	0.018	0.145	0.041			
		2002	0.131	0.018	0.149	0.037			
		2003	0.134	0.018	0.152	0.033			
		2004	0.138	0.018	0.156	0.029			
		2005	0.142	0.018	0.160	0.026			
		2006	0.146	0.018	0.164	0.023			
		2007	0.150	0.018	0.168	0.021			
		2008	0.154	0.018	0.172	0.018			
		2009	0.158	0.018	0.176	0.016			
		2010	0.163	0.018	0.181	0.015			
		2011	0.167	0.018	0.185	0.013			
		Total	2.589	0.356	2.945	0.942			
Economic Evaluation	Total Discounted Benefit = 0.942 Mp Total Discounted Cost = 0.134 Mp Net Present Value (NPV) = 0.808 Mp Benefit/Cost Ratio (B/C) = 7.028 Internal Rate of Return (IRR) = 304.0 %								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-59 (Evaluation of Permanent Measures)																																																																																																																				
Road	Name	Atok-Provincial Rd																																																																																																																			
	Condition	1-lane	Surface Type=Gravel			Surface Condition=Bad																																																																																																															
	Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcye</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>47</td> <td>95</td> <td>0</td> <td>3</td> <td>88</td> <td>44</td> <td>277</td> </tr> <tr> <td>2000</td> <td>58</td> <td>118</td> <td>0</td> <td>3</td> <td>111</td> <td>56</td> <td>346</td> </tr> <tr> <td>2010</td> <td>75</td> <td>156</td> <td>0</td> <td>3</td> <td>148</td> <td>76</td> <td>458</td> </tr> <tr> <td>2020</td> <td>96</td> <td>207</td> <td>0</td> <td>3</td> <td>196</td> <td>102</td> <td>604</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcye	Total	1992	47	95	0	3	88	44	277	2000	58	118	0	3	111	56	346	2010	75	156	0	3	148	76	458	2020	96	207	0	3	196	102	604																																																																					
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Traffic Interruption	Full Width																																																																																																																				
Disaster Pattern	Pattern-1 (5 times a year)																																																																																																																				
Speed Reduction Length	0.150 km																																																																																																																				
Substitutive Transport	Original Road : L=1.000 km Carabao Sledge/Horse : L=1.000 km n= 412 (in 1992) Walking/Head Loading : L=1.000 km n=1678 (in 1992)																																																																																																																				
Urgent Measures	U1-1 : Removal of Deposit Materials Cost=0.007 Mp Completed within 12 days after Disaster Occurrence																																																																																																																				
Permanent Measures	P2-2 : Side Ditch P4-8 : Wattling P6-2 : Grouted Riprap Cost=0.223 Mp																																																																																																																				
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>0.495</td><td>0.025</td><td>0.520</td><td>0.520</td></tr> <tr><td>1993</td><td>0.634</td><td>0.032</td><td>0.665</td><td>0.578</td></tr> <tr><td>1994</td><td>0.650</td><td>0.032</td><td>0.681</td><td>0.515</td></tr> <tr><td>1995</td><td>0.666</td><td>0.032</td><td>0.697</td><td>0.458</td></tr> <tr><td>1996</td><td>0.682</td><td>0.032</td><td>0.714</td><td>0.408</td></tr> <tr><td>1997</td><td>0.700</td><td>0.032</td><td>0.731</td><td>0.364</td></tr> <tr><td>1998</td><td>0.717</td><td>0.032</td><td>0.749</td><td>0.324</td></tr> <tr><td>1999</td><td>0.735</td><td>0.032</td><td>0.767</td><td>0.288</td></tr> <tr><td>2000</td><td>0.754</td><td>0.032</td><td>0.786</td><td>0.257</td></tr> <tr><td>2001</td><td>0.773</td><td>0.032</td><td>0.805</td><td>0.229</td></tr> <tr><td>2002</td><td>0.793</td><td>0.032</td><td>0.825</td><td>0.204</td></tr> <tr><td>2003</td><td>0.814</td><td>0.032</td><td>0.845</td><td>0.182</td></tr> <tr><td>2004</td><td>0.835</td><td>0.032</td><td>0.867</td><td>0.162</td></tr> <tr><td>2005</td><td>0.857</td><td>0.032</td><td>0.888</td><td>0.144</td></tr> <tr><td>2006</td><td>0.879</td><td>0.032</td><td>0.911</td><td>0.129</td></tr> <tr><td>2007</td><td>0.902</td><td>0.032</td><td>0.934</td><td>0.115</td></tr> <tr><td>2008</td><td>0.926</td><td>0.032</td><td>0.957</td><td>0.102</td></tr> <tr><td>2009</td><td>0.950</td><td>0.032</td><td>0.981</td><td>0.091</td></tr> <tr><td>2010</td><td>0.975</td><td>0.032</td><td>1.006</td><td>0.081</td></tr> <tr><td>2011</td><td>1.000</td><td>0.032</td><td>1.032</td><td>0.073</td></tr> <tr> <td>Total</td> <td>15.737</td> <td>0.624</td> <td>16.361</td> <td>5.224</td> </tr> </tbody> </table>							Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	0.495	0.025	0.520	0.520	1993	0.634	0.032	0.665	0.578	1994	0.650	0.032	0.681	0.515	1995	0.666	0.032	0.697	0.458	1996	0.682	0.032	0.714	0.408	1997	0.700	0.032	0.731	0.364	1998	0.717	0.032	0.749	0.324	1999	0.735	0.032	0.767	0.288	2000	0.754	0.032	0.786	0.257	2001	0.773	0.032	0.805	0.229	2002	0.793	0.032	0.825	0.204	2003	0.814	0.032	0.845	0.182	2004	0.835	0.032	0.867	0.162	2005	0.857	0.032	0.888	0.144	2006	0.879	0.032	0.911	0.129	2007	0.902	0.032	0.934	0.115	2008	0.926	0.032	0.957	0.102	2009	0.950	0.032	0.981	0.091	2010	0.975	0.032	1.006	0.081	2011	1.000	0.032	1.032	0.073	Total	15.737	0.624	16.361	5.224
Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit																																																																																																																	
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Total	15.737	0.624	16.361	5.224																																																																																																																	
Economic Evaluation	Total Discounted Benefit = 5.224 Mp Total Discounted Cost = 0.201 Mp Net Present Value (NPV) = 5.023 Mp Benefit/Cost Ratio (B/C) = 26.028 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-62 (Evaluation of Permanent Measures)								
Road	Name	Baguio-Itoyon Rd							
	Condition	2-lane	Surface Type=Gravel			Surface Condition=Bad			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	340	638	7	57	0	16	1058
		2000	518	991	12	82	0	25	1628
		2010	811	1592	19	122	0	41	2585
		2020	1220	2456	30	174	0	67	3947
Disaster Type	D-FL (Debris Flow)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-1 (5 times a year)								
Speed Reduction Length	0.100 km								
Detour	Original Road : L=15.000 km (Gravel,Bad)								
	Detour Road : L=17.000 km (Gravel,Bad)								
Urgent Measures	U1-1 : Removal of Deposit Materials								
	U1-2 : Removal of Unstable Materials								
	Cost=0.007 Mp								
	Completed within 12 days after Disaster Occurrence								
Permanent Measures	P6-2 : Grouted Riprap								
	P8-2 : Catch Gabion Wall								
	P16-3 : Grouted Riprap Apron								
	Cost=0.122 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.988	0.025	1.013	1.013			
		1993	1.303	0.032	1.335	1.161			
		1994	1.375	0.032	1.407	1.064			
		1995	1.451	0.032	1.483	0.975			
		1996	1.531	0.032	1.563	0.894			
		1997	1.616	0.032	1.647	0.819			
		1998	1.705	0.032	1.737	0.751			
		1999	1.800	0.032	1.831	0.688			
		2000	1.899	0.032	1.931	0.631			
		2001	1.989	0.032	2.020	0.574			
		2002	2.082	0.032	2.114	0.523			
		2003	2.181	0.032	2.212	0.475			
		2004	2.283	0.032	2.315	0.433			
		2005	2.391	0.032	2.423	0.394			
		2006	2.504	0.032	2.535	0.358			
		2007	2.622	0.032	2.653	0.326			
		2008	2.745	0.032	2.777	0.297			
		2009	2.875	0.032	2.906	0.270			
		2010	3.011	0.032	3.042	0.246			
		2011	3.140	0.032	3.172	0.223			
		Total	41.492	0.624	42.115	12.114			
Economic Evaluation	Total Discounted Benefit		= 12.114 Mp						
	Total Discounted Cost		= 0.110 Mp						
	Net Present Value (NPV)		= 12.004 Mp						
	Benefit/Cost Ratio (B/C)		= 110.326						
	Internal Rate of Return (IRR)		= infinite						
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-63 (Evaluation of Permanent Measures)																																																																																																																						
Road	Name	Abatan-Mankayan Rd																																																																																																																					
Condition	Traffic	2-lane	Surface Type=Gravel			Surface Condition=Bad																																																																																																																	
		Year	Car	Jeep'y	Bus	Truck	Tricycle	Motorcycle	Total																																																																																																														
		1992	210	155	41	182	0	2	590																																																																																																														
		2000	319	241	65	266	0	3	894																																																																																																														
		2010	500	387	106	394	0	5	1392																																																																																																														
		2020	752	597	166	561	0	8	2084																																																																																																														
Disaster Type	PBr-A (Permanent Bridge Approach Washout)																																																																																																																						
Traffic Interruption	Full Width																																																																																																																						
Disaster Pattern	Pattern-2																																																																																																																						
Speed Reduction Length	0.100 km																																																																																																																						
Urgent Measures	UG-3 : Bailey Bridge Cost=0.122 Mp (0.239 Mp in w/o case) Completed within 24 days after Disaster Occurrence																																																																																																																						
Permanent Measures	PG-2 : Grouted Riprap PI5-1 : Concrete Bridge Cost=1.396 Mp																																																																																																																						
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>-</td><td>0.105</td><td>0.105</td><td>0.105</td></tr> <tr><td>1993</td><td>0.388</td><td>0.011</td><td>0.398</td><td>0.346</td></tr> <tr><td>1994</td><td>0.408</td><td>0.011</td><td>0.419</td><td>0.317</td></tr> <tr><td>1995</td><td>0.430</td><td>0.011</td><td>0.441</td><td>0.290</td></tr> <tr><td>1996</td><td>0.454</td><td>0.011</td><td>0.464</td><td>0.265</td></tr> <tr><td>1997</td><td>0.478</td><td>0.011</td><td>0.489</td><td>0.243</td></tr> <tr><td>1998</td><td>0.504</td><td>0.011</td><td>0.514</td><td>0.222</td></tr> <tr><td>1999</td><td>0.531</td><td>0.011</td><td>0.541</td><td>0.204</td></tr> <tr><td>2000</td><td>0.559</td><td>0.011</td><td>0.570</td><td>0.186</td></tr> <tr><td>2001</td><td>0.585</td><td>0.011</td><td>0.595</td><td>0.169</td></tr> <tr><td>2002</td><td>0.611</td><td>0.011</td><td>0.622</td><td>0.154</td></tr> <tr><td>2003</td><td>0.639</td><td>0.011</td><td>0.650</td><td>0.140</td></tr> <tr><td>2004</td><td>0.668</td><td>0.011</td><td>0.679</td><td>0.127</td></tr> <tr><td>2005</td><td>0.699</td><td>0.011</td><td>0.710</td><td>0.115</td></tr> <tr><td>2006</td><td>0.731</td><td>0.011</td><td>0.741</td><td>0.105</td></tr> <tr><td>2007</td><td>0.764</td><td>0.011</td><td>0.775</td><td>0.095</td></tr> <tr><td>2008</td><td>0.799</td><td>0.011</td><td>0.809</td><td>0.087</td></tr> <tr><td>2009</td><td>0.835</td><td>0.011</td><td>0.846</td><td>0.079</td></tr> <tr><td>2010</td><td>0.873</td><td>0.011</td><td>0.884</td><td>0.071</td></tr> <tr><td>2011</td><td>0.909</td><td>0.011</td><td>0.920</td><td>0.065</td></tr> <tr><td>Total</td><td>11.865</td><td>0.310</td><td>12.174</td><td>3.385</td></tr> </tbody> </table>									Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	-	0.105	0.105	0.105	1993	0.388	0.011	0.398	0.346	1994	0.408	0.011	0.419	0.317	1995	0.430	0.011	0.441	0.290	1996	0.454	0.011	0.464	0.265	1997	0.478	0.011	0.489	0.243	1998	0.504	0.011	0.514	0.222	1999	0.531	0.011	0.541	0.204	2000	0.559	0.011	0.570	0.186	2001	0.585	0.011	0.595	0.169	2002	0.611	0.011	0.622	0.154	2003	0.639	0.011	0.650	0.140	2004	0.668	0.011	0.679	0.127	2005	0.699	0.011	0.710	0.115	2006	0.731	0.011	0.741	0.105	2007	0.764	0.011	0.775	0.095	2008	0.799	0.011	0.809	0.087	2009	0.835	0.011	0.846	0.079	2010	0.873	0.011	0.884	0.071	2011	0.909	0.011	0.920	0.065	Total	11.865	0.310	12.174	3.385
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Economic Evaluation	Total Discounted Benefit = 3.385 Mp Total Discounted Cost = 1.256 Mp Net Present Value (NPV) = 2.129 Mp Benefit/Cost Ratio (B/C) = 2.695 Internal Rate of Return (IRR) = 39.6 %																																																																																																																						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-68 (Evaluation of Permanent Measures)																																																																																																																				
Road Name	Abatan-Mankayan Rd																																																																																																																				
Condition	1-lane			Surface Type=Gravel		Surface Condition=Bad																																																																																																															
Traffic																																																																																																																					
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motoreyc Total																																																																																																														
	1992	210	155	41	182	0	2 590																																																																																																														
	2000	319	241	65	266	0	3 894																																																																																																														
	2010	500	387	106	394	0	5 1392																																																																																																														
	2020	752	597	166	561	0	8 2084																																																																																																														
Disaster Type	CIV-D (Culvert Damage)																																																																																																																				
Traffic Interruption	Shoulder																																																																																																																				
Disaster Pattern	Pattern-3 (5 times a year)																																																																																																																				
Speed Reduction Length	0.100 km																																																																																																																				
Urgent Measures	U1-4 : Refilling/Embankment U3-1 : Sheet Covering U3-2 : Sand Bag Covering U4-1 : Sand Bag Wall Cost=0.015 Mp Completed within 12 days after Disaster Occurrence																																																																																																																				
Permanent Measures	P2-4 : Culvert P2-5 : Catch Basin P6-2 : Grouted Riprap P16-3 : Grouted Riprap Apron Cost=0.068 Mp																																																																																																																				
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Total	11.890	1.336	13.226	3.902																																																																																																																	
Economic Evaluation	Total Discounted Benefit = 3.902 Mp Total Discounted Cost = 0.061 Mp Net Present Value (NPV) = 3.841 Mp Benefit/Cost Ratio (B/C) = 63.758 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Benguet)

Spot No.	Bt-70 (Evaluation of Permanent Measures)						
Road	Name	Kapangan-Acop Rd					
Condition	2-lane	Surface Type=Gravel			Surface Condition=Bad		
Traffic							
	Year	Car	Jeep'y	Bus	Truck	Tricycle	Motorcycle Total
	1992	44	81	0	2	78	39 244
	2000	54	102	0	2	98	50 306
	2010	70	135	0	2	130	67 404
	2020	90	179	0	2	173	90 534
Disaster Type	D-FL (Debris Flow)						
Traffic Interruption	Full Width						
Disaster Pattern	Pattern-1 (5 times a year)						
Speed Reduction Length	0.100 km						
Substitutive Transport	Original Road	: L=1.000 km					
	Carabao Sledge/Horse	: L=1.000 km			n= 352 (in 1992)		
	Walking/Head Loading	: L=1.000 km			n=1425 (in 1992)		
Urgent Measures	U1-1 : Removal of Deposit Materials Cost=0.014 Mp Completed within 12 days after Disaster Occurrence						
Permanent Measures	P1-3 : Refilling/Embankment P15-1 : Concrete Bridge P19-1 : Gravel Surfacing Cost=5.018 Mp						
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit		
	1992	0.401	0.050	0.451	0.451		
	1993	0.514	0.063	0.577	0.502		
	1994	0.528	0.063	0.591	0.447		
	1995	0.542	0.063	0.605	0.398		
	1996	0.556	0.063	0.619	0.354		
	1997	0.571	0.063	0.634	0.315		
	1998	0.586	0.063	0.649	0.281		
	1999	0.601	0.063	0.664	0.250		
	2000	0.617	0.063	0.680	0.222		
	2001	0.634	0.063	0.697	0.198		
	2002	0.650	0.063	0.713	0.176		
	2003	0.667	0.063	0.730	0.157		
	2004	0.685	0.063	0.748	0.140		
	2005	0.703	0.063	0.766	0.124		
	2006	0.722	0.063	0.785	0.111		
	2007	0.741	0.063	0.804	0.099		
	2008	0.760	0.063	0.823	0.088		
	2009	0.780	0.063	0.843	0.078		
	2010	0.801	0.063	0.864	0.070		
	2011	0.823	0.063	0.886	0.062		
	Total	12.882	1.247	14.130	4.523		
Economic Evaluation	Total Discounted Benefit = 4.523 Mp						
	Total Discounted Cost = 4.516 Mp						
	Net Present Value (NPV) = 0.007 Mp						
	Benefit/Cost Ratio (B/C) = 1.002						
	Internal Rate of Return (IRR) = 15.0 %						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-3 (Evaluation of Permanent Measures)																																																																																																																					
Road Name	Matingain-Tabla Rd																																																																																																																					
Condition	2-lane			Surface Type=Bitum's		Surface Condition=Fair																																																																																																																
Traffic																																																																																																																						
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total																																																																																																														
	1992	305	150	1	52	35	37	580																																																																																																														
	2000	450	225	2	75	51	56	859																																																																																																														
	2010	694	353	3	111	79	90	1330																																																																																																														
	2020	1032	534	5	158	118	139	1986																																																																																																														
Disaster Type	E-F (Embankment Slope Failure)																																																																																																																					
Traffic Interruption	One-lane																																																																																																																					
Disaster Pattern	Pattern-3 (3 times a year)																																																																																																																					
Speed Reduction Length	0.100 km																																																																																																																					
Urgent Measures	U1-4 : Refilling/Embankment U3-2 : Sand Bag Covering Cost=0.005 Mp Completed within 12 days after Disaster Occurrence																																																																																																																					
Permanent Measures	P1-3 : Refilling/Embankment P6-2 : Grouted Riprap P16-3 : Grouted Riprap Apron Cost=0.057 Mp																																																																																																																					
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>0.185</td><td>0.009</td><td>0.194</td><td>0.194</td></tr> <tr><td>1993</td><td>0.291</td><td>0.013</td><td>0.305</td><td>0.265</td></tr> <tr><td>1994</td><td>0.306</td><td>0.013</td><td>0.320</td><td>0.242</td></tr> <tr><td>1995</td><td>0.321</td><td>0.013</td><td>0.335</td><td>0.220</td></tr> <tr><td>1996</td><td>0.338</td><td>0.013</td><td>0.351</td><td>0.201</td></tr> <tr><td>1997</td><td>0.355</td><td>0.013</td><td>0.368</td><td>0.183</td></tr> <tr><td>1998</td><td>0.373</td><td>0.013</td><td>0.386</td><td>0.167</td></tr> <tr><td>1999</td><td>0.392</td><td>0.013</td><td>0.405</td><td>0.152</td></tr> <tr><td>2000</td><td>0.411</td><td>0.013</td><td>0.425</td><td>0.139</td></tr> <tr><td>2001</td><td>0.430</td><td>0.013</td><td>0.443</td><td>0.126</td></tr> <tr><td>2002</td><td>0.449</td><td>0.013</td><td>0.462</td><td>0.114</td></tr> <tr><td>2003</td><td>0.469</td><td>0.013</td><td>0.482</td><td>0.104</td></tr> <tr><td>2004</td><td>0.489</td><td>0.013</td><td>0.503</td><td>0.094</td></tr> <tr><td>2005</td><td>0.511</td><td>0.013</td><td>0.525</td><td>0.085</td></tr> <tr><td>2006</td><td>0.534</td><td>0.013</td><td>0.547</td><td>0.077</td></tr> <tr><td>2007</td><td>0.558</td><td>0.013</td><td>0.571</td><td>0.070</td></tr> <tr><td>2008</td><td>0.583</td><td>0.013</td><td>0.596</td><td>0.064</td></tr> <tr><td>2009</td><td>0.608</td><td>0.013</td><td>0.622</td><td>0.058</td></tr> <tr><td>2010</td><td>0.635</td><td>0.013</td><td>0.649</td><td>0.052</td></tr> <tr><td>2011</td><td>0.661</td><td>0.013</td><td>0.675</td><td>0.047</td></tr> <tr> <td>Total</td> <td>8.899</td> <td>0.266</td> <td>9.164</td> <td>2.655</td> </tr> </tbody> </table>								Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	0.185	0.009	0.194	0.194	1993	0.291	0.013	0.305	0.265	1994	0.306	0.013	0.320	0.242	1995	0.321	0.013	0.335	0.220	1996	0.338	0.013	0.351	0.201	1997	0.355	0.013	0.368	0.183	1998	0.373	0.013	0.386	0.167	1999	0.392	0.013	0.405	0.152	2000	0.411	0.013	0.425	0.139	2001	0.430	0.013	0.443	0.126	2002	0.449	0.013	0.462	0.114	2003	0.469	0.013	0.482	0.104	2004	0.489	0.013	0.503	0.094	2005	0.511	0.013	0.525	0.085	2006	0.534	0.013	0.547	0.077	2007	0.558	0.013	0.571	0.070	2008	0.583	0.013	0.596	0.064	2009	0.608	0.013	0.622	0.058	2010	0.635	0.013	0.649	0.052	2011	0.661	0.013	0.675	0.047	Total	8.899	0.266	9.164	2.655
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1992	0.185	0.009	0.194	0.194																																																																																																																		
1993	0.291	0.013	0.305	0.265																																																																																																																		
1994	0.306	0.013	0.320	0.242																																																																																																																		
1995	0.321	0.013	0.335	0.220																																																																																																																		
1996	0.338	0.013	0.351	0.201																																																																																																																		
1997	0.355	0.013	0.368	0.183																																																																																																																		
1998	0.373	0.013	0.386	0.167																																																																																																																		
1999	0.392	0.013	0.405	0.152																																																																																																																		
2000	0.411	0.013	0.425	0.139																																																																																																																		
2001	0.430	0.013	0.443	0.126																																																																																																																		
2002	0.449	0.013	0.462	0.114																																																																																																																		
2003	0.469	0.013	0.482	0.104																																																																																																																		
2004	0.489	0.013	0.503	0.094																																																																																																																		
2005	0.511	0.013	0.525	0.085																																																																																																																		
2006	0.534	0.013	0.547	0.077																																																																																																																		
2007	0.558	0.013	0.571	0.070																																																																																																																		
2008	0.583	0.013	0.596	0.064																																																																																																																		
2009	0.608	0.013	0.622	0.058																																																																																																																		
2010	0.635	0.013	0.649	0.052																																																																																																																		
2011	0.661	0.013	0.675	0.047																																																																																																																		
Total	8.899	0.266	9.164	2.655																																																																																																																		
Economic Evaluation	Total Discounted Benefit = 2.655 Mp Total Discounted Cost = 0.051 Mp Net Present Value (NPV) = 2.603 Mp Benefit/Cost Ratio (B/C) = 51.750 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)																																																																																																																					

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-6 (Evaluation of Permanent Measures)																																																																																																																				
Road	Name	Calaca-Sinisian Rd																																																																																																																			
Condition	2-lane	Surface Type=Bitum's			Surface Condition=Good																																																																																																																
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>1290</td> <td>965</td> <td>15</td> <td>1858</td> <td>167</td> <td>196</td> <td>4491</td> </tr> <tr> <td>2000</td> <td>1907</td> <td>1445</td> <td>23</td> <td>2650</td> <td>248</td> <td>298</td> <td>6571</td> </tr> <tr> <td>2010</td> <td>2942</td> <td>2268</td> <td>37</td> <td>3911</td> <td>385</td> <td>478</td> <td>10021</td> </tr> <tr> <td>2020</td> <td>4376</td> <td>3159</td> <td>57</td> <td>5565</td> <td>576</td> <td>738</td> <td>14471</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total	1992	1290	965	15	1858	167	196	4491	2000	1907	1445	23	2650	248	298	6571	2010	2942	2268	37	3911	385	478	10021	2020	4376	3159	57	5565	576	738	14471																																																																						
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2020	4376	3159	57	5565	576	738	14471																																																																																																														
Disaster Type	PBr-D (Permanent Bridge Other Damage)																																																																																																																				
Traffic Interruption	Full Width																																																																																																																				
Disaster Pattern	Pattern-5 (collapse after 3 years)																																																																																																																				
Detour	Original Road : L=10.000 km (Bitum's,Good) Detour Road : L=20.000 km (Gravel ,Bad)																																																																																																																				
Urgent Measures	U5-1 : Gabion Foot Protection Cost=0.006 Mp																																																																																																																				
Permanent Measures	P14-2 : Gabion Consolidation P16-1 : Concrete Foot Protection Cost=0.354 Mp																																																																																																																				
Collapse in w/o Case	Restoration Cost=4.662 Mp Completed within 180 days after Collapse																																																																																																																				
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1993</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1994</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1995</td><td>97.179</td><td>4.196</td><td>101.375</td><td>66.656</td></tr> <tr><td>1996</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1997</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1998</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1999</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2000</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2001</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2002</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2003</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2004</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2005</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2006</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2007</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2008</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2009</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2010</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>2011</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>Total</td><td>97.179</td><td>4.196</td><td>101.375</td><td>66.656</td></tr> </tbody> </table>							Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	-	-	-	-	1993	-	-	-	-	1994	-	-	-	-	1995	97.179	4.196	101.375	66.656	1996	-	-	-	-	1997	-	-	-	-	1998	-	-	-	-	1999	-	-	-	-	2000	-	-	-	-	2001	-	-	-	-	2002	-	-	-	-	2003	-	-	-	-	2004	-	-	-	-	2005	-	-	-	-	2006	-	-	-	-	2007	-	-	-	-	2008	-	-	-	-	2009	-	-	-	-	2010	-	-	-	-	2011	-	-	-	-	Total	97.179	4.196	101.375	66.656
Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit																																																																																																																	
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Total	97.179	4.196	101.375	66.656																																																																																																																	
Economic Evaluation	<table> <tr> <td>Total Discounted Benefit</td> <td>=</td> <td>66.656 Mp</td> </tr> <tr> <td>Total Discounted Cost</td> <td>=</td> <td>0.324 Mp</td> </tr> <tr> <td>Net Present Value (NPV)</td> <td>=</td> <td>66.332 Mp</td> </tr> <tr> <td>Benefit/Cost Ratio (B/C)</td> <td>=</td> <td>205.727</td> </tr> <tr> <td>Internal Rate of Return (IRR)</td> <td>=</td> <td>578.9 %</td> </tr> </table>							Total Discounted Benefit	=	66.656 Mp	Total Discounted Cost	=	0.324 Mp	Net Present Value (NPV)	=	66.332 Mp	Benefit/Cost Ratio (B/C)	=	205.727	Internal Rate of Return (IRR)	=	578.9 %																																																																																															
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Note : Total Discounted Cost = 90 % of Urgent & Permanent Measures Costs

Economic Evaluation (Batangas)

Spot No.	Bs-8 (Evaluation of Permanent Measures)								
Road	Name	Mabini-Saguing Rd							
	Condition	2-lane	Surface Type=Bitum's			Surface Condition=Very bad			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	338	511	3	136	139	23	1150
		2000	499	766	5	194	206	35	1705
		2010	770	1202	8	286	320	56	2642
		2020	1145	1819	12	407	479	86	3948
Disaster Type	SW-D (Seawall Damage)								
Traffic Interruption	Shoulder								
Disaster Pattern	Pattern-3 (3 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U4-1 : Sand Bag Wall U4-3 : Wooden Fence Cost=0.001 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P6-4 : Gravity Type Stone Masonry Wall Cost=0.008 Mp								
Benefit (Mp)									
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit				
	1992	0.184	0.002	0.186	0.186				
	1993	0.291	0.003	0.293	0.255				
	1994	0.305	0.003	0.308	0.233				
	1995	0.321	0.003	0.323	0.213				
	1996	0.337	0.003	0.339	0.194				
	1997	0.354	0.003	0.356	0.177				
	1998	0.371	0.003	0.374	0.162				
	1999	0.390	0.003	0.393	0.148				
	2000	0.410	0.003	0.412	0.135				
	2001	0.428	0.003	0.431	0.122				
	2002	0.447	0.003	0.450	0.111				
	2003	0.467	0.003	0.470	0.101				
	2004	0.488	0.003	0.490	0.092				
	2005	0.509	0.003	0.512	0.083				
	2006	0.532	0.003	0.535	0.076				
	2007	0.556	0.003	0.559	0.069				
	2008	0.581	0.003	0.583	0.062				
	2009	0.606	0.003	0.609	0.057				
	2010	0.633	0.003	0.636	0.051				
	2011	0.659	0.003	0.662	0.047				
	Total	8.870	0.053	8.923	2.573				
Economic Evaluation	Total Discounted Benefit		=	2.573 Mp					
	Total Discounted Cost		=	0.007 Mp					
	Net Present Value (NPV)		=	2.566 Mp					
	Benefit/Cost Ratio (B/C)		=	357.323					
	Internal Rate of Return (IRR)		=	infinite					
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-12 (Evaluation of Permanent Measures)								
Road	Name	Mabini-Solo Rd							
	Condition	2-lane			Surface Type=Gravel	Surface Condition=Bad			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	89	65	0	15	13	18	200
		2000	132	98	0	21	19	27	297
		2010	204	154	0	31	29	43	461
		2020	303	233	0	44	4	66	650
Disaster Type	FALL (Rock Fall/Debris Fall)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-1 (3 times a year)								
Speed Reduction Length	0.150 km								
Substitutive Transport	Original Road : L=1.000 km								
	Carabao Sledge/Horse : L=1.000 km n= 470 (in 1992)								
	Walking/Head Loading : L=1.000 km n=2384 (in 1992)								
Urgent Measures	U1-1 : Removal of Deposit Materials								
	U1-2 : Removal of Unstable Materials								
	Cost=0.006 Mp								
	Completed within 12 days after Disaster Occurrence								
Permanent Measures	P8-2 : Catch Gabion Wall								
	P19-1 : Gravel Surfacing								
	Cost=0.123 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.341	0.011	0.352	0.352		0.352	
		1993	0.536	0.016	0.552	0.480		0.480	
		1994	0.562	0.016	0.578	0.437		0.437	
		1995	0.589	0.016	0.605	0.398		0.398	
		1996	0.618	0.016	0.634	0.362		0.362	
		1997	0.648	0.016	0.664	0.330		0.330	
		1998	0.679	0.016	0.695	0.300		0.300	
		1999	0.712	0.016	0.728	0.274		0.274	
		2000	0.746	0.016	0.762	0.249		0.249	
		2001	0.779	0.016	0.795	0.226		0.226	
		2002	0.812	0.016	0.828	0.205		0.205	
		2003	0.848	0.016	0.864	0.186		0.186	
		2004	0.884	0.016	0.900	0.168		0.168	
		2005	0.923	0.016	0.939	0.153		0.153	
		2006	0.963	0.016	0.979	0.138		0.138	
		2007	1.004	0.016	1.021	0.125		0.125	
		2008	1.048	0.016	1.064	0.114		0.114	
		2009	1.093	0.016	1.110	0.103		0.103	
		2010	1.141	0.016	1.157	0.094		0.094	
		2011	1.182	0.016	1.198	0.084		0.084	
		Total	16.107	0.319	16.425	4.779		4.779	
Economic Evaluation	Total Discounted Benefit = 4.779 Mp								
	Total Discounted Cost = 0.111 Mp								
	Net Present Value (NPV) = 4.668 Mp								
	Benefit/Cost Ratio (B/C) = 43.166								
	Internal Rate of Return (IRR) = infinite								
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-14 (Evaluation of Permanent Measures)																																																																																																																				
Road Name	Mabini-Solo Rd																																																																																																																				
Condition	2-lane			Surface Type=Gravel		Surface Condition=Bad																																																																																																															
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>89</td> <td>65</td> <td>0</td> <td>15</td> <td>13</td> <td>18</td> <td>200</td> </tr> <tr> <td>2000</td> <td>132</td> <td>98</td> <td>0</td> <td>21</td> <td>19</td> <td>27</td> <td>297</td> </tr> <tr> <td>2010</td> <td>204</td> <td>154</td> <td>0</td> <td>31</td> <td>29</td> <td>43</td> <td>461</td> </tr> <tr> <td>2020</td> <td>303</td> <td>233</td> <td>0</td> <td>44</td> <td>4</td> <td>66</td> <td>650</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total	1992	89	65	0	15	13	18	200	2000	132	98	0	21	19	27	297	2010	204	154	0	31	29	43	461	2020	303	233	0	44	4	66	650																																																																						
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Disaster Type	FM-Rd (Flooded/Muddy Road Surface)																																																																																																																				
Traffic Interruption	Full Width																																																																																																																				
Disaster Pattern	Pattern-1 (3 times a year)																																																																																																																				
Speed Reduction Length	0.100 km																																																																																																																				
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Urgent Measures	U2-2 : Temporary Side Ditch U7-1 : Gravel Surfacing Cost=0.004 Mp Completed within 12 days after Disaster Occurrence																																																																																																																				
Permanent Measures	P2-2 : Side Ditch P2-5 : Catch Basin P6-6 : Supported Type Concrete Wall P6-9 : Gabion Wall P16-3 : Grouted Riprap Apron P18-1 : Concrete Spillway Cost=0.070 Mp																																																																																																																				
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>0.323</td><td>0.007</td><td>0.330</td><td>0.330</td></tr> <tr><td>1993</td><td>0.508</td><td>0.011</td><td>0.519</td><td>0.451</td></tr> <tr><td>1994</td><td>0.532</td><td>0.011</td><td>0.543</td><td>0.411</td></tr> <tr><td>1995</td><td>0.558</td><td>0.011</td><td>0.569</td><td>0.374</td></tr> <tr><td>1996</td><td>0.585</td><td>0.011</td><td>0.596</td><td>0.341</td></tr> <tr><td>1997</td><td>0.613</td><td>0.011</td><td>0.624</td><td>0.310</td></tr> <tr><td>1998</td><td>0.643</td><td>0.011</td><td>0.654</td><td>0.283</td></tr> <tr><td>1999</td><td>0.674</td><td>0.011</td><td>0.685</td><td>0.257</td></tr> <tr><td>2000</td><td>0.706</td><td>0.011</td><td>0.717</td><td>0.234</td></tr> <tr><td>2001</td><td>0.737</td><td>0.011</td><td>0.748</td><td>0.213</td></tr> <tr><td>2002</td><td>0.769</td><td>0.011</td><td>0.779</td><td>0.193</td></tr> <tr><td>2003</td><td>0.802</td><td>0.011</td><td>0.813</td><td>0.175</td></tr> <tr><td>2004</td><td>0.837</td><td>0.011</td><td>0.847</td><td>0.158</td></tr> <tr><td>2005</td><td>0.873</td><td>0.011</td><td>0.884</td><td>0.144</td></tr> <tr><td>2006</td><td>0.911</td><td>0.011</td><td>0.921</td><td>0.130</td></tr> <tr><td>2007</td><td>0.950</td><td>0.011</td><td>0.961</td><td>0.118</td></tr> <tr><td>2008</td><td>0.991</td><td>0.011</td><td>1.002</td><td>0.107</td></tr> <tr><td>2009</td><td>1.034</td><td>0.011</td><td>1.045</td><td>0.097</td></tr> <tr><td>2010</td><td>1.079</td><td>0.011</td><td>1.090</td><td>0.088</td></tr> <tr><td>2011</td><td>1.117</td><td>0.011</td><td>1.128</td><td>0.079</td></tr> <tr> <td>Total</td> <td>15.241</td> <td>0.212</td> <td>15.453</td> <td>4.493</td> </tr> </tbody> </table>							Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	0.323	0.007	0.330	0.330	1993	0.508	0.011	0.519	0.451	1994	0.532	0.011	0.543	0.411	1995	0.558	0.011	0.569	0.374	1996	0.585	0.011	0.596	0.341	1997	0.613	0.011	0.624	0.310	1998	0.643	0.011	0.654	0.283	1999	0.674	0.011	0.685	0.257	2000	0.706	0.011	0.717	0.234	2001	0.737	0.011	0.748	0.213	2002	0.769	0.011	0.779	0.193	2003	0.802	0.011	0.813	0.175	2004	0.837	0.011	0.847	0.158	2005	0.873	0.011	0.884	0.144	2006	0.911	0.011	0.921	0.130	2007	0.950	0.011	0.961	0.118	2008	0.991	0.011	1.002	0.107	2009	1.034	0.011	1.045	0.097	2010	1.079	0.011	1.090	0.088	2011	1.117	0.011	1.128	0.079	Total	15.241	0.212	15.453	4.493
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Economic Evaluation	Total Discounted Benefit = 4.493 Mp Total Discounted Cost = 0.063 Mp Net Present Value (NPV) = 4.430 Mp Benefit/Cost Ratio (B/C) = 71.313 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-28 (Evaluation of Permanent Measures)							
Road	Name	Batangas-Lobo Rd						
Condition	2-lane	Surface Type=Bitum's	Surface Condition=Very bad					
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	438	423	125	347	181	30	1544
	2000	556	546	165	425	269	45	2006
	2010	751	750	232	550	419	73	2775
	2020	1015	1030	327	711	627	112	3822
Disaster Type	E-F (Embankment Slope Failure)							
Traffic Interruption	One-lane							
Disaster Pattern	Pattern-3 (3 times a year)							
Speed Reduction Length	0.100 km							
Urgent Measures	U1-4 : Refilling/Embankment U3-2 : Sand Bag Covering U4-3 : Wooden Fence Cost=0.011 Mp Completed within 12 days after Disaster Occurrence							
Permanent Measures	P1-3 : Refilling/Embankment P2-4 : Culvert P6-2 : Grouted Riprap P6-9 : Gabion Wall P16-3 : Grouted Riprap Apron Cost=0.261 Mp							
Benefit (Mp)								
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.627	0.020	0.646	0.646			
	1993	0.970	0.030	0.999	0.869			
	1994	1.000	0.030	1.030	0.779			
	1995	1.032	0.030	1.062	0.698			
	1996	1.065	0.030	1.094	0.626			
	1997	1.098	0.030	1.128	0.561			
	1998	1.133	0.030	1.163	0.503			
	1999	1.169	0.030	1.199	0.451			
	2000	1.206	0.030	1.236	0.404			
	2001	1.244	0.030	1.274	0.362			
	2002	1.283	0.030	1.313	0.325			
	2003	1.324	0.030	1.354	0.291			
	2004	1.366	0.030	1.395	0.261			
	2005	1.409	0.030	1.439	0.234			
	2006	1.453	0.030	1.483	0.210			
	2007	1.499	0.030	1.529	0.188			
	2008	1.547	0.030	1.577	0.168			
	2009	1.596	0.030	1.626	0.151			
	2010	1.646	0.030	1.676	0.135			
	2011	1.698	0.030	1.728	0.121			
	Total	25.366	0.584	25.950	7.982			
Economic Evaluation	Total Discounted Benefit = 7.982 Mp							
	Total Discounted Cost = 0.235 Mp							
	Net Present Value (NPV) = 7.747 Mp							
	Benefit/Cost Ratio (B/C) = 33.982							
	Internal Rate of Return (IRR) = infinite (1st year benefit > cost)							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-30 (Evaluation of Permanent Measures)																																																																																																																				
Road	Name	Batangas-Lobo Rd																																																																																																																			
Condition	2-lane	Surface Type=Bitum's		Surface Condition=Very bad																																																																																																																	
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Disaster Type	FALL (Rock Fall/Debris Fall)																																																																																																																				
Traffic Interruption	Full Width																																																																																																																				
Disaster Pattern	Pattern-1 (3 times a year)																																																																																																																				
Speed Reduction Length	0.100 km																																																																																																																				
Substitutive Transport	Original Road	: L=1.000 km																																																																																																																			
	Carabao Sledge/Horse	: L=1.000 km					n= 6451 (in 1992)																																																																																																														
	Walking/Head Loading	: L=1.000 km					n=35231 (in 1992)																																																																																																														
Urgent Measures	U1-1 : Removal of Deposit Materials U1-2 : Removal of Unstable Materials Cost=0.008 Mp Completed within 12 days after Disaster Occurrence																																																																																																																				
Permanent Measures	P1-1 : Recutting P4-8 : Wattling P8-2 : Catch Gabion Wall Cost=0.267 Mp																																																																																																																				
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>4.568</td><td>0.014</td><td>4.582</td><td>4.582</td></tr> <tr><td>1993</td><td>7.046</td><td>0.022</td><td>7.068</td><td>6.146</td></tr> <tr><td>1994</td><td>7.246</td><td>0.022</td><td>7.268</td><td>5.496</td></tr> <tr><td>1995</td><td>7.452</td><td>0.022</td><td>7.474</td><td>4.914</td></tr> <tr><td>1996</td><td>7.664</td><td>0.022</td><td>7.685</td><td>4.394</td></tr> <tr><td>1997</td><td>7.882</td><td>0.022</td><td>7.903</td><td>3.929</td></tr> <tr><td>1998</td><td>8.106</td><td>0.022</td><td>8.128</td><td>3.514</td></tr> <tr><td>1999</td><td>8.337</td><td>0.022</td><td>8.358</td><td>3.142</td></tr> <tr><td>2000</td><td>8.574</td><td>0.022</td><td>8.596</td><td>2.810</td></tr> <tr><td>2001</td><td>8.820</td><td>0.022</td><td>8.842</td><td>2.513</td></tr> <tr><td>2002</td><td>9.073</td><td>0.022</td><td>9.094</td><td>2.248</td></tr> <tr><td>2003</td><td>9.333</td><td>0.022</td><td>9.354</td><td>2.011</td></tr> <tr><td>2004</td><td>9.601</td><td>0.022</td><td>9.622</td><td>1.798</td></tr> <tr><td>2005</td><td>9.876</td><td>0.022</td><td>9.898</td><td>1.609</td></tr> <tr><td>2006</td><td>10.160</td><td>0.022</td><td>10.181</td><td>1.439</td></tr> <tr><td>2007</td><td>10.452</td><td>0.022</td><td>10.473</td><td>1.287</td></tr> <tr><td>2008</td><td>10.752</td><td>0.022</td><td>10.774</td><td>1.151</td></tr> <tr><td>2009</td><td>11.062</td><td>0.022</td><td>11.083</td><td>1.030</td></tr> <tr><td>2010</td><td>11.380</td><td>0.022</td><td>11.402</td><td>0.921</td></tr> <tr><td>2011</td><td>11.706</td><td>0.022</td><td>11.728</td><td>0.824</td></tr> <tr> <td>Total</td> <td>179.089</td> <td>0.425</td> <td>179.514</td> <td>55.760</td> </tr> </tbody> </table>							Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	4.568	0.014	4.582	4.582	1993	7.046	0.022	7.068	6.146	1994	7.246	0.022	7.268	5.496	1995	7.452	0.022	7.474	4.914	1996	7.664	0.022	7.685	4.394	1997	7.882	0.022	7.903	3.929	1998	8.106	0.022	8.128	3.514	1999	8.337	0.022	8.358	3.142	2000	8.574	0.022	8.596	2.810	2001	8.820	0.022	8.842	2.513	2002	9.073	0.022	9.094	2.248	2003	9.333	0.022	9.354	2.011	2004	9.601	0.022	9.622	1.798	2005	9.876	0.022	9.898	1.609	2006	10.160	0.022	10.181	1.439	2007	10.452	0.022	10.473	1.287	2008	10.752	0.022	10.774	1.151	2009	11.062	0.022	11.083	1.030	2010	11.380	0.022	11.402	0.921	2011	11.706	0.022	11.728	0.824	Total	179.089	0.425	179.514	55.760
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Economic Evaluation	Total Discounted Benefit = 55.760 Mp Total Discounted Cost = 0.240 Mp Net Present Value (NPV) = 55.519 Mp Benefit/Cost Ratio (B/C) = 232.042 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-33 (Evaluation of Permanent Measures)																																																																																																																				
Road Name	Batangas-Lobo Rd																																																																																																																				
Condition	2-lane	Surface Type=PCC			Surface Condition=Fair																																																																																																																
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>438</td> <td>423</td> <td>125</td> <td>347</td> <td>181</td> <td>30</td> <td>1544</td> </tr> <tr> <td>2000</td> <td>556</td> <td>546</td> <td>165</td> <td>425</td> <td>269</td> <td>45</td> <td>2006</td> </tr> <tr> <td>2010</td> <td>751</td> <td>750</td> <td>232</td> <td>550</td> <td>419</td> <td>73</td> <td>2775</td> </tr> <tr> <td>2020</td> <td>1015</td> <td>1030</td> <td>327</td> <td>711</td> <td>627</td> <td>112</td> <td>3822</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total	1992	438	423	125	347	181	30	1544	2000	556	546	165	425	269	45	2006	2010	751	750	232	550	419	73	2775	2020	1015	1030	327	711	627	112	3822																																																																						
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Disaster Type	PBr-A (Permanent Bridge Approach Washout)																																																																																																																				
Traffic Interruption	Full Width																																																																																																																				
Disaster Pattern	Pattern-2																																																																																																																				
Speed Reduction Length	0.200 km																																																																																																																				
Urgent Measures	U6-2 : H-Pile Bent U6-3 : Bailey Bridge Cost=3.375 Mp (9.189 Mp in w/o case) Completed within 34 days after Disaster Occurrence																																																																																																																				
Permanent Measures	P6-9 : Gabion Wall P15-1 : Concrete Bridge P17-2 : Gabion Spurdike Cost=15.348 Mp																																																																																																																				
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Economic Evaluation	Total Discounted Benefit = 21.742 Mp Total Discounted Cost = 13.813 Mp Net Present Value (NPV) = 7.929 Mp Benefit/Cost Ratio (B/C) = 1.574 Internal Rate of Return (IRR) = 29.2 %																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-36 (Evaluation of Permanent Measures)								
Road	Name	Talisay-Canlubang Rd					Surface Condition=Fair		
	Condition	2-lane	Surface Type=Bitum's						
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	55	63	0	4	0	2	124
		2000	81	95	0	6	0	3	185
		2010	125	149	0	9	0	5	288
		2020	186	225	0	13	0	8	432
Disaster Type	C-F (Cut Slope Failure)								
Traffic Interruption	Shoulder								
Disaster Pattern	Pattern-1 (3 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-1 : Removal of Deposit Materials Cost=0.004 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P1-1 : Recutting P2-2 : Side Ditch P4-6 : Pick Hole Seeding P6-2 : Grouted Riprap Cost=0.378 Mp								
Benefit (Mp)									
		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.021	0.007	0.028	0.028			
		1993	0.033	0.011	0.043	0.038			
		1994	0.034	0.011	0.045	0.034			
		1995	0.036	0.011	0.047	0.031			
		1996	0.038	0.011	0.049	0.028			
		1997	0.040	0.011	0.051	0.025			
		1998	0.042	0.011	0.053	0.023			
		1999	0.044	0.011	0.055	0.021			
		2000	0.046	0.011	0.057	0.019			
		2001	0.049	0.011	0.059	0.017			
		2002	0.051	0.011	0.062	0.015			
		2003	0.053	0.011	0.064	0.014			
		2004	0.055	0.011	0.066	0.012			
		2005	0.058	0.011	0.069	0.011			
		2006	0.061	0.011	0.071	0.010			
		2007	0.063	0.011	0.074	0.009			
		2008	0.066	0.011	0.077	0.008			
		2009	0.069	0.011	0.080	0.007			
		2010	0.072	0.011	0.083	0.007			
		2011	0.075	0.011	0.086	0.006			
		Total	1.007	0.212	1.219	0.363			
Economic Evaluation	Total Discounted Benefit = 0.363 Mp Total Discounted Cost = 0.340 Mp Net Present Value (NPV) = 0.023 Mp Benefit/Cost Ratio (B/C) = 1.067 Internal Rate of Return (IRR) = 16.2 %								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-42 (Evaluation of Permanent Measures)							
Road	Name	Laurel-Talisay Rd						
Condition	2-lane	Surface Type=Bitum's			Surface Condition=Good			
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	201	92	0	105	53	42	493
	2000	296	137	0	149	78	64	724
	2010	457	215	0	220	121	103	1116
	2020	680	325	0	313	181	159	1658
Disaster Type	CLV-D (Culvert Damage)							
Traffic Interruption	Shoulder							
Disaster Pattern	Pattern-3 (3 times a year)							
Speed Reduction Length	0.100 km							
Urgent Measures	U4-1 : Sand Bag Wall Cost=0.001 Mp Completed within 12 days after Disaster Occurrence							
Permanent Measures	P2-4 : Culvert P6-2 : Grouted Riprap P16-3 : Grouted Riprap Apron Cost=0.026 Mp							
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.074	0.002	0.076	0.076			
	1993	0.117	0.003	0.119	0.104			
	1994	0.122	0.003	0.125	0.094			
	1995	0.128	0.003	0.131	0.086			
	1996	0.134	0.003	0.137	0.078			
	1997	0.141	0.003	0.144	0.071			
	1998	0.148	0.003	0.151	0.065			
	1999	0.155	0.003	0.158	0.059			
	2000	0.163	0.003	0.165	0.054			
	2001	0.170	0.003	0.172	0.049			
	2002	0.177	0.003	0.180	0.044			
	2003	0.185	0.003	0.187	0.040			
	2004	0.193	0.003	0.195	0.037			
	2005	0.201	0.003	0.204	0.033			
	2006	0.210	0.003	0.213	0.030			
	2007	0.219	0.003	0.222	0.027			
	2008	0.229	0.003	0.231	0.025			
	2009	0.239	0.003	0.241	0.022			
	2010	0.249	0.003	0.252	0.020			
	2011	0.259	0.003	0.262	0.018			
	Total	3.512	0.053	3.565	1.035			
Economic Evaluation	Total Discounted Benefit = 1.035 Mp							
	Total Discounted Cost = 0.023 Mp							
	Net Present Value (NPV) = 1.012 Mp							
	Benefit/Cost Ratio (B/C) = 44.230							
	Internal Rate of Return (IRR) = infinite (1st year benefit > cost)							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-43 (Evaluation of Permanent Measures)								
Road	Name	Laurel-Talisay Rd					Surface Condition=Good		
	Condition	2-lane	Surface Type=Bitum's						
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	201	92	0	105	53	42	493
		2000	296	137	0	149	78	64	724
		2010	457	215	0	220	121	103	1116
		2020	680	325	0	313	181	159	1658
Disaster Type	CLV-D (Culvert Damage)								
Traffic Interruption	Shoulder								
Disaster Pattern	Pattern-3 (3 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-4 : Refilling/Embankment U3-2 : Sand Bag Covering Cost=0.005 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P6-2 : Grouted Riprap P16-3 : Grouted Riprap Apron Cost=0.023 Mp								
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit				
	1992	0.074	0.009	0.083	0.083				
	1993	0.117	0.013	0.130	0.113				
	1994	0.122	0.013	0.136	0.103				
	1995	0.128	0.013	0.142	0.093				
	1996	0.134	0.013	0.148	0.085				
	1997	0.141	0.013	0.154	0.077				
	1998	0.148	0.013	0.161	0.070				
	1999	0.155	0.013	0.168	0.063				
	2000	0.163	0.013	0.176	0.058				
	2001	0.170	0.013	0.183	0.052				
	2002	0.177	0.013	0.191	0.047				
	2003	0.185	0.013	0.198	0.043				
	2004	0.193	0.013	0.206	0.039				
	2005	0.201	0.013	0.215	0.035				
	2006	0.210	0.013	0.223	0.032				
	2007	0.219	0.013	0.233	0.029				
	2008	0.229	0.013	0.242	0.026				
	2009	0.239	0.013	0.252	0.023				
	2010	0.249	0.013	0.263	0.021				
	2011	0.259	0.013	0.272	0.019				
	Total	3.512	0.266	3.777	1.109				
Economic Evaluation	Total Discounted Benefit = 1.109 Mp								
	Total Discounted Cost = 0.021 Mp								
	Net Present Value (NPV) = 1.088 Mp								
	Benefit/Cost Ratio (B/C) = 53.581								
	Internal Rate of Return (IRR) = infinite (1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-45 (Evaluation of Permanent Measures)																																																																																																																				
Road Name	Tubig-Agoncillo Rd																																																																																																																				
Condition	2-lane			Surface Type=PCC		Surface Condition=Fair																																																																																																															
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motoreyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>107</td> <td>293</td> <td>1</td> <td>12</td> <td>37</td> <td>37</td> <td>487</td> </tr> <tr> <td>2000</td> <td>136</td> <td>378</td> <td>1</td> <td>15</td> <td>47</td> <td>49</td> <td>626</td> </tr> <tr> <td>2010</td> <td>184</td> <td>520</td> <td>2</td> <td>20</td> <td>64</td> <td>68</td> <td>858</td> </tr> <tr> <td>2020</td> <td>249</td> <td>714</td> <td>3</td> <td>25</td> <td>88</td> <td>94</td> <td>1173</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motoreyc	Total	1992	107	293	1	12	37	37	487	2000	136	378	1	15	47	49	626	2010	184	520	2	20	64	68	858	2020	249	714	3	25	88	94	1173																																																																						
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2011	0.215	0.008	0.224	0.016																																																																																																																	
Total	3.205	0.159	3.365	1.037																																																																																																																	
Economic Evaluation	Total Discounted Benefit = 1.037 Mp Total Discounted Cost = 0.022 Mp Net Present Value (NPV) = 1.015 Mp Benefit/Cost Ratio (B/C) = 46.091 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-48 (Evaluation of Permanent Measures)							
Road Name	Bugaan-Tubig Rd							
Condition	2-lane Surface Type=Gravel Surface Condition=Very bad							
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricycle	Motorcye	Total
	1992	23	78	0	2	62	54	219
	2000	27	94	0	2	75	68	266
	2010	32	121	0	2	94	91	340
	2020	38	154	0	2	123	123	440
Disaster Type	PBR-D (Permanent Bridge Other Damage)							
Traffic Interruption	Full Width							
Disaster Pattern	Pattern-5 (collapse after 5 years)							
Detour	Original Road : L=1.000 km (Gravel,Very bad)							
	Detour Road : L=6.000 km (Gravel,Very bad)							
Urgent Measures	None							
Permanent Measures	P6-10 : Sheet Pile Wall							
	P16-1 : Concrete Foot Protection							
	P16-2 : Gabion Foot Protection							
	Cost=0.812 Mp							
Collapse in w/o Case	Restoration Cost=4.050 Mp							
	Completed within 180 days after Collapse							
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	-	-	-	-		-	
	1993	-	-	-	-		-	
	1994	-	-	-	-		-	
	1995	-	-	-	-		-	
	1996	-	-	-	-		-	
	1997	1.185	3.645	4.830	2.402			
	1998	-	-	-	-		-	
	1999	-	-	-	-		-	
	2000	-	-	-	-		-	
	2001	-	-	-	-		-	
	2002	-	-	-	-		-	
	2003	-	-	-	-		-	
	2004	-	-	-	-		-	
	2005	-	-	-	-		-	
	2006	-	-	-	-		-	
	2007	-	-	-	-		-	
	2008	-	-	-	-		-	
	2009	-	-	-	-		-	
	2010	-	-	-	-		-	
	2011	-	-	-	-		-	
	Total	1.185	3.645	4.830	2.402			
Economic Evaluation	Total Discounted Benefit = 2.402 Mp							
	Total Discounted Cost = 0.731 Mp							
	Net Present Value (NPV) = 1.671 Mp							
	Benefit/Cost Ratio (B/C) = 3.286							
	Internal Rate of Return (IRR) = 45.9 %							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-50 (Evaluation of Permanent Measures)							
Road Name	Sn.Luis-Bato Rd							
Condition	2-lane Surface Type=Bitum's Surface Condition=Very bad							
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	53	326	20	29	3	3	434
	2000	69	421	26	35	4	4	559
	2010	90	578	36	46	5	6	761
	2020	122	794	51	59	7	8	1041
Disaster Type	TBr-D (Temporary Bridge Other Damage)							
Traffic Interruption	Full Width							
Disaster Pattern	Pattern-5 (collapse after 3 years)							
Detour	Original Road : L=2.000 km (Bitum's,Very bad) Detour Road : L=6.000 km (Gravel ,Very bad)							
Urgent Measures	U1-4 : Refilling/Embankment U4-2 : Gabion Wall Cost=0.173 Mp							
Permanent Measures	P1-3 : Refilling/Embankment P6-9 : Gabion Wall Cost=0.180 Mp							
Collapse in w/o Case	Restoration Cost=0.820 Mp Completed within 90 days after Collapse							
Benefit (Mp)								
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	-	-	-	-		-	
	1993	-	-	-	-		-	
	1994	-	-	-	-		-	
	1995	1.432	0.738	2.170	-		1.427	
	1996	-	-	-	-		-	
	1997	-	-	-	-		-	
	1998	-	-	-	-		-	
	1999	-	-	-	-		-	
	2000	-	-	-	-		-	
	2001	-	-	-	-		-	
	2002	-	-	-	-		-	
	2003	-	-	-	-		-	
	2004	-	-	-	-		-	
	2005	-	-	-	-		-	
	2006	-	-	-	-		-	
	2007	-	-	-	-		-	
	2008	-	-	-	-		-	
	2009	-	-	-	-		-	
	2010	-	-	-	-		-	
	2011	-	-	-	-		-	
	Total	1.432	0.738	2.170	-		1.427	
Economic Evaluation	Total Discounted Benefit = 1.427 Mp							
	Total Discounted Cost = 0.318 Mp							
	Net Present Value (NPV) = 1.109 Mp							
	Benefit/Cost Ratio (B/C) = 4.490							
	Internal Rate of Return (IRR) = 89.8 %							

Note : Total Discounted Cost = 90 % of Urgent & Permanent Measures Costs

Economic Evaluation (Batangas)

Spot No.	Bs-51 (Evaluation of Permanent Measures)							
Road	Name	Sn.Luis-Bato Rd						
	Condition	2-lane	Surface Type=Bitum's		Surface Condition=Very bad			
	Traffic							
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	53	326	20	29	3	3	434
	2000	69	421	26	35	4	4	559
	2010	90	578	36	46	5	6	761
	2020	122	794	51	59	7	8	1041
Disaster Type	SW-D (Seawall Damage)							
Traffic Interruption	Shoulder							
Disaster Pattern	Pattern-3 (3 times a year)							
Speed Reduction Length	0.200 km							
Urgent Measures	U1-4 : Refilling/Embankment U3-2 : Sand Bag Covering U4-3 : Wooden Fence Cost=0.020 Mp Completed within 12 days after Disaster Occurrence							
Permanent Measures	P6-5 : Gravity Type Concrete Wall Cost=0.773 Mp							
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.146	0.036	0.182	0.182			
	1993	0.226	0.054	0.280	0.243			
	1994	0.233	0.054	0.287	0.217			
	1995	0.241	0.054	0.295	0.194			
	1996	0.248	0.054	0.302	0.173			
	1997	0.256	0.054	0.310	0.154			
	1998	0.264	0.054	0.318	0.138			
	1999	0.273	0.054	0.327	0.123			
	2000	0.282	0.054	0.336	0.110			
	2001	0.291	0.054	0.345	0.098			
	2002	0.300	0.054	0.354	0.087			
	2003	0.309	0.054	0.363	0.078			
	2004	0.319	0.054	0.373	0.070			
	2005	0.329	0.054	0.383	0.062			
	2006	0.339	0.054	0.393	0.056			
	2007	0.350	0.054	0.404	0.050			
	2008	0.361	0.054	0.415	0.044			
	2009	0.373	0.054	0.427	0.040			
	2010	0.384	0.054	0.438	0.035			
	2011	0.397	0.054	0.451	0.032			
	Total	5.920	1.062	6.982	2.185			
Economic Evaluation	Total Discounted Benefit = 2.185 Mp							
	Total Discounted Cost = 0.696 Mp							
	Net Present Value (NPV) = 1.489 Mp							
	Benefit/Cost Ratio (B/C) = 3.141							
	Internal Rate of Return (IRR) = 57.1 %							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-53 (Evaluation of Permanent Measures)																																																																																																																				
Road Name	Bayabayin Rd																																																																																																																				
Condition	2-lane			Surface Type=Gravel		Surface Condition=Bad																																																																																																															
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motoreyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>13</td> <td>34</td> <td>0</td> <td>1</td> <td>29</td> <td>25</td> <td>102</td> </tr> <tr> <td>2000</td> <td>15</td> <td>41</td> <td>0</td> <td>1</td> <td>34</td> <td>31</td> <td>122</td> </tr> <tr> <td>2010</td> <td>18</td> <td>52</td> <td>0</td> <td>1</td> <td>44</td> <td>42</td> <td>157</td> </tr> <tr> <td>2020</td> <td>22</td> <td>66</td> <td>0</td> <td>1</td> <td>56</td> <td>57</td> <td>202</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motoreyc	Total	1992	13	34	0	1	29	25	102	2000	15	41	0	1	34	31	122	2010	18	52	0	1	44	42	157	2020	22	66	0	1	56	57	202																																																																						
Year	Car	Jeep'y	Bus	Truck	Tricyc	Motoreyc	Total																																																																																																														
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2020	22	66	0	1	56	57	202																																																																																																														
Disaster Type	FM-Rd (Flooded/Muddy Road Surface)																																																																																																																				
Traffic Interruption	Full Width (21 days a year)																																																																																																																				
Disaster Pattern	Pattern-4																																																																																																																				
Substitutive Transport	Original Road : L=1.000 km Carabao Sledge/Horse : L=1.000 km n=143 (in 1992) Walking/Head Loading : L=1.000 km n=573 (in 1992)																																																																																																																				
Urgent Measures	None																																																																																																																				
Permanent Measures	P1-3 : Refilling/Embankment P2-2 : Side Ditch P2-4 : Culvert P19-1 : Gravel Surfacing Cost=0.301 Mp																																																																																																																				
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1993</td><td>0.062</td><td>-</td><td>0.062</td><td>0.054</td></tr> <tr><td>1994</td><td>0.063</td><td>-</td><td>0.063</td><td>0.048</td></tr> <tr><td>1995</td><td>0.065</td><td>-</td><td>0.065</td><td>0.042</td></tr> <tr><td>1996</td><td>0.066</td><td>-</td><td>0.066</td><td>0.038</td></tr> <tr><td>1997</td><td>0.067</td><td>-</td><td>0.067</td><td>0.033</td></tr> <tr><td>1998</td><td>0.068</td><td>-</td><td>0.068</td><td>0.030</td></tr> <tr><td>1999</td><td>0.070</td><td>-</td><td>0.070</td><td>0.026</td></tr> <tr><td>2000</td><td>0.071</td><td>-</td><td>0.071</td><td>0.023</td></tr> <tr><td>2001</td><td>0.073</td><td>-</td><td>0.073</td><td>0.021</td></tr> <tr><td>2002</td><td>0.074</td><td>-</td><td>0.074</td><td>0.018</td></tr> <tr><td>2003</td><td>0.076</td><td>-</td><td>0.076</td><td>0.016</td></tr> <tr><td>2004</td><td>0.078</td><td>-</td><td>0.078</td><td>0.015</td></tr> <tr><td>2005</td><td>0.079</td><td>-</td><td>0.079</td><td>0.013</td></tr> <tr><td>2006</td><td>0.081</td><td>-</td><td>0.081</td><td>0.011</td></tr> <tr><td>2007</td><td>0.083</td><td>-</td><td>0.083</td><td>0.010</td></tr> <tr><td>2008</td><td>0.085</td><td>-</td><td>0.085</td><td>0.009</td></tr> <tr><td>2009</td><td>0.086</td><td>-</td><td>0.086</td><td>0.008</td></tr> <tr><td>2010</td><td>0.088</td><td>-</td><td>0.088</td><td>0.007</td></tr> <tr><td>2011</td><td>0.090</td><td>-</td><td>0.090</td><td>0.006</td></tr> <tr> <td>Total</td> <td>1.426</td> <td>-</td> <td>1.426</td> <td>0.429</td> </tr> </tbody> </table>							Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	-	-	-	-	1993	0.062	-	0.062	0.054	1994	0.063	-	0.063	0.048	1995	0.065	-	0.065	0.042	1996	0.066	-	0.066	0.038	1997	0.067	-	0.067	0.033	1998	0.068	-	0.068	0.030	1999	0.070	-	0.070	0.026	2000	0.071	-	0.071	0.023	2001	0.073	-	0.073	0.021	2002	0.074	-	0.074	0.018	2003	0.076	-	0.076	0.016	2004	0.078	-	0.078	0.015	2005	0.079	-	0.079	0.013	2006	0.081	-	0.081	0.011	2007	0.083	-	0.083	0.010	2008	0.085	-	0.085	0.009	2009	0.086	-	0.086	0.008	2010	0.088	-	0.088	0.007	2011	0.090	-	0.090	0.006	Total	1.426	-	1.426	0.429
Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit																																																																																																																	
1992	-	-	-	-																																																																																																																	
1993	0.062	-	0.062	0.054																																																																																																																	
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2006	0.081	-	0.081	0.011																																																																																																																	
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2011	0.090	-	0.090	0.006																																																																																																																	
Total	1.426	-	1.426	0.429																																																																																																																	
Economic Evaluation	Total Discounted Benefit = 0.429 Mp Total Discounted Cost = 0.271 Mp Net Present Value (NPV) = 0.158 Mp Benefit/Cost Ratio (B/C) = 1.585 Internal Rate of Return (IRR) = 24.4 %																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-62 (Evaluation of Urgent Measures)								
Road	Name	Pinagbayanan Rd							
	Condition	2-lane	Surface Type=Gravel			Surface Condition=Bad			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motoreyc	Total
		1992	24	83	0	2	67	57	233
		2000	28	101	0	2	80	72	283
		2010	34	129	0	2	103	97	365
		2020	40	164	0	2	131	130	467
Disaster Type	TBr-W (Temporary Bridge Washout)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-4								
	Approach washout is anticipated after 3 years.								
Substitutive Transport	Original Road	: L=1.000 km							
	Carabao Sledge/Horse	: L=1.000 km n= 330 (in 1992)							
	Walking/Head Loading	: L=1.000 km n=1297 (in 1992)							
Urgent Measures	U6-2 : H-Pile Bent								
	U6-3 : Bailey Bridge								
	Cost=0.503 Mp								
	Completed within 34 days after Disaster Occurrence								
Permanent Measures	None								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	2.118	-	2.118	2.118			
		1993	2.386	-.023	2.363	2.055			
		1994	2.438	-.023	2.415	1.826			
		1995	2.259	-.475	1.783	1.172			
		1996	2.545	-.045	2.499	1.428			
		1997	2.600	-.045	2.555	1.270			
		1998	2.657	-.045	2.612	1.129			
		1999	2.715	-.045	2.670	1.004			
		2000	2.775	-.045	2.729	0.892			
		2001	2.837	-.045	2.791	0.793			
		2002	2.900	-.045	2.855	0.706			
		2003	2.966	-.045	2.920	0.628			
		2004	3.032	-.045	2.987	0.558			
		2005	3.101	-.045	3.056	0.497			
		2006	3.171	-.045	3.126	0.442			
		2007	3.243	-.045	3.198	0.393			
		2008	3.317	-.045	3.272	0.350			
		2009	3.392	-.045	3.347	0.311			
		2010	3.470	-.045	3.425	0.277			
		2011	3.546	-.045	3.501	0.246			
		Total	57.467	-1.245	56.222	18.096			
Economic Evaluation	Total Discounted Benefit	= 18.096 Mp							
	Total Discounted Cost	= 0.453 Mp							
	Net Present Value (NPV)	= 17.643 Mp							
	Benefit/Cost Ratio (B/C)	= 39.974							
	Internal Rate of Return (IRR)	= infinite							
		(1st year benefit > cost)							

Note : Total Discounted Cost = 90 % of Urgent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-62 (Evaluation of Permanent Measures)																																																																																																																						
Road	Name	Pinagbayan Rd																																																																																																																					
Condition	Traffic	2-lane	Surface Type=Gravel			Surface Condition=Bad																																																																																																																	
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total																																																																																																														
		1992	24	83	0	2	67	57	233																																																																																																														
		2000	28	101	0	2	80	72	283																																																																																																														
		2010	34	129	0	2	103	97	365																																																																																																														
		2020	40	164	0	2	131	130	467																																																																																																														
Disaster Type	TBr-W (Temporary Bridge Washout)																																																																																																																						
Traffic Interruption	Full Width																																																																																																																						
Disaster Pattern	Pattern-2																																																																																																																						
Speed Reduction Length	Approach washout is anticipated after 3 years in w/o case. 0.100 km																																																																																																																						
Substitutive Transport	Original Road : L=1.000 km Carabao Sledge/Horse : L=1.000 km n= 353 (in 1995) Walking/Head Loading : L=1.000 km n=1382 (in 1995)																																																																																																																						
Urgent Measures	U6-2 : H-Pile Bent U6-3 : Bailey Bridge Cost=0.204 Mp (0.503 Mp in w/o case) Completed within 34 days after Disaster Occurrence																																																																																																																						
Permanent Measures	P1-3 : Refilling/Embankment P6-2 : Grouted Riprap P15-1 : Concrete Bridge P16-2 : Gabion Foot Protection P19-1 : Gravel Surfacing Cost=1.074 Mp																																																																																																																						
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>-</td><td>0.269</td><td>0.269</td><td>0.269</td></tr> <tr><td>1993</td><td>0.083</td><td>0.023</td><td>0.106</td><td>0.092</td></tr> <tr><td>1994</td><td>0.085</td><td>0.023</td><td>0.108</td><td>0.082</td></tr> <tr><td>1995</td><td>0.319</td><td>0.475</td><td>0.795</td><td>0.523</td></tr> <tr><td>1996</td><td>0.090</td><td>0.045</td><td>0.135</td><td>0.077</td></tr> <tr><td>1997</td><td>0.092</td><td>0.045</td><td>0.137</td><td>0.068</td></tr> <tr><td>1998</td><td>0.094</td><td>0.045</td><td>0.139</td><td>0.060</td></tr> <tr><td>1999</td><td>0.096</td><td>0.045</td><td>0.141</td><td>0.053</td></tr> <tr><td>2000</td><td>0.098</td><td>0.045</td><td>0.144</td><td>0.047</td></tr> <tr><td>2001</td><td>0.101</td><td>0.045</td><td>0.146</td><td>0.042</td></tr> <tr><td>2002</td><td>0.103</td><td>0.045</td><td>0.149</td><td>0.037</td></tr> <tr><td>2003</td><td>0.106</td><td>0.045</td><td>0.151</td><td>0.032</td></tr> <tr><td>2004</td><td>0.108</td><td>0.045</td><td>0.154</td><td>0.029</td></tr> <tr><td>2005</td><td>0.111</td><td>0.045</td><td>0.156</td><td>0.025</td></tr> <tr><td>2006</td><td>0.114</td><td>0.045</td><td>0.159</td><td>0.022</td></tr> <tr><td>2007</td><td>0.117</td><td>0.045</td><td>0.162</td><td>0.020</td></tr> <tr><td>2008</td><td>0.120</td><td>0.045</td><td>0.165</td><td>0.018</td></tr> <tr><td>2009</td><td>0.122</td><td>0.045</td><td>0.168</td><td>0.016</td></tr> <tr><td>2010</td><td>0.125</td><td>0.045</td><td>0.171</td><td>0.014</td></tr> <tr><td>2011</td><td>0.128</td><td>0.045</td><td>0.174</td><td>0.012</td></tr> <tr> <td>Total</td> <td>2.214</td> <td>1.514</td> <td>3.728</td> <td>1.538</td> </tr> </tbody> </table>									Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	-	0.269	0.269	0.269	1993	0.083	0.023	0.106	0.092	1994	0.085	0.023	0.108	0.082	1995	0.319	0.475	0.795	0.523	1996	0.090	0.045	0.135	0.077	1997	0.092	0.045	0.137	0.068	1998	0.094	0.045	0.139	0.060	1999	0.096	0.045	0.141	0.053	2000	0.098	0.045	0.144	0.047	2001	0.101	0.045	0.146	0.042	2002	0.103	0.045	0.149	0.037	2003	0.106	0.045	0.151	0.032	2004	0.108	0.045	0.154	0.029	2005	0.111	0.045	0.156	0.025	2006	0.114	0.045	0.159	0.022	2007	0.117	0.045	0.162	0.020	2008	0.120	0.045	0.165	0.018	2009	0.122	0.045	0.168	0.016	2010	0.125	0.045	0.171	0.014	2011	0.128	0.045	0.174	0.012	Total	2.214	1.514	3.728	1.538
Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit																																																																																																																			
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Total	2.214	1.514	3.728	1.538																																																																																																																			
Economic Evaluation	Total Discounted Benefit = 1.538 Mp Total Discounted Cost = 0.967 Mp Net Present Value (NPV) = 0.571 Mp Benefit/Cost Ratio (B/C) = 1.591 Internal Rate of Return (IRR) = 31.1 %																																																																																																																						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Batangas)

Spot No.	Bs-66 (Evaluation of Permanent Measures)																																																																																																																				
Road Name	Lipa-Balete Rd																																																																																																																				
Condition	1-lane	Surface Type=Gravel			Surface Condition=Very bad																																																																																																																
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>23</td> <td>76</td> <td>0</td> <td>2</td> <td>61</td> <td>52</td> <td>214</td> </tr> <tr> <td>2000</td> <td>27</td> <td>92</td> <td>0</td> <td>2</td> <td>74</td> <td>66</td> <td>261</td> </tr> <tr> <td>2010</td> <td>32</td> <td>117</td> <td>0</td> <td>2</td> <td>94</td> <td>89</td> <td>334</td> </tr> <tr> <td>2020</td> <td>38</td> <td>150</td> <td>0</td> <td>2</td> <td>121</td> <td>121</td> <td>432</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total	1992	23	76	0	2	61	52	214	2000	27	92	0	2	74	66	261	2010	32	117	0	2	94	89	334	2020	38	150	0	2	121	121	432																																																																						
Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total																																																																																																														
1992	23	76	0	2	61	52	214																																																																																																														
2000	27	92	0	2	74	66	261																																																																																																														
2010	32	117	0	2	94	89	334																																																																																																														
2020	38	150	0	2	121	121	432																																																																																																														
Disaster Type	SPW-D (Spillway Damage)																																																																																																																				
Traffic Interruption	Full Width																																																																																																																				
Disaster Pattern	Pattern-2																																																																																																																				
Speed Reduction Length	0.100 km																																																																																																																				
Urgent Measures	U1-5 : Selected Material Fill U4-2 : Gabion Wall Cost=0.126 Mp Completed within 24 days after Disaster Occurrence																																																																																																																				
Permanent Measures	P2-4 : Culvert P6-6 : Supported Type Concrete Wall P19-3 : Concrete Pavement Cost=0.267 Mp																																																																																																																				
Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>-</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>1993</td><td>0.079</td><td>-</td><td>0.079</td><td>0.069</td></tr> <tr><td>1994</td><td>0.081</td><td>-</td><td>0.081</td><td>0.061</td></tr> <tr><td>1995</td><td>0.083</td><td>-</td><td>0.083</td><td>0.054</td></tr> <tr><td>1996</td><td>0.085</td><td>-</td><td>0.085</td><td>0.048</td></tr> <tr><td>1997</td><td>0.087</td><td>-</td><td>0.087</td><td>0.043</td></tr> <tr><td>1998</td><td>0.089</td><td>-</td><td>0.089</td><td>0.038</td></tr> <tr><td>1999</td><td>0.091</td><td>-</td><td>0.091</td><td>0.034</td></tr> <tr><td>2000</td><td>0.093</td><td>-</td><td>0.093</td><td>0.030</td></tr> <tr><td>2001</td><td>0.095</td><td>-</td><td>0.095</td><td>0.027</td></tr> <tr><td>2002</td><td>0.097</td><td>-</td><td>0.097</td><td>0.024</td></tr> <tr><td>2003</td><td>0.100</td><td>-</td><td>0.100</td><td>0.021</td></tr> <tr><td>2004</td><td>0.102</td><td>-</td><td>0.102</td><td>0.019</td></tr> <tr><td>2005</td><td>0.105</td><td>-</td><td>0.105</td><td>0.017</td></tr> <tr><td>2006</td><td>0.107</td><td>-</td><td>0.107</td><td>0.015</td></tr> <tr><td>2007</td><td>0.110</td><td>-</td><td>0.110</td><td>0.013</td></tr> <tr><td>2008</td><td>0.112</td><td>-</td><td>0.112</td><td>0.012</td></tr> <tr><td>2009</td><td>0.115</td><td>-</td><td>0.115</td><td>0.011</td></tr> <tr><td>2010</td><td>0.118</td><td>-</td><td>0.118</td><td>0.009</td></tr> <tr><td>2011</td><td>0.120</td><td>-</td><td>0.120</td><td>0.008</td></tr> <tr> <td>Total</td> <td>1.867</td> <td>-</td> <td>1.867</td> <td>0.556</td> </tr> </tbody> </table>							Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	-	-	-	-	1993	0.079	-	0.079	0.069	1994	0.081	-	0.081	0.061	1995	0.083	-	0.083	0.054	1996	0.085	-	0.085	0.048	1997	0.087	-	0.087	0.043	1998	0.089	-	0.089	0.038	1999	0.091	-	0.091	0.034	2000	0.093	-	0.093	0.030	2001	0.095	-	0.095	0.027	2002	0.097	-	0.097	0.024	2003	0.100	-	0.100	0.021	2004	0.102	-	0.102	0.019	2005	0.105	-	0.105	0.017	2006	0.107	-	0.107	0.015	2007	0.110	-	0.110	0.013	2008	0.112	-	0.112	0.012	2009	0.115	-	0.115	0.011	2010	0.118	-	0.118	0.009	2011	0.120	-	0.120	0.008	Total	1.867	-	1.867	0.556
Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit																																																																																																																	
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Total	1.867	-	1.867	0.556																																																																																																																	
Economic Evaluation	Total Discounted Benefit = 0.556 Mp Total Discounted Cost = 0.240 Mp Net Present Value (NPV) = 0.316 Mp Benefit/Cost Ratio (B/C) = 2.315 Internal Rate of Return (IRR) = 35.1 %																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-4 (Evaluation of Urgent Measures)																																																																																																																						
Road	Name	Barugo-Bagacay Rd																																																																																																																					
Condition	Traffic	1-lane	Surface Type=Gravel			Surface Condition=Bad																																																																																																																	
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motoreyc	Total																																																																																																														
		1992	40	35	0	4	32	38	149																																																																																																														
		2000	50	43	0	5	39	48	185																																																																																																														
		2010	66	56	0	5	50	65	242																																																																																																														
		2020	88	72	0	6	65	87	318																																																																																																														
Disaster Type	TBr-W (Temporary Bridge Washout)																																																																																																																						
Traffic Interruption	Full Width																																																																																																																						
Disaster Pattern	Pattern-4																																																																																																																						
Substitutive Transport	Original Road	: L=1.000 km																																																																																																																					
	Banca Boat	: L=1.500 km n=287 (in 1992)																																																																																																																					
Urgent Measures	U1-4 : Refilling/Embankment																																																																																																																						
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Economic Evaluation	Total Discounted Benefit		= 8.664 Mp																																																																																																																				
	Total Discounted Cost		= 5.242 Mp																																																																																																																				
	Net Present Value (NPV)		= 3.422 Mp																																																																																																																				
	Benefit/Cost Ratio (B/C)		= 1.653																																																																																																																				
	Internal Rate of Return (IRR)		= 27.7 %																																																																																																																				

Note : Total Discounted Cost = 90 % of Urgent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-4 (Evaluation of Permanent Measures)								
Road	Name	Barugo-Bagacay Rd					Surface Condition=Fair		
	Condition	1-lane	Surface Type=PCC						
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	40	35	0	4	32	38	149
		2000	50	43	0	5	39	48	185
		2010	66	56	0	5	50	65	242
		2020	88	72	0	6	65	87	318
Disaster Type	TBr-W (Temporary Bridge Washout)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-2								
Speed Reduction Length	0.200 km								
Urgent Measures	U1-4 : Refilling/Embankment U6-2 : H-Pile Bent U6-3 : Bailey Bridge U7-1 : Gravel Surfacing Cost=2.616 Mp (5.824 Mp in w/o case) Completed within 34 days after Disaster Occurrence								
Permanent Measures	P15-1 : Concrete Bridge Cost=12.892 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	-	2.887	2.887	2.887			
		1993	0.109	0.262	0.371	0.323			
		1994	0.112	0.262	0.374	0.283			
		1995	0.115	0.262	0.377	0.248			
		1996	0.118	0.262	0.380	0.217			
		1997	0.121	0.262	0.383	0.191			
		1998	0.125	0.262	0.387	0.167			
		1999	0.128	0.262	0.390	0.147			
		2000	0.131	0.262	0.393	0.129			
		2001	0.135	0.262	0.397	0.113			
		2002	0.138	0.262	0.400	0.099			
		2003	0.142	0.262	0.404	0.087			
		2004	0.146	0.262	0.408	0.076			
		2005	0.150	0.262	0.412	0.067			
		2006	0.153	0.262	0.416	0.059			
		2007	0.158	0.262	0.420	0.052			
		2008	0.162	0.262	0.424	0.045			
		2009	0.166	0.262	0.428	0.040			
		2010	0.170	0.262	0.432	0.035			
		2011	0.175	0.262	0.437	0.031			
		Total	2.654	7.867	10.520	5.294			
Economic Evaluation	Total Discounted Benefit = 5.294 Mp								
	Total Discounted Cost = 11.603 Mp								
	Net Present Value (NPV) = -6.309 Mp								
	Benefit/Cost Ratio (B/C) = 0.456								
	Internal Rate of Return (IRR) = less than 0 %								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-6 (Evaluation of Urgent Measures)																																																																																																																				
Road Name	Babatogon-StaCruz Rd																																																																																																																				
Condition	1-lane Surface Type=Gravel Surface Condition=Bad																																																																																																																				
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>22</td> <td>12</td> <td>0</td> <td>1</td> <td>13</td> <td>18</td> <td>66</td> </tr> <tr> <td>2000</td> <td>26</td> <td>16</td> <td>0</td> <td>1</td> <td>17</td> <td>23</td> <td>83</td> </tr> <tr> <td>2010</td> <td>35</td> <td>20</td> <td>0</td> <td>1</td> <td>22</td> <td>31</td> <td>109</td> </tr> <tr> <td>2020</td> <td>46</td> <td>26</td> <td>0</td> <td>1</td> <td>28</td> <td>41</td> <td>142</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total	1992	22	12	0	1	13	18	66	2000	26	16	0	1	17	23	83	2010	35	20	0	1	22	31	109	2020	46	26	0	1	28	41	142																																																																						
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Traffic Interruption	Full Width																																																																																																																				
Disaster Pattern	Pattern-4																																																																																																																				
Substitutive Transport	Original Road : L=1.000 km Carabao Sledge/Horse : L=0.900 km n= 86 (in 1992) Walking/Head Loading : L=0.900 km n=390 (in 1992) Banca Boat : L=0.100 km n=111 (in 1992)																																																																																																																				
Urgent Measures	U1-4 : Refilling/Embankment U6-2 : H-Pile Bent U6-3 : Bailey Bridge U7-1 : Gravel Surfacing Cost=2.127 Mp Completed within 34 days after Disaster Occurrence																																																																																																																				
Permanent Measures	None																																																																																																																				
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Economic Evaluation	Total Discounted Benefit = 4.375 Mp Total Discounted Cost = 1.914 Mp Net Present Value (NPV) = 2.460 Mp Benefit/Cost Ratio (B/C) = 2.285 Internal Rate of Return (IRR) = 41.7 %																																																																																																																				

Note : Total Discounted Cost = 90 % of Urgent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-6 (Evaluation of Permanent Measures)																																																																																																																						
Road	Name	Babatogon-StaCruz Rd					Surface Condition=Fair																																																																																																																
	Condition	1-lane	Surface Type=PCC																																																																																																																				
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Permanent Measures	P15-1 : Concrete Bridge Cost=4.788 Mp																																																																																																																						
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Total	0.660	2.866	3.526	1.835																																																																																																																			
Economic Evaluation	Total Discounted Benefit = 1.835 Mp Total Discounted Cost = 4.309 Mp Net Present Value (NPV) = -2.474 Mp Benefit/Cost Ratio (B/C) = 0.426 Internal Rate of Return (IRR) = less than 0 %																																																																																																																						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-13 (Evaluation of Permanent Measures)								
Road	Name	Palompon-Matagob Rd							
	Condition	2-lane	Surface Type=Gravel			Surface Condition=Fair			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricycle	Motorcyc	Total
		1992	86	80	12	26	10	7	221
		2000	122	114	17	35	14	11	313
		2010	184	174	26	50	19	17	470
		2020	273	262	39	71	27	26	698
Disaster Type	CLV-D (Culvert Damage)								
Traffic Interruption	One-lane								
Disaster Pattern	Pattern-3 (3 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-4 : Refilling/Embankment U3-1 : Sheet Covering U3-2 : Sand Bag Covering U4-3 : Wooden Fence Cost=0.021 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P2-1 : Slope Ditch P2-4 : Culvert P2-5 : Catch Basin P6-2 : Grouted Riprap P16-3 : Grouted Riprap Apron Cost=0.101 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.085	0.038	0.123	0.123			
		1993	0.134	0.057	0.190	0.165			
		1994	0.139	0.057	0.196	0.148			
		1995	0.146	0.057	0.202	0.133			
		1996	0.152	0.057	0.209	0.119			
		1997	0.159	0.057	0.215	0.107			
		1998	0.166	0.057	0.222	0.096			
		1999	0.173	0.057	0.230	0.086			
		2000	0.181	0.057	0.237	0.078			
		2001	0.188	0.057	0.245	0.070			
		2002	0.196	0.057	0.253	0.062			
		2003	0.204	0.057	0.261	0.056			
		2004	0.213	0.057	0.269	0.050			
		2005	0.222	0.057	0.278	0.045			
		2006	0.231	0.057	0.288	0.041			
		2007	0.241	0.057	0.297	0.037			
		2008	0.251	0.057	0.307	0.033			
		2009	0.261	0.057	0.318	0.030			
		2010	0.272	0.057	0.329	0.027			
		2011	0.283	0.057	0.340	0.024			
		Total	3.895	1.115	5.010	1.530			
Economic Evaluation	Total Discounted Benefit = 1.530 M Total Discounted Cost = 0.091 Mp Net Present Value (NPV) = 1.439 Mp Benefit/Cost Ratio (B/C) = 16.831 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-16 (Evaluation of Permanent Measures)							
Road Name	Ormoc-Lake Danao Rd							
Condition	2-lane			Surface Type=Gravel		Surface Condition=Fair		
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	31	22	0	2	22	28	105
	2000	38	26	0	2	26	35	127
	2010	51	34	0	3	33	47	168
	2020	67	44	0	3	43	63	220
Disaster Type	C-F (Cut Slope Failure)							
Traffic Interruption	One-lane							
Disaster Pattern	Pattern-1 (3 times a year)							
Speed Reduction Length	0.100 km							
Urgent Measures	U1-1 : Removal of Deposit Materials Cost=0.003 Mp Completed within 12 days after Disaster Occurrence							
Permanent Measures	P8-2 : Catch Gabion Wall Cost=0.274 Mp							
Benefit (Mp)								
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.025	0.005	0.030	0.030			
	1993	0.038	0.008	0.046	0.040			
	1994	0.039	0.008	0.047	0.035			
	1995	0.040	0.008	0.048	0.031			
	1996	0.041	0.008	0.049	0.028			
	1997	0.041	0.008	0.050	0.025			
	1998	0.042	0.008	0.051	0.022			
	1999	0.043	0.008	0.051	0.019			
	2000	0.044	0.008	0.052	0.017			
	2001	0.046	0.008	0.054	0.015			
	2002	0.047	0.008	0.055	0.014			
	2003	0.048	0.008	0.056	0.012			
	2004	0.050	0.008	0.058	0.011			
	2005	0.051	0.008	0.059	0.010			
	2006	0.053	0.008	0.061	0.009			
	2007	0.054	0.008	0.062	0.008			
	2008	0.056	0.008	0.064	0.007			
	2009	0.057	0.008	0.065	0.006			
	2010	0.059	0.008	0.067	0.005			
	2011	0.060	0.008	0.068	0.005			
	Total	0.933	0.159	1.093	0.348			
Economic Evaluation	Total Discounted Benefit = 0.348 Mp							
	Total Discounted Cost = 0.247 Mp							
	Net Present Value (NPV) = 0.102 Mp							
	Benefit/Cost Ratio (B/C) = 1.413							
	Internal Rate of Return (IRR) = 22.6 %							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-19. (Evaluation of Permanent Measures)							
Road Name	Kananga-Milagros Rd							
Condition	2-lane Surface Type=Gravel Surface Condition=Bad							
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	46	49	0	7	41	47	190
	2000	58	61	0	8	50	60	237
	2010	77	79	0	9	65	81	311
	2020	101	103	0	10	84	109	407
Disaster Type	SPW-D (Spillway Damage)							
Traffic Interruption	Full Width							
Disaster Pattern	Pattern-2							
Speed Reduction Length	0.100 km							
Urgent Measures	U1-5 : Selected Material Fill U4-2 : Gabion Wall Cost=0.296 Mp Completed within 24 days after Disaster Occurrence							
Permanent Measures	P6-6 : Supported Type Concrete Wall P19-3 : Concrete Pavement Cost=0.530 Mp							
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	-	-	-	-		-	
	1993	0.068	-	0.068	-		0.059	
	1994	0.070	-	0.070	-		0.053	
	1995	0.072	-	0.072	-		0.047	
	1996	0.074	-	0.074	-		0.042	
	1997	0.076	-	0.076	-		0.038	
	1998	0.078	-	0.078	-		0.034	
	1999	0.080	-	0.080	-		0.030	
	2000	0.082	-	0.082	-		0.027	
	2001	0.085	-	0.085	-		0.024	
	2002	0.087	-	0.087	-		0.021	
	2003	0.089	-	0.089	-		0.019	
	2004	0.091	-	0.091	-		0.017	
	2005	0.094	-	0.094	-		0.015	
	2006	0.096	-	0.096	-		0.014	
	2007	0.099	-	0.099	-		0.012	
	2008	0.102	-	0.102	-		0.011	
	2009	0.104	-	0.104	-		0.010	
	2010	0.107	-	0.107	-		0.009	
	2011	0.110	-	0.110	-		0.008	
	Total	1.664	-	1.664	-		0.490	
Economic Evaluation	Total Discounted Benefit = 0.490 Mp							
	Total Discounted Cost = 0.477 Mp							
	Net Present Value (NPV) = 0.013 Mp							
	Benefit/Cost Ratio (B/C) = 1.027							
	Internal Rate of Return (IRR) = 15.5 %							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-21 (Evaluation of Permanent Measures)						
Road Name	Calubian Rd		Surface Type=Gravel		Surface Condition=Fair		
Condition Traffic	2-lane						
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc Total
	1992	79	29	33	23	19	10 193
	2000	113	42	48	31	25	14 273
	2010	170	64	74	44	35	19 406
	2020	252	96	112	62	49	27 598
Disaster Type	FALL (Rock Fall/Debris Fall)						
Traffic Interruption	One-lane						
Disaster Pattern	Pattern-1 (3 times a year)						
Speed Reduction Length	0.100 km						
Urgent Measures	U1-1 : Removal of Deposit Materials U1-2 : Removal of Unstable Materials Cost=0.001 Mp Completed within 12 days after Disaster Occurrence						
Permanent Measures	P1-1 : Recutting P2-1 : Slope Ditch P6-2 : Grouted Riprap Cost=0.157 Mp						
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit		
	1992	0.084	0.002	0.086	0.086		
	1993	0.132	0.003	0.135	0.117		
	1994	0.138	0.003	0.141	0.107		
	1995	0.145	0.003	0.147	0.097		
	1996	0.151	0.003	0.154	0.088		
	1997	0.158	0.003	0.161	0.080		
	1998	0.165	0.003	0.168	0.073		
	1999	0.173	0.003	0.176	0.066		
	2000	0.181	0.003	0.184	0.060		
	2001	0.189	0.003	0.191	0.054		
	2002	0.196	0.003	0.199	0.049		
	2003	0.205	0.003	0.207	0.045		
	2004	0.213	0.003	0.216	0.040		
	2005	0.222	0.003	0.225	0.037		
	2006	0.232	0.003	0.234	0.033		
	2007	0.241	0.003	0.244	0.030		
	2008	0.251	0.003	0.254	0.027		
	2009	0.262	0.003	0.265	0.025		
	2010	0.273	0.003	0.276	0.022		
	2011	0.284	0.003	0.287	0.020		
	Total	3.897	0.053	3.950	1.156		
Economic Evaluation	Total Discounted Benefit = 1.156 Mp						
	Total Discounted Cost = 0.141 Mp						
	Net Present Value (NPV) = 1.015 Mp						
	Benefit/Cost Ratio (B/C) = 8.184						
	Internal Rate of Return (IRR) = 249.9 %						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-23 (Evaluation of Permanent Measures)							
Road Name	SanIsidro-Tabango Rd							
Condition	2-lane Surface Type=Gravel Surface Condition=Very bad							
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	64	46	13	18	43	12	196
	2000	91	66	18	24	57	17	273
	2010	137	101	28	34	81	26	407
	2020	203	152	42	48	114	39	598
Disaster Type	FM-Rd (Flooded/Muddy Road Surface)							
Traffic Interruption	Full Width							
Disaster Pattern	Pattern-1 (3 times a year)							
Speed Reduction Length	0.100 km							
Substitutive Transport	Original Road : L=1.000 km							
	Carabao Sledge/Horse : L=1.000 km n= 512 (in 1992)							
	Walking/Head Loading : L=1.000 km n=2518 (in 1992)							
Urgent Measures	U2-2 : Temporary Side Ditch							
	U7-1 : Gravel Surfacing							
	Cost=0.016 Mp							
	Completed within 12 days after Disaster Occurrence							
Permanent Measures	P2-2 : Side Ditch							
	P2-3 : Water Channel							
	P2-4 : Culvert							
	P2-5 : Catch Basin							
	Cost=0.234 Mp							
Benefit (Mp)								
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.349	0.029	0.378	0.378			
	1993	0.545	0.043	0.588	0.511			
	1994	0.567	0.043	0.610	0.462			
	1995	0.590	0.043	0.633	0.417			
	1996	0.614	0.043	0.657	0.376			
	1997	0.639	0.043	0.683	0.339			
	1998	0.665	0.043	0.709	0.306			
	1999	0.692	0.043	0.736	0.277			
	2000	0.721	0.043	0.764	0.250			
	2001	0.749	0.043	0.792	0.225			
	2002	0.779	0.043	0.822	0.203			
	2003	0.810	0.043	0.853	0.183			
	2004	0.842	0.043	0.885	0.165			
	2005	0.875	0.043	0.918	0.149			
	2006	0.910	0.043	0.953	0.135			
	2007	0.946	0.043	0.989	0.122			
	2008	0.983	0.043	1.026	0.110			
	2009	1.022	0.043	1.065	0.099			
	2010	1.063	0.043	1.106	0.089			
	2011	1.103	0.043	1.147	0.081			
	Total	15.465	0.850	16.314	4.877			
Economic Evaluation	Total Discounted Benefit = 4.877 Mp							
	Total Discounted Cost = 0.211 Mp							
	Net Present Value (NPV) = 4.666 Mp							
	Benefit/Cost Ratio (B/C) = 23.155							
	Internal Rate of Return (IRR) = infinite							
	(1st year benefit > cost)							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost.

Economic Evaluation (Leyte)

Spot No.	L-26 (Evaluation of Permanent Measures)							
Road Name	Cabugeayan Rd							
Condition	2-lane Surface Type=Gravel Surface Condition=Very bad							
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motoreyc	Total
	1992	60	59	54	56	36	75	340
	2000	85	84	78	77	48	98	470
	2010	128	128	120	110	67	138	691
	2020	190	193	181	156	95	195	1010
Disaster Type	FM-Rd (Flooded/Muddy Road Surface)							
Traffic Interruption	Full Width							
Disaster Pattern	Pattern-1 (3 times a year)							
Speed Reduction Length	0.200 km							
Substitutive Transport	Original Road : L=1.000 km							
	Carabao Sledge/Horse : L=1.000 km n=1221 (in 1992)							
	Walking/Head Loading : L=1.000 km n=6102 (in 1992)							
Urgent Measures	U4-1 : Sand Bag Wall							
	Cost=0.007 Mp							
	Completed within 12 days after Disaster Occurrence							
Permanent Measures	P1-3 : Refilling/Embankment							
	P2-2 : Side Ditch							
	P2-4 : Culvert							
	P6-2 : Grouted Riprap							
	P18-1 : Concrete Spillway							
	Cost=0.800 Mp							
Benefit (Mp)								
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.920	0.013	0.932	0.932			
	1993	1.438	0.019	1.457	1.267			
	1994	1.500	0.019	1.519	1.148			
	1995	1.564	0.019	1.583	1.041			
	1996	1.631	0.019	1.650	0.943			
	1997	1.700	0.019	1.719	0.855			
	1998	1.773	0.019	1.792	0.775			
	1999	1.849	0.019	1.868	0.702			
	2000	1.928	0.019	1.947	0.636			
	2001	2.004	0.019	2.022	0.575			
	2002	2.082	0.019	2.101	0.519			
	2003	2.164	0.019	2.183	0.469			
	2004	2.249	0.019	2.268	0.424			
	2005	2.338	0.019	2.357	0.383			
	2006	2.430	0.019	2.448	0.346			
	2007	2.525	0.019	2.544	0.313			
	2008	2.625	0.019	2.643	0.282			
	2009	2.728	0.019	2.747	0.255			
	2010	2.835	0.019	2.854	0.231			
	2011	2.944	0.019	2.963	0.208			
	Total	41.226	0.372	41.597	12.305			
Economic Evaluation	Total Discounted Benefit = 12.305 Mp							
	Total Discounted Cost = 0.720 Mp							
	Net Present Value (NPV) = 11.585 Mp							
	Benefit/Cost Ratio (B/C) = 17.091							
	Internal Rate of Return (IRR) = infinite							
	(1st year benefit > cost)							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-38 (Evaluation of Permanent Measures)								
Road	Name	Culaba-Kawayan Rd							
	Condition	1-lane	Surface Type=Gravel		Surface Condition=Very bad				
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	46	27	18	41	41	47	220
		2000	65	39	26	55	55	61	301
		2010	98	60	40	79	77	87	441
		2020	145	90	60	112	108	122	637
Disaster Type	TBr-A (Temporary Bridge Approach Washout)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-3 (3 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-4 : Refilling/Embankment U3-2 : Sand Bag Covering Cost=0.003 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P6-2 : Grouted Riprap P16-2 : Gabion Foot Protection Cost=0.028 Mp								
Benefit (Mp)									
		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.072	0.005	0.077	0.077		0.077	
		1993	0.113	0.008	0.121	0.121		0.105	
		1994	0.117	0.008	0.125	0.125		0.095	
		1995	0.122	0.008	0.130	0.130		0.086	
		1996	0.128	0.008	0.136	0.136		0.078	
		1997	0.133	0.008	0.141	0.141		0.070	
		1998	0.139	0.008	0.147	0.147		0.063	
		1999	0.144	0.008	0.153	0.153		0.057	
		2000	0.151	0.008	0.159	0.159		0.052	
		2001	0.157	0.008	0.165	0.165		0.047	
		2002	0.163	0.008	0.171	0.171		0.042	
		2003	0.170	0.008	0.178	0.178		0.038	
		2004	0.177	0.008	0.185	0.185		0.035	
		2005	0.184	0.008	0.192	0.192		0.031	
		2006	0.191	0.008	0.199	0.199		0.028	
		2007	0.199	0.008	0.207	0.207		0.025	
		2008	0.207	0.008	0.215	0.215		0.023	
		2008	0.216	0.008	0.224	0.224		0.021	
		2010	0.225	0.008	0.233	0.233		0.019	
		2011	0.233	0.008	0.241	0.241		0.017	
		Total	3.240	0.159	3.400	3.400		1.010	
Economic Evaluation	Total Discounted Benefit = 1.010 Mp								
	Total Discounted Cost = 0.025 Mp								
	Net Present Value (NPV) = 0.984 Mp								
	Benefit/Cost Ratio (B/C) = 40.067								
	Internal Rate of Return (IRR) = infinite								
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-39 (Evaluation of Permanent Measures)							
Road Name	Culaba-Kawayan Rd							
Condition	1-lane Surface Type=Gravel Surface Condition=Very bad							
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	46	27	18	41	41	47	220
	2000	65	39	26	55	55	61	301
	2010	98	60	40	79	77	87	441
	2020	145	90	60	112	108	122	637
Disaster Type	D-FL (Debris Flow)							
Traffic Interruption	Full Width							
Disaster Pattern	Pattern-1 (3 times a year)							
Speed Reduction Length	0.100 km							
Substitutive Transport	Original Road : L=1.000 km							
	Carabao Sledge/Horse : L=1.000 km n= 741 { in 1992 }							
	Walking/Head Loading : L=1.000 km n=4064 { in 1992 }							
Urgent Measures	U1-1 : Removal of Deposit Materials							
	Cost=0.006 Mp							
	Completed within 12 days after Disaster Occurrence							
Permanent Measures	P1-3 : Refilling/Embankment							
	P15-1 : Concrete Bridge							
	P19-1 : Gravel Surfacing							
	Cost=1.829 Mp							
Benefit (Mp)								
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.522	0.011	0.533	0.533			
	1993	0.815	0.016	0.831	0.723			
	1994	0.847	0.016	0.863	0.653			
	1995	0.881	0.016	0.897	0.590			
	1996	0.916	0.016	0.932	0.533			
	1997	0.952	0.016	0.968	0.481			
	1998	0.990	0.016	1.006	0.435			
	1999	1.029	0.016	1.046	0.393			
	2000	1.070	0.016	1.087	0.355			
	2001	1.112	0.016	1.128	0.321			
	2002	1.155	0.016	1.171	0.289			
	2003	1.199	0.016	1.216	0.261			
	2004	1.246	0.016	1.262	0.236			
	2005	1.294	0.016	1.310	0.213			
	2006	1.344	0.016	1.360	0.192			
	2007	1.396	0.016	1.412	0.174			
	2008	1.450	0.016	1.466	0.157			
	2009	1.506	0.016	1.522	0.141			
	2010	1.565	0.016	1.581	0.128			
	2011	1.623	0.016	1.639	0.115			
	Total	22.912	0.319	23.231	6.923			
Economic Evaluation	Total Discounted Benefit = 6.923 Mp							
	Total Discounted Cost = 1.646 Mp							
	Net Present Value (NPV) = 5.277 Mp							
	Benefit/Cost Ratio (B/C) = 4.206							
	Internal Rate of Return (IRR) = 78.7 %							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-45 (Evaluation of Permanent Measures)								
Road	Name	Baybay-Liberacio Rd.							
	Condition	2-lane	Surface Type=PCC			Surface Condition=Good			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	151	115	63	80	15	22	446
		2000	215	166	91	109	20	32	633
		2010	324	254	140	156	29	49	952
		2020	481	383	212	221	41	74	1412
Disaster Type	E-F (Embankment Slope Failure)								
Traffic Interruption	One-lane								
Disaster Pattern	Pattern-3 (3 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-4 : Refilling/Embankment U2-2 : Temporary Side Ditch U3-2 : Sand Bag Covering U4-3 : Wooden Fence Cost=0.017 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P1-3 : Refilling/Embankment P2-2 : Side Ditch P4-2 : Hand Seeding with Mat P16-2 : Gabion Foot Protection Cost=0.131 Mp								
Benefit (Mp)									
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit				
	1992	0.204	0.031	0.234	0.234				
	1993	0.320	0.046	0.365	0.318				
	1994	0.334	0.046	0.380	0.287				
	1995	0.349	0.046	0.395	0.260				
	1996	0.365	0.046	0.411	0.235				
	1997	0.381	0.046	0.427	0.212				
	1998	0.399	0.046	0.444	0.192				
	1999	0.417	0.046	0.462	0.174				
	2000	0.435	0.046	0.481	0.157				
	2001	0.454	0.046	0.500	0.142				
	2002	0.473	0.046	0.519	0.128				
	2003	0.493	0.046	0.539	0.116				
	2004	0.513	0.046	0.559	0.105				
	2005	0.535	0.046	0.581	0.094				
	2006	0.558	0.046	0.604	0.085				
	2007	0.581	0.046	0.627	0.077				
	2008	0.606	0.046	0.651	0.070				
	2009	0.631	0.046	0.677	0.063				
	2010	0.658	0.046	0.704	0.057				
	2011	0.684	0.046	0.730	0.051				
	Total	9.388	0.903	10.291	3.058				
Economic Evaluation	Total Discounted Benefit = 3.058 Mp Total Discounted Cost = 0.118 Mp Net Present Value (NPV) = 2.940 Mp Benefit/Cost Ratio (B/C) = 25.935 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-47 (Evaluation of Permanent Measures)							
Road Name	Baybay-Liberacio Rd							
Condition	2-lane			Surface Type=PCC		Surface Condition=Good		
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
	1992	151	115	63	80	15	22	446
	2000	215	166	91	109	20	32	633
	2010	324	254	140	156	29	49	952
	2020	481	383	212	221	41	74	1412
Disaster Type	L-SL (Landslide)							
Traffic Interruption	One-lane							
Disaster Pattern	Pattern-1 (3 times a year)							
Speed Reduction Length	0.100 km							
Urgent Measures	U1-1 : Removal of Deposit Materials U2-2 : Temporary Side Ditch Cost=0.001 Mp Completed within 12 days after Disaster Occurrence							
Permanent Measures	P1-1 : Recutting P1-3 : Refilling/Embankment P2-2 : Side Ditch P3-2 : Horizontal Drain Hole P4-2 : Hand Seeding with Mat P16-2 : Gabion Foot Protection Cost=0.131 Mp							
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.204	0.002	0.206	0.206			
	1993	0.320	0.003	0.322	0.280			
	1994	0.334	0.003	0.337	0.255			
	1995	0.349	0.003	0.352	0.231			
	1996	0.365	0.003	0.368	0.210			
	1997	0.381	0.003	0.384	0.191			
	1998	0.399	0.003	0.401	0.173			
	1999	0.417	0.003	0.419	0.158			
	2000	0.435	0.003	0.438	0.143			
	2001	0.454	0.003	0.456	0.130			
	2002	0.473	0.003	0.476	0.118			
	2003	0.493	0.003	0.495	0.106			
	2004	0.513	0.003	0.516	0.096			
	2005	0.535	0.003	0.538	0.087			
	2006	0.558	0.003	0.560	0.079			
	2007	0.581	0.003	0.584	0.072			
	2008	0.606	0.003	0.608	0.065			
	2009	0.631	0.003	0.634	0.059			
	2010	0.658	0.003	0.660	0.053			
	2011	0.684	0.003	0.687	0.048			
	Total	9.388	0.053	9.441	2.761			
Economic Evaluation	Total Discounted Benefit = 2.761 Mp							
	Total Discounted Cost = 0.118 Mp							
	Net Present Value (NPV) = 2.643 Mp							
	Benefit/Cost Ratio (B/C) = 23.420							
	Internal Rate of Return (IRR) = infinite (1st year benefit > cost)							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-50 (Evaluation of Permanent Measures)								
Road	Name	Baybay-Liberacio Rd							
	Condition	2-lane	Surface Type=PCC			Surface Condition=Good			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	151	115	63	80	15	22	446
		2000	215	166	91	109	20	32	633
		2010	324	254	140	156	29	49	952
		2020	481	383	212	221	41	74	1412
Disaster Type	L-SL (Landslide)								
Traffic Interruption	One-lane								
Disaster Pattern	Pattern-1 (3 times a year)								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-1 : Removal of Deposit Materials Cost=0.004 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P2-2 : Side Ditch P3-2 : Horizontal Drain Hole P16-2 : Gabion Foot Protection Cost=0.168 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.204	0.007	0.211	0.211			
		1993	0.320	0.011	0.330	0.287			
		1994	0.334	0.011	0.345	0.261			
		1995	0.349	0.011	0.360	0.237			
		1996	0.365	0.011	0.376	0.215			
		1997	0.381	0.011	0.392	0.195			
		1998	0.399	0.011	0.409	0.177			
		1999	0.417	0.011	0.427	0.161			
		2000	0.435	0.011	0.446	0.146			
		2001	0.454	0.011	0.465	0.132			
		2002	0.473	0.011	0.484	0.120			
		2003	0.493	0.011	0.504	0.108			
		2004	0.513	0.011	0.524	0.098			
		2005	0.535	0.011	0.546	0.089			
		2006	0.558	0.011	0.568	0.080			
		2007	0.581	0.011	0.592	0.073			
		2008	0.606	0.011	0.616	0.066			
		2009	0.631	0.011	0.642	0.060			
		2010	0.658	0.011	0.668	0.054			
		2011	0.684	0.011	0.695	0.049			
		Total	9.388	0.212	9.601	2.817			
Economic Evaluation	Total Discounted Benefit = 2.817 Mp								
	Total Discounted Cost = 0.151 Mp								
	Net Present Value (NPV) = 2.666 Mp								
	Benefit/Cost Ratio (B/C) = 18.630								
	Internal Rate of Return (IRR) = infinite								
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-65 (Evaluation of Permanent Measures)							
Road Name	Albuera-Burauen Rd.							
Condition	2-lane	Surface Type=Gravel	Surface Condition=Bad					
Traffic								
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcye	Total
	1992	19	11	0	1	12	15	58
	2000	24	14	0	1	16	20	75
	2010	31	19	0	1	20	27	98
	2020	41	24	0	1	26	36	128
Disaster Type	FALL (Rock Fall/Debris Fall)							
Traffic Interruption	Full Width							
Disaster Pattern	Pattern-1 (3 times a year)							
Speed Reduction Length	0.100 km							
Substitutive Transport	Original Road	: L=1.000 km						
	Carabao Sledge/Horse	: L=1.000 km					n= 78 (in 1992)	
	Walking/Head Loading	: L=1.000 km					n=354 (in 1992)	
Urgent Measures	U1-1 : Removal of Deposit Materials							
	U1-2 : Removal of Unstable Materials							
	Cost=0.002 Mp							
	Completed within 12 days after Disaster Occurrence							
Permanent Measures	P1-1 : Recutting							
	P2-2 : Side Ditch							
	P6-2 : Grouted Riprap							
	Cost=0.462 Mp							
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
	1992	0.052	0.004	0.055	0.055			
	1993	0.079	0.005	0.085	0.074			
	1994	0.081	0.005	0.087	0.086			
	1995	0.084	0.005	0.089	0.059			
	1996	0.086	0.005	0.091	0.052			
	1997	0.088	0.005	0.094	0.047			
	1998	0.091	0.005	0.096	0.041			
	1999	0.093	0.005	0.098	0.037			
	2000	0.095	0.005	0.101	0.033			
	2001	0.098	0.005	0.103	0.029			
	2002	0.100	0.005	0.106	0.026			
	2003	0.103	0.005	0.108	0.023			
	2004	0.105	0.005	0.110	0.021			
	2005	0.108	0.005	0.113	0.018			
	2006	0.110	0.005	0.116	0.016			
	2007	0.113	0.005	0.118	0.015			
	2008	0.116	0.005	0.121	0.013			
	2009	0.119	0.005	0.124	0.012			
	2010	0.122	0.005	0.127	0.010			
	2011	0.124	0.005	0.130	0.009			
	Total	1.966	0.106	2.072	0.656			
Economic Evaluation	Total Discounted Benefit = 0.656 Mp							
	Total Discounted Cost = 0.416 Mp							
	Net Present Value (NPV) = 0.240 Mp							
	Benefit/Cost Ratio (B/C) = 1.577							
	Internal Rate of Return (IRR) = 25.5 %							

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-68 (Evaluation of Permanent Measures)						
Road Name	Albuera-Burauen Rd						
Condition	2-lane			Surface Type=Gravel		Surface Condition=Bad	
Traffic							
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc Total
	1992	19	11	0	1	12	15 58
	2000	24	14	0	1	16	20 75
	2010	31	19	0	1	20	27 98
	2020	41	24	0	1	26	36 128
Disaster Type	C-F (Cut Slope Failure)						
Traffic Interruption	Full Width						
Disaster Pattern	Pattern-1 (3 times a year)						
Speed Reduction Length	0.100 km						
Substitutive Transport	Original Road : L=1.000 km						
	Carabao Sledge/Horse : L=1.000 km n= 78 (in 1992)						
	Walking/Head Loading : L=1.000 km n=354 (in 1992)						
Urgent Measures	U1-1 : Removal of Deposit Materials						
	U1-2 : Removal of Unstable Materials						
	Cost=0.001 Mp						
	Completed within 12 days after Disaster Occurrence						
Permanent Measures	P1-1 : Recutting						
	P2-2 : Side Ditch						
	P4-6 : Pick Hole Seeding						
	P6-2 : Grouted Riprap						
	Cost=0.197 Mp						
Benefit (Mp)							
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit		
	1992	0.052	0.002	0.053	0.053		
	1993	0.079	0.003	0.082	0.071		
	1994	0.081	0.003	0.084	0.064		
	1995	0.084	0.003	0.086	0.057		
	1996	0.086	0.003	0.089	0.051		
	1997	0.088	0.003	0.091	0.045		
	1998	0.091	0.003	0.093	0.040		
	1999	0.093	0.003	0.096	0.036		
	2000	0.095	0.003	0.098	0.032		
	2001	0.098	0.003	0.100	0.029		
	2002	0.100	0.003	0.103	0.025		
	2003	0.103	0.003	0.105	0.023		
	2004	0.105	0.003	0.108	0.020		
	2005	0.108	0.003	0.110	0.018		
	2006	0.110	0.003	0.113	0.016		
	2007	0.113	0.003	0.116	0.014		
	2008	0.116	0.003	0.118	0.013		
	2009	0.119	0.003	0.121	0.011		
	2010	0.122	0.003	0.124	0.010		
	2011	0.124	0.003	0.127	0.009		
	Total	1.966	0.053	2.019	0.637		
Economic Evaluation	Total Discounted Benefit = 0.637 Mp						
	Total Discounted Cost = 0.177 Mp						
	Net Present Value (NPV) = 0.460 Mp						
	Benefit/Cost Ratio (B/C) = 3.593						
	Internal Rate of Return (IRR) = 68.9 %						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-76 (Evaluation of Permanent Measures)								
Road	Name	Burauen-Lapaz Rd							
	Condition	2-lane	Surface Type=Gravel			Surface Condition=Fair			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	57	12	7	31	50	94	251
		2000	82	17	11	43	65	136	354
		2010	123	26	17	62	92	209	529
		2020	183	39	26	88	130	316	782
Disaster Type	PBr-A (Permanent Bridge Approach Washout)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-4								
Substitutive Transport	Original Road	: L=1.000 km							
	Carabao Sledge/Horse	: L=0.950 km							n= 563 (in 1992)
	Walking/Head Loading	: L=0.950 km							n=3177 (in 1992)
	Banca Boat	: L=0.050 km							n= 739 (in 1992)
Urgent Measures	U6-3 : Bailey Bridge								
	Cost=0.407 Mp								
	Completed within 24 days after Disaster Occurrence								
Permanent Measures	P6-2 : Grouted Riprap								
	P15-1 : Concrete Bridge								
	Cost=2.935 Mp								
Benefit (Mp)		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	4.834	-	4.834	4.834			
		1993	5.495	-	5.495	4.778			
		1994	5.731	-	5.731	4.333			
		1995	5.977	-	5.977	3.930			
		1996	6.235	-	6.235	3.565			
		1997	6.503	-	6.503	3.233			
		1998	6.784	-	6.784	2.933			
		1999	7.076	-	7.076	2.660			
		2000	7.381	-	7.381	2.413			
		2001	7.666	-	7.666	2.179			
		2002	7.961	-	7.961	1.968			
		2003	8.269	-	8.269	1.777			
		2004	8.588	-	8.588	1.605			
		2005	8.919	-	8.919	1.450			
		2006	9.263	-	9.263	1.309			
		2007	9.621	-	9.621	1.182			
		2008	9.992	-	9.992	1.068			
		2009	10.378	-	10.378	0.964			
		2010	10.779	-	10.779	0.871			
		2011	11.180	-	11.180	0.786			
		Total	158.631	-	158.631	47.839			
Economic Evaluation	Total Discounted Benefit		= 47.839 Mp						
	Total Discounted Cost		= 3.008 Mp						
	Net Present Value (NPV)		= 44.831 Mp						
	Benefit/Cost Ratio (B/C)		= 15.905						
	Internal Rate of Return (IRR)		= infinite						
	(1st year benefit > cost)								

Note : Total Discounted Cost = 90 % of Urgent & Permanent Measures Costs

Economic Evaluation (Leyte)

Spot No.	L-78 (Evaluation of Permanent Measures)								
Road	Name	Mahagnao Rd							
	Condition	2-lane	Surface Type=Gravel			Surface Condition=Fair			
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total
		1992	36	29	0	3	28	34	130
		2000	45	35	0	3	34	43	160
		2010	59	46	0	4	43	58	210
		2020	78	59	0	4	56	77	274
Disaster Type	C-F (Cut Slope Failure)								
Traffic Interruption	One-lane								
Disaster Pattern	Pattern-1 (3 times a year)								
Speed Reduction Length	0.250 km								
Urgent Measures	U1-1 : Removal of Deposit Materials Cost=0.003 Mp Completed within 12 days after Disaster Occurrence								
Permanent Measures	P4-8 : Wattling P8-2 : Catch Gabion Wall Cost=0.861 Mp								
Benefit (Mp)									
		Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit			
		1992	0.063	0.005	0.069	0.069			
		1993	0.097	0.008	0.105	0.091			
		1994	0.099	0.008	0.108	0.081			
		1995	0.102	0.008	0.110	0.072			
		1996	0.105	0.008	0.113	0.064			
		1997	0.107	0.008	0.115	0.057			
		1998	0.110	0.008	0.118	0.051			
		1999	0.113	0.008	0.121	0.045			
		2000	0.115	0.008	0.124	0.040			
		2001	0.119	0.008	0.127	0.036			
		2002	0.122	0.008	0.130	0.032			
		2003	0.125	0.008	0.133	0.029			
		2004	0.129	0.008	0.137	0.026			
		2005	0.132	0.008	0.140	0.023			
		2006	0.136	0.008	0.144	0.020			
		2007	0.140	0.008	0.148	0.018			
		2008	0.143	0.008	0.152	0.016			
		2009	0.147	0.008	0.156	0.014			
		2010	0.151	0.008	0.160	0.013			
		2011	0.155	0.008	0.163	0.011			
		Total	2.411	0.159	2.571	0.811			
Economic Evaluation	Total Discounted Benefit = 0.811 Mp Total Discounted Cost = 0.775 Mp Net Present Value (NPV) = 0.036 Mp Benefit/Cost Ratio (B/C) = 1.047 Internal Rate of Return (IRR) = 15.9 %								

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-80 (Evaluation of Permanent Measures)																																																																																																																				
Road Name	Abuyog-Nebga Rd																																																																																																																				
Condition	2-lane	Surface Type=Gravel	Surface Condition=Bad																																																																																																																		
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>46</td> <td>47</td> <td>0</td> <td>6</td> <td>40</td> <td>46</td> <td>185</td> </tr> <tr> <td>2000</td> <td>58</td> <td>58</td> <td>0</td> <td>7</td> <td>49</td> <td>59</td> <td>231</td> </tr> <tr> <td>2010</td> <td>77</td> <td>74</td> <td>0</td> <td>8</td> <td>63</td> <td>79</td> <td>301</td> </tr> <tr> <td>2020</td> <td>101</td> <td>97</td> <td>0</td> <td>9</td> <td>82</td> <td>106</td> <td>395</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total	1992	46	47	0	6	40	46	185	2000	58	58	0	7	49	59	231	2010	77	74	0	8	63	79	301	2020	101	97	0	9	82	106	395																																																																						
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Economic Evaluation	<table> <tr> <td>Total Discounted Benefit</td> <td>=</td> <td>0.236 Mp</td> </tr> <tr> <td>Total Discounted Cost</td> <td>=</td> <td>0.159 Mp</td> </tr> <tr> <td>Net Present Value (NPV)</td> <td>=</td> <td>0.077 Mp</td> </tr> <tr> <td>Benefit/Cost Ratio (B/C)</td> <td>=</td> <td>1.484</td> </tr> <tr> <td>Internal Rate of Return (IRR)</td> <td>=</td> <td>23.8 %</td> </tr> </table>							Total Discounted Benefit	=	0.236 Mp	Total Discounted Cost	=	0.159 Mp	Net Present Value (NPV)	=	0.077 Mp	Benefit/Cost Ratio (B/C)	=	1.484	Internal Rate of Return (IRR)	=	23.8 %																																																																																															
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Internal Rate of Return (IRR)	=	23.8 %																																																																																																																			

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-81 (Evaluation of Permanent Measures)						
Road Name	Abuyog-Nebga Rd						
Condition	2-lane		Surface Type=Gravel			Surface Condition=Bad	
Traffic	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc Total
	1992	46	47	0	6	40	46 185
	2000	58	58	0	7	49	59 231
	2010	77	74	0	8	63	79 301
	2020	101	97	0	9	82	106 395
Disaster Type	CLV-D (Culvert Damage)						
Traffic Interruption	Shoulder						
Disaster Pattern	Pattern-3 (3 times a year)						
Speed Reduction Length	0.100 km						
Urgent Measures	U3-1 : Sheet Covering U4-1 : Sand Bag Wall Cost=0.010 Mp Completed within 12 days after Disaster Occurrence						
Permanent Measures	P1-3 : Refilling/Embankment P2-5 : Catch Basin P4-2 : Hand Seeding with Mat P6-2 : Grouted Riprap P16-3 : Grouted Riprap Apron Cost=0.043 Mp						
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit		
	1992	0.018	0.018	0.036	0.036		
	1993	0.028	0.027	0.055	0.048		
	1994	0.029	0.027	0.056	0.042		
	1995	0.029	0.027	0.056	0.037		
	1996	0.030	0.027	0.057	0.033		
	1997	0.031	0.027	0.058	0.029		
	1998	0.032	0.027	0.059	0.025		
	1999	0.033	0.027	0.060	0.022		
	2000	0.034	0.027	0.061	0.020		
	2001	0.034	0.027	0.061	0.017		
	2002	0.035	0.027	0.062	0.015		
	2003	0.036	0.027	0.063	0.014		
	2004	0.037	0.027	0.064	0.012		
	2005	0.038	0.027	0.065	0.011		
	2006	0.039	0.027	0.066	0.009		
	2007	0.040	0.027	0.067	0.008		
	2008	0.041	0.027	0.068	0.007		
	2009	0.042	0.027	0.069	0.006		
	2010	0.043	0.027	0.070	0.006		
	2011	0.045	0.027	0.072	0.005		
	Total	0.696	0.531	1.227	0.403		
Economic Evaluation	Total Discounted Benefit = 0.403 Mp						
	Total Discounted Cost = 0.039 Mp						
	Net Present Value (NPV) = 0.364 Mp						
	Benefit/Cost Ratio (B/C) = 10.418						
	Internal Rate of Return (IRR) = 2071.8 %						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-82 (Evaluation of Permanent Measures)						
Road Name	Abuyog-Nebga Rd						
Condition	2-lane	Surface Type=Earth			Surface Condition=Bad		
Traffic							
	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motoreyc Total
	1992	46	47	0	6	40	46 185
	2000	58	58	0	7	49	59 231
	2010	77	74	0	8	63	79 301
	2020	101	97	0	9	82	106 395
Disaster Type	E-F (Embankment Slope Failure)						
Traffic Interruption	Shoulder						
Disaster Pattern	Pattern-3 (3 times a year)						
Speed Reduction Length	0.100 km						
Urgent Measures	U2-2 : Temporary Side Ditch U4-3 : Wooden Fence Cost=0.006 Mp Completed within 12 days after Disaster Occurrence						
Permanent Measures	P2-1 : Slope Ditch P2-2 : Side Ditch P2-4 : Culvert P2-5 : Catch Basin Cost=0.053 Mp						
Benefit (Mp)							
	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit		
	1992	0.014	0.011	0.025	0.025		
	1993	0.021	0.016	0.037	0.032		
	1994	0.022	0.016	0.038	0.029		
	1995	0.022	0.016	0.039	0.025		
	1996	0.023	0.016	0.039	0.022		
	1997	0.024	0.016	0.040	0.020		
	1998	0.024	0.016	0.040	0.017		
	1999	0.025	0.016	0.041	0.015		
	2000	0.026	0.016	0.042	0.014		
	2001	0.026	0.016	0.042	0.012		
	2002	0.027	0.016	0.043	0.011		
	2003	0.028	0.016	0.044	0.009		
	2004	0.028	0.016	0.044	0.008		
	2005	0.029	0.016	0.045	0.007		
	2006	0.030	0.016	0.046	0.006		
	2007	0.031	0.016	0.047	0.006		
	2008	0.031	0.016	0.048	0.005		
	2009	0.032	0.016	0.048	0.004		
	2010	0.033	0.016	0.049	0.004		
	2011	0.034	0.016	0.050	0.004		
	Total	0.529	0.319	0.847	0.277		
Economic Evaluation	Total Discounted Benefit = 0.277 Mp						
	Total Discounted Cost = 0.048 Mp						
	Net Present Value (NPV) = 0.229 Mp						
	Benefit/Cost Ratio (B/C) = 5.803						
	Internal Rate of Return (IRR) = 162.9 %						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-84 (Evaluation of Permanent Measures)						
Road Name	Abuyog-Nebga Rd						
Condition	2-lane			Surface Type=Gravel		Surface Condition=Bad	
Traffic	Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc Total
	1992	46	47	0	6	40	46 185
	2000	58	58	0	7	49	59 231
	2010	77	74	0	8	63	79 301
	2020	101	97	0	9	82	106 395
Disaster Type	C-F (Cut Slope Failure)						
Traffic Interruption	Full Width						
Disaster Pattern	Pattern-1 (3 times a year)						
Speed Reduction Length	0.100 km						
Substitutive Transport	Original Road : L=1.000 km						
	Carabao Sledge/Horse : L=1.000 km n= 291 (in 1992)						
	Walking/Head Loading : L=1.000 km n=1348 (in 1992)						
Urgent Measures	U1-1 : Removal of Deposit Materials Cost=0.003 Mp Completed within 12 days after Disaster Occurrence						
Permanent Measures	P1-1 : Recutting P2-2 : Side Ditch P4-2 : Hand Seeding with Mat P6-2 : Grouted Riprap Cost=0.057 Mp						
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit		
	1992	0.194	0.005	0.199	0.199		
	1993	0.298	0.008	0.306	0.266		
	1994	0.305	0.008	0.313	0.237		
	1995	0.313	0.008	0.321	0.211		
	1996	0.321	0.008	0.329	0.188		
	1997	0.329	0.008	0.337	0.168		
	1998	0.338	0.008	0.346	0.150		
	1999	0.346	0.008	0.355	0.133		
	2000	0.355	0.008	0.363	0.119		
	2001	0.364	0.008	0.372	0.106		
	2002	0.372	0.008	0.380	0.094		
	2003	0.381	0.008	0.389	0.084		
	2004	0.389	0.008	0.397	0.074		
	2005	0.398	0.008	0.407	0.066		
	2006	0.408	0.008	0.416	0.059		
	2007	0.417	0.008	0.425	0.052		
	2008	0.427	0.008	0.435	0.046		
	2009	0.437	0.008	0.445	0.041		
	2010	0.447	0.008	0.455	0.037		
	2011	0.458	0.008	0.466	0.033		
	Total	7.298	0.159	7.457	2.363		
Economic Evaluation	Total Discounted Benefit = 2.363 Mp						
	Total Discounted Cost = 0.051 Mp						
	Net Present Value (NPV) = 2.311 Mp						
	Benefit/Cost Ratio (B/C) = 46.058						
	Internal Rate of Return (IRR) = infinite (1st year benefit > cost)						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-87 (Evaluation of Permanent Measures)																																																																																																																				
Road Name	Abuyog-Nebga Rd																																																																																																																				
Condition	2-lane	Surface Type=Gravel	Surface Condition=Fair																																																																																																																		
Traffic	<table border="1"> <thead> <tr> <th>Year</th> <th>Car</th> <th>Jeep'y</th> <th>Bus</th> <th>Truck</th> <th>Tricyc</th> <th>Motorcyc</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1992</td> <td>46</td> <td>47</td> <td>0</td> <td>6</td> <td>40</td> <td>46</td> <td>185</td> </tr> <tr> <td>2000</td> <td>58</td> <td>58</td> <td>0</td> <td>7</td> <td>49</td> <td>59</td> <td>231</td> </tr> <tr> <td>2010</td> <td>77</td> <td>74</td> <td>0</td> <td>8</td> <td>63</td> <td>79</td> <td>301</td> </tr> <tr> <td>2020</td> <td>101</td> <td>97</td> <td>0</td> <td>9</td> <td>82</td> <td>106</td> <td>395</td> </tr> </tbody> </table>							Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcyc	Total	1992	46	47	0	6	40	46	185	2000	58	58	0	7	49	59	231	2010	77	74	0	8	63	79	301	2020	101	97	0	9	82	106	395																																																																						
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Benefit (Mp)	<table border="1"> <thead> <tr> <th>Year</th> <th>Traffic Benefit</th> <th>Maintenance Benefit</th> <th>Total Benefit</th> <th>Disc'd Benefit</th> </tr> </thead> <tbody> <tr><td>1992</td><td>0.200</td><td>0.005</td><td>0.206</td><td>0.206</td></tr> <tr><td>1993</td><td>0.308</td><td>0.008</td><td>0.316</td><td>0.275</td></tr> <tr><td>1994</td><td>0.316</td><td>0.008</td><td>0.324</td><td>0.245</td></tr> <tr><td>1995</td><td>0.324</td><td>0.008</td><td>0.332</td><td>0.219</td></tr> <tr><td>1996</td><td>0.333</td><td>0.008</td><td>0.341</td><td>0.195</td></tr> <tr><td>1997</td><td>0.341</td><td>0.008</td><td>0.349</td><td>0.174</td></tr> <tr><td>1998</td><td>0.350</td><td>0.008</td><td>0.358</td><td>0.155</td></tr> <tr><td>1999</td><td>0.359</td><td>0.008</td><td>0.367</td><td>0.138</td></tr> <tr><td>2000</td><td>0.368</td><td>0.008</td><td>0.376</td><td>0.123</td></tr> <tr><td>2001</td><td>0.377</td><td>0.008</td><td>0.385</td><td>0.109</td></tr> <tr><td>2002</td><td>0.385</td><td>0.008</td><td>0.393</td><td>0.097</td></tr> <tr><td>2003</td><td>0.394</td><td>0.008</td><td>0.402</td><td>0.087</td></tr> <tr><td>2004</td><td>0.404</td><td>0.008</td><td>0.412</td><td>0.077</td></tr> <tr><td>2005</td><td>0.413</td><td>0.008</td><td>0.421</td><td>0.068</td></tr> <tr><td>2006</td><td>0.423</td><td>0.008</td><td>0.431</td><td>0.061</td></tr> <tr><td>2007</td><td>0.432</td><td>0.008</td><td>0.441</td><td>0.054</td></tr> <tr><td>2008</td><td>0.443</td><td>0.008</td><td>0.451</td><td>0.048</td></tr> <tr><td>2009</td><td>0.453</td><td>0.008</td><td>0.461</td><td>0.043</td></tr> <tr><td>2010</td><td>0.464</td><td>0.008</td><td>0.472</td><td>0.038</td></tr> <tr><td>2011</td><td>0.475</td><td>0.008</td><td>0.483</td><td>0.034</td></tr> <tr> <td>Total</td> <td>7.562</td> <td>0.159</td> <td>7.721</td> <td>2.445</td> </tr> </tbody> </table>							Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit	1992	0.200	0.005	0.206	0.206	1993	0.308	0.008	0.316	0.275	1994	0.316	0.008	0.324	0.245	1995	0.324	0.008	0.332	0.219	1996	0.333	0.008	0.341	0.195	1997	0.341	0.008	0.349	0.174	1998	0.350	0.008	0.358	0.155	1999	0.359	0.008	0.367	0.138	2000	0.368	0.008	0.376	0.123	2001	0.377	0.008	0.385	0.109	2002	0.385	0.008	0.393	0.097	2003	0.394	0.008	0.402	0.087	2004	0.404	0.008	0.412	0.077	2005	0.413	0.008	0.421	0.068	2006	0.423	0.008	0.431	0.061	2007	0.432	0.008	0.441	0.054	2008	0.443	0.008	0.451	0.048	2009	0.453	0.008	0.461	0.043	2010	0.464	0.008	0.472	0.038	2011	0.475	0.008	0.483	0.034	Total	7.562	0.159	7.721	2.445
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Total	7.562	0.159	7.721	2.445																																																																																																																	
Economic Evaluation	Total Discounted Benefit = 2.445 Mp Total Discounted Cost = 0.152 Mp Net Present Value (NPV) = 2.293 Mp Benefit/Cost Ratio (B/C) = 16.078 Internal Rate of Return (IRR) = infinite (1st year benefit > cost)																																																																																																																				

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

Economic Evaluation (Leyte)

Spot No.	L-90 (Evaluation of Permanent Measures)								
Road	Name	Sto. Domingo Rd		Surface Type=Gravel			Surface Condition=Bad		
	Condition	1-lane							
	Traffic								
		Year	Car	Jeep'y	Bus	Truck	Tricyc	Motorcye	Total
		1992	30	22	0	2	22	27	103
		2000	37	26	0	2	26	34	125
		2010	49	34	0	3	33	45	164
		2020	64	44	0	3	43	60	214
Disaster Type	SPW-D (Spillway Damage)								
Traffic Interruption	Full Width								
Disaster Pattern	Pattern-2								
Speed Reduction Length	0.100 km								
Urgent Measures	U1-5 : Selected Material Fill								
	U4-2 : Gabion Wall								
	Cost=0.051 Mp								
	Completed within 24 days after Disaster Occurrence								
Permanent Measures	P2-4 : Culvert								
	P6-6 : Supported Type Concrete Wall								
	P16-2 : Gabion Foot Protection								
	P19-3 : Concrete Pavement								
	Cost=0.222 Mp								
Benefit (Mp)	Year	Traffic Benefit	Maintenance Benefit	Total Benefit	Disc'd Benefit				
	1992	-	-	-	-				
	1993	0.035	-	0.035	0.031				
	1994	0.036	-	0.036	0.027				
	1995	0.037	-	0.037	0.024				
	1996	0.038	-	0.038	0.021				
	1997	0.038	-	0.038	0.019				
	1998	0.039	-	0.039	0.017				
	1999	0.040	-	0.040	0.015				
	2000	0.041	-	0.041	0.013				
	2001	0.042	-	0.042	0.012				
	2002	0.044	-	0.044	0.011				
	2003	0.045	-	0.045	0.010				
	2004	0.046	-	0.046	0.009				
	2005	0.047	-	0.047	0.008				
	2006	0.049	-	0.049	0.007				
	2007	0.050	-	0.050	0.006				
	2008	0.051	-	0.051	0.005				
	2009	0.053	-	0.053	0.005				
	2010	0.054	-	0.054	0.004				
	2011	0.056	-	0.056	0.004				
	Total	0.842	-	0.842	0.249				
Economic Evaluation	Total Discounted Benefit		= 0.249 Mp						
	Total Discounted Cost		= 0.200 Mp						
	Net Present Value		(NPV) = 0.049 Mp						
	Benefit/Cost Ratio		(B/C) = 1.244						
	Internal Rate of Return (IRR)		= 19.0 %						

Note : Total Discounted Cost = 90 % of Permanent Measures Cost

JICA