

APPENDIX 21-4
ECONOMIC COST-BENEFIT-STREAMS

TABLE 1 (a) ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Widening of Sta. Rita - Plaridel Section (Case-1)

KN. STA. : 39+000 - 40+500

LENGTH : 1.50 kms.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT	Total	COST	BENEFIT	Total
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost			
1988	-	-	-	-	-	-
1989	-	-	-	-	-	-
1990	-	-	-	-	-	-
1991	1.93	-	-	2.94	-	-
1992	-	-	-	-	-	-
1993	-	-	-	-	-	-
1994	8.36	-	-	8.36	-	-
1995	1.92	2.66	-	-	3.98	3.98
1996	2.20	3.03	-	-	3.95	3.95
1997	2.52	3.45	-	-	3.93	3.93
1998	2.89	3.93	-	-	3.90	3.90
1999	3.31	4.47	-	-	3.87	3.87
2000	3.80	5.10	-	-	3.85	3.85
2001	4.34	5.80	-	-	3.81	3.81
2002	4.98	6.60	-	-	3.79	3.79
2003	5.70	7.51	-	-	3.76	3.76
2004	6.54	8.55	-	-	3.73	3.73
2005	7.50	9.74	-	-	3.71	3.71
2006	8.58	11.09	-	-	3.68	3.68
2007	9.84	12.62	-	-	3.65	3.65
2008	11.27	14.40	-	-	3.63	3.63
2009	12.92	16.36	-	-	3.60	3.60
2010	14.80	18.63	-	-	3.57	3.57
2011	16.95	21.21	-	-	3.55	3.55
2012	19.48	24.15	-	-	3.53	3.53
2013	22.27	27.50	-	-	3.50	3.50
TOTAL	10.29	161.81	206.80	17.30	368.61	70.96

B/C = 6.28
 NPV = 59.66 Million Pesos
 IRR = 45.81 %

TABLE 1 (b) ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Widening of Sta. Rita - Plaridel Section (Case-2)
 KM. STA. : 39+000 - 40+500
 LENGTH : 1.50 kms.
 (Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT	Total	COST	BENEFIT	Total
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost			
1988	-	-	-	-	-	-
1989	10.29	-	-	10.29	-	-
1990	-	.72	-	-	1.44	2.16
1991	-	.87	-	-	1.62	2.49
1992	-	1.06	-	-	1.84	2.90
1993	-	1.30	-	-	2.04	3.34
1994	-	1.57	-	-	2.35	3.92
1995	-	1.92	-	-	2.66	4.58
1996	-	2.20	-	-	3.03	5.23
1997	-	2.52	-	-	3.45	5.97
1998	-	2.89	-	-	3.93	6.82
1999	-	3.31	-	-	4.47	7.78
2000	-	3.80	-	-	5.10	8.90
2001	-	4.34	-	-	5.80	10.14
2002	-	4.98	-	-	6.60	11.58
2003	-	5.70	-	-	7.51	13.21
2004	-	6.54	-	-	8.55	15.09
2005	-	7.50	-	-	9.74	17.24
2006	-	8.58	-	-	11.09	19.67
2007	-	9.84	-	-	12.62	22.46
2008	-	11.27	-	-	14.40	25.67
2009	-	12.92	-	-	16.36	29.28
2010	-	14.80	-	-	18.63	33.43
2011	-	16.95	-	-	21.21	38.16
2012	-	19.48	-	-	24.15	43.63
2013	-	22.27	-	-	27.50	49.77
TOTAL	10.29	167.33	-	10.29	216.09	383.42
						44.81

B/C = 4.35
 NPV = 34.52 Million Pesos
 IRR = 35.91 %

TABLE 2 (a) ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Widening of Calamba - Sto. Tomas Section (Case-1)
 KN. STA. : 52+000 - 61+000
 LENGTH : 10.0 kms.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT	Total	COST	BENEFIT	Total
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost			
1988	-	-	-	-	-	-
1989	-	-	-	-	-	-
1990	6.23	-	-	9.48	-	-
1991	-	-	-	-	-	-
1992	-	-	-	-	-	-
1993	-	-	-	-	-	-
1994	25.90	-	-	25.90	-	-
1995	25.90	-	-	22.52	-	-
1996	-	16.70	-	-	33.62	33.62
1997	-	19.00	-	-	38.22	38.22
1998	-	21.33	-	-	43.46	43.46
1999	-	23.96	-	-	49.44	49.44
2000	-	26.90	-	-	56.23	56.23
2001	-	30.20	-	-	63.96	63.96
2002	-	33.91	-	-	72.77	72.77
2003	-	38.08	-	-	82.82	82.82
2004	-	42.76	-	-	94.26	94.26
2005	-	48.01	-	-	107.29	107.29
2006	-	53.91	-	-	122.16	122.16
2007	-	60.54	-	-	139.10	139.10
2008	-	67.98	-	-	158.42	158.42
2009	-	76.33	-	-	180.44	180.44
2010	-	85.71	-	-	205.55	205.55
2011	-	96.24	-	-	234.20	234.20
2012	-	108.06	-	-	266.87	266.87
2013	-	121.34	-	-	304.16	304.16
2013	-	136.25	-	-	346.71	346.71
TOTAL	58.03	1107.43	1492.25	57.90	489.88	2599.68

B/C = 7.60
 NPV = 381.99 Million Pesos
 IRR = 48.90 %

TABLE 2 (b) ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Widening of Calamba - Sto. Tomas Section (Case-2)
 KM. STA. : 52+000 - 61+000
 LENGTH : 10.0 kms.
 (Unit : Million Pesos at Nov.1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)	
	COST	BENEFIT	Total	COST	BENEFIT
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost		
1988	6.23	-	-	7.16	-
1989	25.90	-	-	25.90	-
1990	25.90	-	-	22.52	-
1991	-	8.61	-	-	14.16
1992	-	10.20	-	-	14.25
1993	-	12.07	-	-	14.33
1994	-	14.30	-	-	14.44
1995	-	16.92	-	-	14.53
1996	-	19.00	-	-	14.37
1997	-	21.33	-	-	14.21
1998	-	23.96	-	-	14.05
1999	-	26.90	-	-	13.90
2000	-	30.20	-	-	13.75
2001	-	33.91	-	-	13.60
2002	-	38.08	-	-	13.46
2003	-	42.76	-	-	13.32
2004	-	48.01	-	-	13.19
2005	-	53.91	-	-	13.05
2006	-	60.54	-	-	12.93
2007	-	67.98	-	-	12.80
2008	-	76.33	-	-	12.68
2009	-	85.71	-	-	12.56
2010	-	96.24	-	-	12.44
2011	-	108.06	-	-	12.33
2012	-	121.34	-	-	12.22
2013	-	136.25	-	-	12.11
TOTAL	58.03	1152.61	1541.58	55.59	308.69

B/C = 5.55
 NPV = 253.10 Million Pesos
 IRR = 39.83 %

TABLE 3 (a) ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Construction of Plaridel By-pass (Case-1)

KM. STA. : 40+500 - 45+000

LENGTH : 4.56 kms.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	C O S T	B E N E F I T	Total	C O S T	B E N E F I T	Total
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost			
1988	-	-	-	-	-	-
1989	-	-	-	-	-	-
1990	8.10	-	-	12.32	-	-
1991	-	-	-	-	-	-
1992	-	-	-	-	-	-
1993	34.48	-	-	34.48	-	-
1994	34.48	-	-	29.98	-	-
1995	7.38	.47	-	-	7.85	-
1996	8.19	.69	-	-	8.88	-
1997	9.09	1.02	-	-	10.11	-
1998	10.10	1.50	-	-	11.60	-
1999	11.21	2.20	-	-	13.41	-
2000	12.44	3.24	-	-	15.68	-
2001	12.90	3.97	-	-	16.87	-
2002	13.39	4.86	-	-	18.25	-
2003	13.88	5.95	-	-	19.83	-
2004	14.40	7.29	-	-	21.69	-
2005	14.94	8.93	-	-	23.87	-
2006	14.56	10.54	-	-	25.10	-
2007	14.18	12.45	-	-	26.63	-
2008	13.82	14.70	-	-	28.52	-
2009	13.47	17.36	-	-	30.83	-
2010	13.12	20.50	-	-	33.62	-
2011	12.78	24.21	-	-	36.99	-
2012	12.46	28.28	-	-	40.74	-
2013	12.14	33.75	-	-	45.89	-
TOTAL	77.06	201.91	-	76.78	436.36	86.16

B/C = 1.12
 NPV = 9.38 Million Pesos
 IRR = 16.40 %

TABLE 3 (b) ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Construction of Plaridel By-pass (Case-2)
 KM. STA. : 40+500 - 45+000
 LENGTH : 4.56 kms.

(Unit : Million Pesos at Nov.1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)	
	COST	BENEFIT	Total	COST	BENEFIT
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost		
1988	8.10	-	-	9.32	-
1989	34.48	-	-	34.48	-
1990	34.48	-	-	29.98	-
1991	-	3.34	.48	-	2.89
1992	-	4.07	.25	-	2.84
1993	-	4.97	.01	-	2.85
1994	-	6.05	.23	-	3.12
1995	-	7.38	.47	-	3.39
1996	-	8.19	.69	-	3.34
1997	-	9.09	1.02	-	3.30
1998	-	10.10	1.50	-	3.30
1999	-	11.21	2.20	-	3.31
2000	-	12.44	3.24	-	3.37
2001	-	12.90	3.97	-	3.15
2002	-	13.39	4.86	-	2.97
2003	-	13.88	5.95	-	2.80
2004	-	14.40	7.29	-	2.67
2005	-	14.94	8.93	-	2.55
2006	-	14.56	10.54	-	2.33
2007	-	14.18	12.45	-	2.15
2008	-	13.82	14.70	-	2.00
2009	-	13.47	17.36	-	1.88
2010	-	13.12	20.50	-	1.79
2011	-	12.78	24.21	-	1.71
2012	-	12.46	28.28	-	1.64
2013	-	12.14	33.75	-	1.60
TOTAL	77.06	252.88	202.88	73.78	60.96
			455.76		

B/C = .88
 NPV = -12.81 Million Pesos
 IRR = 13.15 %

TABLE 4 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Improvement of Cabanatuan Urban Section (Shoulder & Sidewalk)

KM. STA. : 112+500 - 117+000

LENGTH : 4.50 kms.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT	Total	COST	BENEFIT	
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost			
1988	1.93	-	-	2.22	-	-
1989	23.25	-	-	23.25	-	-
1990	-	5.33	2.09	-	7.42	6.45
1991	-	5.34	2.36	-	7.70	5.82
1992	-	5.35	2.66	-	8.01	5.27
1993	-	5.36	3.01	-	8.37	4.79
1994	-	5.36	3.39	-	8.75	4.35
1995	-	5.37	3.83	-	9.20	3.98
1996	-	6.64	4.35	-	10.99	4.13
1997	-	8.20	4.94	-	13.14	4.30
1998	-	10.13	5.62	-	15.75	4.48
1999	-	12.51	6.38	-	18.89	4.67
2000	-	15.45	7.25	-	22.70	4.88
2001	-	15.76	8.23	-	23.99	4.48
2002	-	16.07	9.33	-	25.40	4.13
2003	-	16.38	10.58	-	26.96	3.81
2004	-	16.71	12.01	-	28.72	3.53
2005	-	17.03	13.62	-	30.65	3.28
2006	-	17.98	14.83	-	32.81	3.05
2007	-	18.98	16.15	-	35.13	2.84
2008	-	20.04	17.58	-	37.62	2.64
2009	-	21.16	19.14	-	40.30	2.46
2010	-	22.33	20.85	-	43.18	2.29
2011	-	23.58	22.70	-	46.28	2.14
2012	-	24.89	24.71	-	49.60	1.99
2013	-	26.28	26.91	-	53.19	1.86
TOTAL	25.18	342.23	262.52	25.47	604.75	91.61

B/C = 3.60
 NPV = 66.14 Million Pesos
 IRR = 36.39 %

TABLE 5 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Construction of Cabanatuan By-pass
 KM. STA. : 111+600 - 117+700
 LENGTH : 7.134 kms.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT		COST	BENEFIT	
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total		
1988	14.65	-	-	-	16.85	-
1989	26.87	-	-	-	26.87	-
1990	26.88	-	-	-	23.37	-
1991	-	13.73	8.33	22.06	-	16.68
1992	-	15.21	9.60	24.81	-	16.31
1993	-	16.85	11.06	27.91	-	15.96
1994	-	18.67	12.74	31.41	-	15.62
1995	-	20.68	14.67	35.35	-	15.28
1996	-	22.75	16.91	39.66	-	14.91
1997	-	25.03	19.49	44.52	-	14.55
1998	-	27.54	22.47	50.01	-	14.22
1999	-	30.30	25.90	56.20	-	13.89
2000	-	33.34	29.86	63.20	-	13.58
2001	-	30.18	34.08	64.26	-	12.01
2002	-	27.33	38.89	66.22	-	10.76
2003	-	24.74	44.38	69.12	-	9.77
2004	-	22.40	50.64	73.04	-	8.98
2005	-	20.28	57.79	78.07	-	8.34
2006	-	16.57	65.76	82.33	-	7.65
2007	-	13.54	74.84	88.38	-	7.14
2008	-	11.07	85.16	96.23	-	6.76
2009	-	9.04	96.92	105.96	-	6.47
2010	-	7.39	110.29	117.68	-	6.25
2011	-	6.04	125.51	131.55	-	6.08
2012	-	4.93	142.83	147.76	-	5.94
2013	-	4.03	162.53	166.56	-	5.82
TOTAL	68.40	421.64	1260.65	1682.29	67.09	252.98

B/C = 3.77
 NPV = 185.89 Million Pesos
 IRR = 35.64 %

TABLE 6 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Improvement of Urban Section and Construction of By-pass in Cabanatuan City
 KM. STA. : 111+600 - 117+700
 LENGTH : 4.50 kms. for Improvement, 7.134 kms. for By-pass
 (Unit : Million Pesos at Nov. 1986 Prices)

YEAR	B E F O R E D I S C O U N T			A F T E R D I S C O U N T (15%)		
	C O S T	B E N E F I T		C O S T	B E N E F I T	
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total		
1988	1.93	-	-	.00	2.22	-
1989	23.25	-	-	.00	23.25	-
1990	-	5.33	2.09	7.42	-	6.45
1991	14.65	5.34	2.36	7.70	11.08	5.82
1992	-	5.35	2.66	8.01	-	5.27
1993	26.87	5.36	3.01	8.37	15.36	4.79
1994	26.88	5.36	3.39	8.75	13.36	4.35
1995	-	23.90	16.97	40.87	-	17.67
1996	-	26.73	19.52	46.25	-	17.39
1997	-	29.95	22.45	52.40	-	17.13
1998	-	33.62	25.84	59.46	-	16.90
1999	-	37.81	29.73	67.54	-	16.69
2000	-	42.61	34.21	76.82	-	16.51
2001	-	39.64	39.02	78.66	-	14.70
2002	-	36.97	44.49	81.46	-	13.24
2003	-	34.57	50.73	85.30	-	12.06
2004	-	32.43	57.85	90.28	-	11.09
2005	-	30.50	65.96	96.46	-	10.31
2006	-	27.36	74.66	102.02	-	9.48
2007	-	24.93	84.53	109.46	-	8.84
2008	-	23.09	95.71	118.80	-	8.35
2009	-	21.74	108.40	130.14	-	7.95
2010	-	20.79	122.80	143.59	-	7.63
2011	-	20.19	139.13	159.32	-	7.36
2012	-	19.86	157.66	177.52	-	7.13
2013	-	19.80	178.68	198.48	-	6.93
TOTAL	93.58	573.23	1381.85	1955.08	65.27	254.05

B/C = 3.89
 NPV = 188.78 Million Pesos
 IRR = 37.95 %

TABLE 7 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Improvement of Capan Urban Section
 KM. SIA. : 92+700 - 93+800
 LENGTH : 1.10 kms.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)	
	COST	BENEFIT	Total	COST	BENEFIT
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost		
1988	-	-	-	-	-
1989	5.48	-	-	5.48	-
1990	-	.51	.79	-	.69
1991	-	.63	.95	-	.72
1992	-	.76	1.12	-	.74
1993	-	.93	1.34	-	.77
1994	-	1.14	1.60	-	.80
1995	-	1.39	1.91	-	.83
1996	-	1.10	1.69	-	.64
1997	-	.87	1.54	-	.50
1998	-	.69	1.45	-	.41
1999	-	.54	1.41	-	.35
2000	-	.43	1.42	-	.31
2001	-	.47	1.59	-	.30
2002	-	.52	1.78	-	.29
2003	-	.57	2.00	-	.28
2004	-	.62	2.23	-	.27
2005	-	.69	2.51	-	.27
2006	-	.55	2.55	-	.24
2007	-	.41	2.61	-	.21
2008	-	.27	2.69	-	.19
2009	-	.13	2.79	-	.17
2010	-	.10	3.02	-	.16
2011	-	.06	3.27	-	.15
2012	-	.02	3.55	-	.14
2013	-	.02	3.90	-	.14
TOTAL	5.48	36.29	49.71	5.48	9.54

B/C = 1.74
 NPV = 4.06 Million Pesos
 IRR = 23.86 %

TABLE 8 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Improvement of San Jose Urban Section
 KM. STA. : 112+500 - 117+000
 LENGTH : 4.50 kms.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT	Total	COST	BENEFIT	Total
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost			
1988	-	-	-	17.88	-	-
1989	-	-	-	-	-	-
1990	.84	.41	-	-	1.25	1.09
1991	.99	.46	-	-	1.45	1.10
1992	1.18	.51	-	-	1.69	1.11
1993	1.39	.57	-	-	1.96	1.12
1994	1.65	.64	-	-	2.29	1.14
1995	1.95	.71	-	-	2.66	1.15
1996	2.41	.80	-	-	3.21	1.21
1997	2.97	.90	-	-	3.87	1.27
1998	3.67	1.01	-	-	4.68	1.33
1999	4.53	1.14	-	-	5.67	1.40
2000	5.59	1.28	-	-	6.87	1.48
2001	4.47	1.44	-	-	5.91	1.10
2002	3.35	1.62	-	-	4.97	.81
2003	2.24	1.82	-	-	4.06	.57
2004	1.12	2.05	-	-	3.17	.39
2005	1.02	2.30	-	-	3.32	.35
2006	.94	2.17	-	-	3.11	.29
2007	.86	2.04	-	-	2.90	.23
2008	.78	1.92	-	-	2.70	.19
2009	.72	1.81	-	-	2.53	.15
2010	.66	1.70	-	-	2.36	.13
2011	.60	1.60	-	-	2.20	.10
2012	.60	1.51	-	-	2.11	.08
2013	.60	1.42	-	-	2.02	.07
TOTAL	17.88	45.13	31.83	17.88	76.96	17.88

B/C = 1.00
 NPV = -.02 Million Pesos
 IRR = 14.99 %

TABLE 9 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Improvement of San Ildefonso Urban Section
 KM. STA. : 65+700 - 66+700
 LENGTH : 1.00 km.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT				AFTER DISCOUNT (15%)	
	COST	BENEFIT	COST	BENEFIT	COST	BENEFIT
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total		
1988	-	-	-	-	-	-
1989	-	-	-	-	-	-
1990	-	-	-	-	-	-
1991	3.77	-	-	-	3.77	-
1992	.12	.09	-	.21	-	.18
1993	.14	.10	-	.24	-	.18
1994	.16	.12	-	.28	-	.18
1995	.19	.13	-	.32	-	.18
1996	.23	.15	-	.38	-	.19
1997	.26	.18	-	.44	-	.19
1998	.31	.20	-	.51	-	.19
1999	.35	.23	-	.58	-	.19
2000	.39	.26	-	.65	-	.18
2001	.44	.29	-	.73	-	.18
2002	.49	.33	-	.82	-	.18
2003	.55	.37	-	.92	-	.17
2004	.61	.42	-	1.03	-	.17
2005	.69	.47	-	1.16	-	.16
2006	.77	.53	-	1.30	-	.16
2007	.87	.60	-	1.47	-	.16
2008	.97	.68	-	1.65	-	.15
2009	1.09	.77	-	1.86	-	.15
2010	1.22	.87	-	2.09	-	.15
2011	1.37	.98	-	2.35	-	.14
2012	1.53	1.11	-	2.64	-	.14
2013	1.72	1.26	-	2.98	-	.14
TOTAL	3.77	10.14	-	24.61	3.77	3.73

B/C = .99
 NPV = -.04 Million Pesos
 IRR = 14.86 %

TABLE 10 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Improvement of Sta. Rosa Urban Section
 KM. STA. : 106+800 - 107+900
 LENGTH : 1.10 kms.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	C O S T		B E F O R E D I S C O U N T			A F T E R D I S C O U N T (15%)	
	Savings of Fixed Passenger Cost	Total	Savings of Running Cost	Savings of Accident Cost	C O S T	B E N E F I T	
1988	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-
1990	5.68	5.68	-	-	5.68	-	-
1991	.69	.79	.10	-	-	.69	.69
1992	.77	.89	.12	-	-	.67	.67
1993	.87	1.00	.13	-	-	.66	.66
1994	.98	1.13	.15	-	-	.65	.65
1995	1.10	1.27	.17	-	-	.63	.63
1996	1.24	1.43	.19	-	-	.62	.62
1997	1.44	1.66	.22	-	-	.62	.62
1998	1.66	1.90	.24	-	-	.62	.62
1999	1.92	2.20	.28	-	-	.63	.63
2000	2.23	2.54	.31	-	-	.63	.63
2001	2.58	2.94	.36	-	-	.63	.63
2002	2.99	3.39	.40	-	-	.64	.64
2003	3.46	3.92	.46	-	-	.64	.64
2004	4.00	4.52	.52	-	-	.64	.64
2005	4.64	5.23	.59	-	-	.65	.65
2006	5.37	6.04	.67	-	-	.65	.65
2007	6.22	6.98	.76	-	-	.65	.65
2008	7.20	8.06	.86	-	-	.65	.65
2009	8.33	9.30	.97	-	-	.65	.65
2010	9.65	10.75	1.10	-	-	.66	.66
2011	11.17	12.42	1.25	-	-	.66	.66
2012	12.93	14.35	1.42	-	-	.66	.66
2013	14.97	16.58	1.61	-	-	.67	.67
2013	17.34	19.16	1.82	-	-	.67	.67
TOTAL	5.68	138.45	14.70	-	5.68	15.51	15.51

B/C = 2.73
 NPV = 9.83 Million Pesos
 IRR = 26.83 %

TABLE 11 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Improvement of Talavera Urban Section
 KM. STA. : 215+700 - 216+700
 LENGTH : 1.00 km.

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)	
	COST	BENEFIT	Total	COST	BENEFIT
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost		
1988	-	-	-	4.91	-
1989	-	-	-	-	.45
1990	.44	.08	-	-	.45
1991	.51	.09	-	-	.46
1992	.60	.10	-	-	.46
1993	.69	.12	-	-	.47
1994	.81	.13	-	-	.47
1995	.94	.15	-	-	.47
1996	1.09	.17	-	-	.48
1997	1.27	.19	-	-	.48
1998	1.48	.22	-	-	.48
1999	1.71	.25	-	-	.48
2000	2.00	.28	-	-	.49
2001	2.32	.32	-	-	.49
2002	2.70	.36	-	-	.50
2003	3.13	.41	-	-	.50
2004	3.63	.46	-	-	.50
2005	4.22	.52	-	-	.51
2006	4.91	.59	-	-	.51
2007	5.70	.67	-	-	.51
2008	6.63	.76	-	-	.52
2009	7.70	.86	-	-	.52
2010	8.95	.98	-	-	.53
2011	10.40	1.11	-	-	.53
2012	12.09	1.26	-	-	.54
2013	14.05	1.43	-	-	.54
TOTAL	4.91	11.51	-	4.91	11.88
		109.48			

B/C = 2.42
 NPV = 6.97 Million Pesos
 IRR = 24.63 %

TABLE 12 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Plaridel Intersection
 KM. STA. : 41+700

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT		COST	BENEFIT	
	Savings of Fixed & Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total		
1988	-	-	-	-	-	-
1989	1.47	-	-	-	1.47	-
1990	.07	.89	-	.89	.06	.77
1991	.07	1.14	-	1.14	.05	.86
1992	.07	1.45	-	1.45	.05	.95
1993	.07	1.85	-	1.85	.04	1.06
1994	.07	2.37	-	2.37	.03	1.18
1995	.07	3.02	-	3.02	.03	1.31
1996	.07	3.86	-	3.86	.03	1.45
1997	.07	4.92	-	4.92	.02	1.61
TOTAL	2.03	19.50	-	19.50	1.78	9.19

B/C = 5.15
 NPV = 7.41 Million Pesos
 IRR = 81.12 %

TABLE 13 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Capan Intersection
 KM. STA. : 93+900
 (Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)	
	COST	BENEFIT		COST	BENEFIT
	Savings of Fixed & Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total	
1988	-	-	-	-	-
1989	1.27	-	-	1.27	-
1990	.07	3.54	-	3.54	3.08
1991	.07	4.47	-	4.47	3.38
1992	.07	5.64	-	5.64	3.71
1993	.07	7.12	-	7.12	4.07
1994	.07	8.99	-	8.99	4.47
1995	.07	11.35	-	11.35	4.91
1996	.07	14.33	-	14.33	5.39
1997	.07	18.09	-	18.09	5.91
TOTAL	1.83	73.53	-	73.53	34.91

B/C = 22.04
 NPV = 33.33 Million Pesos
 IRR = 299.59 %

TABLE 14 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Sta. Rosa Intersection
 KM. STA. : 107+500

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT				AFTER DISCOUNT (15%)	
	COST	BENEFIT		COST	BENEFIT	
	Savings of Fixed & Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total		
1988	-	-	-	-	-	
1989	1.51	.00	-	-	1.51	
1990	.07	.21	-	.21	.18	
1991	.07	.25	-	.25	.19	
1992	.07	.30	-	.30	.20	
1993	.07	.36	-	.36	.21	
1994	.07	.43	-	.43	.21	
1995	.07	.51	-	.51	.22	
1996	.07	.61	-	.61	.23	
1997	.07	.73	-	.73	.24	
TOTAL	2.07	3.40	-	3.40	1.82	

B/C = .92
 NPV = -.15 Million Pesos
 IRR = 12.59 %

TABLE 15 (a) ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Cabanatuan Intersection (Mabini St.)

KM. STA. : 115+700

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT				AFTER DISCOUNT (15%)	
	C O S T		B E N E F I T		C O S T	B E N E F I T
	Savings of Fixed & Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total		
1988	-	-	-	-	-	-
1989	1.33	-	-	-	1.33	-
1990	.07	2.53	-	2.53	.06	2.20
1991	.07	3.30	-	3.30	.05	2.50
1992	.07	4.32	-	4.32	.05	2.84
1993	.07	5.64	-	5.64	.04	3.22
1994	.07	7.36	-	7.36	.03	3.66
1995	.07	9.62	-	9.62	.03	4.16
1996	.07	12.57	-	12.57	.03	4.73
1997	.07	16.41	-	16.41	.02	5.36
TOTAL	1.89	61.75	-	61.75	1.64	28.67

B/C = 17.44

NPV = 27.02 Million Pesos

IRR = 215.77 %

TABLE 15 (b) ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : Cabanatuan Intersection (Del Pilar St.)
 KM. STA. : 116+600

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT				AFTER DISCOUNT (15%)	
	COST	BENEFIT		COST	BENEFIT	
		Savings of Fixed & Passenger Cost	Savings of Running Cost	Total	Savings of Accident Cost	
1988	-	-	-	-	-	-
1989	1.58	-	-	-	-	-
1990	.07	3.38	-	3.38	-	2.94
1991	.07	4.31	-	4.31	-	3.26
1992	.07	5.50	-	5.50	-	3.62
1993	.07	7.02	-	7.02	-	4.01
1994	.07	8.96	-	8.96	-	4.45
1995	.07	11.44	-	11.44	-	4.95
1996	.07	14.60	-	14.60	-	5.49
1997	.07	18.63	-	18.63	-	6.09
TOTAL	2.14	73.84	-	73.84	-	34.81

B/C = 18.38
 NPV = 32.91 Million Pesos
 IRR = 236.76 %

TABLE 16 ECONOMIC COST - BENEFIT STREAMS

PROJECT NAME : San Jose Intersection
 KM. STA. : 159+500

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)	
	C O S T	B E N E F I T		C O S I	B E N E F I T
	Savings of Fixed & Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total	
1988	-	-	-	-	-
1989	1.59	-	-	1.59	-
1990	.07	.25	-	.32	.22
1991	.07	.33	-	.40	.25
1992	.07	.42	-	.49	.28
1993	.07	.55	-	.62	.31
1994	.07	.72	-	.79	.36
1995	.07	.94	-	1.01	.41
1996	.07	1.23	-	1.30	.46
1997	.07	1.60	-	1.67	.52
TOTAL	2.15	6.04	-	6.04	2.81

B/C = 1.47
 NPV = .90 Million Pesos
 IRR = 25.51 %

TABLE 17 ECONOMIC COST - BENEFIT STREAMS
 (Unit : Million Pesos at Nov.1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT	Total	COST	BENEFIT	Total
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost			
1988	-	-	-	-	-	-
1989	1.47	-	-	5.95	-	-
1990	8.17	.89	-	28.74	3.13	3.13
1991	5.77	1.14	.89	17.65	3.49	3.49
1992	.07	1.57	1.66	.19	4.42	4.42
1993	34.55	1.99	2.09	79.92	4.83	4.83
1994	42.91	2.53	2.65	86.31	5.33	5.33
1995	.07	12.51	15.77	.12	27.58	27.58
1996	.07	14.48	18.35	.11	27.91	27.91
1997	.07	16.79	21.44	.09	28.35	28.35
1998	-	13.30	18.93	-	21.77	21.77
1999	-	14.87	21.77	-	21.77	21.77
2000	-	16.63	25.23	-	21.94	21.94
2001	-	17.68	27.74	-	20.98	20.98
2002	-	18.86	30.65	-	20.15	20.15
2003	-	20.13	33.96	-	19.42	19.42
2004	-	21.55	37.81	-	18.80	18.80
2005	-	23.13	42.27	-	18.27	18.27
2006	-	23.91	46.07	-	17.32	17.32
2007	-	24.89	50.56	-	16.53	16.53
2008	-	26.06	55.84	-	15.87	15.87
2009	-	27.48	61.97	-	15.32	15.32
2010	-	29.14	69.14	-	14.86	14.86
2011	-	31.10	77.50	-	14.49	14.49
2012	-	33.47	87.01	-	14.14	14.14
2013	-	36.13	98.64	-	13.94	13.94
TOTAL	93.15	430.23	849.08	219.07	390.61	390.61

B/C = 1.78
 NPV = 171.54 Million Pesos
 IRR = 23.16 %

TABLE 18 ECONOMIC COST - BENEFIT STREAMS

(Unit : Million Pesos at Nov. 1986 Price)

N-1 Section

YEAR	B E F O R E D I S C O U N T			B E N E F I T		C O S T	B E N E F I T
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total	A F T E R D I S C O U N T (15%)		
1988	8.10	-	-	-	-	9.32	-
1989	46.24	-	-	-	-	46.24	-
1990	34.55	1.61	1.44	3.05	3.05	30.04	2.65
1991	3.84	5.35	2.10	7.45	7.45	2.90	5.63
1992	.07	6.70	2.18	8.88	8.88	.05	5.84
1993	.07	8.26	2.15	10.41	10.41	.04	5.95
1994	.07	10.15	2.70	12.85	12.85	.03	6.39
1995	.07	12.51	3.26	15.77	15.77	.03	6.82
1996	.07	14.48	3.87	18.35	18.35	.03	6.90
1997	.07	16.79	4.65	21.44	21.44	.02	7.01
1998	-	13.30	5.63	18.93	18.93	-	5.38
1999	-	14.87	6.90	21.77	21.77	-	5.38
2000	-	16.63	8.60	25.23	25.23	-	5.42
2001	-	17.68	10.06	27.74	27.74	-	5.18
2002	-	18.86	11.79	30.65	30.65	-	4.98
2003	-	20.13	13.83	33.96	33.96	-	4.80
2004	-	21.55	16.26	37.81	37.81	-	4.65
2005	-	23.13	19.14	42.27	42.27	-	4.52
2006	-	23.91	22.16	46.07	46.07	-	4.28
2007	-	24.89	25.67	50.56	50.56	-	4.09
2008	-	26.06	29.78	55.84	55.84	-	3.92
2009	-	27.48	34.49	61.97	61.97	-	3.79
2010	-	29.14	40.00	69.14	69.14	-	3.67
2011	-	31.10	46.40	77.50	77.50	-	3.58
2012	-	33.47	53.54	87.01	87.01	-	3.50
2013	-	36.13	62.51	98.64	98.64	-	3.45
TOTAL	93.15	454.18	429.11	883.29	883.29	88.70	117.78

B/C = 1.33
 NPV = 29.07 Million Pesos
 IRR = 18.13 %

TABLE 19 ECONOMIC COST - BENEFIT STREAMS

(Unit : Million Pesos at Nov. 1986 Prices)

N-2 Section

YEAR	BEFORE DISCOUNT			BENEFIT		AFTER DISCOUNT (15%)	
	COST	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total	COST	BENEFIT
1988	1.93	-	-	-	-	2.22	-
1989	40.10	-	-	-	-	40.10	-
1990	.28	16.19	2.47	-	18.66	.24	16.23
1991	14.93	19.07	2.80	-	21.87	11.29	16.54
1992	.28	22.74	3.15	-	25.89	.18	17.02
1993	27.15	27.41	3.57	-	30.98	15.52	17.71
1994	27.16	33.34	4.02	-	37.36	13.50	18.57
1995	.28	59.45	17.68	-	77.13	.12	33.35
1996	.28	71.38	20.33	-	91.71	.11	34.48
1997	.28	86.34	23.36	-	109.70	.09	35.86
1998	-	36.23	26.88	-	63.11	-	17.94
1999	-	40.58	30.91	-	71.49	-	17.67
2000	-	45.62	35.56	-	81.18	-	17.45
2001	-	43.10	40.54	-	83.64	-	15.63
2002	-	40.95	46.21	-	87.16	-	14.17
2003	-	39.14	52.68	-	91.82	-	12.98
2004	-	37.69	60.05	-	97.74	-	12.01
2005	-	36.56	68.45	-	105.01	-	11.22
2006	-	34.13	77.42	-	111.55	-	10.37
2007	-	32.54	87.59	-	120.13	-	9.71
2008	-	31.69	99.10	-	130.79	-	9.19
2009	-	31.52	112.16	-	143.68	-	8.78
2010	-	32.06	126.97	-	159.03	-	8.45
2011	-	33.18	143.76	-	176.94	-	8.17
2012	-	34.85	162.80	-	197.65	-	7.94
2013	-	37.16	184.38	-	221.54	-	7.74
TOTAL	112.67	922.92	1432.84	-	2355.76	83.38	379.17

B/C = 4.55
 NPV = 295.79 Million Pesos
 IRR = 53.05 %

TABLE 20 ECONOMIC COST - BENEFIT STREAMS
(Unit : Million Pesos at Nov. 1986 Prices)

N-3 Section

YEAR	BEFORE DISCOUNT			BENEFIT		COST	AFTER DISCOUNT (15%)	BENEFIT
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total				
1988	-	-	-	-	-	24.38	-	-
1989	24.38	-	-	-	-	-	24.38	-
1990	.07	.49	-	2.02	-	.06	1.76	1.76
1991	.07	.55	-	2.38	-	.05	1.80	1.80
1992	.07	.61	-	2.81	-	.05	1.85	1.85
1993	.07	.69	-	3.32	-	.04	1.90	1.90
1994	.07	.77	-	3.95	-	.03	1.96	1.96
1995	.07	.86	-	4.69	-	.03	2.03	2.03
1996	.07	.97	-	5.70	-	.03	2.14	2.14
1997	.07	1.09	-	6.93	-	.02	2.27	2.27
1998	-	1.23	-	6.38	-	-	1.81	1.81
1999	-	1.39	-	7.63	-	-	1.89	1.89
2000	-	1.56	-	9.15	-	-	1.97	1.97
2001	-	1.76	-	8.55	-	-	1.60	1.60
2002	-	1.98	-	8.03	-	-	1.31	1.31
2003	-	2.23	-	7.60	-	-	1.07	1.07
2004	-	2.51	-	7.26	-	-	.89	.89
2005	-	2.82	-	8.06	-	-	.86	.86
2006	-	2.76	-	8.61	-	-	.80	.80
2007	-	2.71	-	9.27	-	-	.75	.75
2008	-	2.68	-	10.09	-	-	.71	.71
2009	-	2.67	-	11.09	-	-	.68	.68
2010	-	2.68	-	12.29	-	-	.65	.65
2011	-	2.71	-	13.71	-	-	.63	.63
2012	-	2.77	-	15.46	-	-	.62	.62
2013	-	2.85	-	17.50	-	-	.61	.61
TOTAL	24.94	43.34	-	192.48	-	24.69	32.55	32.55

B/C = 1.32
NPV = 7.86 Million Pesos
IRR = 18.50 %

TABLE 23 ECONOMIC COST - BENEFIT STREAMS
(Unit : Million Pesos at Nov. 1986 Prices)

North Study Section

YEAR	B E F O R E D I S C O U N T			B E N E F I T		A F T E R D I S C O U N T (15%)	
	C O S T	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Total	C O S T	B E N E F I T
1988	10.03	-	-	-	-	11.53	-
1989	110.72	-	-	-	-	110.72	-
1990	34.90	19.33	4.40	-	23.73	30.35	20.63
1991	18.84	26.25	5.45	-	31.70	14.25	23.97
1992	.42	31.54	5.94	-	37.58	.28	24.71
1993	27.29	38.30	6.41	-	44.71	15.60	25.56
1994	27.30	46.67	7.49	-	54.16	13.57	26.93
1995	.42	75.79	21.80	-	97.59	.18	42.19
1996	.42	90.59	25.17	-	115.76	.16	43.52
1997	.42	108.97	29.10	-	138.07	.14	45.14
1998	-	54.68	33.74	-	88.42	-	25.13
1999	-	61.69	39.20	-	100.89	-	24.94
2000	-	69.84	45.72	-	115.56	-	24.84
2001	-	67.57	52.36	-	119.93	-	22.42
2002	-	65.86	59.98	-	125.84	-	20.45
2003	-	64.64	68.74	-	133.38	-	18.85
2004	-	63.99	78.82	-	142.81	-	17.55
2005	-	64.93	90.41	-	155.34	-	16.60
2006	-	63.89	102.34	-	166.23	-	15.45
2007	-	63.99	115.97	-	179.96	-	14.54
2008	-	65.16	131.56	-	196.72	-	13.82
2009	-	67.42	149.32	-	216.74	-	13.24
2010	-	70.81	163.65	-	240.46	-	12.78
2011	-	75.28	192.87	-	268.15	-	12.39
2012	-	81.01	219.11	-	300.12	-	12.06
2013	-	87.94	249.74	-	337.68	-	11.80
TOTAL	230.76	1526.24	1905.29	-	3431.53	196.78	529.50

B/C = 2.69
NPV = 332.73 Million Pesos
IRR = 31.18 %

TABLE 22 ECONOMIC COST - BENEFIT STREAMS

North Study Section (F/S)

(Unit : Million Pesos at Nov. 1986 Prices)

YEAR	C O S T		B E F O R E D I S C O U N T		B E N E F I T		T o t a l	C O S T	A F T E R D I S C O U N T (15%)	B E N E F I T
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost	Savings of Accident Cost						
1988	1.93	-	-	-	-	-	-	2.22	-	-
1989	65.95	-	-	-	-	-	-	65.95	-	-
1990	8.52	18.61	2.96	3.35	-	-	21.57	7.41	18.76	
1991	20.77	22.04	3.35	3.85	-	-	25.39	15.71	19.20	
1992	.42	26.51	4.36	4.91	-	-	30.36	.28	19.96	
1993	61.77	32.03	4.91	21.80	-	-	36.39	35.32	20.81	
1994	70.14	39.05	21.80	25.17	-	-	43.96	34.87	21.86	
1995	.42	75.79	25.17	29.10	-	-	97.59	.18	42.19	
1996	.42	90.59	29.10	33.74	-	-	115.76	.16	43.52	
1997	.42	108.97	33.74	39.20	-	-	138.07	.14	45.14	
1998	-	54.68	39.20	45.72	-	-	88.42	-	25.13	
1999	-	61.69	45.72	52.36	-	-	100.89	-	24.94	
2000	-	69.84	52.36	59.98	-	-	115.56	-	24.84	
2001	-	67.57	59.98	68.74	-	-	119.93	-	22.42	
2002	-	65.86	68.74	78.82	-	-	125.84	-	20.45	
2003	-	64.64	78.82	90.41	-	-	133.38	-	18.85	
2004	-	63.99	90.41	102.34	-	-	142.81	-	17.55	
2005	-	64.93	102.34	115.97	-	-	155.34	-	16.60	
2006	-	63.89	115.97	131.56	-	-	166.23	-	15.45	
2007	-	63.99	131.56	149.32	-	-	179.96	-	14.54	
2008	-	65.16	149.32	169.65	-	-	196.72	-	13.82	
2009	-	67.42	169.65	192.87	-	-	216.74	-	13.24	
2010	-	70.81	192.87	219.11	-	-	240.46	-	12.78	
2011	-	75.28	219.11	249.74	-	-	268.15	-	12.39	
2012	-	81.01	249.74	-	-	-	300.12	-	12.06	
2013	-	87.94	-	-	-	-	337.68	-	11.80	
TOTAL	230.76	1502.29	1895.03	-	-	-	3397.32	162.23	508.28	

B/C = 3.13
 NPV = 346.05 Million Pesos
 IRR = 38.55 %

TABLE 23 ECONOMIC COST - BENEFIT STREAMS
PROJECT NAME : ALL STUDY SECTIONS

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT	Total	COST	BENEFIT	Total
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost			
1988	16.26	-	-	18.70	-	-
1989	136.62	-	-	136.62	-	-
1990	60.80	19.33	-	52.87	20.63	23.73
1991	18.84	34.86	-	14.25	38.13	50.43
1992	.42	41.84	-	.28	38.96	59.25
1993	27.29	50.37	-	15.60	39.90	69.78
1994	27.30	60.97	-	13.57	41.37	83.20
1995	.42	92.71	-	.18	56.73	131.21
1996	.42	109.59	-	.16	57.89	153.98
1997	.42	130.30	-	.14	59.34	181.53
1998	-	78.64	-	-	39.19	137.86
1999	-	88.59	-	-	38.84	157.12
2000	-	100.04	-	-	38.59	179.52
2001	-	101.48	-	-	36.02	192.70
2002	-	103.94	-	-	33.91	208.66
2003	-	107.40	-	-	32.17	227.64
2004	-	112.00	-	-	30.74	250.10
2005	-	118.84	-	-	29.65	277.50
2006	-	124.43	-	-	28.37	305.33
2007	-	131.97	-	-	27.34	338.38
2008	-	141.49	-	-	26.50	377.16
2009	-	153.13	-	-	25.80	422.29
2010	-	167.05	-	-	25.22	474.66
2011	-	183.34	-	-	24.72	535.02
2012	-	202.85	-	-	24.28	604.28
2013	-	224.19	-	-	23.91	684.39
TOTAL	288.79	2678.85	-	252.86	838.19	6125.72

B/C = 3.32
NPV = 585.83 Million Pesos
IRR = 33.70 %

TABLE 24 ECONOMIC COST - BENEFIT STREAMS
 (Unit : Million Pesos at Nov. 1986 Prices)

YEAR	BEFORE DISCOUNT			AFTER DISCOUNT (15%)		
	COST	BENEFIT	Total	COST	BENEFIT	Total
	Savings of Fixed Passenger Cost	Savings of Running Cost	Savings of Accident Cost			
1988	8.16	-	-	9.38	-	-
1989	91.85	-	-	91.85	-	-
1990	34.42	18.61	-	29.93	18.76	18.76
1991	20.77	30.65	-	15.71	33.36	33.36
1992	.42	36.71	-	.28	34.21	34.21
1993	61.77	44.10	-	35.32	35.14	35.14
1994	70.14	53.35	-	34.87	36.29	36.29
1995	.42	92.71	-	.18	56.73	56.73
1996	.42	109.59	-	.16	57.89	57.89
1997	.42	130.30	-	.14	59.24	59.24
1998	-	78.64	-	-	39.19	39.19
1999	-	88.59	-	-	38.84	38.84
2000	-	100.04	-	-	38.59	38.59
2001	-	101.48	-	-	36.02	36.02
2002	-	103.94	-	-	33.91	33.91
2003	-	107.40	-	-	32.17	32.17
2004	-	112.00	-	-	30.74	30.74
2005	-	118.84	-	-	29.65	29.65
2006	-	124.43	-	-	28.37	28.37
2007	-	131.97	-	-	27.34	27.34
2008	-	141.49	-	-	26.50	26.50
2009	-	153.13	-	-	25.80	25.80
2010	-	167.05	-	-	25.22	25.22
2011	-	183.34	-	-	24.72	24.72
2012	-	202.35	-	-	24.28	24.28
2013	-	224.19	-	-	23.91	23.91
TOTAL	288.79	2654.90	-	217.81	816.96	816.96

B/C = 3.75
 NPV = 599.15 Million Pesos
 IRR = 39.06 %

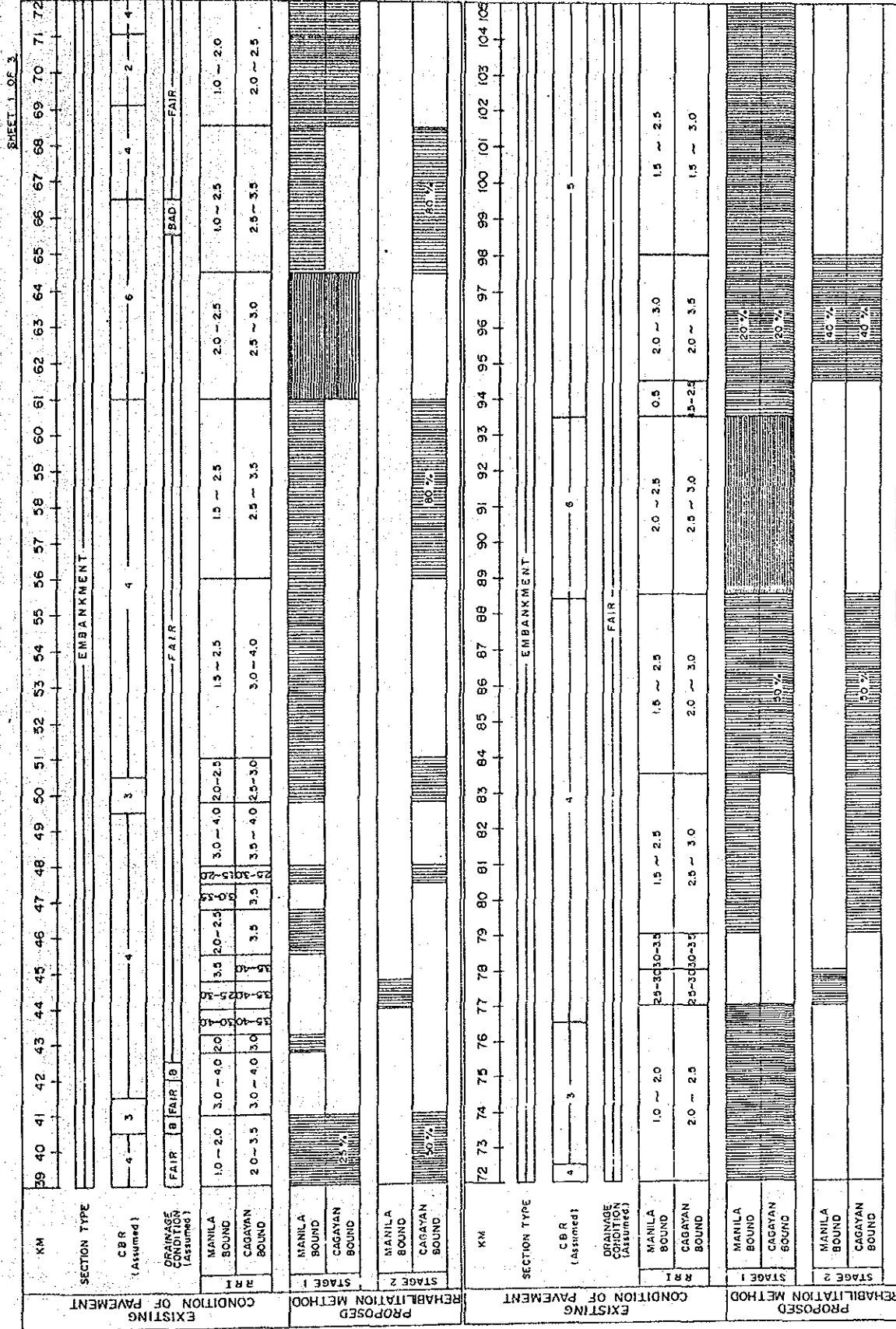
**APPENDICES FOR
CHAPTER 22**

APPENDIX 22-1

PAVEMENT CONDITION AND PROPOSED REHABILITATION METHODS

FIGURE 1

PAVEMENT CONDITION AND PROPOSED REHABILITATION (NORTH STUDY SECTION)



LEGEND: PCC RECONSTRUCTION AC OVERLAY PCC RECONSTRUCTION WITH TREATMENT OF WEAK SUBGRADE

FIGURE 1 (CONTINUED)

PAVEMENT CONDITION AND PROPOSED REHABILITATION (NORTH STUDY SECTION.)

SHEET 2 OF 3

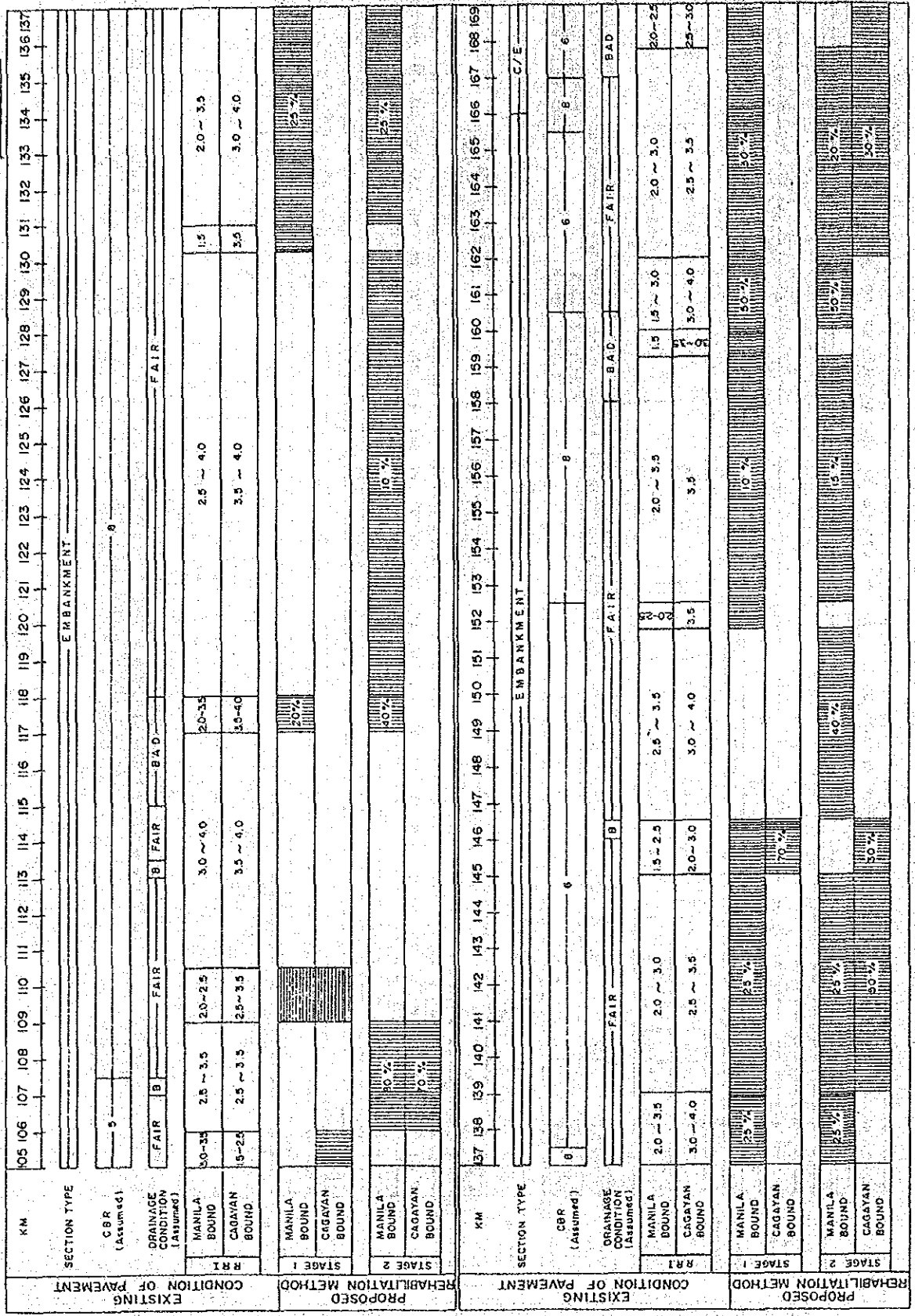


FIGURE 1 (CONTINUED)
PAVEMENT CONDITION AND PROPOSED REHABILITATION (NORTH STUDY SECTION)

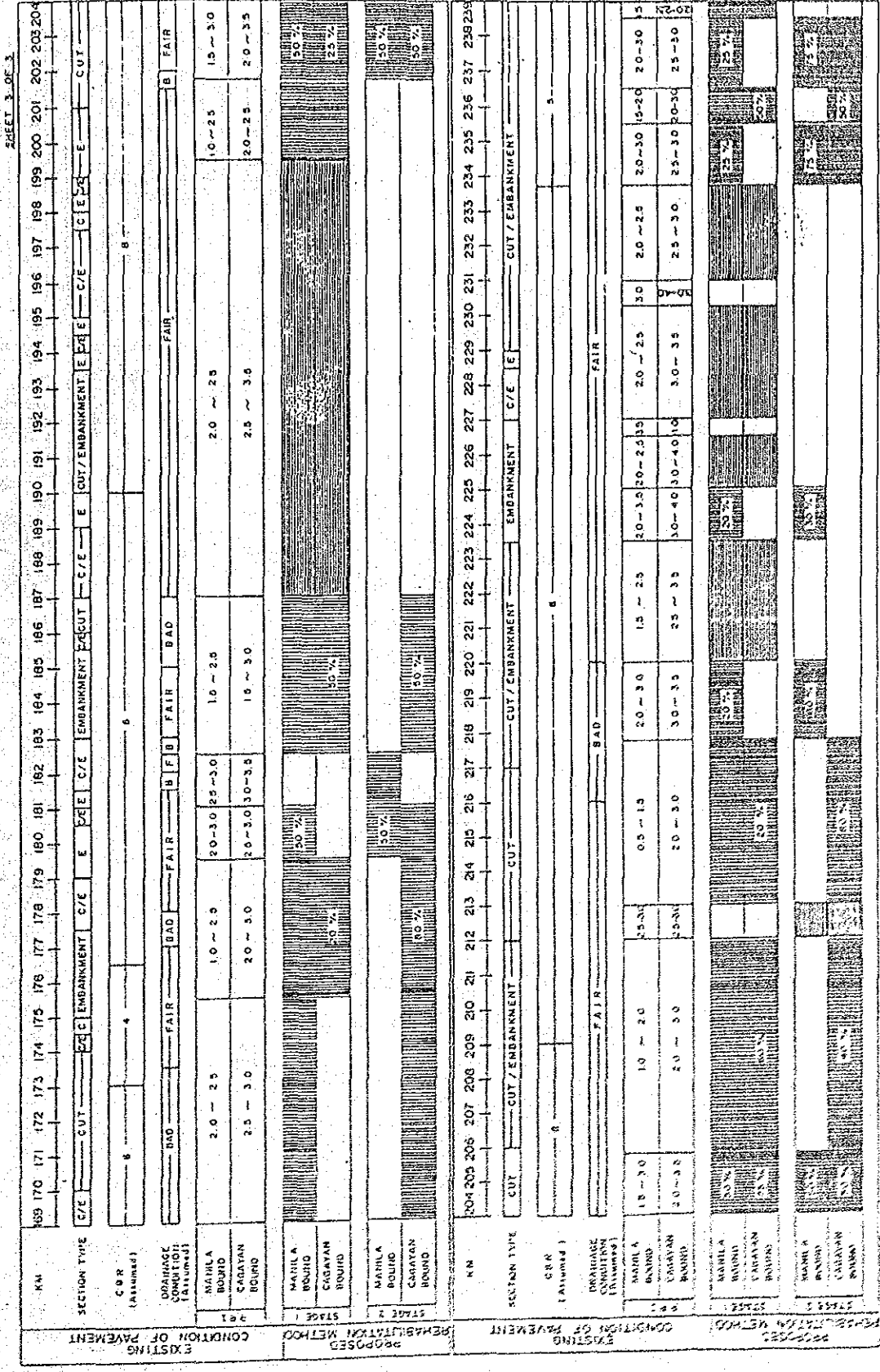
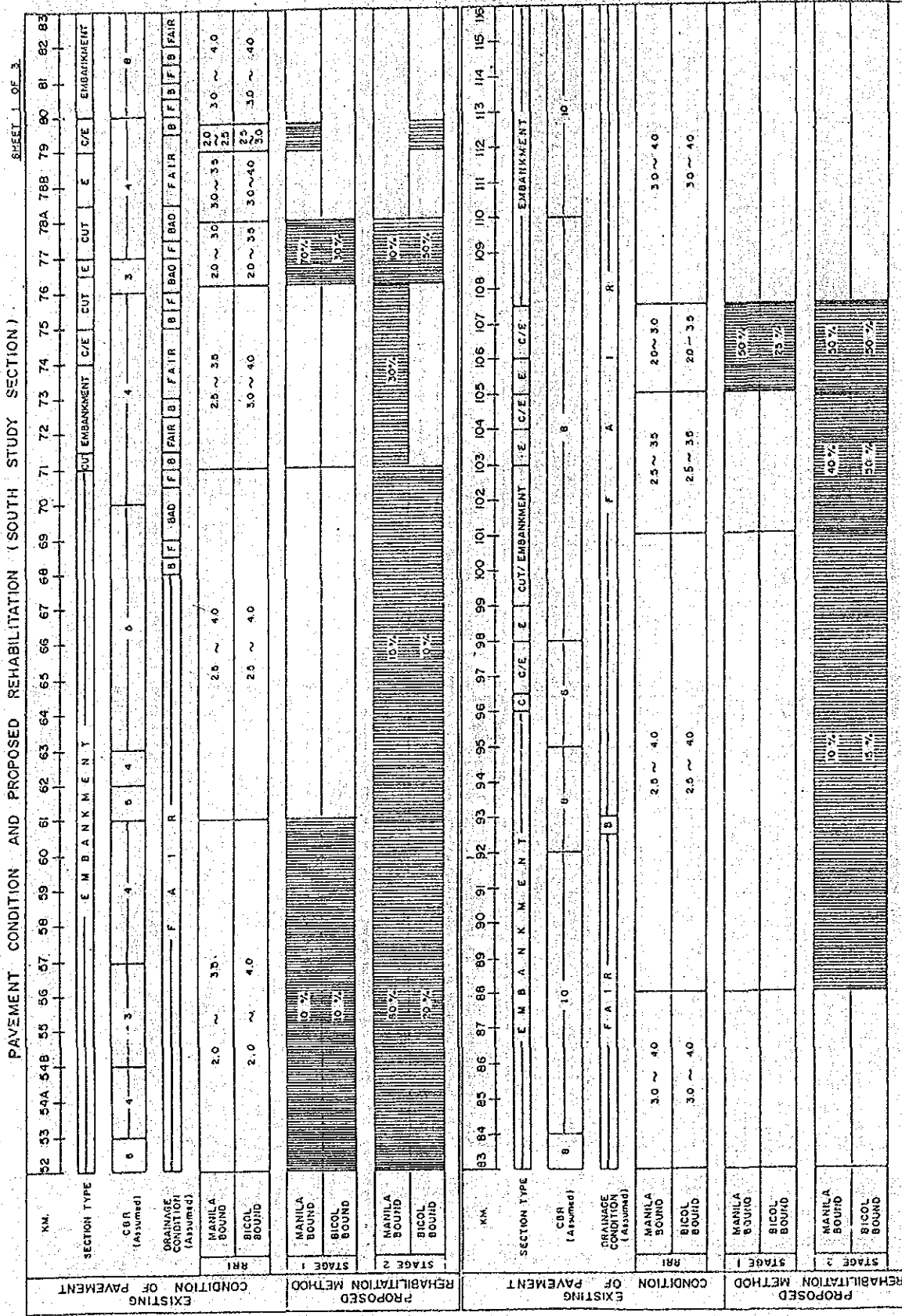


FIGURE 2



LEGEND: PCC RECONSTRUCTION AC OVERLAY

FIGURE 2 (CONTINUED)
PAVEMENT CONDITION AND PROPOSED REHABILITATION (SOUTH STUDY SECTION)

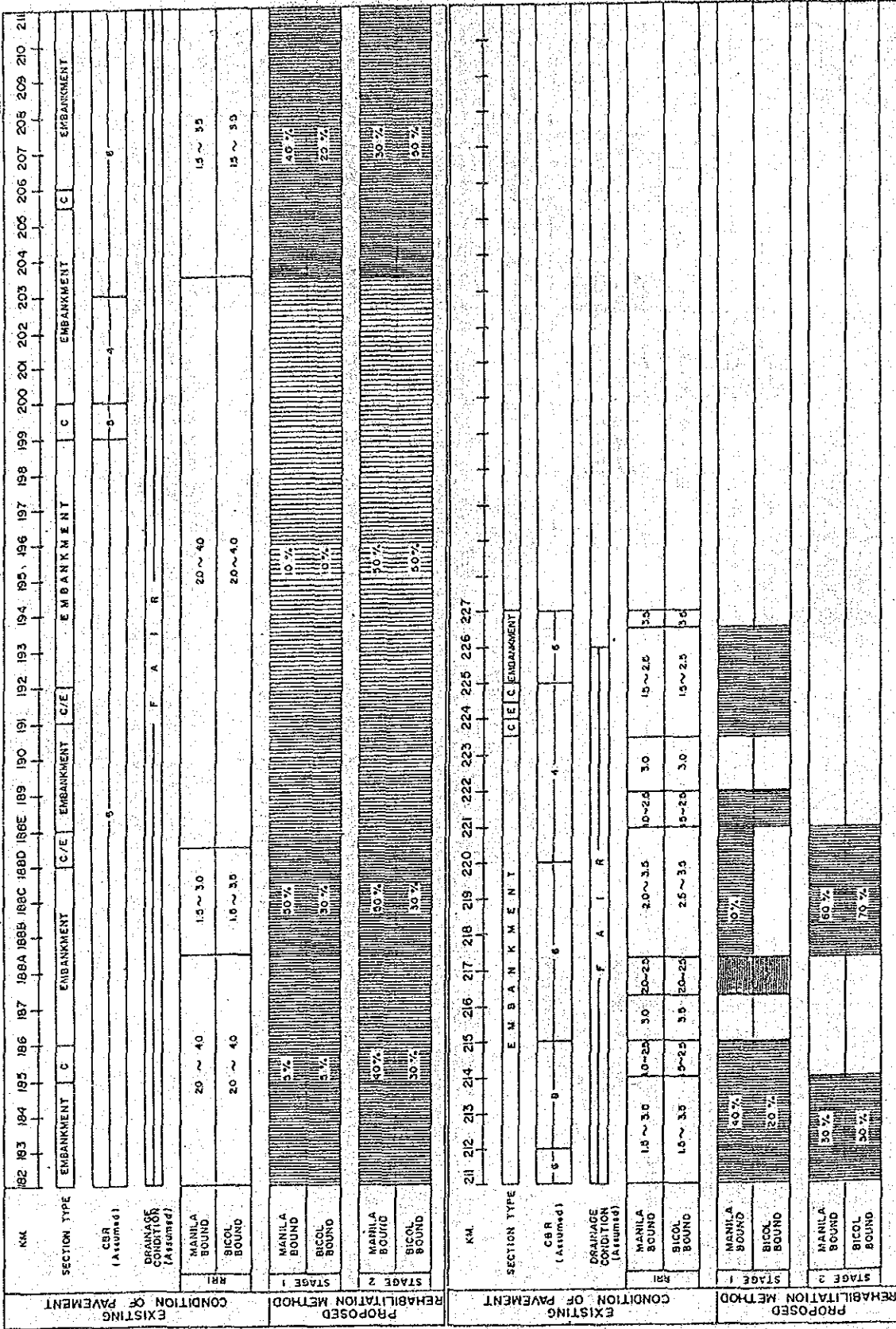
SHEET 2 OF 3

KM.	EM BANKMENT										EM BANKMENT																						
	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149
EXISTING CONDITION OF PAVEMENT	EM BANKMENT										EM BANKMENT																						
	EM BANKMENT										EM BANKMENT																						
PROPOSED REHABILITATION METHOD	EM BANKMENT										EM BANKMENT																						
	EM BANKMENT										EM BANKMENT																						
EXISTING CONDITION OF PAVEMENT	EM BANKMENT										EM BANKMENT																						
	EM BANKMENT										EM BANKMENT																						
PROPOSED REHABILITATION METHOD	EM BANKMENT										EM BANKMENT																						
	EM BANKMENT										EM BANKMENT																						

LEGEND: PCC RECONSTRUCTION AC OVERLAY

PAVEMENT CONDITION AND PROPOSED REHABILITATION (SOUTH STUDY SECTION)

SHEET 2 OF 3.



LEGEND: PCC RECONSTRUCTION AC OVERLAY

APPENDIX 22-2

QUANTITIES OF MAJOR ITEMS:

PAVEMENT REHABILITATION

DRAINAGE IMPROVEMENT

NORTH STUDY SECTION
 TABLE 1
 Quantity of Pavement and Drainage To Be Rehabilitated/Improved

Item	Description	Unit	Segment N-1	Segment N-2	Segment N-3	Segment N-4	Sub-Total
104	Removal of Miscellaneous Structures (Concrete Pavement Removal, Thickness = 23 cm)	Cu.M.	47,539	25,811	17,005	33,293	159,091
108	Roadway and Drainage Excavation (Common Material)	Cu.M.	130,979	70,807	45,935	88,128	428,325
108	Aggregate Subbase	Cu.M.	95,736	51,865	33,903	55,702	316,647
110-1	Reparation of Previously Constructed Concrete Pavement (Thickness = 23 cm)	Sq.M.	1,172	2,177	0	4,188	11,557
200-2	Crushed Aggregate Base Course	Cu.M.	14,440	10,480	4,414	15,362	61,116
302	Bituminous Prime Coat	M.T.	56	104	0	200	552
303	Bituminous Tack Coat	M.T.	10	20	0	37	103
310	Bituminous Concrete Surface Course	M.T.	7,739	13,929	0	24,837	73,036
316	Portland Cement Concrete Pavement	Cu.M.	70,444	38,054	24,623	47,079	229,479
CSD-1	Concrete Side Ditch	L.M.	6,020	1,600	0	0	25,370
MSD-1	Masonry Side Ditch	L.M.	1,250	7,000	9,750	18,130	36,130
MSD-2	Masonry Side Ditch	L.M.	12,030	0	0	16,950	48,230
SSD	Subsurface Drainage	L.M.	0	0	0	0	3,250

TABLE 2
Quantity of Pavement and Drainage To Be Rehabilitated/Improved

Item	Description	Unit	Segment S-1	Segment S-2	Segment S-3	Segment S-4	Sub-Total
104	Removal of Miscellaneous Structures (Concrete Pavement Removal, Thickness = 23 cm)	Cu.M.	14,563	12,128	37,447	37,416	101,554
105	Roadway and Drainage Excavation (Common Material)	Cu.M.	38,922	29,519	90,082	89,628	249,151
108	Aggregate Subbase	Cu.M.	28,878	22,967	70,517	70,316	192,678
118-1	Reparation of Previously Constructed Concrete Pavement (Thickness = 23 cm)	Sq.M.	0	503	0	335	838
200-2	Crushed Aggregate Base Course	Cu.M.	3,780	3,808	9,729	10,112	27,429
302	Bituminous Prime Coat	M.T.	0	16	0	8	24.0
303	Bituminous Tack Coat	M.T.	0	4.5	0	3.0	7.5
310	Bituminous Concrete Surface Course	M.T.	0	2,432	0	1,474	3,906
316	Portland Cement Concrete Pavement	Cu.M.	20,828	15,572	47,292	47,016	130,668
CSD-1	Concrete Side Ditch	L.M.	4,200	0	8,100	0	12,300
MSD-1	Masonry Side Ditch	L.M.	8,750	0	14,050	0	22,800
MSD-2	Masonry Side Ditch	L.M.	0	10,850	3,300	25,270	39,420
SSD	Subsurface Drainage	L.M.	0	0	11,250	0	11,250

TABLE 3 PROPOSED REHABILITATION WORKS (NORTH STUDY SECTION)

Segment	A, B, C, D in 1989	No. of ESALS in 1989	C B R	Stage-1		Stage-2		Total	
				Proposed* Rehabilitation Works	Proposed Drainage Works	Proposed* Rehabilitation Works	Proposed Drainage Works	Pavement (Km.)	Drainage (Km.)
Segment N-1 (Sta. Rita- Gapan) l = 46 km	Light Veh. 9,070 Bus 950 Truck 2,490 Total 12,510	3.50/1.45 (J/F)	3-4	2-PCC, D=35/33cm, 1-PCC, D=35cm, 2-ol, h=15/15cm, l = 0.50 l = 1.50 l = 2.00	MSD-1 CDS-1	1-PCC, D = 33 cm, l = 1.00	MSD-1	3.00	2.77
				2-PCC, D=35/33cm, 1-PCC, D=35cm, 2-ol, h=15/15cm, l = 9.25 l = 22.75 l = 3.50 l = 35.50	CSD-1 MSD-1	2-PCC, D=35/33cm, 1-PCC, D=30cm, 1-PCC, D=33cm, 1-PCC, D=35cm, l = 1.00 l = 1.60 l = 12.60 l = 0.75 l = 15.95		51.45	16.53
Segment N-2 (Gapan-Cabanatuan) l = 35 km	4,830 700 1,620 7,150	2.95/0.96 (I/E)	4-5	2-PCC, D=35/33cm, 1-PCC, D=35cm, 1-PCC, D=33cm, 2-ol, h=13/13cm, 2-ol, h=15/15cm, l = 10.45 l = 1.95 l = 1.00 l = 1.50 l = 5.00 l = 19.90	CSD-1 MSD-1	2-PCC, D=35/30cm, 2-PCC, D=35/33cm, 1-PCC, D=33cm, 1-PCC, D=35cm, l = 1.05 l = 2.45 l = 1.75 l = 0.90 l = 6.15	CSD-1	26.05	8.60
				2-PCC, D=35/30cm, 1-PCC, D=33cm, 1-PCC, D=35cm, 2-ol, h=15/15cm, l = 1.05 l = 3.80 l = 4.08 l = 8.93	MSD-1	2-PCC, D=35/30cm, 1-PCC, D=30cm, 1-PCC, D=33cm, 1-PCC, D=35cm, l = 1.50 l = 1.95 l = 3.66 l = 3.48 l = 10.59		19.52	9.75
Segment N-3 (Cabanatuan-San Jose) l = 42 km	3,040 570 1,270 4,880	2.46/0.76 (H/D)	6	2-PCC, D=35/30cm, 1-PCC, D=33cm, 1-PCC, D=35cm, l = 1.05 l = 3.80 l = 4.08 l = 8.93	MSD-1	2-PCC, D=35/30cm, 1-PCC, D=30cm, 1-PCC, D=33cm, 1-PCC, D=35cm, l = 1.50 l = 1.95 l = 3.66 l = 3.48 l = 10.59		19.52	9.75
				2-PCC, D=33/28cm, 2-PCC, D=35/30cm, 1-PCC, D=33cm, 1-PCC, D=35cm, 2-ol, h=15/15cm, 2-ol, h=15/15cm, l = 0.50 l = 3.05 l = 0.45 l = 15.23 l = 9.50 l = 3.00 l = 31.73	MSD-1 MSD-2	2-PCC, D=33/28cm, 2-PCC, D=35/30cm, 1-PCC, D=28cm, 1-PCC, D=30cm, 1-PCC, D=35cm, l = 0.30 l = 1.60 l = 0.15 l = 14.38 l = 1.50 l = 17.93		49.66	35.08
Segment N-4 (San Jose-Dalton) l = 38 km	1,600 240 940 2,780	1.79/0.52 (G/D)	4-6	2-PCC, D=33/28cm, 2-PCC, D=35/30cm, 1-PCC, D=33cm, 1-PCC, D=35cm, 2-ol, h=15/15cm, 2-ol, h=15/15cm, l = 0.50 l = 3.05 l = 0.45 l = 15.23 l = 9.50 l = 3.00 l = 31.73	MSD-1 MSD-2	2-PCC, D=33/28cm, 2-PCC, D=35/30cm, 1-PCC, D=28cm, 1-PCC, D=30cm, 1-PCC, D=35cm, l = 0.30 l = 1.60 l = 0.15 l = 14.38 l = 1.50 l = 17.93		49.66	35.08
				2-PCC, D=33/28cm, 2-PCC, D=35/30cm, 1-PCC, D=33cm, 1-PCC, D=35cm, 2-ol, h=15/15cm, 2-ol, h=15/15cm, l = 4.70 l = 3.75 l = 2.30 l = 7.19 l = 11.00 l = 28.94	CSD-1 MSD-2 SSD	2-PCC, D=33/28cm, 2-PCC, D=35/30cm, 1-PCC, D=28cm, 1-PCC, D=30cm, 1-PCC, D=35cm, 2-ol, h=15/15cm, l = 2.81 l = 1.30 l = 6.44 l = 2.25 l = 1.00 l = 15.80		44.74	40.25
Total				127.00	95.24	67.42	17.74	194.42	112.98

* 2-PCC: 2-lane PCC Reconstruction
1-PCC: 1-lane PCC Reconstruction
2-ol: 2-lane AC Overlay

TABLE 4 PROPOSED REHABILITATION WORKS (SOUTH STUDY SECTION)

Segment	A.A. 1989 No. of Light Veh. Bus Truck Total	No. of EALS in 1989 Manila Bound Lane/Shoulder Bound Lane (x 100)	C B R	Stage-1		Stage-2		Total	
				Proposed* Rehabilitation Works (Km.)	Proposed Drainage Works (Km.)	Proposed* Rehabilitation Works (Km.)	Proposed Drainage Works (Km.)	Pavement (Km.)	Drainage (Km.)
Segment N-1 (Calauag-Tiaong) l = 42 km	10,800	1.75/1.26	3-6	2-PCC, D=35/33cm, l = 0.90	CSD-1 MSD-1	2-PCC, D=35/33cm, l = 1.80 1-PCC, D=35cm, l = 3.60 5.40	LSD-1 MSD-1 l = 3.60 l = 1.80 5.40	6.30	6.30
	1,340 2,060 14,200	(G/F)							
Sto. Tomas-Tiaong	5,260	1.09/0.64	3-4	2-PCC, D=33/30cm, 1-PCC, D=33cm, l = 0.63 l = 1.45 2.08	MSD-1	2-PCC, D=30/28cm, 2-PCC, D=33/30cm, 1-PCC, D=28cm, 1-PCC, D=30cm, 1-PCC, D=33cm, l = 0.40 l = 1.38 l = 0.20 l = 1.45 l = 1.98 5.41	MSD-1 l = 3.95	7.49	6.65
	1,300 7,140	(E/D)							
Segment S-2 (Tiaong-Pagbilao) l = 54 km	5,310	0.97/0.58	8	2-PCC, D=30/28cm, 1-PCC, D=30cm, 2-o1, h=10/10cm, 2-o1, h=13/13cm, l = 1.63 l = 1.00 l = 1.38 l = 1.00 l = 0.50 5.51	MSD-2	2-PCC, D=30/28cm, 1-PCC, D=30/30cm, 1-PCC, D=28cm, 1-PCC, D=30cm, l = 3.45 l = 0.30 l = 0.70 l = 0.90 5.35	MSD-2 l = 5.35	10.86	10.85
	610 1,120 5,040	(E/D)	3						
Segment S-3 (Pagbilao-Piari del) l = 46 km	1,390	0.79/0.48	3-6	2-PCC, D=30/28cm, 1-PCC, D=28cm, 1-PCC, D=30cm, l = 16.60 l = 1.10 l = 0.60 18.36	CSD-1 MSD-1 MSD-2 SSD	2-PCC, D=30/28cm, 1-PCC, D=30cm, l = 5.90 l = 10.05 l = 1.55 6.25 24.55	CSD-1 MSD-1 MSD-2 SSD l = 2.20 l = 3.20 l = 1.75 l = 5.00 12.15	26.55	36.70
	510 750 2,350	(D/C)							
Segment S-4 (Piari del-Calaug) l = 39 km	1,130	0.71/0.41	8	2-PCC, D=28/28cm, 2-PCC, D=30/28cm, 1-PCC, D=28cm, 1-PCC, D=30cm, 2-o1, h=10/10cm, l = 1.40 l = 7.25 l = 0.40 l = 2.08 l = 1.00 12.13	MSD-2	2-PCC, D=28/28cm, 2-PCC, D=30/28cm, 1-PCC, D=28cm, l = 0.60 l = 12.55 l = 2.48 15.63	MSD-2 l = 13.15	27.76	25.27
	300 710 2,140	(D/C)	4-6						
Total l = 181 km				38.92	45.77	40.04	40.00	78.95	85.77

* 2-PCC: 2-lane PCC Reconstruction
1-PCC: 1-lane PCC Reconstruction
2-o1: 2-lane AC Overlay

APPENDIX 22-3
CONSTRUCTION COSTS
FOR
PAVEMENT REHABILITATION.
FOR
DRAINAGE IMPROVEMENT

T A B L E 1
 (P A V E M E N T R E H A B I L I T A T I O N & D R A I N A G E I M P R O V E M E N T - S E C T M E N T N - T O T A L)
 C O N S T R U C T I O N C O S T

D e s c r i p t i o n	U n i t	Q u a n t i t y	U n i t C o s t	C o n s t r u c t i o n C o s t	C o m p o n e n t		
					F o r e i g n	L o c a l	T a x
• Removal of Existing Concrete Slab	Cu. H.	159,091	114.22	18,171,374	12,538,248	2,907,420	2,725,706
• Roadway Excavation	Cu. H.	428,325	48.30	20,688,098	13,654,144	4,137,620	2,896,334
• Aggregate Subbase	Cu. H.	316,647	208.55	66,036,732	42,923,876	13,867,714	9,245,142
• Partial Repair of Existing Pavement	Sq. M.	11,557	442.89	5,118,480	3,531,751	818,957	767,772
• Crushed Aggregate Base Course	Cu. H.	61,116	276.65	16,907,741	11,159,109	3,212,471	2,536,161
• Bituminous Prime Coat	M.T.	552	7,272.15	4,014,227	2,528,963	682,419	802,845
• Bituminous Tack Coat	H.T.	103	7,420.85	764,348	473,895	137,583	152,870
• Bituminous Concrete Surface Course	M.T.	73,036	1,061.95	77,560,580	51,965,589	8,531,664	17,063,328
• Portland Cement Concrete Pavement	Cu. H.	229,479	1,196.70	274,617,519	159,278,161	74,146,730	41,192,628
• Masonry Side Ditch (MSD-1), Incl. RCPC	Li. M.	36,130	486.00	17,559,180	9,481,957	5,794,529	2,282,693
• Masonry Side Ditch (MSD-2), Incl. RCPC	Li. M.	48,230	496.00	23,922,080	12,917,923	7,894,286	3,109,870
• Concrete Side Ditch (CSD-1), Incl. RCPC	Li. M.	25,370	578.00	14,663,860	7,038,653	5,865,544	1,759,663
• Subsurface Drainage	Li. M.	3,250	512.68	1,666,210	533,187	899,753	233,269
T o t a l				541,690,428	328,025,457	128,896,689	84,768,282

TABLE 2
 (PAVEMENT REHABILITATION & DRAINAGE IMPROVEMENT - SEGMENT N-1)

Description	Unit	Quantity	Unit Cost	Construction Cost	Component		
					Foreign	Local	Tax
Removal of Existing Concrete Slab	Cu.M.	47,539	114.22	5,429,905	3,746,634	868,785	814,486
Roadway Excavation	Cu.M.	130,979	48.30	6,326,286	4,175,349	1,265,257	885,680
Aggregate Subbase	Cu.M.	95,736	208.55	19,965,743	12,977,738	4,192,806	2,795,204
Partial Repair of Existing Pavement	Sq.M.	1,172	442.89	519,067	358,156	83,051	77,860
Crushed Aggregate Base Course	Cu.M.	14,440	276.65	3,994,826	2,636,585	759,017	599,224
Bituminous Prime Coat	M.T.	56	7,272.15	407,240	256,561	69,231	81,448
Bituminous Tack Coat	M.T.	10	7,420.85	74,209	46,009	13,358	14,842
Bituminous Concrete Surface Course	M.T.	7,738	1,061.95	8,217,369	5,505,637	903,911	1,807,821
Portland Cement Concrete Pavement	Cu.M.	70,444	1,196.70	84,300,335	48,894,194	22,761,090	12,645,050
Masonry Side Ditch (MSD-1), Incl. RCPC	Li.M.	1,250	486.00	607,500	328,050	200,475	78,975
Masonry Side Ditch (MSD-2), Incl. RCPC	Li.M.	12,030	496.00	5,966,880	3,222,115	1,969,070	775,694
Concrete Side Ditch (CSD-1), Incl. RCPC	Li.M.	6,020	578.00	3,479,560	1,670,189	1,391,824	417,547
Subsurface Drainage	Li.M.	0	512.68	0	0	0	0
Total				139,288,919	83,817,213	34,477,874	20,993,831

T A B L E 3

CONSTRUCTION COST
(PAVEMENT REHABILITATION & DRAINAGE IMPROVEMENT - SEGMENT N-2)

D e s c r i p t i o n	Unit	Quantity	Unit Cost	Construction Cost	C o m p o n e n t		
					Foreign	Local	Tax
• Removal of Existing Concrete Slab	Cu.M.	25.811	114.22	2,948.132	2,034,211	471,701	442,220
• Roadway Excavation	Cu.M.	70.807	48.30	3,419.978	2,257,186	683,996	478,797
• Aggregate Subbase	Cu.M.	51.865	208.55	10,816.446	7,030,690	2,271,454	1,514,302
• Partial Repair of Existing Pavement	Sq.M.	2,177	442.89	964,172	665,278	154,267	144,626
• Crushed Aggregate Base Course	Cu.M.	10,480	276.65	2,899,292	1,913,533	550,865	434,894
• Bituminous Prime Coat	M.T.	104	7,272.15	756,304	476,471	128,572	151,261
• Bituminous Jack Coat	M.T.	20	7,420.85	148,417	92,019	26,715	29,683
• Bituminous Concrete Surface Course	M.T.	13,929	1,061.95	14,791,902	9,910,574	1,627,109	3,254,218
• Portland Cement Concrete Pavement	Cu.M.	38,054	1,196.70	45,539,222	26,412,749	12,295,590	6,830,883
• Masonry Side Ditch (MSD-1), Incl. RCPC	Li.M.	7,000	486.00	3,402,000	1,837,080	1,122,660	442,260
• Masonry Side Ditch (MSD-2), Incl. RCPC	Li.H.	0	496.00	0	0	0	0
• Concrete Side Ditch (CSD-1), Incl. RCPC	Li.M.	1,600	578.00	924,800	443,904	369,920	110,976
• Subsurface Drainage	Li.M.	0	512.68	0	0	0	0
T o t a l		221,847	20,114.94	86,610,664	53,073,694	19,702,849	13,834,120

T A B L E 4

CONSTRUCTION COST
(PAVEMENT REHABILITATION & DRAINAGE IMPROVEMENT - SECHENT N-3)

D e s c r i p t i o n	Unit	Quantity	Unit Cost	Construction Cost	C o m p o n e n t		
					Foreign	Local	Tax
• Removal of Existing Concrete Slab	Cu.M.	17,005	114.22	1,942,311	1,340,195	310,770	291,347
• Roadway Excavation	Cu.M.	45,935	48.30	2,218,661	1,464,316	443,732	310,612
• Aggregate Subbase	Cu.M.	33,903	208.55	7,070,471	4,595,806	1,484,799	989,866
• Partial Repair of Existing Pavement	Sq.M.	0	442.89	0	0	0	0
• Crushed Aggregate Base Course	Cu.M.	4,414	276.65	1,221,133	805,948	232,015	183,170
• Bituminous Prime Coat	M.T.	0	7,272.15	0	0	0	0
• Bituminous Tack Coat	M.T.	0	7,420.85	0	0	0	0
• Bituminous Concrete Surface Course	M.T.	0	1,061.95	0	0	0	0
• Portland Cement Concrete Pavement	Cu.M.	24,623	1,196.70	29,466,344	17,090,480	7,955,913	4,419,952
• Masonry Side Ditch (MSD-1), Incl. RCPC	Li.M.	9,750	486.00	4,738,500	2,558,790	1,563,705	616,005
• Masonry Side Ditch (MSD-2), Incl. RCPC	Li.M.	0	496.00	0	0	0	0
• Concrete Side Ditch (CSD-1), Incl. RCPC	Li.M.	0	578.00	0	0	0	0
• Subsurface Drainage	Li.M.	0	512.68	0	0	0	0
T o t a l				46,657,419	27,855,534	11,990,934	6,810,952

T A B L E 5 C O N S T R U C T I O N C O S T
 (P A V E M E N T R E H A B I L I T A T I O N & D R A I N A G E I M P R O V E M E N T - S E G M E N T N - 4)

D e s c r i p t i o n	U n i t	Q u a n t i t y	U n i t C o s t	C o n s t r u c t i o n C o s t	C o m p o n e n t		
					F o r e i g n	L o c a l	T a x
• Removal of Existing Concrete Slab	Cu.M.	33,293	114.22	3,802,726	2,623,881	608,436	570,409
• Roadway Excavation	Cu.M.	88,128	48.30	4,256,582	2,809,344	851,316	595,922
• Aggregate Subbase	Cu.M.	65,702	208.55	13,702,152	8,906,399	2,877,452	1,918,301
• Partial Repair of Existing Pavement	Sq.M.	4,188	442.89	1,854,823	1,279,828	296,772	278,223
• Crushed Aggregate Base Course	Cu.M.	15,382	276.65	4,255,430	2,808,584	808,532	638,315
• Bituminous Prime Coat	M.T.	200	7,272.15	1,454,430	916,291	247,253	290,886
• Bituminous Jack Coat	M.T.	37	7,420.85	274,571	170,234	49,423	54,914
• Bituminous Concrete Surface Course	M.T.	24,837	1,061.95	26,375,652	17,671,687	2,901,322	5,802,643
• Portland Cement Concrete Pavement	Cu.M.	47,079	1,196.70	56,339,439	32,676,875	15,211,649	8,450,916
• Masonry Side Ditch (MSD-1), Incl. RCPC	Li.M.	18,130	486.00	8,811,180	4,758,037	2,907,689	1,145,453
• Masonry Side Ditch (MSD-2), Incl. RCPC	Li.M.	16,950	496.00	8,407,200	4,539,888	2,774,376	1,092,936
• Concrete Side Ditch (CSD-1), Incl. RCPC	Li.M.	0	578.00	0	0	0	0
• Subsurface Drainage	Li.M.	0	512.68	0	0	0	0
T o t a l				129,534,187	79,161,049	29,534,220	20,838,919

T A B L E 6
 (P A V E M E N T R E H A B I L I T A T I O N & D R A I N A G E I M P R O V E M E N T - S E C H E N T N - 5)

D e s c r i p t i o n	U n i t	Q u a n t i t y	U n i t C o s t	C o n s t r u c t i o n C o s t	C o m p o n e n t		
					F o r e i g n	L o c a l	T a x
• Removal of Existing Concrete Slab	Cu. H.	35,443	114.22	4,048,299	2,798,327	647,728	607,245
• Roadway Excavation	Cu. H.	92,476	48.30	4,466,591	2,947,950	893,318	625,323
• Aggregate Subbase	Cu. H.	69,441	208.55	14,481,921	9,413,248	3,041,203	2,027,469
• Partial Repair of Existing Pavement	Sq. M.	4,020	442.89	1,780,418	1,228,488	284,867	267,063
• Crushed Aggregate Base Course	Cu. H.	16,400	276.65	4,537,060	2,994,460	862,041	680,559
• Bituminous Prime Coat	M. T.	192	7,272.15	1,396,253	879,639	237,363	279,251
• Bituminous Tack Coat	M. T.	36	7,420.85	267,151	165,633	48,087	53,430
• Bituminous Concrete Surface Course	M. T.	26,532	1,061.95	28,175,657	18,877,690	3,099,322	6,198,645
• Portland Cement Concrete Pavement	Cu. H.	49,279	1,196.70	58,972,179	34,203,864	15,922,488	8,845,827
• Masonry Side Ditch (MSD-1), Incl. RCPC	Li. M.	0	486.00	0	0	0	0
• Masonry Side Ditch (MSD-2), Incl. RCPC	Li. M.	19,250	496.00	9,548,000	5,155,920	3,150,840	1,241,240
• Concrete Side Ditch (CSD-1), Incl. RCPC	Li. M.	17,750	578.00	10,259,500	4,924,560	4,103,800	1,231,140
• Subsurface Drainage	Li. M.	3,250	512.68	1,666,210	533,187	899,753	233,269
T o t a l				139,599,239	84,117,967	33,190,812	22,290,460

T A B L E 7

CONSTRUCTION COST
(PAVEMENT REHABILITATION & DRAINAGE IMPROVEMENT - SEGMENT S TOTAL)

D e s c r i p t i o n	Unit	Quantity	Unit Cost	Construction Cost	C o m p o n e n t		
					Foreign	Local	Tax
• Removal of Existing Concrete Slab	Cu. M.	101,554	114.22	11,599,498	8,008,654	1,855,920	1,739,925
• Roadway Excavation	Cu. M.	248,151	48.30	11,985,693	7,910,558	2,397,139	1,677,997
• Aggregate Subbase	Cu. M.	192,678	208.55	40,182,997	26,118,948	8,438,429	5,625,620
• Partial Repair of Existing Pavement	Sq. H.	838	442.89	371,142	256,088	59,383	55,671
• Crushed Aggregate Base Course	Cu. M.	27,420	276.65	7,585,743	5,006,590	1,441,291	1,137,861
• Bituminous Prime Coat	M. T.	24	7,272.15	174,532	109,955	29,670	34,906
• Bituminous Tack Coat	M. T.	8	7,420.85	59,367	36,807	10,686	11,873
• Bituminous Concrete Surface Course	M. T.	3,906	1,061.95	4,147,977	2,779,144	456,277	912,555
• Portland Cement Concrete Pavement	Cu. H.	180,668	1,196.70	156,370,396	90,694,829	42,220,007	23,455,559
• Masonry Side Ditch (MSD-1), Incl. RCPC	Li. M.	22,800	486.00	11,080,800	5,983,632	3,656,664	1,440,504
• Masonry Side Ditch (MSD-2), Incl. RCPC	Li. M.	39,420	496.00	19,552,320	10,558,253	6,452,266	2,541,802
• Concrete Side Ditch (CSD-1), Incl. RCPC	Li. H.	12,300	578.00	7,109,400	3,412,512	2,843,760	853,128
• Subsurface Drainage	Li. M.	11,250	512.68	5,767,650	1,845,648	3,114,531	807,471
T o t a l				275,987,514	162,716,618	72,976,023	40,294,873

T A B L E 8
 (P A V E M E N T R E H A B I L I T A T I O N & D R A I N A G E I M P R O V E M E N T - S E C T I O N S - 1)

D e s c r i p t i o n	Unit	Quantity	Unit Cost	Construction Cost	C o m p o n e n t		
					Foreign	Local	Tax
• Removal of Existing Concrete Slab	Cu. M.	14.563	114.22	1,663,386	1,147,736	266,142	249,508
• Roadway Excavation	Cu. M.	38,922	48.30	1,879,933	1,240,756	375,987	263,191
• Aggregate Subbase	Cu. M.	28,878	208.55	6,022,507	3,914,629	1,264,726	843,151
• Partial Repair of Existing Pavement	Sq. M.	0	442.89	0	0	0	0
• Crushed Aggregate Base Course	Cu. M.	3,780	276.65	1,045,737	690,186	198,690	156,861
• Bituminous Prime Coat	M. T.	0	7,272.15	0	0	0	0
• Bituminous Tack Coat	M. T.	0	7,420.85	0	0	0	0
• Bituminous Concrete Surface Course	M. T.	0	1,061.95	0	0	0	0
• Portland Cement Concrete Pavement	Cu. M.	20,828	1,196.70	24,924,868	14,456,423	6,729,714	3,738,730
• Masonry Side Ditch (MSD-1), Incl. RPC	Li. M.	8,750	486.00	4,252,500	2,296,350	1,403,325	552,825
• Masonry Side Ditch (MSD-2), Incl. RPC	Li. M.	0	496.00	0	0	0	0
• Concrete Side Ditch (CSD-1), Incl. RPC	Li. M.	4,200	578.00	2,427,600	1,165,248	971,040	291,312
• Subsurface Drainage	Li. M.	0	512.68	0	0	0	0
T o t a l				42,216,530	24,911,329	11,209,624	6,095,577

T A B L E 9
 (P A V E M E N T R E H A B I L I T A T I O N & D R A I N A G E I M P R O V E M E N T - S E C H E N I S - 2)

D e s c r i p t i o n	Unit	Quantity	Unit Cost	Construction Cost	C o m p o n e n t		
					Foreign	Local	Tax
• Removal of Existing Concrete Slab	Cu.M.	12.128	114.22	1,385,260	955,830	221,642	207,789
• Roadway Excavation	Cu.M.	29,519	48.30	1,425,768	941,007	285,154	199,607
• Aggregate Subbase	Cu.M.	22,967	208.55	4,789,768	3,113,349	1,005,851	670,567
• Partial Repair of Existing Pavement	Sq.M.	503	442.89	222,774	153,714	35,644	33,416
• Crushed Aggregate Base Course	Cu.M.	3,808	276.65	1,053,483	695,299	200,162	158,022
• Bituminous Prime Coat	M.T.	16	7,272.15	116,354	73,303	19,780	23,271
• Bituminous Tack Coat	M.T.	5	7,420.85	37,104	23,005	6,679	7,421
• Bituminous Concrete Surface Course	M.T.	2,432	1,061.95	2,582,662	1,730,384	284,093	568,186
• Portland Cement Concrete Pavement	Cu.M.	15,532	1,196.70	18,587,144	10,780,544	5,018,529	2,788,072
• Masonry Side Ditch (MSD-1), Incl. RCPC	Li.M.	0	486.00	0	0	0	0
• Masonry Side Ditch (MSD-2), Incl. RCPC	Li.M.	10,850	496.00	5,381,600	2,906,064	1,775,928	699,608
• Concrete Side Ditch (CSD-1), Incl. RCPC	Li.M.	0	578.00	0	0	0	0
• Subsurface Drainage	Li.M.	0	512.68	0	0	0	0
T o t a l				35,581,918	21,372,498	8,853,461	5,355,960

T A B L E 10
 (P A V E M E N T R E H A B I L I T A T I O N & D R A I N A G E I M P R O V E M E N T - S E C T I O N S - 3)

D e s c r i p t i o n	Unit	Quantity	Unit Cost	Construction Cost	C o m p o n e n t		
					Foreign	Local	Tax
• Removal of Existing Concrete Slab	Cu.M.	37,447	114.22	4,277,196	2,951,265	684,351	641,579
• Roadway Excavation	Cu.M.	90,082	48.30	4,350,961	2,871,634	870,192	609,134
• Aggregate Subbase	Cu.M.	70,517	208.55	14,706,320	9,559,108	3,088,327	2,058,885
• Partial Repair of Existing Pavement	Sq.M.	0	442.89	0	0	0	0
• Crushed Aggregate Base Course	Cu.M.	9,720	276.65	2,689,038	1,774,765	510,917	403,356
• Bituminous Prime Coat	M.T.	0	7,272.15	0	0	0	0
• Bituminous Tack Coat	M.T.	0	7,420.85	0	0	0	0
• Bituminous Concrete Surface Course	M.T.	0	1,061.95	0	0	0	0
• Portland Cement Concrete Pavement	Cu.M.	47,292	1,196.70	56,594,336	32,824,715	15,280,471	8,489,150
• Masonry Side Ditch (MSD-1), Incl. RPCP	Li.M.	14,050	486.00	6,828,300	3,687,282	2,253,339	887,679
• Masonry Side Ditch (MSD-2), Incl. RPCP	Li.M.	3,300	496.00	1,636,800	883,872	540,144	212,784
• Concrete Side Ditch (CSD-1), Incl. RPCP	Li.M.	8,100	578.00	4,681,800	2,247,264	1,872,720	561,816
• Subsurface Drainage	Li.M.	11,250	512.68	5,767,650	1,045,648	3,114,531	807,471
T o t a l				101,532,402	58,645,554	28,214,993	14,671,855

T A B L E 11

CONSTRUCTION COST
(PAVEMENT REHABILITATION & DRAINAGE IMPROVEMENT - SEGMENT S-4)

D e s c r i p t i o n	Unit	Quantity	Unit Cost	C o m p o n e n t			Tax
				Construction Cost	Foreign	Local	
• Removal of Existing Concrete Slab	Cu.M.	37,416	114.22	4,273,656	2,948,822	683,785	641,048
• Roadway Excavation	Cu.M.	89,628	48.30	4,329,032	2,857,161	865,806	606,065
• Aggregate Subbase	Cu.M.	70,316	208.55	14,664,402	9,531,861	3,079,524	2,053,016
• Partial Repair of Existing Pavement	Sq.M.	335	442.89	148,368	102,374	23,739	22,255
• Crushed Aggregate Base Course	Cu.M.	10,112	276.65	2,797,485	1,846,340	531,522	419,623
• Bituminous Prime Coat	M.T.	8	7,272.15	58,177	36,652	9,890	11,635
• Bituminous Jack Coat	M.T.	3	7,420.85	22,263	13,803	4,007	4,453
• Bituminous Concrete Surface Course	M.T.	1,474	1,061.95	1,565,314	1,048,761	172,185	344,369
• Portland Cement Concrete Pavement	Cu.M.	47,016	1,196.70	56,264,047	32,633,147	15,191,293	8,439,607
• Masonry Side Ditch (MSD-1), Incl. RCPC	Li.M.	0	486.00	0	0	0	0
• Masonry Side Ditch (MSD-2), Incl. RCPC	Li.M.	25,270	496.00	12,533,920	6,768,317	4,136,194	1,629,410
• Concrete Side Ditch (CSD-1), Incl. RCPC	Li.M.	0	578.00	0	0	0	0
• Subsurface Drainage	Li.M.	0	512.68	0	0	0	0
T o t a l				96,656,664	57,787,238	24,697,945	14,171,481

APPENDIX 22-4
EVALUATION OF PAVEMENT REHABILITATION

TABLE 1

EVALUATION OF PAYMENT REHABILITATION (Segment N-1)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	2.37	-	2.37 (2.73)	.00	.00	.00	.00	.00 (.00)
1989	48.12	-	48.12 (48.12)	.28	.19	52.19	34.06	18.22 (18.22)
1990	48.12	-	48.12 (41.84)	.83	.56	164.60	109.03	55.85 (48.56)
1991	31.52	-	31.52 (23.83)	1.30	.87	271.66	180.69	91.40 (69.11)
1992	-	-	- (-)	1.50	1.00	328.63	219.09	110.04 (72.35)
1993	-	-	- (-)	1.50	1.00	345.50	231.81	114.19 (65.29)
1994	-	-	- (-)	1.50	1.00	363.24	248.18	115.56 (57.45)
1995	-	3.63	3.63 (1.57)	1.50	1.00	381.90	259.31	123.09 (53.22)
1996	-	-	- (-)	1.50	1.00	401.53	281.45	120.58 (45.33)
1997	-	-	- (-)	1.50	1.00	422.19	305.76	116.93 (38.23)
1998	-	-	- (-)	1.50	1.00	443.92	332.71	111.70 (31.75)
1999	-	3.63	3.63 (.90)	1.50	1.00	466.78	356.19	111.09 (27.46)
2000	-	7.33	7.33 (1.58)	1.50	1.01	490.83	381.55	109.77 (23.59)
2001	-	13.07	13.07 (2.44)	1.50	1.03	516.13	409.73	106.87 (19.97)
2002	-	44.85	44.85 (7.29)	1.50	1.07	542.75	402.09	141.09 (22.93)
2003	-	5.81	5.81 (.82)	1.50	1.07	570.77	420.32	150.88 (21.32)
2004	-	2.65	2.65 (.33)	1.50	1.07	600.24	452.93	147.74 (18.16)
2005	-	9.32	9.32 (1.00)	1.50	1.07	631.26	462.37	169.31 (18.09)
2006	-	5.71	5.71 (.53)	1.50	1.07	663.89	489.59	174.73 (16.24)
2007	-	3.34	3.34 (.27)	1.50	1.07	698.23	534.72	163.94 (13.25)
2008	-	1.04	1.04 (.07)	1.50	1.07	734.38	583.14	151.66 (10.66)
2009	-	7.53	7.53 (.46)	1.50	1.07	772.41	604.16	168.68 (10.31)
2010	-	67.41	67.41 (3.58)	1.50	1.07	812.43	647.23	165.63 (8.80)
2011	-	1.41	1.41 (.07)	1.50	1.07	854.56	614.63	240.36 (11.10)
2012	-	.52	.52 (.02)	1.50	1.07	898.89	660.85	238.46 (9.58)
2013	-	-38.85	-38.85 (-1.36)	1.50	1.07	945.55	711.78	234.20 (8.18)
Total	130.13	138.40	268.53 (136.09)	35.44	24.55	13374.45	9933.38	3451.95 (739.16)

Net Present Value : 603.07 million pesos

B/C Ratio : 5.43

Internal Rate of Return : 120.3 %

Delta-l & Delta-t

	w/o	with	saving
Delta-l (km)	25.556	5.958	19.598
Delta-t (min)	34.343	5.246	29.098

TABLE 2

EVALUATION OF PAYMENT REHABILITATION (Segment N-2)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	1.46	-	1.46 (1.68)	.00	.00	.00	.00	.00 (.00)
1989	30.78	-	30.78 (30.78)	.20	.14	34.31	22.61	11.76 (11.76)
1990	30.78	-	30.78 (26.77)	.60	.43	108.29	74.11	34.36 (29.88)
1991	17.04	-	17.04 (12.88)	.91	.64	171.79	119.08	52.98 (40.06)
1992	-	-	- (-)	1.02	.71	201.66	140.95	61.01 (40.12)
1993	-	-	- (-)	1.02	.71	212.16	150.52	61.95 (35.42)
1994	-	1.56	1.56 (.77)	1.02	.71	223.22	159.46	64.07 (31.86)
1995	-	5.19	5.19 (2.24)	1.02	.71	234.86	160.62	74.55 (32.23)
1996	-	-	- (-)	1.02	.71	247.12	176.38	71.05 (26.71)
1997	-	-	- (-)	1.02	.71	260.02	193.30	67.03 (21.91)
1998	-	1.56	1.56 (.44)	1.02	.71	273.61	209.91	64.01 (18.20)
1999	-	5.19	5.19 (1.28)	1.02	.71	287.91	218.44	69.77 (17.25)
2000	-	-	- (-)	1.02	.71	302.97	235.27	68.00 (14.62)
2001	-	-	- (-)	1.02	.71	318.82	260.05	59.09 (11.04)
2002	-	22.51	22.51 (3.66)	1.02	.75	335.52	261.43	74.35 (12.08)
2003	-	6.11	6.11 (.86)	1.02	.78	353.10	273.68	79.65 (11.26)
2004	-	1.89	1.89 (.23)	1.02	.80	371.61	293.63	78.20 (9.61)
2005	-	1.56	1.56 (.17)	1.02	.80	391.10	315.33	75.98 (8.12)
2006	-	5.19	5.19 (.48)	1.02	.80	411.63	325.48	86.37 (8.03)
2007	-	10.85	10.85 (.88)	1.02	.80	433.25	338.73	94.73 (7.65)
2008	-	2.54	2.54 (.18)	1.02	.80	456.01	342.23	114.00 (8.01)
2009	-	-	- (-)	1.02	.80	479.99	373.76	106.44 (6.50)
2010	-	1.79	1.79 (.10)	1.02	.80	505.24	409.79	95.67 (5.08)
2011	-	6.80	6.80 (.31)	1.02	.80	531.84	441.33	90.72 (4.19)
2012	-	1.69	1.69 (.07)	1.02	.80	559.85	471.54	88.53 (3.56)
2013	-	-6.93	-6.93 (-.24)	1.02	.80	589.36	467.02	122.55 (4.28)
Total	80.06	67.50	147.56 (83.55)	24.07	17.79	8295.22	6434.66	1866.84 (419.43)

Net Present Value : 335.88 million pesos

B/C Ratio : 5.02

Internal Rate of Return : 111.8 %

Delta-l & Delta-t

	w/o	with	saving
Delta-l (km)	11.997	3.890	8.106
Delta-t (min)	16.426	3.545	12.881

TABLE 3

EVALUATION OF PAVEMENT REHABILITATION (Segment N-3)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	.80	-	.80 (.92)	.00	.00	.00	.00	.00 (.00)
1989	10.09	-	10.09 (10.09)	.05	.04	6.55	4.23	2.34 (2.34)
1990	10.09	-	10.09 (8.77)	.16	.11	20.63	13.34	7.36 (6.40)
1991	22.86	-	22.86 (17.29)	.35	.23	46.41	30.00	16.53 (12.50)
1992	-	-	- (-)	.48	.31	67.15	43.40	23.91 (15.72)
1993	-	-	- (-)	.48	.31	70.54	45.63	25.08 (14.34)
1994	-	-	- (-)	.48	.31	74.11	48.22	26.05 (12.95)
1995	-	-	- (-)	.48	.31	77.86	51.26	26.77 (11.57)
1996	-	-	- (-)	.48	.31	81.80	54.94	27.03 (10.16)
1997	-	-	- (-)	.48	.31	85.95	59.35	26.77 (8.75)
1998	-	-	- (-)	.48	.31	90.31	64.31	26.16 (7.44)
1999	-	-	- (-)	.48	.31	94.88	69.96	25.10 (6.20)
2000	-	-	- (-)	.48	.31	99.70	76.38	23.48 (5.05)
2001	-	6.80	6.80 (1.27)	.48	.31	104.76	79.25	25.67 (4.80)
2002	-	6.55	6.55 (1.07)	.48	.31	110.08	82.17	28.07 (4.56)
2003	-	-	- (-)	.48	.31	115.67	87.34	28.49 (4.03)
2004	-	9.56	9.56 (1.18)	.48	.32	121.55	94.01	27.70 (3.40)
2005	-	9.25	9.25 (.99)	.48	.32	127.72	94.06	33.83 (3.61)
2006	-	-	- (-)	.48	.33	134.22	94.35	40.02 (3.72)
2007	-	-	- (-)	.48	.33	141.05	103.15	38.05 (3.07)
2008	-	6.80	6.80 (.48)	.48	.33	148.23	112.99	35.39 (2.49)
2009	-	9.79	9.79 (.60)	.48	.33	155.78	112.91	43.02 (2.63)
2010	-	-	- (-)	.48	.33	163.72	116.44	47.43 (2.52)
2011	-	-	- (-)	.48	.33	172.07	126.42	45.79 (2.12)
2012	-	1.09	1.09 (.04)	.48	.33	180.84	139.16	41.83 (1.68)
2013	-	-5.75	-5.75 (-.20)	.48	.33	190.07	148.77	41.45 (1.45)
Total	43.84	44.10	87.94 (42.49)	11.18	7.43	2681.65	1952.05	733.35 (153.50)

Net Present Value : 111.01 million pesos

B/C Ratio : 3.61

Internal Rate of Return : 68.2 %

Delta-l & Delta-t

	w/o	with	saving
Delta-l (km)	9.214	1.911	7.303
Delta-t (min)	13.155	1.681	11.474

TABLE 4

EVALUATION OF PAVEMENT REHABILITATION (Segment N-4)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	2.17	-	2.17 (2.50)	.00	.00	.00	.00	.00 (.00)
1989	41.68	-	41.68 (41.68)	.26	.19	19.27	12.53	6.81 (6.81)
1990	41.68	-	41.68 (36.24)	.78	.57	60.90	41.49	19.62 (17.06)
1991	34.02	-	34.02 (25.72)	1.26	.91	103.27	71.28	32.35 (24.46)
1992	-	-	- (-)	1.48	1.05	127.47	88.53	39.37 (25.89)
1993	-	-	- (-)	1.48	1.05	134.27	94.58	40.12 (22.94)
1994	-	-	- (-)	1.48	1.05	141.43	101.21	40.65 (20.21)
1995	-	-	- (-)	1.48	1.05	148.98	108.28	41.14 (17.79)
1996	-	9.86	9.86 (3.71)	1.48	1.05	156.94	112.59	44.78 (16.84)
1997	-	3.12	3.12 (1.02)	1.48	1.05	165.33	112.87	52.89 (17.29)
1998	-	-	- (-)	1.48	1.05	174.17	121.53	53.08 (15.09)
1999	-	-	- (-)	1.48	1.05	183.49	132.95	50.97 (12.60)
2000	-	-	- (-)	1.48	1.05	193.32	145.24	48.51 (10.43)
2001	-	-	- (-)	1.48	1.05	203.67	158.63	45.47 (8.50)
2002	-	9.86	9.86 (1.60)	1.48	1.05	214.59	159.89	55.13 (8.96)
2003	-	4.82	4.82 (.68)	1.48	1.05	226.09	169.00	57.52 (8.13)
2004	-	.78	.78 (.10)	1.48	1.05	238.22	183.43	55.22 (6.79)
2005	-	-	- (-)	1.48	1.05	251.01	200.59	50.84 (5.43)
2006	-	34.13	34.13 (3.17)	1.48	1.05	264.49	217.13	47.78 (4.44)
2007	-	-	- (-)	1.48	1.07	278.70	217.83	61.28 (4.95)
2008	-	29.54	29.54 (2.08)	1.48	1.08	293.69	222.79	71.30 (5.01)
2009	-	-	- (-)	1.48	1.08	309.49	232.70	77.19 (4.72)
2010	-	9.86	9.86 (.52)	1.48	1.08	326.15	230.00	96.55 (5.13)
2011	-	3.12	3.12 (.14)	1.48	1.08	343.72	244.04	100.07 (4.62)
2012	-	1.04	1.04 (.04)	1.48	1.08	362.24	263.90	98.74 (3.97)
2013	-	-29.33	-29.33 (-1.02)	1.48	1.08	381.78	282.00	100.18 (3.50)
Total	119.55	76.80	196.35 (118.18)	34.80	24.95	5302.70	3925.00	1387.56 (281.53)

Net Present Value : 163.35 million pesos

B/C Ratio : 2.38

Internal Rate of Return : 39.3 %

Delta-l & Delta-t

	w/o	with	saving
Delta-l (km)	23.803	5.623	18.180
Delta-t (min)	29.325	4.701	24.624

TABLE 5

EVALUATION OF PAVEMENT REHABILITATION (Segment N-5)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	2.35	-	2.35 (2.70)	.00	.00	.00	.00	.00 (.00)
1989	44.03	-	44.03 (44.03)	.26	.19	19.52	12.68	6.91 (6.91)
1990	44.03	-	44.03 (38.29)	.79	.57	61.68	41.73	20.16 (17.53)
1991	38.64	-	38.64 (29.22)	1.29	.92	105.96	72.40	33.93 (25.66)
1992	-	-	- (-)	1.53	1.08	131.98	90.79	41.64 (27.38)
1993	-	-	- (-)	1.53	1.08	139.01	96.83	42.64 (24.38)
1994	-	-	- (-)	1.53	1.08	146.43	103.37	43.52 (21.64)
1995	-	-	- (-)	1.53	1.08	154.25	110.75	43.96 (19.00)
1996	-	-	- (-)	1.53	1.08	162.49	118.80	44.15 (16.60)
1997	-	11.42	11.42 (3.73)	1.53	1.08	171.18	122.97	48.66 (15.91)
1998	-	-	- (-)	1.53	1.08	180.33	125.98	54.80 (15.58)
1999	-	1.04	1.04 (.26)	1.53	1.08	189.98	137.07	53.36 (13.19)
2000	-	-	- (-)	1.53	1.08	200.15	150.01	50.59 (10.87)
2001	-	-	- (-)	1.53	1.08	210.87	164.24	47.08 (8.80)
2002	-	-	- (-)	1.53	1.08	222.17	179.94	42.68 (6.94)
2003	-	24.02	24.02 (3.39)	1.53	1.10	234.08	175.64	58.87 (8.32)
2004	-	6.68	6.68 (.82)	1.53	1.12	246.64	182.11	64.95 (7.98)
2005	-	-	- (-)	1.53	1.12	259.88	196.98	63.31 (6.77)
2006	-	-	- (-)	1.53	1.12	273.84	215.32	58.93 (5.48)
2007	-	25.35	25.35 (2.05)	1.53	1.14	288.56	226.69	62.26 (5.03)
2008	-	4.23	4.23 (.30)	1.53	1.17	304.07	233.39	71.04 (4.99)
2009	-	10.67	10.67 (.65)	1.53	1.17	320.43	245.51	75.29 (4.60)
2010	-	-	- (-)	1.53	1.17	337.68	265.00	73.05 (3.88)
2011	-	11.42	11.42 (.53)	1.53	1.17	355.87	269.31	86.93 (4.02)
2012	-	7.20	7.20 (.29)	1.53	1.17	375.05	278.05	97.36 (3.91)
2013	-	30.66	30.66 (-1.07)	1.53	1.17	395.27	301.00	94.64 (3.31)
Total	129.05	71.37	200.42 (125.19)	36.00	26.12	5487.38	4116.55	1380.70 (288.66)

Net Present Value : 163.47 million pesos
 B/C Ratio : 2.31
 Internal Rate of Return : 38.1 %

Delta-I & Delta-t

	w/o	with	saving
Delta-I (km)	21.444	5.687	15.757
Delta-t (min)	26.420	4.765	21.655

TABLE 6

EVALUATION OF PAYMENT REHABILITATION (All North Segments)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost		Traffic Cost		Total Benefit (Dis'd)
				w/o	with	w/o	with	
1988	9.15	-	9.15 (10.52)	.00	.00	.00	.00	.00 (.00)
1989	174.70	-	174.70 (174.70)	1.06	.75	131.84	86.12	46.04 (46.04)
1990	174.70	-	174.70 (151.91)	3.18	2.24	416.10	279.69	137.35 (119.43)
1991	144.08	-	144.08 (108.95)	5.12	3.57	699.08	473.44	227.19 (171.79)
1992	-	-	- (-)	6.01	4.15	856.88	582.77	275.97 (181.45)
1993	-	-	- (-)	6.01	4.15	901.48	619.36	283.98 (162.37)
1994	-	1.56	1.56 (.77)	6.01	4.15	948.44	660.44	289.85 (144.11)
1995	-	8.83	8.83 (3.82)	6.01	4.15	997.86	690.22	309.50 (133.81)
1996	-	9.86	9.86 (3.71)	6.01	4.15	1049.89	744.16	307.60 (115.64)
1997	-	14.54	14.54 (4.75)	6.01	4.15	1104.67	794.24	312.29 (102.09)
1998	-	1.56	1.56 (.44)	6.01	4.15	1162.33	854.44	309.75 (88.05)
1999	-	9.86	9.86 (2.44)	6.01	4.15	1223.04	914.61	310.29 (76.70)
2000	-	7.33	7.33 (1.58)	6.01	4.15	1286.96	988.45	300.36 (64.56)
2001	-	19.88	19.88 (3.72)	6.01	4.18	1354.25	1071.90	284.18 (53.12)
2002	-	83.77	83.77 (13.62)	6.01	4.26	1425.10	1085.52	341.33 (55.48)
2003	-	40.76	40.76 (5.76)	6.01	4.32	1499.71	1125.98	375.41 (53.06)
2004	-	21.57	21.57 (2.65)	6.01	4.35	1578.26	1206.11	373.80 (45.94)
2005	-	20.12	20.12 (2.15)	6.01	4.37	1660.97	1269.34	393.27 (42.03)
2006	-	45.04	45.04 (4.18)	6.01	4.38	1748.07	1341.88	407.82 (37.90)
2007	-	39.54	39.54 (3.19)	6.01	4.41	1839.79	1421.13	420.26 (33.96)
2008	-	44.15	44.15 (3.10)	6.01	4.45	1936.38	1494.55	443.40 (31.16)
2009	-	27.99	27.99 (1.71)	6.01	4.45	2038.10	1569.03	470.62 (28.76)
2010	-	79.07	79.07 (4.20)	6.01	4.45	2145.23	1668.46	478.32 (25.41)
2011	-	22.75	22.75 (1.05)	6.01	4.45	2258.05	1695.74	563.87 (26.05)
2012	-	11.54	11.54 (.46)	6.01	4.45	2376.88	1813.51	564.92 (22.70)
2013	-	-111.53	-111.53 (-3.90)	6.01	4.45	2502.03	1910.57	593.02 (20.72)
Total	502.63	398.17	900.80 (505.49)	141.49	100.85	35141.40	26361.65	8820.40 (1882.29)

Net Present Value : 1376.80 million pesos

B/C Ratio : 3.72

Internal Rate of Return : 70.8 %

Delta-l & Delta-t

	w/o	with	saving
Delta-l (km)	92.013	23.069	68.945
Delta-t (min)	119.669	19.938	99.731

TABLE 7

EVALUATION OF PAVEMENT REHABILITATION (Segment S-1)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	.72	-	.72 (.83)	.00	.00	.00	.00	.00 (.00)
1989	4.76	-	4.76 (4.76)	.02	.02	5.47	3.61	1.87 (1.87)
1990	4.76	-	4.76 (4.14)	.07	.05	17.25	11.38	5.90 (5.13)
1991	29.49	-	29.49 (22.30)	.26	.17	65.45	43.19	22.35 (16.90)
1992	-	-	- (-)	.41	.27	112.23	74.09	38.29 (25.18)
1993	-	-	- (-)	.41	.27	118.03	77.94	40.24 (23.01)
1994	-	-	- (-)	.41	.27	124.14	81.99	42.29 (21.03)
1995	-	-	- (-)	.41	.27	130.58	86.27	44.45 (19.22)
1996	-	-	- (-)	.41	.27	137.35	91.10	46.39 (17.44)
1997	-	-	- (-)	.41	.27	144.49	96.62	48.01 (15.70)
1998	-	-	- (-)	.41	.27	152.01	103.70	48.45 (13.77)
1999	-	-	- (-)	.41	.27	159.93	111.65	48.42 (11.97)
2000	-	-	- (-)	.41	.27	168.27	120.46	47.96 (10.31)
2001	-	-	- (-)	.41	.27	177.05	130.14	47.06 (8.79)
2002	-	-	- (-)	.41	.27	186.31	140.83	45.63 (7.42)
2003	-	-	- (-)	.41	.27	196.07	152.77	43.44 (6.14)
2004	-	1.03	1.03 (.13)	.41	.27	206.34	165.73	40.75 (5.01)
2005	-	1.62	1.62 (.17)	.41	.27	217.17	177.43	39.88 (4.26)
2006	-	4.38	4.38 (.41)	.41	.28	228.58	184.31	44.40 (4.13)
2007	-	9.17	9.17 (.74)	.41	.29	240.61	189.14	51.59 (4.17)
2008	-	2.49	2.49 (.17)	.41	.30	253.28	187.97	65.43 (4.60)
2009	-	-	- (-)	.41	.30	266.64	202.53	64.22 (3.92)
2010	-	6.14	6.14 (.33)	.41	.30	280.72	214.91	65.92 (3.50)
2011	-	.65	.65 (.03)	.41	.30	295.56	227.39	68.28 (3.15)
2012	-	.93	.93 (.04)	.41	.30	311.20	239.13	72.18 (2.90)
2013	-	-9.02	-9.02 (-.32)	.41	.30	327.69	240.12	87.68 (3.06)
Total	39.73	17.41	57.14 (33.73)	9.44	6.40	4522.44	3354.40	1171.07 (242.57)

Net Present Value : 208.84 million pesos

B/C Ratio : 7.19

Internal Rate of Return : 134.3 %

Delta-I & Delta-t

	w/o	with	saving
Delta-I (km)	6.125	1.216	4.909
Delta-t (min)	8.540	1.063	7.477

TABLE 8

EVALUATION OF PAVEMENT REHABILITATION (Segment S-2)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	.60	-	.60 (.69)	.00	.00	.00	.00	.00 (.00)
1989	7.99	-	7.99 (7.99)	.05	.04	6.61	4.32	2.30 (2.30)
1990	7.99	-	7.99 (6.95)	.16	.11	20.81	13.93	6.92 (6.02)
1991	16.66	-	16.66 (12.60)	.31	.21	42.87	28.79	14.18 (10.72)
1992	-	-	- (-)	.41	.28	59.43	39.93	19.63 (12.91)
1993	-	-	- (-)	.41	.28	62.40	42.20	20.33 (11.62)
1994	-	-	- (-)	.41	.28	65.51	44.63	21.01 (10.45)
1995	-	-	- (-)	.41	.28	68.78	47.47	21.44 (9.27)
1996	-	1.04	1.04 (.39)	.41	.28	72.22	50.24	22.11 (8.31)
1997	-	-	- (-)	.41	.28	75.84	53.08	22.90 (7.49)
1998	-	-	- (-)	.41	.28	79.64	57.64	22.14 (6.29)
1999	-	.52	.52 (.13)	.41	.28	83.64	61.63	22.14 (5.47)
2000	-	-	- (-)	.41	.28	87.85	66.99	20.99 (4.51)
2001	-	-	- (-)	.41	.28	92.27	73.09	19.31 (3.61)
2002	-	-	- (-)	.41	.28	96.92	80.02	17.03 (2.77)
2003	-	3.98	3.98 (.56)	.41	.28	101.81	82.68	19.26 (2.72)
2004	-	10.15	10.15 (1.25)	.41	.30	106.95	80.80	26.27 (3.23)
2005	-	1.76	1.76 (.19)	.41	.31	112.36	81.05	31.41 (3.36)
2006	-	1.80	1.80 (.17)	.41	.32	118.05	84.86	33.29 (3.09)
2007	-	-	- (-)	.41	.32	124.04	90.69	33.44 (2.70)
2008	-	-	- (-)	.41	.32	130.34	98.38	32.05 (2.25)
2009	-	.25	.25 (.02)	.41	.32	136.96	106.29	30.76 (1.88)
2010	-	-	- (-)	.41	.32	143.93	114.99	29.04 (1.54)
2011	-	1.04	1.04 (.05)	.41	.32	151.27	123.34	28.02 (1.29)
2012	-	2.14	2.14 (.09)	.41	.32	158.98	127.45	31.62 (1.27)
2013	-	-4.69	-4.69 (-.16)	.41	.32	167.10	134.04	33.15 (1.16)
Total	33.24	17.98	51.22 (30.89)	9.53	6.86	2366.60	1788.53	580.75 (126.25)

Net Present Value : 95.35 million pesos

B/C Ratio : 4.09

Internal Rate of Return : 78.5 %

Delta-l & Delta-t

	w/o	with	saving
Delta-l (km)	5.009	1.349	3.660
Delta-t (min)	6.560	1.137	5.423

TABLE 9

EVALUATION OF PAVEMENT REHABILITATION (Segment S-3)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	1.74	-	1.74 (2.00)	.00	.00	.00	.00	.00 (.00)
1989	33.21	-	33.21 (33.21)	.19	.12	14.54	9.41	5.20 (5.20)
1990	33.21	-	33.21 (28.88)	.57	.37	45.48	29.44	16.25 (14.13)
1991	27.39	-	27.39 (20.71)	.91	.59	75.67	48.98	27.01 (20.42)
1992	-	-	- (-)	1.06	.69	91.88	59.49	32.76 (21.54)
1993	-	-	- (-)	1.06	.69	95.85	62.07	34.15 (19.53)
1994	-	-	- (-)	1.06	.69	99.99	64.76	35.60 (17.70)
1995	-	-	- (-)	1.06	.69	104.31	67.57	37.11 (16.04)
1996	-	-	- (-)	1.06	.69	108.83	70.64	38.56 (14.50)
1997	-	-	- (-)	1.06	.69	113.55	74.86	39.06 (12.77)
1998	-	-	- (-)	1.06	.69	118.48	79.74	39.10 (11.12)
1999	-	-	- (-)	1.06	.69	123.63	85.22	38.77 (9.58)
2000	-	-	- (-)	1.06	.69	129.00	91.19	38.18 (8.21)
2001	-	-	- (-)	1.06	.69	134.62	97.71	37.29 (6.97)
2002	-	-	- (-)	1.06	.69	140.49	104.84	36.02 (5.85)
2003	-	-	- (-)	1.06	.69	146.63	112.67	34.32 (4.85)
2004	-	-	- (-)	1.06	.69	153.04	121.30	32.10 (3.95)
2005	-	-	- (-)	1.06	.69	159.73	131.36	28.75 (3.07)
2006	-	-	- (-)	1.06	.69	166.73	143.00	24.10 (2.24)
2007	-	31.66	31.66 (2.56)	1.06	.76	174.04	136.59	37.75 (3.05)
2008	-	15.46	15.46 (1.09)	1.06	.83	181.68	129.17	52.75 (3.71)
2009	-	-	- (-)	1.06	.84	189.67	138.29	51.61 (3.15)
2010	-	-	- (-)	1.06	.84	198.02	150.06	48.19 (2.56)
2011	-	-	- (-)	1.06	.84	206.75	161.71	45.26 (2.09)
2012	-	-	- (-)	1.06	.84	215.87	174.58	41.51 (1.67)
2013	-	-10.90	-10.90 (- .38)	1.06	.84	225.40	188.54	37.08 (1.30)
Total	95.55	36.21	131.76 (88.06)	25.04	17.27	3413.87	2533.17	888.47 (215.18)

Net Present Value : 127.12 million pesos

D/C Ratio : 2.44

Internal Rate of Return : 41.3 %

Delta-l & Delta-t

	w/o	with	saving
Delta-l (km)	12.951	3.016	9.935
Delta-t (min)	15.509	2.427	13.082

TABLE 10

EVALUATION OF PAYEMENT REHABILITATION (Segment S-4)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	1.65	-	1.65 (1.90)	.00	.00	.00	.00	.00 (.00)
1989	19.10	-	19.10 (19.10)	.12	.08	7.16	4.63	2.57 (2.57)
1990	19.10	-	19.10 (16.61)	.36	.24	22.39	14.59	7.93 (6.89)
1991	50.89	-	50.89 (38.48)	.79	.52	51.68	33.67	18.28 (13.82)
1992	-	-	- (-)	1.10	.73	75.30	49.06	26.62 (17.50)
1993	-	-	- (-)	1.10	.73	78.49	51.23	27.63 (15.80)
1994	-	-	- (-)	1.10	.73	81.82	53.53	28.66 (14.25)
1995	-	-	- (-)	1.10	.73	85.29	56.03	29.64 (12.81)
1996	-	1.04	1.04 (.39)	1.10	.73	88.92	58.41	30.88 (11.61)
1997	-	-	- (-)	1.10	.73	92.70	61.05	32.02 (10.47)
1998	-	-	- (-)	1.10	.73	96.65	65.00	32.03 (9.10)
1999	-	-	- (-)	1.10	.73	100.77	69.53	31.62 (7.82)
2000	-	-	- (-)	1.10	.73	105.08	74.47	30.98 (6.66)
2001	-	-	- (-)	1.10	.73	109.57	79.91	30.04 (5.62)
2002	-	-	- (-)	1.10	.73	114.27	85.89	28.75 (4.67)
2003	-	4.19	4.19 (.59)	1.10	.73	119.17	90.10	29.44 (4.16)
2004	-	1.08	1.08 (.13)	1.10	.74	124.29	95.78	28.87 (3.55)
2005	-	-	- (-)	1.10	.74	129.63	103.16	26.83 (2.87)
2006	-	-	- (-)	1.10	.74	135.21	111.97	23.60 (2.19)
2007	-	16.52	16.52 (1.33)	1.10	.77	141.04	114.31	27.07 (2.19)
2008	-	22.63	22.63 (1.59)	1.10	.85	147.12	107.11	40.27 (2.83)
2009	-	-	- (-)	1.10	.87	153.48	113.05	40.67 (2.48)
2010	-	3.89	3.89 (.21)	1.10	.87	160.12	122.11	38.24 (2.03)
2011	-	-	- (-)	1.10	.87	167.06	130.52	36.77 (1.70)
2012	-	1.67	1.67 (.07)	1.10	.87	174.31	138.76	35.78 (1.44)
2013	-	-14.26	-14.26 (-.50)	1.10	.87	181.88	149.23	32.89 (1.15)
Total	90.74	36.75	127.49 (79.90)	25.57	17.77	2743.41	2033.11	718.10 (166.19)

Net Present Value : 86.28 million pesos
 B/C Ratio : 2.08
 Internal Rate of Return : 34.9 %

Delta-t & Delta-t

	w/o	with	saving
Delta-l (km)	13.506	3.226	10.280
Delta-t (min)	16.242	2.600	13.642

TABLE 11

EVALUATION OF PAVEMENT REHABILITATION (All South Segments)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost w/o	Maintenance Cost with	Traffic Cost w/o	Traffic Cost with	Total Benefit (Dis'd)
1988	4.71	-	4.71 (5.42)	.00	.00	.00	.00	.00 (.00)
1989	65.06	-	65.06 (65.06)	.39	.26	33.78	21.96	11.94 (11.94)
1990	65.06	-	65.06 (56.57)	1.16	.77	105.94	69.34	36.99 (32.17)
1991	124.43	-	124.43 (94.09)	2.27	1.50	235.67	154.63	81.81 (61.86)
1992	-	-	- (-)	2.99	1.97	338.85	222.56	117.31 (77.13)
1993	-	-	- (-)	2.99	1.97	354.76	233.44	122.35 (69.95)
1994	-	-	- (-)	2.99	1.97	371.46	244.92	127.56 (63.42)
1995	-	-	- (-)	2.99	1.97	388.96	257.34	132.64 (57.34)
1996	-	2.08	2.08 (.78)	2.99	1.97	407.32	270.40	137.95 (51.86)
1997	-	-	- (-)	2.99	1.97	426.58	285.61	141.99 (46.42)
1998	-	-	- (-)	2.99	1.97	446.78	306.09	141.71 (40.28)
1999	-	.52	.52 (.13)	2.99	1.97	467.97	328.04	140.96 (34.84)
2000	-	-	- (-)	2.99	1.97	490.20	353.11	138.12 (29.69)
2001	-	-	- (-)	2.99	1.97	513.52	380.85	133.69 (24.99)
2002	-	-	- (-)	2.99	1.97	537.99	411.58	127.44 (20.71)
2003	-	8.17	8.17 (1.15)	2.99	1.98	563.67	438.22	126.46 (17.87)
2004	-	12.26	12.26 (1.51)	2.99	2.00	590.62	463.61	127.99 (15.73)
2005	-	3.38	3.38 (.36)	2.99	2.02	618.90	493.00	126.87 (13.56)
2006	-	6.18	6.18 (.57)	2.99	2.03	648.58	524.13	125.40 (11.65)
2007	-	57.35	57.35 (4.63)	2.99	2.14	679.73	530.73	149.85 (12.11)
2008	-	40.58	40.58 (2.85)	2.99	2.30	712.43	522.63	190.49 (13.38)
2009	-	.25	.25 (.02)	2.99	2.33	746.76	560.15	187.26 (11.44)
2010	-	10.03	10.03 (.53)	2.99	2.33	782.80	602.07	181.38 (9.64)
2011	-	1.69	1.69 (.08)	2.99	2.33	820.63	642.95	178.34 (8.24)
2012	-	4.74	4.74 (.19)	2.99	2.33	860.36	679.93	181.09 (7.28)
2013	-	-38.88	-38.88 (-1.36)	2.99	2.33	902.07	711.93	190.80 (6.67)
Total	259.26	108.36	367.62 (232.59)	69.58	48.29	13046.32	9709.22	3358.39 (750.18)

Net Present Value : 517.59 million pesos

B/C Ratio : 3.23

Internal Rate of Return : 54.4 %

Delta-l & Delta-t

	w/o	with	saving
Delta-l (km)	37.592	8.808	28.784
Delta-t (min)	46.851	7.227	39.623

TABLE 12

EVALUATION OF PAVEMENT REHABILITATION (All Segments)

Cost and Benefit Stream

(unit : million pesos)

Year	Cost			Benefit (Maintenance Cost and Traffic Cost Savings)				
	Initial Cost	Rehab. Cost	Total Cost (Dis'd)	Maintenance Cost		Traffic Cost		Total Benefit (Dis'd)
				w/o	with	w/o	with	
1988	13.86	-	13.86 (15.94)	.00	.00	.00	.00	.00 (.00)
1989	239.76	-	239.76 (239.76)	1.45	1.00	165.62	108.08	57.98 (57.98)
1990	239.76	-	239.76 (208.49)	4.34	3.01	522.04	349.03	174.34 (151.60)
1991	268.51	-	268.51 (203.03)	7.39	5.06	934.76	628.08	309.01 (233.65)
1992	-	-	- (-)	9.00	6.11	1195.72	805.33	393.28 (258.59)
1993	-	-	- (-)	9.00	6.11	1256.25	852.80	406.33 (282.32)
1994	-	1.56	1.56 (.77)	9.00	6.11	1319.89	905.37	417.41 (207.53)
1995	-	8.83	8.83 (3.82)	9.00	6.11	1386.82	947.56	442.15 (191.15)
1996	-	11.94	11.94 (4.49)	9.00	6.11	1457.21	1014.56	445.54 (167.50)
1997	-	14.54	14.54 (4.75)	9.00	6.11	1531.25	1079.85	454.28 (148.51)
1998	-	1.56	1.56 (.44)	9.00	6.11	1609.11	1160.52	451.47 (128.34)
1999	-	10.38	10.38 (2.57)	9.00	6.11	1691.01	1242.64	451.25 (111.54)
2000	-	7.33	7.33 (1.58)	9.00	6.12	1777.15	1341.56	438.47 (94.25)
2001	-	19.88	19.88 (3.72)	9.00	6.14	1867.77	1452.75	417.88 (78.10)
2002	-	83.77	83.77 (13.62)	9.00	6.22	1963.10	1497.10	468.76 (76.19)
2003	-	48.92	48.92 (6.91)	9.00	6.30	2063.38	1564.20	501.88 (70.93)
2004	-	33.83	33.83 (4.16)	9.00	6.36	2168.88	1669.72	501.80 (61.67)
2005	-	23.51	23.51 (2.51)	9.00	6.39	2279.87	1762.33	520.14 (55.59)
2006	-	51.22	51.22 (4.76)	9.00	6.41	2396.65	1866.01	533.22 (49.55)
2007	-	96.88	96.88 (7.83)	9.00	6.56	2519.52	1951.85	570.11 (46.07)
2008	-	84.73	84.73 (5.95)	9.00	6.74	2648.81	2017.18	633.89 (44.54)
2009	-	28.24	28.24 (1.73)	9.00	6.79	2784.86	2129.19	657.88 (40.20)
2010	-	89.10	89.10 (4.73)	9.00	6.79	2928.02	2270.53	659.70 (35.05)
2011	-	24.44	24.44 (1.13)	9.00	6.79	3078.68	2338.69	742.20 (34.29)
2012	-	16.28	16.28 (.65)	9.00	6.79	3237.24	2493.44	746.01 (29.97)
2013	-	-150.41	-150.41 (-5.25)	9.00	6.79	3404.10	2622.50	783.81 (27.38)
Total	761.89	506.52	1268.41 (738.08)	211.06	149.14	48187.72	36070.86	12178.78 (2632.46)

Net Present Value : 1894.39 million pesos

D/C Ratio : 3.57

Internal Rate of Return : 65.3 %

Delta-I & Delta-t

	w/o	with	saving
Delta-I (km)	129.605	31.876	97.729
Delta-t (min)	166.520	27.165	139.355

**APPENDICES FOR
CHAPTER 23**

APPENDIX 23-1
ECONOMIC EVALUATION
(ROAD FUNCTION AND PAVEMENT REHABILITATION)

TABLE 1

ECONOMIC EVALUATION (Segment N-1)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	-	2.37	2.37	(2.73)	-	-	-	(-)
1989	1.47	48.12	49.59	(49.59)	-	18.22	18.22	(18.22)
1990	8.17	48.12	56.29	(48.95)	.89	55.85	56.74	(49.34)
1991	5.77	31.52	37.29	(28.20)	1.14	91.40	92.54	(69.97)
1992	.07	-	.07	(.05)	1.66	110.04	111.70	(73.44)
1993	34.55	-	34.55	(19.75)	2.09	114.19	116.28	(66.48)
1994	42.91	-	42.91	(21.33)	2.65	115.56	118.21	(58.77)
1995	.07	3.63	3.70	(1.60)	15.77	123.09	138.86	(60.03)
1996	.07	-	.07	(.03)	18.35	120.58	138.93	(52.23)
1997	.07	-	.07	(.02)	21.44	116.93	138.37	(45.23)
1998	-	-	-	(-)	18.93	111.70	130.63	(37.13)
1999	-	3.63	3.63	(.90)	21.77	111.09	132.86	(32.84)
2000	-	7.33	7.33	(1.58)	25.23	109.77	135.00	(29.02)
2001	-	13.07	13.07	(2.44)	27.74	106.87	134.61	(25.16)
2002	-	44.85	44.85	(7.29)	30.65	141.09	171.74	(27.91)
2003	-	5.81	5.81	(.82)	33.96	150.88	184.84	(26.12)
2004	-	2.65	2.65	(.33)	37.81	147.74	185.55	(22.80)
2005	-	9.32	9.32	(1.00)	42.27	169.31	211.58	(22.61)
2006	-	5.71	5.71	(.53)	46.07	174.73	220.80	(20.52)
2007	-	3.34	3.34	(.27)	50.56	163.94	214.50	(17.33)
2008	-	1.04	1.04	(.07)	55.84	151.66	207.50	(14.58)
2009	-	7.53	7.53	(.46)	61.97	168.68	230.65	(14.09)
2010	-	67.41	67.41	(3.58)	69.14	165.63	234.77	(12.47)
2011	-	1.41	1.41	(.07)	77.50	240.36	317.86	(14.69)
2012	-	.52	.52	(.02)	87.01	238.46	325.47	(13.08)
2013	-	-38.85	-38.85	(-1.36)	98.64	234.20	332.84	(11.63)
Total	93.15	268.53	361.68	(190.23)	849.08	3451.97	4301.05	(835.71)

Net Present Value : 645.48 million pesos

B/C Ratio : 4.39

Internal Rate of Return : 105.6 %

TABLE 2

ECONOMIC EVALUATION (Segment N-2)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	1.93	1.46	3.39 (	3.90)	-	-	- (-)
1989	40.10	30.78	70.88 (	70.88)	-	11.76	11.76 (	11.76)
1990	.28	30.78	31.06 (	27.01)	18.66	34.36	53.02 (	46.10)
1991	14.93	17.04	31.97 (	24.17)	21.87	52.98	74.85 (	56.60)
1992	.28	-	.28 (	.18)	25.89	61.01	86.90 (	57.14)
1993	27.15	-	27.15 (	15.52)	30.98	61.95	92.93 (	53.13)
1994	27.16	1.56	28.72 (	14.28)	37.36	64.07	101.43 (	50.43)
1995	.28	5.19	5.47 (	2.36)	77.13	74.55	151.68 (	65.58)
1996	.28	-	.28 (	.11)	91.71	71.05	162.76 (	61.19)
1997	.28	-	.28 (	.09)	109.70	67.03	176.73 (	57.77)
1998	-	1.56	1.56 (	.44)	63.11	64.01	127.12 (	36.14)
1999	-	5.19	5.19 (	1.28)	71.49	69.77	141.26 (	34.92)
2000	-	-	- (	- )	81.18	68.00	149.18 (	32.07)
2001	-	-	- (	- )	83.64	59.09	142.73 (	26.68)
2002	-	22.51	22.51 (	3.66)	87.16	74.35	161.51 (	26.25)
2003	-	6.11	6.11 (	.86)	91.82	79.65	171.47 (	24.23)
2004	-	1.89	1.89 (	.23)	97.74	78.20	175.94 (	21.62)
2005	-	1.56	1.56 (	.17)	105.01	75.98	180.99 (	19.34)
2006	-	5.19	5.19 (	.48)	111.55	86.37	197.92 (	18.39)
2007	-	10.85	10.85 (	.88)	120.13	94.73	214.86 (	17.36)
2008	-	2.54	2.54 (	.18)	130.79	114.00	244.79 (	17.20)
2009	-	-	- (	- )	143.68	106.44	250.12 (	15.28)
2010	-	1.79	1.79 (	.10)	159.03	95.67	254.70 (	13.53)
2011	-	6.80	6.80 (	.31)	176.94	90.72	267.66 (	12.37)
2012	-	1.69	1.69 (	.07)	197.65	88.53	286.18 (	11.50)
2013	-	-6.93	-6.93 (	-.24)	221.54	122.55	344.09 (	12.02)
Total	112.67	147.56	260.23 (	166.93)	2355.76	1866.82	4222.58 (	798.59)

Net Present Value : 631.66 million pesos

B/C Ratio : 4.78

Internal Rate of Return : 76.1 %

TABLE 3

ECONOMIC EVALUATION (Segment N-3)

Cost and Benefit Stream

(unit : million peso)

Year	Cost			Benefit				
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	-	.80	.80	(.92)	-	-	-	(-)
1989	24.38	10.09	34.47	(34.47)	-	2.34	2.34	(2.34)
1990	.07	10.09	10.16	(8.83)	2.02	7.36	9.38	(8.16)
1991	.07	22.86	22.93	(17.34)	2.38	16.53	18.91	(14.30)
1992	.07	-	.07	(.05)	2.81	23.91	26.72	(17.57)
1993	.07	-	.07	(.04)	3.32	25.08	28.40	(16.24)
1994	.07	-	.07	(.03)	3.95	26.05	30.00	(14.92)
1995	.07	-	.07	(.03)	4.69	26.77	31.46	(13.60)
1996	.07	-	.07	(.03)	5.70	27.03	32.73	(12.30)
1997	.07	-	.07	(.02)	6.93	26.77	33.70	(11.02)
1998	-	-	-	(-)	6.38	26.16	32.54	(9.25)
1999	-	-	-	(-)	7.63	25.10	32.73	(8.09)
2000	-	-	-	(-)	9.15	23.48	32.63	(7.01)
2001	-	6.80	6.80	(1.27)	8.55	25.67	34.22	(6.40)
2002	-	6.55	6.55	(1.06)	8.03	28.07	36.10	(5.87)
2003	-	-	-	(-)	7.60	28.49	36.09	(5.10)
2004	-	9.56	9.56	(1.17)	7.26	27.70	34.96	(4.30)
2005	-	9.25	9.25	(.99)	8.06	33.83	41.89	(4.48)
2006	-	-	-	(-)	8.61	40.02	48.63	(4.52)
2007	-	-	-	(-)	9.27	38.05	47.32	(3.82)
2008	-	6.80	6.80	(.48)	10.09	35.39	45.48	(3.20)
2009	-	9.79	9.79	(.60)	11.09	43.02	54.11	(3.31)
2010	-	-	-	(-)	12.29	47.43	59.72	(3.17)
2011	-	-	-	(-)	13.71	45.79	59.50	(2.75)
2012	-	1.09	1.09	(.04)	15.46	41.83	57.29	(2.30)
2013	-	-5.75	-5.75	(-.20)	17.50	41.45	58.95	(2.06)
Total	24.94	87.93	112.87	(67.18)	192.48	733.32	925.80	(186.06)

Net Present Value : 118.88 million pesos

B/C Ratio : 2.77

Internal Rate of Return : 41.3 %

TABLE 4

ECONOMIC EVALUATION (Segment N-4)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	-	2.17	2.17	(2.50)	-	-	-	(-)
1989	-	41.68	41.68	(41.68)	-	6.81	6.81	(6.81)
1990	-	41.68	41.68	(36.24)	-	19.62	19.62	(17.06)
1991	-	34.02	34.02	(25.72)	-	32.35	32.35	(24.46)
1992	-	-	-	(-)	-	39.37	39.37	(25.89)
1993	-	-	-	(-)	-	40.12	40.12	(22.94)
1994	-	-	-	(-)	-	40.65	40.65	(20.21)
1995	-	-	-	(-)	-	41.14	41.14	(17.79)
1996	-	9.86	9.86	(3.71)	-	44.78	44.78	(16.83)
1997	-	3.12	3.12	(1.02)	-	52.89	52.89	(17.29)
1998	-	-	-	(-)	-	53.08	53.08	(15.09)
1999	-	-	-	(-)	-	50.97	50.97	(12.60)
2000	-	-	-	(-)	-	48.51	48.51	(10.43)
2001	-	-	-	(-)	-	45.47	45.47	(8.50)
2002	-	9.86	9.86	(1.60)	-	55.13	55.13	(8.96)
2003	-	4.82	4.82	(.68)	-	57.52	57.52	(8.13)
2004	-	.78	.78	(.10)	-	55.22	55.22	(6.79)
2005	-	-	-	(-)	-	50.84	50.84	(5.43)
2006	-	34.13	34.13	(3.17)	-	47.78	47.78	(4.44)
2007	-	-	-	(-)	-	61.28	61.28	(4.95)
2008	-	29.54	29.54	(2.08)	-	71.30	71.30	(5.01)
2009	-	-	-	(-)	-	77.19	77.19	(4.72)
2010	-	9.86	9.86	(.52)	-	96.55	96.55	(5.13)
2011	-	3.12	3.12	(.14)	-	100.07	100.07	(4.62)
2012	-	1.04	1.04	(.04)	-	98.74	98.74	(3.97)
2013	-	-29.33	-29.33	(-1.02)	-	100.18	100.18	(3.50)
Total	.00	196.35	196.35	(118.18)	.00	1387.56	1387.56	(281.54)

Net Present Value : 163.36 million pesos
 B/C Ratio : 2.38
 Internal Rate of Return : 39.3 %

TABLE 5

ECONOMIC EVALUATION (Segment N-5)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	-	2.35	2.35	(2.70)	-	-	-	(-)
1989	-	44.03	44.03	(44.03)	-	6.91	6.91	(6.91)
1990	-	44.03	44.03	(38.29)	-	20.16	20.16	(17.53)
1991	-	38.64	38.64	(29.22)	-	33.93	33.93	(25.66)
1992	-	-	-	(-)	-	41.64	41.64	(27.38)
1993	-	-	-	(-)	-	42.64	42.64	(24.38)
1994	-	-	-	(-)	-	43.52	43.52	(21.64)
1995	-	-	-	(-)	-	43.96	43.96	(19.01)
1996	-	-	-	(-)	-	44.15	44.15	(16.60)
1997	-	11.42	11.42	(3.73)	-	48.66	48.66	(15.91)
1998	-	-	-	(-)	-	54.80	54.80	(15.58)
1999	-	1.04	1.04	(.26)	-	53.36	53.36	(13.19)
2000	-	-	-	(-)	-	50.59	50.59	(10.87)
2001	-	-	-	(-)	-	47.08	47.08	(8.80)
2002	-	-	-	(-)	-	42.68	42.68	(6.94)
2003	-	24.02	24.02	(3.39)	-	58.87	58.87	(8.32)
2004	-	6.68	6.68	(.82)	-	64.95	64.95	(7.98)
2005	-	-	-	(-)	-	63.31	63.31	(6.77)
2006	-	-	-	(-)	-	58.93	58.93	(5.48)
2007	-	25.35	25.35	(2.05)	-	62.26	62.26	(5.03)
2008	-	4.23	4.23	(.30)	-	71.04	71.04	(4.99)
2009	-	10.67	10.67	(.65)	-	75.29	75.29	(4.60)
2010	-	-	-	(-)	-	73.05	73.05	(3.88)
2011	-	11.42	11.42	(.53)	-	86.93	86.93	(4.02)
2012	-	7.20	7.20	(.29)	-	97.36	97.36	(3.91)
2013	-	-30.66	-30.66	(-1.07)	-	94.64	94.64	(3.31)
Total	.00	200.42	200.42	(125.19)	.00	1380.71	1380.71	(288.66)

Net Present Value : 163.47 million pesos

B/C Ratio : 2.31

Internal Rate of Return : 38.1 %

TABLE 6

ECONOMIC EVALUATION (All North Segments)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	1.93	9.15	11.08	(12.74)	-	-	-	(-)
1989	65.95	174.70	240.65	(240.65)	-	46.04	46.04	(46.04)
1990	8.52	174.70	183.22	(159.32)	21.57	137.35	158.92	(138.19)
1991	20.77	144.08	164.85	(124.65)	25.39	227.19	252.58	(190.99)
1992	.42	-	.42	(.28)	30.36	275.97	306.33	(201.42)
1993	61.77	-	61.77	(35.32)	36.39	283.98	320.37	(183.17)
1994	70.14	1.56	71.70	(35.65)	43.96	289.85	333.81	(165.96)
1995	.42	8.82	9.24	(3.99)	97.59	309.51	407.10	(176.00)
1996	.42	9.86	10.28	(3.86)	115.76	307.59	423.35	(159.15)
1997	.42	14.54	14.96	(4.89)	138.07	312.28	450.35	(147.22)
1998	-	1.56	1.56	(.44)	88.42	309.75	398.17	(113.18)
1999	-	9.86	9.86	(2.44)	100.89	310.29	411.18	(101.64)
2000	-	7.33	7.33	(1.58)	115.56	300.35	415.91	(89.40)
2001	-	19.87	19.87	(3.71)	119.93	284.18	404.11	(75.53)
2002	-	83.77	83.77	(13.61)	125.84	341.32	467.16	(75.93)
2003	-	40.76	40.76	(5.76)	133.38	375.41	508.79	(71.91)
2004	-	21.56	21.56	(2.65)	142.81	373.81	516.62	(63.49)
2005	-	20.13	20.13	(2.15)	155.34	393.27	548.61	(58.63)
2006	-	45.03	45.03	(4.18)	166.23	407.83	574.06	(53.35)
2007	-	39.54	39.54	(3.20)	179.96	420.26	600.22	(48.50)
2008	-	44.15	44.15	(3.10)	196.72	443.39	640.11	(44.98)
2009	-	27.99	27.99	(1.71)	216.74	470.62	687.36	(42.00)
2010	-	79.06	79.06	(4.20)	240.46	478.33	718.79	(38.19)
2011	-	22.75	22.75	(1.05)	268.15	563.87	832.02	(38.44)
2012	-	11.54	11.54	(.46)	300.12	564.92	865.04	(34.75)
2013	-	-111.52	-111.52	(-3.90)	337.68	593.02	930.70	(32.51)
Total	230.76	900.79	1131.55	(667.71)	3397.32	8820.38	12217.70	(2390.56)

Net Present Value : 1722.85 million pesos

B/C Ratio : 3.58

Internal Rate of Return : 61.7 %

TABLE 7

ECONOMIC EVALUATION (Segment S-1)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	6.23	.72	6.95	(7.99)	-	-	-	(-)
1989	25.90	4.76	30.66	(30.66)	-	1.87	1.87	(1.87)
1990	25.90	4.76	30.66	(26.66)	-	5.90	5.90	(5.13)
1991	-	29.49	29.49	(22.30)	18.73	22.35	41.06	(31.06)
1992	-	-	-	(-)	21.67	38.29	59.96	(39.42)
1993	-	-	-	(-)	25.07	40.24	65.31	(37.34)
1994	-	-	-	(-)	29.04	42.29	71.33	(35.46)
1995	-	-	-	(-)	33.62	44.45	78.07	(33.75)
1996	-	-	-	(-)	38.22	46.39	84.61	(31.81)
1997	-	-	-	(-)	43.46	48.01	91.47	(29.90)
1998	-	-	-	(-)	49.44	48.45	97.89	(27.83)
1999	-	-	-	(-)	56.23	48.42	104.65	(25.87)
2000	-	-	-	(-)	63.96	47.96	111.92	(24.06)
2001	-	-	-	(-)	72.77	47.06	119.83	(22.40)
2002	-	-	-	(-)	82.82	45.63	128.45	(20.88)
2003	-	-	-	(-)	94.26	43.44	137.70	(19.46)
2004	-	1.03	1.03	(.13)	107.29	40.75	148.04	(18.19)
2005	-	1.62	1.62	(.17)	122.16	39.88	162.04	(17.32)
2006	-	4.38	4.38	(.41)	139.10	44.40	183.50	(17.05)
2007	-	9.17	9.17	(.74)	158.42	51.59	210.01	(16.97)
2008	-	2.49	2.49	(.17)	180.44	65.43	245.87	(17.28)
2009	-	-	-	(-)	205.55	64.22	269.77	(16.48)
2010	-	6.14	6.14	(.33)	234.20	65.92	300.12	(15.95)
2011	-	.65	.65	(.03)	266.87	68.28	335.15	(15.48)
2012	-	.93	.93	(.04)	304.16	72.18	376.34	(15.12)
2013	-	-9.02	-9.02	(-.32)	346.71	87.68	434.39	(15.18)
Total	58.03	57.12	115.15	(89.31)	2694.19	1171.08	3865.27	(551.25)

Net Present Value : 461.94 million pesos

B/C Ratio : 6.17

Internal Rate of Return : 56.8 %

TABLE 8

ECONOMIC EVALUATION (Segment S-2)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	-	.60	.60	(.69)	-	-	-	(-)
1989	-	7.99	7.99	(7.99)	-	2.30	2.30	(2.30)
1990	-	7.99	7.99	(6.95)	-	6.92	6.92	(6.02)
1991	-	16.66	16.66	(12.60)	-	14.18	14.18	(10.72)
1992	-	-	-	(-)	-	19.63	19.63	(12.91)
1993	-	-	-	(-)	-	20.33	20.33	(11.62)
1994	-	-	-	(-)	-	21.01	21.01	(10.45)
1995	-	-	-	(-)	-	21.44	21.44	(9.27)
1996	-	1.04	1.04	(.39)	-	22.11	22.11	(8.31)
1997	-	-	-	(-)	-	22.90	22.90	(7.49)
1998	-	-	-	(-)	-	22.14	22.14	(6.29)
1999	-	.52	.52	(.13)	-	22.14	22.14	(5.47)
2000	-	-	-	(-)	-	20.99	20.99	(4.51)
2001	-	-	-	(-)	-	19.31	19.31	(3.61)
2002	-	-	-	(-)	-	17.03	17.03	(2.77)
2003	-	3.98	3.98	(.56)	-	19.26	19.26	(2.72)
2004	-	10.15	10.15	(1.25)	-	26.27	26.27	(3.23)
2005	-	1.76	1.76	(.19)	-	31.41	31.41	(3.36)
2006	-	1.80	1.80	(.17)	-	33.29	33.29	(3.09)
2007	-	-	-	(-)	-	33.44	33.44	(2.70)
2008	-	-	-	(-)	-	32.05	32.05	(2.25)
2009	-	.25	.25	(.02)	-	30.76	30.76	(1.88)
2010	-	-	-	(-)	-	29.04	29.04	(1.54)
2011	-	1.04	1.04	(.05)	-	28.02	28.02	(1.29)
2012	-	2.14	2.14	(.09)	-	31.62	31.62	(1.27)
2013	-	-4.69	-4.69	(-16)	-	33.15	33.15	(1.16)
Total	.00	51.23	51.23	(30.90)	.00	580.74	580.74	(126.24)

Net Present Value : 95.34 million pesos

B/C Ratio : 4.09

Internal Rate of Return : 78.4 %

TABLE 9

ECONOMIC EVALUATION (Segment S-3)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	-	1.74	1.74	(2.00)	-	-	-	()
1989	-	33.21	33.21	(33.21)	-	5.20	5.20	(5.20)
1990	-	33.21	33.21	(28.88)	-	16.25	16.25	(14.13)
1991	-	27.39	27.39	(20.71)	-	27.01	27.01	(20.42)
1992	-	-	-	(-)	-	32.76	32.76	(21.54)
1993	-	-	-	(-)	-	34.15	34.15	(19.53)
1994	-	-	-	(-)	-	35.60	35.60	(17.70)
1995	-	-	-	(-)	-	37.11	37.11	(16.04)
1996	-	-	-	(-)	-	38.56	38.56	(14.50)
1997	-	-	-	(-)	-	39.06	39.06	(12.77)
1998	-	-	-	(-)	-	39.10	39.10	(11.11)
1999	-	-	-	(-)	-	38.77	38.77	(9.58)
2000	-	-	-	(-)	-	38.18	38.18	(8.21)
2001	-	-	-	(-)	-	37.29	37.29	(6.97)
2002	-	-	-	(-)	-	36.02	36.02	(5.85)
2003	-	-	-	(-)	-	34.32	34.32	(4.85)
2004	-	-	-	(-)	-	32.10	32.10	(3.94)
2005	-	-	-	(-)	-	28.75	28.75	(3.07)
2006	-	-	-	(-)	-	24.10	24.10	(2.24)
2007	-	31.66	31.66	(2.56)	-	37.75	37.75	(3.05)
2008	-	15.46	15.46	(1.09)	-	52.75	52.75	(3.71)
2009	-	-	-	(-)	-	51.61	51.61	(3.15)
2010	-	-	-	(-)	-	48.19	48.19	(2.56)
2011	-	-	-	(-)	-	45.26	45.26	(2.09)
2012	-	-	-	(-)	-	41.51	41.51	(1.67)
2013	-	-10.90	-10.90	(-1.38)	-	37.08	37.08	(1.30)
Total	.00	131.77	131.77	(88.06)	.00	888.48	888.48	(215.19)

Net Present Value : 127.12 million pesos

B/C Ratio : 2.44

Internal Rate of Return : 41.3 %

TABLE 10

ECONOMIC EVALUATION (Segment S-4)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	-	1.65	1.65	(1.90)	-	-	-	(-)
1989	-	19.10	19.10	(19.10)	-	2.57	2.57	(2.57)
1990	-	19.10	19.10	(16.61)	-	7.93	7.93	(6.90)
1991	-	50.89	50.89	(38.48)	-	18.28	18.28	(13.82)
1992	-	-	-	(-)	-	26.62	26.62	(17.50)
1993	-	-	-	(-)	-	27.63	27.63	(15.80)
1994	-	-	-	(-)	-	28.66	28.66	(14.25)
1995	-	-	-	(-)	-	29.64	29.64	(12.81)
1996	-	1.04	1.04	(.39)	-	30.88	30.88	(11.61)
1997	-	-	-	(-)	-	32.02	32.02	(10.47)
1998	-	-	-	(-)	-	32.03	32.03	(9.10)
1999	-	-	-	(-)	-	31.62	31.62	(7.82)
2000	-	-	-	(-)	-	30.98	30.98	(6.66)
2001	-	-	-	(-)	-	30.04	30.04	(5.61)
2002	-	-	-	(-)	-	28.75	28.75	(4.67)
2003	-	4.19	4.19	(.59)	-	29.44	29.44	(4.16)
2004	-	1.08	1.08	(.13)	-	28.87	28.87	(3.55)
2005	-	-	-	(-)	-	26.83	26.83	(2.87)
2006	-	-	-	(-)	-	23.60	23.60	(2.19)
2007	-	16.52	16.52	(1.33)	-	27.07	27.07	(2.19)
2008	-	22.63	22.63	(1.59)	-	40.27	40.27	(2.83)
2009	-	-	-	(-)	-	40.67	40.67	(2.48)
2010	-	3.89	3.89	(.21)	-	38.24	38.24	(2.03)
2011	-	-	-	(-)	-	36.77	36.77	(1.70)
2012	-	1.67	1.67	(.07)	-	35.78	35.78	(1.44)
2013	-	-14.26	-14.26	(-.50)	-	32.89	32.89	(1.15)
Total	.00	127.50	127.50	(79.90)	.00	718.08	718.08	(166.18)

Net Present Value : 86.28 million pesos

B/C Ratio : 2.08

Internal Rate of Return : 34.9 %

TABLE 11

ECONOMIC EVALUATION (All South Segments)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	6.23	4.71	10.94	(12.58)	-	-	-	(-)
1989	25.90	65.06	90.96	(90.96)	-	11.94	11.94	(11.94)
1990	25.90	65.06	90.96	(79.10)	-	37.00	37.00	(32.17)
1991	-	124.43	124.43	(94.09)	18.73	81.82	100.55	(76.03)
1992	-	-	-	(-)	21.67	117.30	138.97	(91.38)
1993	-	-	-	(-)	25.07	122.35	147.42	(84.29)
1994	-	-	-	(-)	29.04	127.56	156.60	(77.86)
1995	-	-	-	(-)	33.62	132.64	166.26	(71.88)
1996	-	2.08	2.08	(.78)	38.22	137.94	176.16	(66.23)
1997	-	-	-	(-)	43.46	141.99	185.45	(60.62)
1998	-	-	-	(-)	49.44	141.72	191.16	(54.34)
1999	-	.52	.52	(.13)	56.23	140.95	197.18	(48.74)
2000	-	-	-	(-)	63.96	138.11	202.07	(43.43)
2001	-	-	-	(-)	72.77	133.70	206.47	(38.59)
2002	-	-	-	(-)	82.82	127.43	210.25	(34.17)
2003	-	8.17	8.17	(1.15)	94.26	126.46	220.72	(31.19)
2004	-	12.26	12.26	(1.51)	107.29	127.99	235.28	(28.91)
2005	-	3.38	3.38	(.36)	122.16	126.87	249.03	(26.61)
2006	-	6.18	6.18	(.57)	139.10	125.39	264.49	(24.58)
2007	-	57.35	57.35	(4.63)	158.42	149.85	308.27	(24.91)
2008	-	40.58	40.58	(2.85)	180.44	190.50	370.94	(26.06)
2009	-	.25	.25	(.02)	205.55	187.26	392.81	(24.00)
2010	-	10.03	10.03	(.53)	234.20	181.39	415.59	(22.08)
2011	-	1.69	1.69	(.08)	266.87	178.33	445.20	(20.57)
2012	-	4.74	4.74	(.19)	304.16	181.09	485.25	(19.49)
2013	-	-38.87	-38.87	(-1.36)	346.71	190.80	537.51	(18.78)
Total	58.03	367.62	425.65	(288.18)	2694.19	3358.38	6052.57	(1058.86)

Net Present Value : 770.69 million pesos
 B/C Ratio : 3.67
 Internal Rate of Return : 49.3 %

TABLE 12

ECONOMIC EVALUATION (All Segments)

Cost and Benefit Stream

(unit : million peso)

Year	Cost				Benefit			
	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)	Road Function	Pavement Rehab.	Total (Undis'd)	Total (Dis'd)
1988	8.16	13.86	22.02	(25.32)	-	-	-	(-)
1989	91.85	239.76	331.61	(331.61)	-	57.98	57.98	(57.98)
1990	34.42	239.76	274.18	(238.42)	21.57	174.35	195.92	(170.37)
1991	20.77	268.51	289.28	(218.74)	44.12	309.01	353.13	(267.02)
1992	.42	-	.42	(.28)	52.03	393.27	445.30	(292.79)
1993	61.77	-	61.77	(35.32)	61.46	406.33	467.79	(267.46)
1994	70.14	1.56	71.70	(35.65)	73.00	417.41	490.41	(243.82)
1995	.42	8.82	9.24	(3.99)	131.21	442.15	573.36	(247.88)
1996	.42	11.94	12.36	(4.65)	153.98	445.53	599.51	(225.38)
1997	.42	14.54	14.96	(4.89)	181.53	454.27	635.80	(207.84)
1998	-	1.56	1.56	(.44)	137.86	451.47	589.33	(167.52)
1999	-	10.38	10.38	(2.57)	157.12	451.24	608.36	(150.38)
2000	-	7.33	7.33	(1.58)	179.52	438.46	617.98	(132.83)
2001	-	19.87	19.87	(3.71)	192.70	417.88	610.58	(114.12)
2002	-	83.77	83.77	(13.61)	208.66	468.75	677.41	(110.10)
2003	-	48.93	48.93	(6.92)	227.64	501.87	729.51	(103.10)
2004	-	33.82	33.82	(4.16)	250.10	501.80	751.90	(92.40)
2005	-	23.51	23.51	(2.51)	277.50	520.14	797.64	(85.24)
2006	-	51.21	51.21	(4.76)	305.33	533.22	838.55	(77.92)
2007	-	96.89	96.89	(7.83)	338.38	570.11	908.49	(73.41)
2008	-	84.73	84.73	(5.95)	377.16	633.89	1011.05	(71.04)
2009	-	28.24	28.24	(1.73)	422.29	657.88	1080.17	(66.00)
2010	-	89.09	89.09	(4.73)	474.66	659.72	1134.38	(60.27)
2011	-	24.44	24.44	(1.13)	535.02	742.20	1277.22	(59.01)
2012	-	16.28	16.28	(.65)	604.28	746.01	1350.29	(54.25)
2013	-	-150.39	-150.39	(-5.25)	684.39	783.82	1468.21	(51.29)
Total	288.79	1268.41	1557.20	(955.89)	6091.51	12178.76	18270.27	(3449.42)

Net Present Value : 2493.54 million pesos

B/C Ratio : 3.61

Internal Rate of Return : 57.2 %

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