APPENDIX 4.2.4 RESULTS OF FIELD CBR AND LABORATORY SOIL TESTS

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ROUTE NO.	SURFACE TYPE	SECTION	PAVEMENT STRUCTURE	FIELD D	ENSITY (gm/cc)	W (۶)	FIELD CBR (%)	MOLD CBR & AT CORRESPONDING FIELD DENSITY	WO (mm)	\$ (mm)	R (m
RT - 224	AC	11 + 500 C 2.00 M LT	D.06 AC. 0.15 BASE 0.10 SUBBASE 0.15 SELECT SUBGRADE	BASE SUBBASE SELECT SUBGRADE	2.215 2.316 2.295 1.777	0.59 1.43 1.59 2.29	55.6 49.7 49.7 14.5	42.0 55.7 57.0 11.9	0.449	0.142	217
RT - 224	AC	16 + 000 C 2.00 M LT L	D.IS SELECT SUBGRADE	BASE SUBBASE SELECT SUBGRADE	2.075 2.328 2.246 1.936	0.62 1.37 2.55 3.49	19.1 28.8 36.7 20.5	28.0 33.3 30.7 20.2	0.508	0.152	208
RH - 5	PM	21 + 500 C 2.00 M LT	PH 010 BASE 0.15 SUBBASE 020 SELECT 033 SUBGRADE	BASE SUBBASE SELECT SUBGRADE	2.063 2.223 2.116 1.995	10.10 1.59 6.39 6.59	35.8 53.6 22.8 20.9	53.5 49.3 40.3 22:0	0.372	0.101	325
RH – 5	PM	36 + 200 C 2.00 M LT	D.OS PM O.I5 BASE O.I5 SUBBASE O.I5 SELECT SUBGRADE	BASE SUBBASE SELECT SUBGRADE	2.027 2.298 2.297 2.000	9.50 4.20 4.35 6.29	30.8 18.9 11.9 20.5	50.8 50.0 28.2 22.7	0.819	0.197	174
RH - 12	DT/ST	492 + 600 C 2.50 M RT	ST 0.04 BASE 0.15 SUBBASE 0.15 SUBGRADE	BASE SUBBASE SUBGRADE	2.320 2.261 2.093	6.44 6.13 7.70	43.7 43.1 24.2	65.6 75.3 26.0	0.485	0.154	199
RH - 12	DT/ST	493 + 450 C 2.00 M LT	0.15 SUBBASE 0.15 SELECT 0.15 SELECT 0.15 SELECT 0.15 SELECT	BASE SUBBASE SELECT SUBGRADE	2.295 2.302 2.229 2.101	7.47 7.78 7.79 9.73	58.6 27.8 26.8 21.2	62.2 71.5 41.0 15.2	0.680	0.176	190
RH - 25	DT/ST	9 + 450 C 1.40 M LT	DT 0.00 BASE 0.15 SUBBRASE 0.10 SUBGRADE	BASE SUBBASE SUBGRADE	2.259 2.174 2.000	3.56 6.13 3.61	54.6 52.6 29.8	76.0 58.3 29.7	0.297	0.101	294
RH - 25	CT/ST	11 + 950 C 1.40 M LT	DT 0.06 BASE 0.15 SUBBASE 0.10 SUBGRADE	BASE SUBBASE SUBGRADE	2.031 2.220 2.064	5.43 3.16 6.79	47.7 39.7 31.8	42.0 62.0 25.7	0.419	0.116	280

where, r = distance from center point (cm)

Wo = center deflection (cm)

Wr = deflection at point r (cm)

 $\delta = W - Wr$

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R = radius of curvature of deflection (m)

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APPENDIX 4.2.4

	学校的科学校会主义	040	$(-\frac{1}{2}, -\frac{1}{2}, -\frac{1}{2})$	01314 - 40	an (92-1)	学校課題でもの

Result	of Soil Tes	t (Subgrade)		as display Lucio di								oran orana National		· .				ामस्त् जीव्य
		Surface		HRB			Sieve	Analys	is % F	Passing	[7, 240, 0, 1, 26, 210, 1		Plas	cicity	Сол DH-Т.	A	Lab.	C.B.I
No.	Route No.	Туре	Section	Classi- fication	50	25	19	9.5	# 4	# 10	# 40	# 200	LL.	PI.	Opt. Mc.%	ˈ៵d (gm/cc)	C.B.R.	Swel (%)
1	RT - 224	AC	11+000 RT 2.80m	A-1-b			100.0	87.4	72.8	61.5	35.5	18.3	N	Р	7.6	2.068	9.8	
2	RT - 224	AC	18+000 LT 2.00m	A-1-b			100.0	87.3	72.1	60.7	33.5	15.3	N	P		2.093	8.3	
3	RH - 21	AC	124+000 RT 5.50m	A-4	•			100.0	94.8	93.0	81.8	39.6	32.00	7.94	9.3	1.967	10.0	
4	RH - 21	AC	129+000 RT 5.30m	A-2-4					100.0	99.0	93.6	32.2	N-	P -	8.2	2.012	11.9	-
5	RH - 22	PM	3+000 RT 2.35m	A-4				100.0	98,8	98.2	97.6	37.6	· · · · N	P ^{erson} teres	10.9	1.799	4.2	¹
6	RH ~ 22	PM	6+000 LT 2.30m	A-4			- - - - - - - - - - - - - - - - 	100.0	96.2	94.0	91.6	45.0	N-	а Р ^{адин} та Стабита	7.8	2.001	4.9	0.35
7	RH - 5	РМ	25+000 RT 2.80m	A-2-4	: :	· · · ·	100.0	82.0	56.2	42.1	34.6	27.4	32.2	9.1	10.3	2.008	4.40	0.09
8	RH - 5	РМ	32+000 LT 2.20m	A-2-4			100.0	82.7	61.6	50.1	42.4	27.7	25.8	.7.1	9.6	2.011	6.0	0.09
9	RH - 12	DT/ST	490+000 RT 2.30m	A-4		· · · · · · ·	100.0	96.8	89.2	80.6	77.2	36.6	21.7	9.7	10.6	1.955	2.85	1.80
10	RH - 12	DT/ST	496+000 LT 2.60m	A-4				100.0	96.6	90.0	85.6	47.6	20.8	6.0	11.7	1.905	2.20	0.22
11	RH - 16	DT/ST	10+000 RT 2.50m	A-4				100.0	97.8	94.6	91.2	79.0	20.5	7.1	11.3	1.843	3.55	1.30
12	RH - 16	DT/ST	16+000 LT 2.60m	A-7-6	х - -		100.0	96.4	93.4	89.4	85.4	73.4	61.0	39.5	19.3	1.681	2.85	0.60
13	RH - 25	DT/ST	8+000 RT 2.20m	A-4				100.0	97.2	93.0	86.6	49.6	33.0	8.59	9.2	1,947	11.0	0.13
14	RH - 25	DT/ST	15+000 LT 2.00m	A-4	1			100.0	99.6	97.4	91.2	54.4	32,60	7.76	11.4	1.958	11.3	0.11
15	RH - 27	DT/ST	9+000 RT 2.20m	A-4				100.0	95.4	88.6	82.0	64.0	28.5	9.0	11.2	1.869	5.25	3.74
16	RH - 27	DT/ST	17+000 LT 1.90m	A-6	÷			100.0	98.4	94.8	91.2	64.2	34.9	12.8	13.6	1.852	2.50	2.86

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APPENDIX 4.2.4

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1	MMM (1999) (1999) MMM (1999) (1999)
प्रसंख्य स्टल्प केल्व्य	
C.B.R.	Specific Gravity
Swell (%)	Test
	2.64
	2.73
-	2.66
-	2.53
··· –	2,56
0.35	2.74
0.09	2.62
0.09	2.65
1.80	2.74
0.22	2.60
1,30	2.68
0.60.	2.76
0.13	2.71
0.11	2.54
3.74	2.86
2.86	2.78

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		Surface		HRB		. <u></u>	Sieve	Analys	is t F	assing	 [Plast	icity:	Çọn DH-T.		Lab.	C.B.R.	Remarks
No.	Route No.	Туре	1	Classi- fication	50	25	19	9.5	# 4	# 10	# 40	[#] 200	LL.	PI.	Opt. Mc.%	∛d (gm∕cc)	C.B.R.	Swell (%)	
1	RT - 224	AC	11+000 RT 2.80m			100	92.4	77.0	61.0	40.1	24.0	11.8	•		8.0	2.226	21.2	0.4	
2	RT - 224	AC	18+000 LT 2.00m		t i	100	95.6	83.9	72.4	63.8	46.8	17.8			8.0	2.237	21.4	0.3	
3	RH - 21	AC	124+000 RT 5.50m			100	86.8	72.4	58.1	42.5	32.2	19.1			9.3	2.162	16.8	0.6	
4	RH - 21	AC	129+000 RT 5,30m		100	93.8	88.8	83.2	68.2	43.9	32.9	23.7			10.2	2.081	16.2	0.3	
5	RH - 22	РМ	3+000 RT-2.35m		100	98.8	96.6	81.6	66.2	44.7	36.3	25.0			8.4	2.187	13.0	0.2	
6	RH - 22	PM	6+000 LT 2.30m	-	100	98.7	96.5	82.5	66.0	44.5	37.1	28.2			8.0	2.180	10.0	0.1	
7	RH - 5	Р́М	25+000 RT 2.80m		100	93.1	85.7	79.9	62.6	46.3	34.4	16.7	•• • •		11.1	2.167	12.0	0.3	
8	RH - 5	РМ	32+000 LT 2.20m		100	90.1	82.3	76.3	53.7	44.1	36.1	15.3			11.7	2.210	18.6	0.4	
9	RH - 12	DT/ST	490+000 RT 2.30m		100	96.5	93.3	80.6	67.1	44.9	34.2	22.3			8.1	2.185	22.0	0.2	
10	RH - 12	DT/ST	496+000 LT 2.60m	1997 - S. 1997 -	: .	100	96.6	79.7	67.3	48.0	41.7	27.9	-		7.9	2.209	12.6	0.2	
11	RH - 16	DT/ST	10+000 RT 2.50m		100:	97.7	89.4	81.3	63.6	50.8	39.1	23.0			8.8	2.239	13.6	0.4	-
12	RH - 16	DT/ST	16+000 LT 2.60m		-	ал. 199	100	94.6	41.5	28.4	20.5	15.0			7.4	2.195	16.5	0.1	
13	RH - 25	DT/ST	8+000 RT 2.20m			100	99.6	90.4	69.4	43.2	29.3	16.9			11.5	2.124	18.0	0.4	
14	RH - 25	DT/ST	15+000 LT 2.00m				100	96.3	75.6	43.7	32,8	24.2			12.6	2.094	15.0	0.3	
15	RH - 27	DT/ST	9+000 RT 2.20m	- 1 	100	96.4	92.0	87.6	75.0	59.3	50.4	43.9			10.2	2.187	11.1	0.2	· · · · · · · · · · · · · · · · · · ·
16	RH - 27	DT/ST	17+000 LT 1.90m																

Result of Soil Test (Subbase)

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<u>.</u>				HRB			Sieve	Analys	is % P	assing	1		Plast	cicity	Con DH-T.		Lab.	с.в.н
No.	Route No.	Surface Type	Section	Classi- fication	50	25	19	9,5	#4	# 10	# 40	# 200	LL.	PI.	Opt. Mc.%	४वे (gm/cc	C.B.R.	Swe] (%)
1	RT - 224	AC	11+000 RT 2.80m	A-1-a	100	90.4	75.6	43.2	23.8	13.3	6.3	4.1	N ·	- P	7.6	2.260	74.2	-
2	RT - 224	AC	18+000 LT 2.00m	A-1-a	100	81.7	65.3	35.8	13.7	9.1	4.5	2.5	N	Р	7.6	2.243	79.0	<u> </u>
3	RH - 21	AC	124+000 RT 5.50m	A-1-a	100	68.9	55.1	38.4	29.3	21.1	11.0	6.2	N ·	P	5.8	2,319	80.3	-
4	RH - 21	AC	129+000 RT 5.30m	A-1-a	100	75.5	67.4	52.7	41.5	27.6	11.5	5.7	N -	Р	6.7	2.316	188.0	-
5	RH - 22	РМ	3+000 RT 2.35m	A-1-a	100	78.6	65.1	47.2	37.0	27.7	21.2	11.4	N-	Р	5.1	2.279	88.6	-
6	RH - 22	РМ	6+000 LT 2.30m	A-l-a	100	93.2	80.1	54.7	37.8	23.8	11.7	7.9	N-	Р	6.1	2.290	82.0	 -
7	RH - 5	Р́м	25+000 RT 2.80m	A-l-a	100	93.1	85.4	62.7	38.9	14.9	4.3	1.8	N -	P	9.3	1.936	58.5	-
8	RH - 5	РМ	32+000 LT 2.20m									14 st. 1					· . <u>1</u>	
9	RH - 12	DT/ST	490+000 RT 2.30m	A-l-a	100	85.5	73.9	46.8	33.7	21.9	11.0	7.8	N -	Р	5.1	2.307	115.0	_
10	RH - 12	DT/ST	496+000 LT 2.60m	A-l-a	100	95.6	83.7	56.0	42,4	28.9	20.0	12.5	N -	Р	7.0	2.286	90.0	- :
11	RH - 16	DT/ST	10+000 RT 2.50m	A-l-a	100	80.2	70.9	53.9	43.2	26.7	13.5	8.8	N-	Р	6.5	2.306	117.0	
12	RH - 16	DT/ST	16+000 LT 2.60m	A-l-a	100	87.0	71.3	43.6	31.1	17.2	8.4	4.8	N -	Р	7.0	2.270	92.0	-
13	RH - 25	DT/ST	8+000 RT 2.20m	A-1-a	100	71.6	57.5	37.6	28.5	21.3	11.0	6.8	N -	Р	7.5	2.302	7.4.3	-
14	RH - 25	DT/ST	15+000 LT 2.00m	A-1-a	100	90.9	74.5	48.7	29.8	21.8	12.8	8.4	N	Р	7.6	2.233	. 89.0	
15	RH - 27	DT/ST	9+000 RT 2.20m	A-1-a	100	83.2	70.6	51.4	40.0	26.9	16.0	11.0	N -	Р	6.7	2.327	126.0	-
16	RH - 27	DT/ST	17+000 LT 1.90m	A-1-a	100	94.7	87.0	71.8	53.5	29.7	18.3	12.9	N	Р	6.5	2,290	110.0	-

Result of Soil Test (Base)

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ell %)	Remarks	
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Route No.	Penetration		Penetration Index		Sm (kg,	/cm ²)
Section	Р	P TRB P.I. Cv	Cv	CASE 1	CASE 2	
RT - 224 11 + 500	22.6	70	1.029	0.887	20500 (T = 36 [°] C)	28100 (T= 32.2 ⁰ C)
RT - 224 16 + 000	49.6	53	-0.491	0.890	5100 (T = $36^{\circ}c$)	9000 (T= 32.2 [°] c)

APPENDIX 4.2.5 STIFFNESS OF EXISTING ASPHALT CONCRETE

(1) PI : Penetration index of bitumen defined in the following equation.

$$\frac{\log 800 - \log P}{T - 25} = \frac{20 - PI}{10 + PI} \times \frac{1}{50}$$

(2) Cv : Concentration of mineral aggregate percent by volume

Cv = Volume of Mineral aggregate

Volume of (Mineral aggregate + asphalt)

(3) Sm : Stiffness of existing asphalt concrete defined by the equation below:

Sm = Sb
$$(1 + \frac{2.5}{n} \times \frac{Cv}{1 - Cv})^n$$

where,

$$n = 0.83 \log \left(\frac{4 \times 10^7}{\text{Sb}}\right)$$

Sb : Stiffness of bitumen

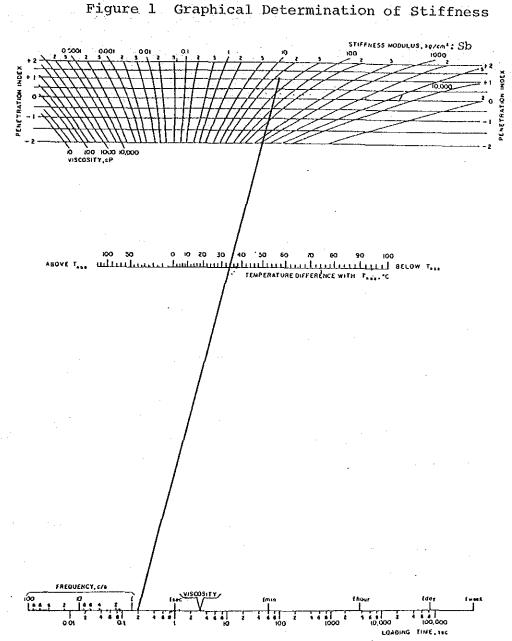
(derived from Figure 1 in assuming the Loading

Time = 0.192 second)

Temperature difference = TRB - T

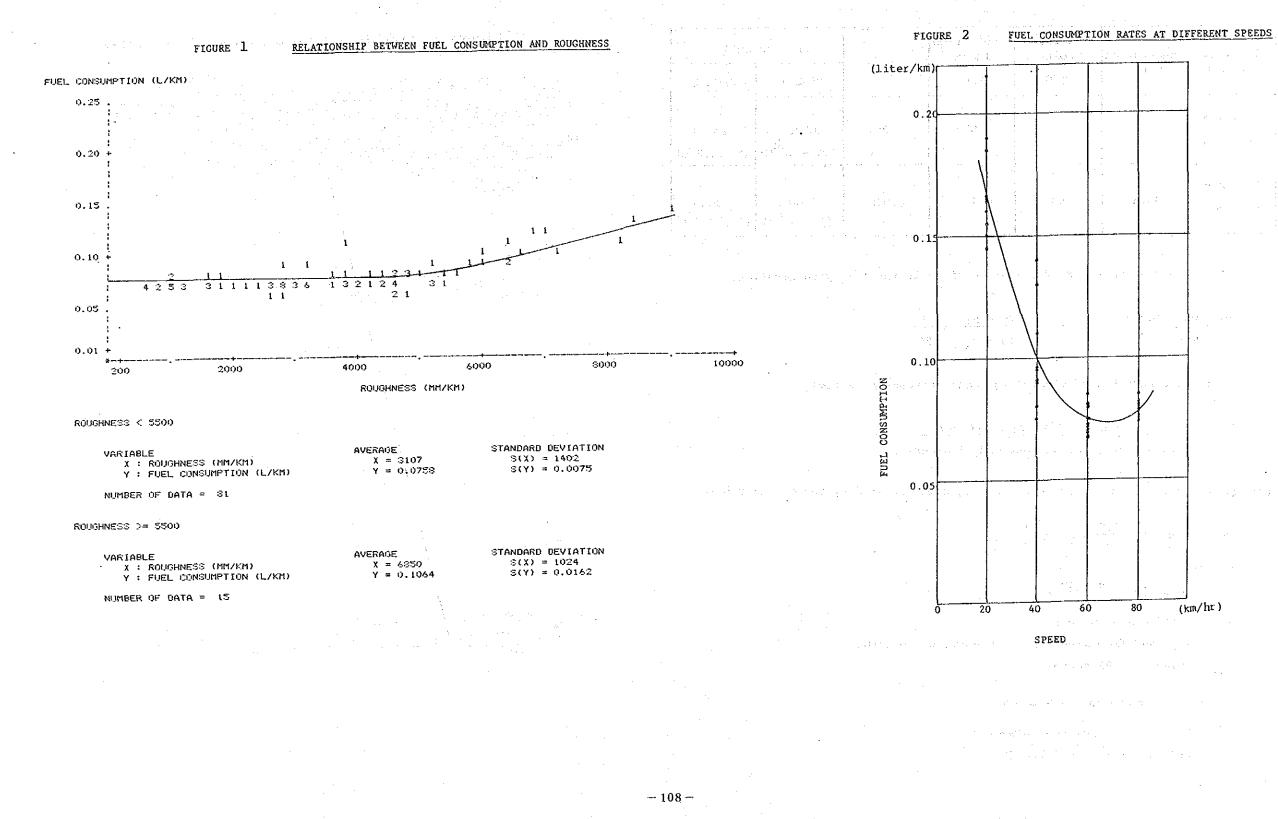
CASE 1:
$$T = pavement temperture$$

CASE 2: $T = 90^{\circ}F (32.2^{\circ}C)$



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O BORD CONTRACT ON OTHER CONTRACTOR APPENDIX 4.2.6 RESULTS OF FUEL CONSUMPTION SURVEY



APPENDIX 4.2.6

APPENDIX 4.3.1 DAILY TRAFFIC VOLUME AND EQUIVALENT STANDARD 8.2 TON AXLE NUMBERS

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* RT - 224 (224 - 0100) ¥ ¥ ¥

YEAR OF CONSTRUCTION : 1968

TRAFFIC GROWTH RATE

				100	
YEA	R	PASSENGER	FREIGHT		
·					
-	1981	3.8	5.2	1	
1982 -	1987	3.8	5.2		
1988 -	2001	3.8	3.8		
			 		

ASSUMED OPENING YEAR : 1969

DESIGN LANE FACTOR : 0.5

ESA CONVERSION FACTOR

HB	MT	HT
0.76	1.24	0.50

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DAIL	Y TRAFF	IC VOL	UME				. •		. •	EQUIVALENT	STANDARD	8.2 TON	AXLE NUMB	ER (ESA)	CUNIT :	X. 10003
 	YEAR	 PÇ	- L8	HB			НТ	I HV	I AADT I	I YEAR	I H8 I		MT	HT	 •	HV I ł
•	 1969	352	187	228	235	181	210	•	1393		1 32 (32) 41	(41)	19 (19)	1 92 (92) ł
	1970 I	366	194	237	248	191	221	1 649	1457	1 1970			(84)	20 (39)		
	1971	380	201	246	260	201	233	1 680	1 1521 1			• •	(129)		100 (
	1972	394	209	255	274	211	245	1 711	l 1588 I	1 1972			(177)	22 (82)		
-	1973	534	375	290	354	200	251	1 741	1 2004 1	1 1973			(222)	23 (105)		501) 1
	1974	478	340	279	370	356	302		1 2117 1				(303)	28 (133)		
	1975	505	310	247	484	285	258		1 2089 1	1 1975			(367)		1 122 (
I	1975	503	322	278	502	398	319		1 2322 1	1 1976			(457)		1 158 (
1	1977	555	354	336	731	423	321	1 1080	1 2720 1	I 1977		e de la companya de l	(553)	29 (215)		
	1978	472	305	392	735	675	321	1388	1 2900 1	1978 -			(706)	29 (244)		1337)
	1979	518	328	342	892	421			1 2871	1 1979		e de la companya de l	(801)	34 (278)		
	1780 I	377	249	304	871	481			1 2576 1	1980			(910)	27 (305)		
	1781 I	492	174	437	791	531	369		1 2794 1	1 1981			(1030)	34 (339)		2116) I
Ì	1982	440	221	451	876	470	390	1 1331	1 2868 1	1 1982		and the second	(1141)	36 (375)		2357) 1
	1983	606	331	552	1016	543	449	1544	1 3497				(1264)			2608) I
1	1984	629	344	573	1069	571	472	1 1615	1 3658 1	1784			(1393)	43 (459)		
1	1985 I	653	357	595	1124	601	497	1 1693	1 3827	I 1985			(1529)	45 (504)		2872)
	1986 I	678	370	617	1183	632	523	1 1772	1 4003 1	1986			(1672)	48 (552)		3149)
	1987	703	384	641	1244	665	550	1 1856	4187	I 1987	1 89 (10		(18/22)	50 (602)		3438)
	1788	730	399	665	1309	700	579	1 1944	1. 4382	1988	1 92 (11		(1980)	53 (655)		3741) 1
	1989	758	414	690	1359	726	601	1 2017	1 4548 1	1 1989) 96 (12		(2144)	55 (710)		4056)
i	1770 I	787	430	717	1410	754	623	1 2094	4721	1 1990			(2315)	57 (767)		4383)
÷	1991	817	446	744	1464	782	647		1 4900 1		1 103 (14		(2492)	59 (826)		4722)
i	1992	848	463	772	1520	812	672		1 5087 1		1 107 (15	. = .	(2676)	61 (887)		5074)]
	1993	880	481	802	1577	843	697	1.2342	1 5280 1		111 (16		(2867)	64 (951)		5440) 1
	1994	913	499	832	1637	875	724	1 2431	1 5480 1		1 115 (17		(3065)	66 (1017)		5819) I
	1995 I	948	518	864	1700	908	751	1 2523	1 5689 1		1 120 (18		(3270)	69 (1086)		6213)
	1996	984	538	896	1764	943	780	1 2619	1 5905 1		124 (19		(3483)	71 (1157)		5621) 1
	1997		558	930	1831	979	809	1 2718	I. 6128 I		1:129 (21		(3705)	74 (1231)		7046) 1
i	1998	1060	579	965	1901	1016	840	1 2822	1 6362 1		1 134 (22		(3935)	77 (1308)		7487)
· 1	1999 1		601	1003	1973	1055	872		1 6605 1	1 1999	1 139 (23		(4174)	80 (1388)		7945) 1
i	2000 1		624	1041	2048	1095	905	1 3041	1 6855 1	1 2000			(4422)	83 (1471)		042U7 I
i	2001		648	1080	2126	1136			1 7115 1		150 (26	77) 257	(4679)	86 (1557)	1 473 (07137 1
			- المراسطة مع مع مع مع مع مع - المراسطة مع مع مع مع مع مع - المراسطة مع							NOTE	; () =	CUMULATI	ON SINCE	ASSUMED OPEN	ING YEA	R

INITIAL TRAFFIC NUMBER (ITN) & DESIGN TRAFFIC NUMBER (DTN)

7 YEARS : ITN = 300 DTN = 120 14 YEARS : ITN = 300

DTN = 2.76

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Delto e *... RH −021 = 66(304 − 0904) ¥

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المعلم والمرجوب والمرجوب المعلم والمرجوب والمعاد

YEAR OF CONSTRUCTION : 1958

TRAFFIC GROWTH RATE

YEA	R	PASSENGER			
_	1981	3.8	5.2		
1982 -	1987	3.8	5.2	• •	••
1988 -	2001	3.8	3.8		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -

ESA CONVERSION FACTOR MT HT HB ------_____ 0.76 1.24 0.50

EQUIVALENT STANDARD 8.2 TON AXLE NUMBER (ES

DESIGN LANE FACTOR : 0.5

ASSUMED OPENING YEAR : 1969 FEED DOTATION TO AN A STATE

이 말씀 같은 것은 것을 가지 않는 것을

化二基氟化盐化合金 化二乙基氨基苯基乙基 DAILY TRAFFIC VOLUME

ور مرسم و مرجوع و INYEAR ME HB 11 MT -- H MT SA OHT I HV GILADTOIL LB HB LT I YEAR I PC ㅠㅠㅠㅠㅠㅠㅋㅋㅠㅠㅠㅠㅋㅋㅋㅋㅋㅋ -----1-----_____ _____ ET CHE (1969 CHO 19 (CCC19)) 33 (V/33) 24 (137 164 147 267 1 551 1216 123 1 1969 1 378 26 (1 1970 (La 20 (CA 39) 35 (68) 281 1 578 1 1272 1 173 155 393 128 142 1 1970 1 37 (:105) 27 (i 1971 i 20 (b) 59) 296 1 606 1 1329 1 147 182 163 408 133 1 1971 311 | 635 (1387 1 1 1 1972 | 21 (80) 39 (144) 28 (138 153 191 171 1 1972 1 423 575 (1. 1503 (1. 1. 1. 1. 1973 (1. 23. (1. 103)) 41 (185) 21 (228 | 232 179 | 1973 | 504 192 168 601 (1 1590) (1 1974 1) 23 (126) 44 (229) 22 (237 1 310 195 1 1974 1 475 2Ő4 169 578 | 1653 | 1 1975 (l. 28 (0454)) (41 (270) 18 (198 | 201 458 179 1 1975 I 428 189 606 | 1772 | 1976 C 181) .49 (319) ⊡18 (197 1 194 511 215 | 1976 | 417 238 .20 (575 | 1822 | 1 1977 | 28 (209) 36 (355) 215 1 202 578 158 1 1977 | 417 252 .37 (2425 1 1 1978 1 36 (245) 69 (424) 402 | 970 | 307 701 1 1978 | 531 223 251 63 (487) 25 C 753 | 2075 | - | 1979 | 29 (S274) 269 278 155 206 634 1 1979 533 -20 (28 (302) 62 (549) 273 219 692 1 1863 I 1980 200 499 1 1980 1 385 287 -24 (28 (330) 50 (3599) 220 261 1 682 | 1921 | 1 1981 353 201 507 | 1981 | 377 27 (63 (662) 39 (369) 282 732 280 300 1 862 1 2260 1 1782 304 | 1982 | 362 1 1983 1 31 (400) 49 (711) 19 (347 224 676 216 207 | 647 1 2045 1 1 1983 I 375 E 1984 E 32 (432) 51 (762) 20 (678 | 2138 | 389 360 233 711 227 218 1 | 1984 | 709 1 2235 0 1 1985 1 33 0 465) 54 (816) 21 (404 1 1985 374 241 748 239 229 | 101986 (35 (500) 57 (873) ,22 (743 1 2337 1 787 251 241 1 1 1986 419 388 251 254 1 779 1 2445 1 1 1987 1 36 (536) 60 (933) 23 (403 828 265 1 1987 435 260 267 1 81501 2556 b 1. (1988 (11. 37 (4.573) 63 (996) .24 (1788 452 418 270 871 278 25 (65 (1061) 277 1 846 1 2653 1 1 1 1989 1 39 (612) 280 904 289 1 1789 1 469 434 68 (1129) 26 (287 | 878 | 2754 | 41990 | 40 (652) 938 300 451 291 | 1990 | 487 -27 (70 (1199) 298 I 911 I 2858 L I 1991 L 42 (694) 974 302 311 468 1 1991 1 505 28 (73 (1272) 310 1 946 F 2967 F 1992 F 43 (C737) 323 313 1011 1 1992 1 525 485 76 (1348) 29 (321 | 981 | 3080 | | 1993 | 45 (782) 1050 335 | 1993 | 545 504 325 79 (1427) ·30 (334 | 1020 | 3197 | | 1994 | 47 (829) 338 1089 348 523 | 1994 | 565 32 (82 (1509) 350 1131 361 | 1995 | 587 543 85 (1594) 33 (359 I 1098 T 3445 (C) 1996 I 50 (0928) 564 364 1174 375 | 1996 | 609 1 1997 1 52 (980) 88 (1682) 34 (373 1 1140 1 3575 1 1997 1 632 585 378 :1218 389 -35 C 387 1 1183 1 3711 (Ref 1 1998 (1 54 (1034) 91 (1773) 404 1 1998 I 656 607 392 1265 37 6 402 | 1228 | 3852 | 31 1979 | 56 (1090) 95 (1868) 419 407 1313 1 1999 1 681 630 38 (417 | 1274 | 3998 | | | | 2000 | | 59 (1149) 98 (1966) 1363 435 707 422 1 2000 L 654 102 (2058) .40 (433 | 1323 | 4150 | 2001 | 61 (1210) 1414 452 679 438 734 1 2001 L _____ _____ د شد مو عد مر م

INITIAL TRAFFIC NUMBER (ITN) & DESIGN TRAFFIC NUMBER (DTN)

· 一般的 一般的 一般的 一个 一般的 一般的

7 YEARS : ITN = 125 DTN = 5014 YEARS : ITN = 125 DTN = 115

-110 -

A) .	EUNIT	:	X 1000	ככ
T	 			1
24)	1 75	(76)	ı
50)	81	(157)	ł
(77.)	1 84	C	241)	I
105)) 88	Ċ	329)	ł
126)	1 85	(414)	ł
148)	189	C	503)	I
166)	1 87	-C	590)	ł
184)	194	(684)	1
204)	1 84	C	768)	ł
241)	1 142	(910)	1
266)	117	(1027)	ł
286)	: 110	C	1137)	I.
310)	1 102	Ċ	1239)	I.
337)	129	(1368)	1
356)	I. 99	(1467)	1
376)	I 103	(1570)	ł
397)	1 108	(1678)	I.
419)	1 114	(1792)	ł
442)	l: 119	(1911)	ł
466)	1 124	€	2035)	ł
491)	129	(2164)	1
517)	ŀ 134	(2298)	I
544)	139	(2437)	I
572)	144	(2581)	t
601)	150	•	2731)	I.
631)	l; 156	(2887)	T
663)	1. 163	(3050)	I
696)	l. 168	(3218)	T
730)	1 174	•	3392)	l
765)	1. 180	C	3572)	ł
802)	1 188	(3760)	I.
840)	1 195	C	3955)	I
880)	I; 203	(4158)	1

NOTE ; () = CUMULATION SINCE ASSUMED OPENING YEAR

	*******	******
	¥	*
 -	* RH - 22	(2023 - 0100) *
	¥	*

YEAR OF CONSTRUCTION : 1973

TRAFFIC GROWTH RATE

YE#	AR	PASSENGER	FREIGHT	
				Ĵ.
	1981	6.6	4.5	
1982 -	1987	6.6	4.5	•
1988 -	2001	5.5	3.6	
			1	

DESIGN LANE FACTOR : 0.5

ASSUMED OPENING YEAR : 1974

ESA	CONVERS	SION FAG	CTOR
	HB	MT	HT

0.76 1.24 0.50 _____

AILY TRAF	IC VOL	UME			•		· : .		من حد من مد بدر نب بند بع	EQU.	IVALENT	STAND	ARD 8.2	TON	XLE NUM	BER (ES	GA) [CUNIT :	X 1800
I YEAR		LB	HB	LT	MT	нт	1	HV	I AADT		I YEAR		НВ		MT :	-	∃T 		HV
1 1972	•	815	70	133	254	115	ł	439	1717		1	• • •			· · ·		· · · .	•	
1 1973	396	857	72	130	418	152	1	642			ŀ .	l'a							
1974	1 434	910	62	144	241	149	1		1 1940		1974		(9)		(55)	14		78 (
1 1975	1 227	864	62	411	283	121	1	466	1968	1.1	1975	9	-		(119)	11		84 (
1 1976		870	61	514	282	152	I.	495	2130		1 1976	l⊧ _ 8	(* 26)		(183)	14		86 (
1 1977	247	881	56	507	208	178	I.	462	1 2097		1 1977	8			(230)	18		73 (
I 1978	421	730	56	540	233	255	1.	544	1 2435		1978	i 8			(283)	23		84 (
1 1979	444	933	59	552	244	229	ł	532	2461		1 1979	8	(50)		(338)		(101)	84 (-
1 1980		807	49	510	231	211	Ł.	491	2277	•	1 1980	7	(57)		(390)		(120)	78 (
1 1981	585	833	51	541	285	246	1	582	1 2541		1 1981	ľ. 7.	(64)		(454)		(142):	93 (
1 1982	420	437	34	331	180	148	1	362	1 1550		1 1982	5	(69)	41	(495)		(156) I	60 (
1 1983	485	558	44	736	262	220	ł	526	1 2305	· .	1 1983	1.6	(75)	.59	(554)		(176)	85 (
1 1984	517	595	47	769	274	230		551	2432		1 1984	1 7	(82)	62	(616)		(197)		
1 1985	551	634	50	804	286	240		576	1 2565		1 1785	1 7	(~89)	65	(681)		(* 219). i	94 (
1 1986	588	676	53	840	299	251	1	603	1 2707		1 1986		(96)	. 68	(749)		(242)		1087)
1 1987	626	721	57	878	312	262	i.	631	1 2856		1 1987		(104)	71	(820)	24	(_266))		1190)
1 1988	668	768	61	917	326	274	i	661	3014		1 1788		(112)	74	(894)		(291)		1297)
1 1788	1 704	810	64	950	338	284		686			1 1989		(121)	76	(970)		(317):		
1 1990	1 743	855	67	784	350	294		711			1 1990		(130)	.79	(1047)	27	(344)		
	1 784	902	71	1020	363	305		739			1 1991		(140)	82	(1131)	28	(372)	. 120 (1643)
1 1991	827	752	75	1057	376	316		767			1 1992		(150)	85	(1216)	29	(401)	124 (1767)
1 1992		A	79	1095	370	327		796			1 1993		(161)		(1304)	30	(431)	129 (1896)
1993	873	1004	- 84	and the second	404	339		827	1		1 1994		(173)		(1395)	31	(462)	134 (2030)
1 1994	921	1059	88	1134 1175	404	-351			4120		1995		(185)		(1490)	32	(494)]	139 (
1 1995	971	1117	93	1175	433	364			4311 .		1 1996		(198)		(1588)		(527)		
1 1996	1025	1179	• =		433	384			1 4510		1 1997		(212)		(1690)		(= 561) ⁻ I		
1 1997	1081	1244	98	1261		370			4716		1 1998		(-226)		(1795)		(5.97)		
1 1998	1140	1312	103	1306	465			1	1 4936		1 1999		(241)		(1904)		(634)		
1 1999	1 1203	1384	109	1353	482	405					1 2000		(257)		(2017)		(672)		
	1 1269	1460	115	1402	499	419	•		1 5164				(257)		(2134)		(712)		
1 2001	1339	1541	121	1453	517	434	1.	1072	1 5405		1 2001	1 17	(£(4)	117	121042				

INITIAL TRAFFIC NUMBER (ITN) & DESIGN TRAFFIC NUMBER (DTN)

 7 YEARS
 : ITN = 97
 DTN = 38

 14 YEARS
 : ITN = 97
 DTN = 87

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APPENDIX 4.3.1 3/8

NOTE ; () = CUMULATION SINCE ASSUMED OPENING YEAR

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YEAR OF CONSTRUCTION : 1970 and a set of particular description

TRAFFIC GROWTH RATE

DESIGN LANE FACTOR : 0.5

YEAR	PASSENGER	FREIGHT		adalah si ji	}
	èssenie		-	e e e e e e e e e e e e e e e e e e e	
- 19	81 4.0	5.0	,		
1982 - 19	87 4.0	5.0			
1988 - 20	01 4.0	4.0	. (

ESA CONVERSION FACTOR Stars of Starser Association Views _____ ΜT HT HB waawin aarra _____ 0.50 0.76 1.24

DAILY TRAFFIC VOLUMER To approve provide a set of a set o

EQUIVALENT STANDARD 8.2 TON AXLE NUMBER (ESA) __________ CUNIT : X 10000

ASSUMED OPENING YEAR : 1971 CREEK NEED CONSTRUCTION AND A CONSTRUCTION OF A CONSTRUCTURA A

Provide the sectors

and a second second second

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-	I YEAR	PC	LB	HB	LT	MT	HT	I HV	I AADT	-	I YEAR		HB		MT	HT
	1971	99	143	39	70	60	51	1 150	1 462	1	1 1971	•	(5)	14	(14)	5 (
	1972	103	147	41	. 74	63	5,4	1 158	1 484	1	1 1972	1 6	(11)		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 (
	1973	123	196	43	93	75	68	1 186	1 578		1 1973		(° a ⊴170)	. 17	(45)	6 🤇 .
i	1974	172	165	. 76	. 82	92	76	1 244	663		1 1974	l 11	(28)	1. 1. 1. M. 1.	(66)	i i 7 (i i
	1975	168	226	54	110	141	69	1 264	1 768	∎ti, sing	1 1975	J 7	(35)	3 2	(98)	6 (
+	1976	292	228	66	139	107	52	1 225	1 884		1 1976	J . 9	(44)	2 2 4	(122)	5 (
.	1977	312	198	68	202	110	ed a 6 84 -		1 974		1. 1977	1 9	(53)		(147)	. 8 (.
-	1978	292	228	77	164	138	101	I 316	1 1000	1	1 1978	1 11	(64)	se 31	(>178)	a.c. x 🕈 🤆 🔅
i	1979	407	290	97	125	130	144	1 371	1 1193	1. I.	E 1979	1 13	(77)	29	(207)	. 1 3 (g
	1980	351	172	121	166	153	154	1 428	1:1117	∦in tir s	1980	1 17	(94)	. 35	(242)	14 (
	1781	375	152	102	149	137	137	1 376	1 1052	1	l 1981	1 14	(108)	31	(273)	13 (
.	1782	425	165	127	207	19.9	125	I 451	1.1248	1 j. s	1 1982	1 🗧 18	(126)	45	(318)	11 (1
I	1983	376	155	124	218	163	140	1 427	1 1176	J 1977	1 1983	1 17	(143)	37	(355)	13 (1
	1984	391	161	129	229	171	147	1 447	1 1228				(161)		(394)	13 (1
· .	1985	407	168	134	240	180	154	I 468	1 1283	1	1 1985	1 19	(180)	41	(435)	14 (1
·	1986	-423	174	139	252	18.7	152	1 490	1 1337	1	1 1786	1 19	(199)	43	(478)	15 (1
ł	l 1987	440	181	145	265	198	170	l 513	1 1399				(219)		(523)	16 (1
· ·	1988	457	189	151	278	208	179		1 1462				(240)		(570)	16 (1
1	1989	476	196	157	289	216	186	559	_I` 1520 °	Ĵ. s	1 1989	(<u> </u> ∷ 22	् (<u> 2</u> 62)	: 49	(619)	17 (2)
1	1990	495	204	163	301	225	193	1 581	1 1581	1 : 1	1 1990	1., 23	(, 285)			18 (2)
1	1991	515	212	170	313	234	201	1 605	1 1645		1 1991	1: : 24	(309)	- 14 - 1	(723)	18 (2
	1992	535	.221	176	325	243	209	l 628	1 1709		a shartat in a sa s	1	(333)		(778)	19 (2)
	1993	5,57	229	184	339	253	217	1 654	1 1779	j	1 1993	1 26	(359)	57	(835)	20 (2)
1	1994	579	239	191	352	263	226	1 680	1 1850	£ ÷∫	1, 1994	1 26	(385)		(895)	21 (3)
. 1	1995	602	248	199	366	274	235	1 708	1 1924	1	1995	1 28	(413)	62	(957)	21 (3)
I	1996	626	258	206	381	285	245	l 736	1 2001	1	1996	1: 1 29	(442)		(1021)	22 (34
1	1997 I	651	268	215	396	296	254	1 765	1 2080	$\mathbf{I}_{i} \in \mathbf{I}_{i}$	l 1997	1 30	(472)	67	(1088)	23 (30
. 1	1998	677	279	223	412	308	264	1 795	1 2163	i	1998	1 31	(503)	. 70	(1158)	24 (39
. 1	1999	704	290	232	428	320	275	l 827:	1 2249	1	1 1999	1 32	(:535)	72	(1230)	25 (4
1 . I	2000	732	302	242	445	333	286	861	1 2340	Berger -	I_ 2000 -	1 34	(569)		(1305)	26 (4)
· 1	2001	762	314	251	463	346	298	I 895	1 2434	1	1 2001	1 35	(604)	7.8	(1383).	27 (4

INITIAL TRAFFIC NUMBER (ITN) & DESIGN TRAFFIC NUMBER (DTN) 7 YEARS : ITN = 77 OTN = 31DTN = 7114 YEARS : ITN = 77

COMPLETE STATES AND TEST COMPLETION SINCE ASSUMED OPENING YEAR

-112-

_____ Telephone In the HV of D 5) | 24 (24) | 10) | 25 (49) | 16) | 29 (78) | 23) | 39 (117) | 29) 1 45 (162) 1 34) | 38 (200) | (42) | 42 (242) | :51) | 51 (293) | (64) | 55 (348) | 78) | 66 (414) | 91) | 58 (472) | 102) | 74 (546) | 115) | 67 (613) | 128) | 78 (683) | 142) | 74 (757) | 157) 1 77 (834) 1 173) | 81 (915) | 187) | 84 (999) | 206) | 88 (1087) | 224) | 92 (1179) | 242) | 95 (1274) | 261) | 98 (1372) | 281) | 103 (1475) | 302) | 107 (1582) | 3230 | 111 (1693) | 345) | 115 (1808) | 368) | 120 (1928) | 392) | 125 (2053) | 417) | 129 (2182) | 443) | 135 (2317) | 470) | 140 (2457) |

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(207 - 0202) RH - 12

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YEAR OF CONSTRUCTION : 1977

DESIGN LANE FACTOR : 0.5

ESA CONVERSION FACTOR

HB

0.76

ASSUMED OPENING YEAR : 1978

ΜT

1.24

HT

0.50

TRAFFIC GROWTH RATE

			1111
YEAR	PASSENGER	FREIGHT	
			-
- 1981	4.0	5.0	
1982 - 1987	4.0	5.0	
1988 - 2001	4.0	4.0	
		المتحديث بترجيع بيوجو بيوجه	

AIL	Y TRAFF	TC VOL	UME	an i≩ tan en tig						EQU		STANDARD 8.2			UNIT : X 10003
	YEAR	I PC	LB	HB	LI	MT	HT I	ΗV	I AADT	1. A.	I YEAR	HB	MT	НТ	HV I
,	1972	•	50	43	20	28	17 I		i 184		1				1
I	1973	1 40	70	60	33	29	28	117			1	1994 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 - 1995 -	•	6	
1	1974	1 73	131	147	49	81	35 I	263			1				
1	1975	41	- 79	70	33	32	23 I	125	1	l 1	1 ·			· · ·	1
1	1976	63	< 72 s	85		33	. 17 I	135	I 305	Ι.	I	· · · · ·	•		
!	1977	i 🤆 92	139	126	101	. 73	511	250	1 582		1				31 (31)
1	1978	109	131	107	·. 97 .	57	. 27 I	193			1978		13 (. 13)	3 (3)	
1	1979	74	78	- 45	74	29	24	98	1 324		1 1979		20)	2 (5)	15 (46) 20 (66)
i	1980	91	76	56	62	44	19		• *		1980		10 (30)	2 (7)	
1	1981	127	83	. 44	88	43	44 1				1981		10 (40)	4 (11)	20 (86) 24 (110)
I	1982	153	94	69	77	43.	45 1	157	A		1 1982		10 (50)	4 (15)	56 (166)
ļ	1983	l 292	58	. 70	237	148	144	362	1 949		1 1983		33 (83)	13 (28)	59 (225)
ł	1984	1 304	60	73	249	155	151	379			I 1984	and the second	35 (118)	14 (42)	63 (288) 1
ł	1985	316	63	76	261	163	159	398	1038		1985		37 (155)	15 (57)	65 (353) I
ł	1785	328	65	: 79	274	171	167	417		l e z	1786		39 (194)	15 (72)	
1	1987	1 342	68	82	288	180	175	437			1987		41 (235)	16 (88)	
}	1988	1 355	71	85	302	189	184		1186		1788		43 (278)	17 (105)	
	1989	369	73	. 89.	315	196	171		1 1233 (J		1 1989	en de la companya de	44 (322)	17 (122)	73 (566) 77 (643)
1	1990	384	76	92	327	204	199		l 1282 ()		1 1990		46 (368)	18 (140)	
- 1	1991	1 400	79	96	340	212	207		1334		1991		48 (416)	19 (159)	
1	1992	416	83	100	354	221	215		1 1389		1 1992		50 (466)	20 (179)	
I	1993	I 3432	86	104	368	230	224	558	1444	t i	l 1993		52 (518)	20 (199)	
- 1	1994	450	89	108	383	239	⇒233 I	/	1502 s		1994		54 (572)	21 (220)	90 (983) 94 (1077)
ł	1995	468	93	112	398	249	242		1 1562		I 1995		56 (628)	22 (242)	94 (1077) (98 (1175)
. 1	1996	486	97	117	414	259	252	628	1 1625		1996	16 (223)	59 (687)	23 (265)	
ļ	1997	506	100	121	431	269	; 262 i		1687		l≕1997		61 (748)	24 (289)	102(1277)
1	1998	526	104	126	448	280	27.2	· · ·	l 1756		1998		63 (811)	25 (314)	105 (1382) 148 (1(82)
. 1	1999	l 547	109	131	466	291	283 I		l 1827		1 1999		66 (877)	26 (340)	110 (1492) 444 (1496)
ł	2000	l :569	113	136	484	302	⇒294 I		<u>l</u> 1898		1 2000		68 (945)		114 (1606) (10 (1705)
. 1	2001	I 592	117	142	504	315	306	763	1976	 -	1 2001	20 (314)	71 (1016)	28 (395)	119 (1725)

INITIAL TRAFFIC NUMBER (ITN) & DESIGN TRAFFIC NUMBER (DTN) 26

	YEARS				DTN = .26
14	YEARS	:	ITN ≕	66	DTN = 61

APPENDIX 4.3.1 5/8

NOTE ; () = CUMULATION SINCE ASSUMED OPENING YEAR

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		计正式分词 医丁氏生物医子氏试验检尿道 法安全法 化化学学
YEAR OF CONSTRUCTION :		YEAR OF REHABILITATION : 1976
TRAFFIC GROWTH RATE	•	

YEAR	PASSENGER	FREIGHT
- 1981	3.8	5.2
1982 - 1987	3.8	5.2
1988 - 2001	3.8	3.8

НТ

- - -

ASSUMED OPENING YEAR : 1977

МТ

DESIGN LANE FACTOR : 0.5

ESA CONVERSION FACTOR

HB

	1982 -	2001	3.8	3	.2	an an sea An an	1	•				1.24				
AI	LY TRAF									· · · ·			a a ara	AXLE NUMBER	(ESA) E	UNIT : X 1000
	I YEAR		LB	НВ	LT	· · · MT · · ·	HT I	ΗV	I AADT I	ti ett	YEAR	I HB	a a a a a A a	MT	HT I	HV
	 1972	•		17	83	36	12		the second second second second	1 A						
	1 1973	1 103	3 237	178	102	68	62	308	1 750 1	3 11	•	1 1	ê., 4		1	
	1 1974	1 13	7 269	237	117	118	31	358	881 1	1 i i					1	
	1 1975	1 15	1 263	205	118	205	6 1	416		- î¥	· · · ·	1		1. S.	- 1 i	
	i 1975	1 13) 214	172	138	138	40 1	350	1 832 1	1		1 × -			an an Alian I.	
	1 1977	1 19	5 373	209	362	166	24	399	1 1329 1	i e ti	1977	Í 29 (° '	29) 3	8 (0.38)	2 (2)	69 (69)
	1 1978	I 33	7 405	192	329	164	51 1	407	1 1478 1	1 - 1 1	1978	1 27 (56) 3	7 (75)	5 (7)	69 (138)
	1 1979	1 40	3 298	104	· 😳 206	116	75 1	295	1 1207 I	i i	1979	1 14 ()	70) 2	6 (101)	7 (14) 1	47 (185)
	1 1980	1 40	+ 293	117	241	134	56	309	1 1247 1	inter di∎	1780	i 17 (87) 31	D (131)	5 (19)	52 (237)
	1 1981			133	275	152	37 1	322	I 1285 I	i ku i j	1781	i 18 (1	05) 34	4 (* 165)	3 (22)	55 (292)
	1 1982	1 25:	2 232	129	320	144	39 1	312	1116	- ÷ - €∦	1982	18 (1	23) 3	3 (198)	4 (26) 1	55 (347)
	1 1983	1 56	3 258	118	263	98	58 1	274	1 1358 1	- P	1983	16 (1	39): 👘 2:	2 (220)	5 (31)	43 (390)
	1 1984	1 584	268	122	277	103	61 1	286	1 1415 1	i i	1984	17 (1	56) 23	3 (*243) 👘	6 (37) I	46 (436)
	I 1985	1 60	7 278	127	291	108	64	299	1 1475 1	i i î	1985	18 (1	74) 24		6 (43) 1	48 (484)
	1 1986	1 630	289	132	306	114	68 1	314	1 1539 1	1 - A - F	1986	18 (1	92) 👘 20	5 (293)	6 (49) 1	50 (534)
	1 1987	1 654	300	137	322	120	71	328	1 1604 1	- 1 - E P	1987	1 9 6 2	11) 👘 27	7 (320)	6 (55) 1	52 (586)
	1988	1 67	3 311	142	339	126	75	343	1 1671	1 - A	1988	20 (2	31) 2'	7 (2349) - 2	7 (62)	56 (642)
	1 1989	1 704	323	148	352	131	78 1	35.7	1 1736 1	1 A f	1989	21 (2	52) - 3(379)	7 (69)	58 (700)
	1 1990	1 73:	335	153	365	136	81	370	1 1801	1	1990	21 (2	73) 👘 3:		7 (76)	59 (759)
	1 1991	1 759	348	159	379	141	84	384	1 1870 1	÷,	1991	22 (2	95) 32	2 (*442)	8 (84)	62 (821)
	1 1992	1 788	361	165	393	147	87	399	1941	1 I -	1992 J	23 (3	18) 33	3 (475)	8 (92)	64 (885)
	1 1993	81	/ 375	171	408	152	90 I	413	1 2013/1	1	1993				8 (100) I	66 (951)
	1 1994	1 849	2 389	178	424	158	93	429	1 2091	-) - 	1994	25 (3	67) 38	6 (545)	8 (108)	69 (1020)
	1 1995	1 88:	404	185	440	164	97	446	2171	61.	1995	26 (3	93) 8837	7 (*582) 🔗	9 (117)	72 (1092)
	1 1996	1 91	419	192	457	170	101 I	463	1 2253 1	(1, 1)	1996	27 (4	20) 🔅 38	3 (-620)	9 (126)	74 (1166)
	1 1997	1 949	7 435	199	474	177	105 I		1 2339 1	4 N.	1997 🗄	° 28 € 4	48) 👘 4(10 (136) I	78 (1244)
	1 1998	1 985	6 451	206	492	183	109	498	1 2426 1	(A_{1},A_{2})	1998	5 29 (Ž4	••••		10 (146) I	80 (1324)
	1999	1 1023	3 469	214	511	190	113		1 2520 1			30 (5			10 (156) J.	
	1 2000	1 106:	486	222	530	198	117 1								11 (167)	
	1 2001	110:	2 505	231	550	205	121	557	1 2714	1111	2001	98 32 (95	70) 3048	6 (2835)	11 (178)	89 (1583)

INITIAL TRAFFIC NUMBER (ITN) & DESIGN TRAFFIC NUMBER (DTN)

7 YEARS	:	ITN =	43	DTN =	17
14 YEARS	:	ITN =	43	DTN =	40

NOTE ; () = CUMULATION SINCE ASSUMED OPENING YEAR

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	t grit i	* RH - 25 (2071 - 0100)	×
		*	* .
	$\chi_{1}(x_{1}) + e^{-\lambda x_{1}} = 0$	*******	***

YEAR OF CONSTRUCTION : 1976 AND A CONSTRUCTION : 1976 AND A CONSTRUCTION : 1976

DESIGN LANE FACTOR : 0.5

ESA CONVERSION FACTOR _____

0.76 1.24 0.50

HB

ASSUMED OPENING YEAR : 1977

TRAFFIC GROWTH	RATE	n Martin and		
YEAR	PASSENGER	FREIGHT	· . : · ·	
- 1981	7.0	5.0	1. ÷	lee€
1982 - 1987	7.0	5.0	(1,1,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2	
1988 - 2001	6.0	4 D		

	 an an air an ann a' an a'	the second s	
		1	
1 · · · · · · · · · · · · · · · · · · ·			
TIV TRAFFIC VOLUME			

MT HT

	•	YEAR			LB		НВ					I AADT	} ·	I YEAR	112 11	HB	· · · · · · · · · · · · · · · · · · ·	MT	 	T		HV
	,	1972	•	86	 21		32	32	31	28	•	•			1				-			
		1973		87	23		33	36	41	30		1 250	Ι.	15	1	· ·						
		1974		107	41		43	62	77	63	183	1 393	1 :	1	I	× .	1 A A					
		1975		136	135		54	124	106	70	1 230	1 625	I		11. S	· ·	÷ 1					
	1	1976	1	143	60		53	172	82	63	I 198	1 573	1. A.	1	17		4	1				
	1	1977	F	120	39		57	269	115	62				1 1977			26			6)		
	1 I	1978	1	125	39	(*)	55	298	162	60	1 277			1 1978		3 (* 16)		/ (34.	s : 5 (
	1	1979	Ł	102	82		63	280	247	65	1 375	1 839		1 1979		7 (25)		(1	୍ର ମି (
	1	1980	ł	.127	. 59	e e	59	332	267	100	। 426			1.1980		3 ((33)) (1	. 9 (26)		
	·	1981	1	144	46	5	69	270	152	61	and the second			1981) (43)		(2	.6 (32)		
	1	1982	1	156	42		69	282	285	139				1982) (53)		(2	13 (45)		
	1	1783	1.	151	33		- 69	.348	350	132		1083		1983	•	3 (63)		(3	12 (101 (
	1	1984	1	162	35	1. 1	74	365	367	139		1142) (* 73)		\$ (4	13 (106 (
	1	1985	1 -	173	38		79	384	386	146		1 1206				1 (84)		(5)	13 (111 (
	ł	1986	1	185	40		85	- 403	405	153		1 1271		1 1986		2 (96)		2 (6			118 (
	· 1	1987	₽	198	43	:	- 90	423	425	160		1339		1 1987		2 (108)		(7			123 (129 (
	ł	1988	1	212	46	te di	97	444	447	168		1 1414		1 1988		3 (121)		(8)			135 (
	· · · I	1989	1	224	49		103	462	465	175		1478		1.1989		+ (135)	· ·	(135(
	1	1990	Ľ	238	52	1	109	480	483	182		1 1544 1				5 (150)		(10)			141 (
	· I	1991	E C	252	55	ъ. ¹ .	115	5 0 0	502	190	-	1614				6 (166)		(11			147 (
	1	1992	ł -	267	58		122	520	523	197		1 1687				7 (183)		(12)			160 (
	i	1993	I _	283	62		130	540	543	205		1763		1 1993	1. C.	3 (201)		(13			166 (
	1	1994		300	66 .		137	562	565	213		1 1843 1		1 1994		? (220)		(15			173 (
	1	1995		318	70		146	584	588	222		1 1928		1 1995) (3240)		(16)	20 (22227	180 (2318
		1996		338	74		154	608	611	231		1 2016 1				1 (261)		(19:	22 (2961	189 (2507
		1997		358	78		164	632	636			2108		1 1997		3 (284)		(20)	24 5	- 749) - I	197 (2704
•		1998		379	83		173	657	661			1 2202 1		1 1998		(308) (374)		(22)	- 20 (- 20 (3477	206 (2910
	-	1999		402	88		184	684	688			1 2305 1				5 (334)		(23)	27 (3437	214 (3124
	. 1	2000		426	- 93		195	711	715			1 2410				7 (361)			 - 25 (- 26 (7941	-223 (3347
	1	2001	ł i		99		206	740	744			1 2522		I 2001		7 (390) 		(25)				

7	YEARS	1	ITN =	96	DTN =	38
14	YEARS	:	ITN =	96	DTN =	89

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YEAR OF CONSTRUCTION : 1974 YEAR OF REHABILITATION : 1977

TRAFFIC GROWTH RATES of the period of the Analysis and the second second

YEAR	PASSENGER		
- 1981	6.6	4.5	
1982 - 1987	6.6	4.5	· · · · ·
1988 - 2001	5.5	3.6	

ASSUMED OPENING YEAR : 1978, and a grade trade state of the state of t

ESA CONVERSION (FACTOR) Contactor and the second statements of the second

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DESIGN LANE FACTOR : 0.5

HB MT HT

0.76 1.24 0.50

YEAR PC	LB HB	LTON MTHE STATE I	HV 1 AADT 1	I YEAR	НВ	MT		ΗV
1972 14	14 24		53 1 95 1	s in the second			· · · · · · · · · · · · · · · · · · ·	
1973 14	14 24		53.1 .95(1	11. 1	• ::		tali in terreta de 🖡	
1974 9	9 20		43 1 76 1	1 1			it a amontae pré 🖡 p	
1975 I 30	12 29	13 24 51	58 113	1		40 ¹⁰ (1	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	
1976 44	16 32	28 20 9 1		1	Na pinaka s		in anna i garaj t a	
1977 1 35	22 31	26 53 53 11	95 178	- 4 Y - 4 Y	et i jekgati	· 같은 · · · · · · · · · · · · · · · · · ·	the state of the first state of the	
1978 1 54	38 30	38 40 20 1	901 22001	1 1978 1	4 (ab) 4)	9) 9 (1109)	2 (2)	15 (1
1979 1 66	45 40	POSS 4 43 PTTE45 1	98 264 1	1 1979 1	6 (10)	(10 (19))	- a 1 (− 3) I	17 (3
1980 106	37 30	95 56 65 1	151 389	1 1980 1	4 (114)	13 (32)	- 6 (· ···9) 1	23 (5
1981 1 62	35 29	74 67 25 1	121 1 292 1	1 1981 1	4 (18)	15 (47)	2 (11)	21 (7
1982 59	43 34	91 91 38 1	163 1 356 1	1 1982 1	5 (23)	21 (68)	- 3 (- 14)⊨l	29 (10
1983 76	71 33	400 115 42	190 737	1 1983 1	5 (28)	26 (94)	4 (18)	35 (14
1984 81	76 35	418 120 44 1	199 1 77481	1 1784 1		27 (121)	4 (22)	36 (17
1985 I 86	81 37	(437) 126 C 46 I	207 813	1 1785		29 (150)	4 (26) 1	38 (21
1986 1 92	86 40	456 131 48 1	219 853	1 1986 1		30 (180)	4 (30)	40 (25
1987 98	92 43	477 137 50 1	230 1 897 1	1 1987 1		31 (211)	5 (35) I	42 (29
1988 105	98 45	498 143 52 1	240 1 941 1	1 1988		32 (243)	5 (40)	43 (33
1989 I 110	103 48	516 148 54 1		1 1989 1		33 (276)	5 (45)	
1990 116	109 51	535 154 56 1	261 1021		7 (70)	35 (311)	5 (50) 1	47 (43
1991 123	115 53	554 159 58 1	270 1062		7 (77)	36 (347)	5 (55)	48 (47
1992 130	121 56	574	281 1106	1 1992 1		37 (384)	5 (60)	50 (52
1993 137	128 59	595 171 62 1	292 1152	1993 1	8 (93)	39 (423)	6 (66) 1	53 (58
1994 144	135 63	616 177 65 1	305 1200	1 1994		40 (463)	6 (72)	55 (63
1995 152	142 66	638 184 67 1	317 1 1249 1	1 1995 1		42 (505)	6 (78)	57 (69
1996 161	150 70	661 190 67 1			10 (121)	43 (548)	6 (84)	59 (75
1997 169	158 74	685 197 72 1	3432451355810		10 (131)	45 (593)	7 (91)	62 (81)
1998 179	167 78	710 204 75 1	357 1 1413 1		11 (142)	46 (639)	7 (98) 1	64 (87
1999 1 189	176 82	736 211 77 1	370 1471		11 (153)	48 (687)	7 (105)	66 (94)
2000 199	186 86	762 219 80 1	385 1532			50 (737)	7 (112)	69 (101
2001 210	196 91	· · · · · · · · · · · · · · · · · · ·	401 1576			51 (788)	8 (120) I	

INITIAL TRAFFIC NUMBER (ITN) & DESIGN TRAFFIC NUMBER (DTN)

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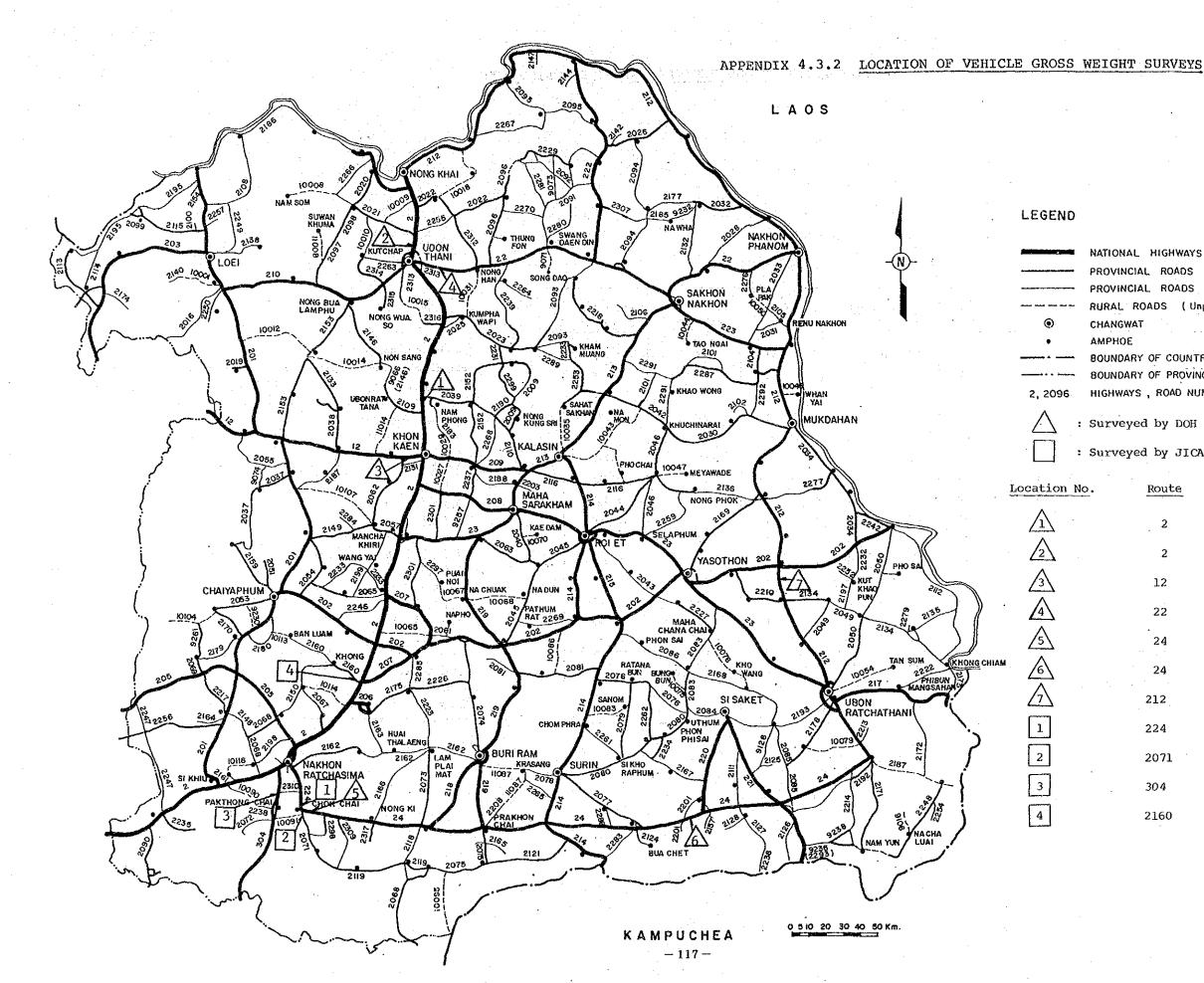
7	YEARS	:	ITN =	32	DTN =	13
14	YEARS	:	ITN =	32	DTN =	29

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NATIONAL HIGHWAYS (Paved) PROVINCIAL ROADS (Poved) PROVINCIAL ROADS (Unpoved) RURAL ROADS (Unpaved) CHANGWAT AMPHOE BOUNDARY OF COUNTRY BOUNDARY OF PROVINCE HIGHWAYS , ROAD NUMBERS

: Surveyed by DOH (1980)

: Surveyed by JICA TEAM (1984)

<u>o</u> .	Route	Km Post
	_ 2	479 + 0
	2	572 + 200
	12	8 + 0
	22	10 + 800
	24	6 + 500
	24	222 + 800
	212	68 + 800
	224	23 + 000
	2071	2 + 000
	304	121 + 000
	2160	3 + 000

<u>(6-Wheel Truck</u>	s)					er de la c								
Gross Weight (tons)	 D1	D2		Locati D4	Lon <u>1</u> / D5		D7	(1) Total (No.)		Local J2	tion J3 J4	(2), Total (No.)	(1) + (2) Total (No.)	(1) + (2) Share (%)
3.5-4.5 4	1		 		• • • • • • • •	· • · · ·		1	25	10	7	42	43	9.287
4.5-5.5 5	3	÷	5	1				9		1		1	10	2.160
5.5-6.5 6	· ´3		7	· 4	1 1 -	2		17	1			1	18	3.888
6.5-7.5 7	9	2	5	8	3	3		30	1		er styles i	1	31	6.695
7.5-8.5 8	12	2	3	13	7	2	2	41			1 :	1	42	9.071
8.5-9.5 9	11	6	1	13	9	1	2	43	2	•	·· · · .	2	45	9.719
9.5-10.5 10	13	8	4	15	. 9	3	2	54	Ź		1	3	57	12.311
10.5-11.5 11	9	3	5	15	1	3	2	38	· 1		1 4	6	44	9.503
11.5-12.5 12	5	7	1	13	1	2	2	31	5		11 13	29	60	12.960
12.5-13.5 13	3	5	3	4	4		2	21	6	1	4	11	32	6.911
13.5-14.5 14	4	4	2	10	12	1	3	36	4		2 2	8	44	9.503
14.5-15.5 15	6		2	2	2			12	4		2	6	18	3.888
15.5-16.5 16	2	2	1	2	1			. 8	2	1	2 2	7	15	3.240
16.5-17.5 17		1		1				2	1949 		1	1 . 1 .	3	0.648
17.5-18.5 18									1			7 1 1	1	0.216
Total Loaded	81	40	39	101	50	17	15	.343	54	1.3	32 21	120	463	100
Loaded +Empty	305	256	274	421	336	64	62	1718	91	36	48 44	219		
Empty Rate(%)) 73	84	86	76	85	73	76	80	41	64	33 52	45		

والمحافظة المحافظ والمراجع والمراجع والمراجع والمحافظ والمحاف

APPENDIX 4.3.3 GROSS VEHICLE WEIGHT DISTRIBUTION

• (3 v) (2

Gross Weight		LOCATI	ON _{. 1}		Total	Share
(Tons) = Range Average	1	2	3	4	(No.)	(%)
1.5-2.5 2						
2.5-3.5 3				۰ ۱	-	
3.5-4.5 4		1997 - 19				
4.5-5.5 5	ya di di				· ·	
5.5-6.5 6 6.5-7.5 7			1		1	0.75
7.5-8.5	20		16		36	26.87
8.5-9.5 9	25		17		42	31.34
9.5-10.5 10	17		6	1	24	17.91
10.5-11.5 11	18		6		24	17.91
11.5-12.5 12	5		· 1		6	4.48
12.5-13.5 13	n san si g Sin si		1 (1)		1	0.75
Total Loaded	85	: 0	48	1	134	
Loaded+Empty	85	0	48	-1	134	
Empty Rate (%)	0%	0%	07	07	07	

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APPENDIX 4.3.3 1/2

GROSS VEHICLE WEIGHT DISTRIBUTION

(10-Wheel Trucks)

.

Gross (tons					ocatio				(1) Total		Loca			(2) Total	(1) +	
(D1	D2	<u>D3</u>	D4	D5	<u>D6</u>	D7	(No.)	<u>J1</u>	J2	<u>J3</u>	J4	(No.)	Total	(no.)
7.5-8	.5 8	1							1	2		2		4	5	
8.5-9	.59	1	· .	1	. :		:	1	3	8	·	1		·: 8	11	
9.5-10	.5 10	2	1	2				1	6	4	. :	•		4	10	
10.5-11	.5 11	3	1	** + <u>1</u>	·.,		4	2	11		· ·	2		2	13	
11.5-12	.5 12	5	2	2	3		1	1	14	1	ana .			1	15	
12.5-13	.5 13	8	3	2	1	1	1	1	17	4		2.	-	6	23	
13.5-14	.5 14	10	2	1	3	1	2	1	20	1	1	2		4	24	
14.5-15	.5 15	13	2	2	1	9	1	1	29	2				2	31	
15.5-16	.5 16	16	5	6	1	3	7	1	39	1		2	1	4	43	
16.5-17	.5 17	22	8	9	7	16	9	2	73	1	.1	4 A.		1	74	
17.5-18	5 18	37	12	9	16	42	25	3	144	4	2	6	1	13	1.57	
18.5-19	.5 19	68	22	8	27	76	28	4	233	5		2	1	8	241	
19.5-20	.5 20	70	20	6	20	69	49	4	238	8	1	3	e - 1	12	250	
20.5-21	.5 21	31	9	2	9	15	31	3	100	10	11	22		43	143	
21.5-22		11	4	· · · <u>·</u> 3,	1	15	1	1.	36			2	· .	2	38	
22.5-23		7	- 3	- 5	3	21	1	2	42	1	1	3	leg to a	2 5	47	
23.5-24		8	-4		3	9	8	2	37	1				1	38	1
24.5-25		1.0	4	2	3	16	6	1	42						42	
25.5-26		12	. 4	2	6	15	. 9	1	. 49		1			1	50	
26.5-27		9	5	1	9	6	5		35			·			35	
27.5-28		5	6	: 1	1	1	4		18		1	1		2	20	
28.5-29		2	3.	· 1 .		1	1		8	1	2	5		6	14	
29.5-30		1	1	1			1		4			1	n a stal Na stal	1	5	
30.5-31					1 <u>1</u> 1		1		1		1	1	1	2	3	[
31.5-32			1. T.	1			;					1	:	1	1	
32.5-33		. *	1 A.				:				1			1	1	
33.5-34										n Therefore Therefore						
34.5-35									:			i.				
35.5-36												. 3	1	3	3	
Total	Loaded	352	121	70	114	316	195	32	1200	54	20	60	3	137	1337	
locar	Loaded +Empty	475	232	207	218	692	258	71	2153	94	29	94	12	229		
Empty	Rate(%)	26	48	66	48	54	24	. 55	44	43	31	36	75	40		

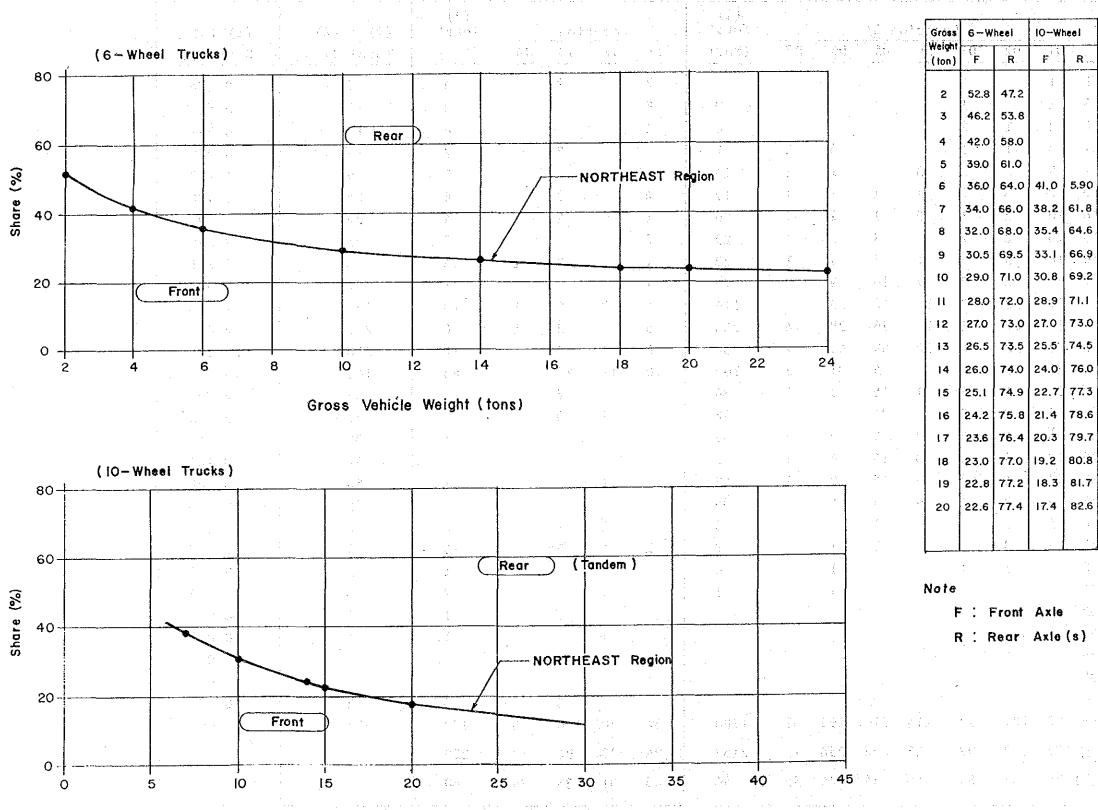
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APPENDIX 4.3.3 2/2

(1) + (2)	
Share (%)	
0.374	
0.823	
0.748	
0.972	
1.122	
1.720	
1.795	
2.319	
• 3.216	_
5.535	
11.743	
18.025	
18.699 10.696	
2.842	
3.515	
2.842	ĺ
3.141	
3.740	
2.618	
1.496	
1.047	
0.374	
0.224	
0.075	
0.075	
0	
0	
0.224	
. 100	

APPENDIX 4.3.4 AXLE LOAD DISTRIBUTION



1 A 1 A 1 A 1

Gross Vehicle Weight (tons) -120-

APPENDIX 4.3.4

Axle Load Distribution(%)

Gross	6-W	heel	10-1	Vheel	
Weight (ton)	F	R	F	R	
21	22.2	77.8	16.7	83.3	
22	21.8	78.2	16.0	84.0	
23	21.4	78.6	15,4	84.6	
24	21.0	79.0	14.8	85.2	
25		н 1	14.4	85.6	
26			14.0	86.0	
27	•	n de la composition de la composition de la composition de la composition de la composition de la composition de la composition de la composition de la composition de la composition de la composition de la composition de la composition de la	13.8	86.2	
28		199	13.6	86.4	
29			13.3	86.7	
30			13.0	87.0	
31		· · ·	12.7	87.3	
32		1.5	12.4	87.6	
33	2. 2. 2.		12.2	87.8	
34			12.0	88.0	
35			. 11. 9	88.1	
36	• •	• •	11.8	88.2	
37			H.6	88.4	
38			11.4	88.6	
39			11.3	88.7	
40			11.2	8,8,8	

. . APPENDIX 4.3.5 AASHTO EQUIVALENCE FACTOR

	Pt = 2.0, SN = 2.0) 	· · · ·		
Axle Load (tons)	Single <u>Axle</u>	Tandem <u>Axle</u>		35	
0.91	0.0002				
1.81	0.003		•		
2.72	0.01			30 -	
3.63	0.04				
4.54	0.08	0.01			
5.44	0.18	0.02	_		
6.35	0.34	0.03			
7.26	0.60	0.05		25-	<u> </u>
8.16	1.00	0.08			
9.07	1.59	0.12			
9.98	2.44	0.17			
10.89	3.62	0.24			1
11.79	5.21	0.34		20 -	
12.70	7.31	0.46		2	
13.61	10.03	0.62		AXLE LOAD (TON)	· .
14.52	13.51	0.82		Ø	
15.43	17.87	1.07		ш	
16.32	23.30	1.38		× 15+	
17.23	29.95	1.75		~	
18.14	38.02	2.19			
19.07	· · · ·	2.73			
19.98		3.36			2
20.88		4.11		10 -	
22.24		4.98			

0 0 0 0 0 0

.

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Pavement Structures, 1972

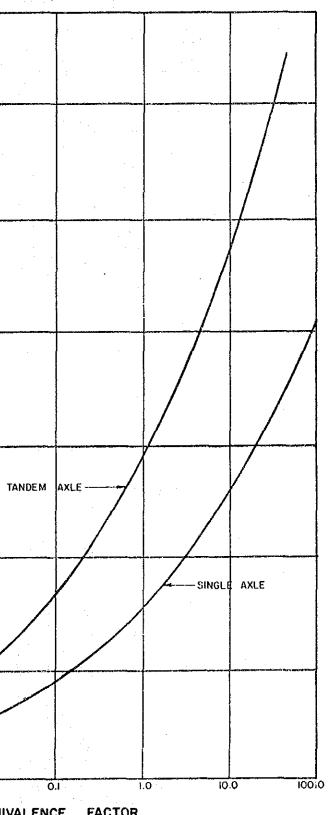


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APPENDIX 4.7.1 INDICES FOR EACH COMPONENT OF VOC ON DIFFERENT CLASSES OF ROADS AND DIFFERENT SPEEDS (REHABILITATION)

INDICES : OIL (DIFFERENT SPEED & ROAD CLASS)

EHICLE	ROAD					SPEED (KPH)							
TYPE	CLASS	10	16	24	32	40	48	56	64	72	30	88	
	(A)	100	100	100	100	100	100	100.	100	100	***	10	
PC	(B)	108	108	108	108	108	. 108	103	103	108	103	10	
	(0)	143	143	143	143	143	143	143	143	143	143	14	
	(A)	100	100	100	100	100	100	100	100	***	100	10	
LB	(B)	109	108	108	108	108	108	108	108	108	103	10	
	(C)	160	160	160	160	140	160	160	160	160	160	16	
	(A)	100	100	100	100	100	100	100	100	***	100	10	
HB	(B)	108	109	108	103	108	108	108	108	108	108	10	
	(C)	160	160	160	160	160	160	140	160	160	160	16	
	(A)	100	100	100	100	100	100	100	100	***	100	.10	
LT	(B)	108	.103	108	109	103	108	103	108	108	108	10	
	(C)	160	160	160	160	160	160	160	160	160	160	16	
	(A)	100	100	100	100	100	100	100	100	***	100	10	
MT	(B)	108	108	108	108	108	108	103	108	108	108	10	
	(C)	160	160	160	160	160	160	160	160	160	160	16	
	(A)	100	100	100	100	100	100	100	100	***	100	10	
нт	(B)	108	108	108	10S	108	108	108	103	108	108	10	
	(c)	160	160	160	160	160	160	160	160	160	160	16	

NÜTE

(1) ROAD CLASS : (A) = GOOD, (B) = FAIR, (C) = POOR (2] "***" = 100% (CORRESPONDS TO BASIC VALUE)

INDICES : REPAIR AND MAINTENANCE (DIFFERENT SPEED & ROAD CLASS)

	<u>.</u>			(UNIT : % TO BASIC VA									
VEHICLE	RUAD		•			SPEE	D (KF	ч)				i. Z	
TYPE	CLASS	10	16	24	32	40	48	56	64	72	80	88	
	(A)	119	103	98	82	83	31	85	90	96	***	105	
PC	(B)	126	114	104	- 94	38	86	90	.95	102	105	111	
	(C)	193	175	159	144	134	131	138	146	156	162	170	
	(A)	120	107.	99	90	87	85	90	95	***	105	110	
LB	(B) :	130	118	107	97	94	92.	. 97	103	108	113	119	
	(0)	205	186	169	154	149	145	154	162	171	130	188	
	(A)	152	132	115	94	83	79	85	90	***	111	122	
HB	(B)	169	147	128	104	. 72	83	. 94	100	111	123	135	
	(0)	275	239	203	170	150	143	154	163	131	201	221	
	(A)	120	109	99		87	85	90	95	***	105	110	
LT	(B)	130	113	107	97	94	92	97	103	108	113	112	
	(C)	205	186	169	154	149	145	154	162	171	180	189	
	(A)	152	132	115	94	83	79	85	90	***	111	122	
MT	(B)	169	147	128	104	92	88	94	100	111	123	135	
	(C)	275	237	203	170	150	143	154	163	181	201	221	
	(A)	152	.132	115	94	83	79	85	90	***	111	122	
нт	(B)	169	147	128	104	92	83	24	100	111	123	135	
	(C)	275	239	208	170	150	143	154	163	181	201	221	

INDICES : FUEL (DIFFERENT SPEED & ROAD CLASS)

er en eleg								UNIT	1 X ·	ro ba:	SIC VI	LUE
VEHICLE	ROAD	•	÷		1	SFE	ED (K	°H)		1		
TYPE	CLASS	10	16	24	32	40	48	56	64	72	30	88
FC	(A) (B) (C)	130	115 115 150		73 93 119	\$7 87 111	85	86 86 106	89	94	*** 100 125	108 108 135
LB	(A) (B) (C)	120 120 153	110 110 140	99 99 125	89 89 111	95 95 104	85 85 104	87 87 105	92 92 109	*** 100 121	110 110 134	120 120 148
НВ	(A) (B) (C)	190 190 283	160 160 243	132 132 196	103 108 159	96 96 133	90 90 130	89 37 123	92 92 133	*** 100 147		126 126 187
LĨ	(A) (B) (C)	120 120 153	110 110 140	99 99 125	89 89 111	85 85 106	85 85 104	87 87 105	92 92 107	*** 100 121	110 110 134	120 120 143
MT	(A) (B) (Ĉ)	190 190 288	160 160 243	132 132 196	108 108 159	96 96 138	90 90 130	87 89 128	92 92 133	*** 100 147	111 111 163	126 126 187
HT	(A) (B) (C)	190 190 238	160 160 243	132 132 196	108 108 159	96 96 138	90 90 130	87 89 128	92 92 133	*** 100 147	111 111 163	126 126 137

ΝΟΤέ [1] ROAD CLASS : (A) = GOOD, (B) = FAIR, (C) = POOR [2] "***" = 100% (CORRESPONDS TO BASIC VALUE)

THEFT		•	-		
INDICES :	TIRE AND TUBE	(DIFFERENT	SPEED	ROAD	CLASS)
		• • • • •	+ - -		

					<u>-</u>					10 BAS		
VEHICLE	RQAD					SPEE	ED (KP	'H)				
TYPE	CLASS	10	16	24	32	40	43	56	64	72	80	83
	· (A)	58	58	61	69	78	89	***	:114	129	149	17:
PC -	(B)	69	- 69	72	82	92	105	118	135	152	176	20
1994 - L	(C)	145	147	150	159	163	173	172	206	220	240	26
	(A)	58	58	61	69	78	89	 ***	114	129	149	17
LB	(B)	69	. 69	72.	82	92	105	118	135	152	176	20
	(C)	145	i 47	150	159	168	178	192	206	220	240	26
	(A)	. 58	58	61	69	78	39	***	114	129	149	17
HB	(B)	69	69	72	82	.92	105	118	135	152		20
	(C)	145	147	150	159	163	178	192	206	220	240	26
	(A)	58	58	61	69	79	89	***	114	129	147	17:
LT	(B) ·	59	69	72.	82	.92	105	118	135	152	176	201
	(c)	145	147	150	159	168	173	192	206	220	240	267
	(A)	58	58	61	. 69	78	39	***	114	129	149	173
MT	(E)	69	69	72	82	92	105	118	135	152	176	201
	(C)	145	147	150	159	163	178	192	206	220	240	267
	(A)	58	58	61	69	73	89	***	114	129	147	17:
нτ	(B)	. 69	69	72	82	92	105	118	135	152		201
	· (C)	145	147	150	159	163	178	192		220		1

N U T E [1] RUAD CLASS : (A) = GUOD, (B) = FAIR. (C) = PUOR [2] "***" = 100% (CORRESPONDS TO BASIC VALUE)

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APPENDIX 4.7.1

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N O T E [1] ROAD CLASS : (A) = GOOD, (B) = FAIR, (C) = POOR [2] "***" = 100% (CORRESPONDS TO BASIC VALUE)

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INDICES : DEPRECIATION AND INTEREST (DIFFERENT SPEED & ROAD CLASS)

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(UNIT : % TO BASIC VALUE)

VEHICLE	ROAD					SPEE	D (KP	н				
TYPE	CLASS	10	16	24	32	40	43	56	64	72	80	83
PC	(A) (B) (C)	100 104 141	100 104 139	100 104 137	100 104 135	100 104 131		104	100 104 111	100 104 100	100 104 90	100 104 81
LB	(A) (B) (C)	348 368 498	266 279 383	.200	155 165 229	140 195	122 160	*** 107 136	91 97 117	83 69 102	75 : 80 83	68 73 77
HB	(A) (B) (C)	356 375 505	270 285 395	190 202 289	156 167 236	132 141		*** 108 138	93 99 119	33 89 104	75 81 90	68 73 78
L.T	(A) (B) (C)	323 345 476		187 195 262	152 157 203	129 135 174	112 118 149	*** 105 128	86 91 110	81 85 95	74 78 83	63 71 72
 MT	(A) (B) (C)	356 375 505	270 285 395		156 167 236			***	93 99 119	83 89 104	75 \$1 90	68 73 78
HT	(A) (B) (C)	356 375 505	270 285 395	190 202 289	156 167 236	132 141 201	115 123 164	*** 108 133	.93 99 119	83 89 104	75 81 90	63 73 79

N O T E [1] RUAD CLASS : (A) = GOOD, (B) = FAIR, (C) = POUR [2] "***" = 100% (CORRESPONDS TO BASIC VALUE)

INDICES : CREW (DIFFERENT SPEED & ROAD CLASS)

· .	•						(UNIT	: % T	O BAS	IC VA	LUE
VEHICLE	RUAD					SPEE	D (KP	'H)				
TYPE	CLASS	10	16	24	32	40	48	56	64	72	30	83
	(A)	560	350	233	175	140	117	***	88	78	70	. 6
PC ·	(B)	560	350	233	175	140	. 117	100	88	78	70	- 6
	(0)	560	350	233	175	140	117	100	83	78	7.0	6
	(A)	560	350	233	.175	140	117	***	88	73	70	Ŀ
LB	(B)	560	350	233	175	140	117	100	83	78	70	6
	(C) .	560	350	233	175	140	.117	100	38	73	70	6
	(A)	560	350	233	175	140	117	***	88	78	70	6
нв	(B)	560	350	233	175	140	117	100	88	78	70	6
	(0)	560	350	233	175	140	117	100	83	73	70	6
	(A)	560	350	233	175	140	117	***	88	78	.70	Ë
LT	(8)	560	350	233	175	140	117	100	38	73	70	- 6
-	(C)	560	350	233	175	140	117	100	. 83	78	70	£
	(A)	560	350	233	175	140	117	***	88	. 78	70	6
MT	(B)	560	350	233	175	140	117	100	88	78		- 6
	(C)	560	320	233	175	140	117	100	- 88	73	70	. <u>.</u> 6
	(A)	560	350	233	175	140	117	***	83	78	70	6
нт	(B)	560	350	233	175	140	117	100	88 -	78	70	6
	(0)	560	350	233	175	140	117	100	83	73	70	6

N O T E [1] ROAD CLASS : (A) = 000D, (B) ⇒ FAIR, (C) = POOR [2] "***" = 100% (CORRESPONDS TO BASIC VALUE)

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N 0 T E (11 ROAD CLASS : (A) = 0000, (B) = FAIR, (C) = POOR (21 "***" = 100% (CORRESPONDS TO BASIC VALUE)

INDICES : OVERHEAD (DIFFERENT SPEED & ROAD CLASS) .

VEHICLE	ROAD					SPEE	3D (KP	H)				
TYPE	CLASS	10	16	24	: 32 /	40	48	56	64	72	80	38
	(A)	434	310	233	174	140	116	***	83	77	70	6
PC	(B)	434	310	233	174	140	116	100	- 88	77	70	- 6
	(C)	434	310	233	174	140	116	100	. 83	77	70	6
	(A)	434	310	233	174	140	116	***	SS	77	70	ė
LB	(B)	434	310	233	174	140	116	100	83	77	70	- 6
	(0)	434	310	233	174	140	116	100	88	77	70	6
	(A)	434	310	233	174	140	115	***	88	77	70	6
нв	(B)	434	310	233	174	140	116	100	83	77	70	- 6
	(C)	434	310	233	174	140	116	100	83	77	70	
	(A)	434	310	233	174	140	116	***	88	77	70	6
LT	(B)	434	310	233	174	140	116	100	83	77	70	6
	(0)	434	310	233	174	140	116	100	88	77	70	6
** ** **	(A)	434	310	233	174	140	116	***	83	77	70	6
MT	(B)	434		233		140	115	100	83	77	70	<u>, 6</u>
	(0)	434	310		174	140	116	100.	83	77	70	
	(A)	434	310	233	174	140	116	***	83	77	70	6
НТ	(B)	434	310		174	140	116	100	88	77	70	- 6
•••	(C)	434	310	233	174	140	116	100	33	77	70	- 6

APPENDIX 4.7.1

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(UNIT : % TO BASIC VALUE)

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APPENDIX 4.8.1 METHOD TO DETERMINE OVERLAY THICKNESS

Asphalt Institute Method

- For a given design life (L), cumulative ESA (N) is obtained by referring to Appendix 4.3.1.
- Design traffic number (DTN) can be obtained by the following formula:
 - $DTN = 5.6804 \times 10^{-5} \times N 0.6444$
- Overlay thickness (T_A) can be read from Figure 4.5.1 corresponding to DTN.

DOH (California) Method

- Cumulative ESA (N) can be obtained as above.
- Cumulative ESA (N) can be converted to ESA' by the following formula:

$$ESA' = N \times (\frac{4100}{2268})^4$$

where, N : cumulative number of equivalent 8.2t standard axles ESA': cumulative number of equivalent 4.5t standard axles

(See section 4.5.2)

- The allowable deflection of 2-inch asphalt concrete (Da) is as follows:

> $= 9.0881 \text{ ESA}'^{-0.1626}$ Da

- Percent reduction in deflection (P) is calculated by the following formula:

$$P = \frac{Dd - Da}{Dd} \times 100 (\%)$$

- From Figure 4.5.4, thickness to be increased in gravel equivalent is obtained by applying the percent reduction in deflection.
- Required overlay thickness is calculated by transforming the increase in gravel equivalent to different layers of new surface by using the following conversion factor:

Thickness of asphalt concrete = 0.5 of gravel equivalent

APPENDIX 4.8.2 DETERMINATION OF DESIGN LIFE

Asphalt Institute Method

- From the given design deflection (Dd) and overlay thickness (T_A) , determine DTN by means of Figure 4.5.1.

- From DTN, cumulative ESA (N) can be obtained by the following
- formula:
- $(DTN + 0.6444) / 5.6804 \times 10^{5}$ N = The design life (L) can be obtained from the N value.
- DOH (California) Method

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- Asphalt concrete overlay thickness is converted to aggregate thickness. Percent reduction in deflection (P) can be obtained by Figure 4.5.4.
- From the percent reduction deflection (P) and the design deflection (Dd), the allowable deflection (Da) can be obtained by using the following formula:

$$P = \frac{Dd - Da}{Dd} \times 100 (\%)$$

- From the given allowable deflection (Da), the cumulative ESA (N) can be obtained as follows:

$$= 73468 \text{ Da}^{-6.15}$$

Design life (L) can be determined by conversion from the cumulative ESA.

APPENDIX 4.8.1

APPENDIX 4.8.2

APPENDIX 4.8.3 OVERLAY DESIGN : OVERLAY TIMING AND THICKNESS

STUDY ROUTE : RT - 224 (224 - 0100)

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STUDY ROUTE : RT - 224 (224 - 0100) STUDY LENGTH : 10 KM WIDTH OF ROAD : 6 M SURFACE TYPE : AC

	EXISTIN	IG CONI	DITION		n provinsi kawa jewi e	en den jaar een			OVE	RLAY DES	IGN	· · · · · · ·	
				DESIGN	CUMULATIVE			T OVERLAY			2N	D OVERLAY	
SECTION	PSI SU	DEFI	ECTION		NO. OF ESA SINCE 1985	DESIGN	YEAR OF	CUMULATIVE NO, OF ESA	OVERLAY			CUMULATIVE	OVERLAY THICKNES
· · · ·			(MM)	METHOD	(X 1000)		OVENERS	(X 1000)	(MM)			(X 1000)	(MM)
10- 11	4.06	DM =	0.346	AI	127,528		·	· · · · · · · · · · · · · · · · · · ·		н 1	· · · ·		
	(956)		0,485	DOH	49,442		.			1			
11- 12	3.47		0.320	AI	170,715				en e		÷		
** **	(1033)		0.491	DOH	77,082		. –				1.11		
12- 13	3.52	DM =	0,394	AI	72,251				1 ₈		· .	2	
	(1497)	DD =	0.516	DOH	21,501		-		:	··	14 14 <u>1</u>		
13- 14	2.95	DM =	0.403	AI	58,109		-			1. 1. j. j.	1.5 · · ·	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	
	(2597)	DD =	0.625	DOH	16,262		-		1				
14- 15	2.78	DM =	0.669	AI	6,220	_	.				÷ .		
	(2935)	DD =	0.891	DOH	602	7	1987 1987	2,291	50 35	6	1991	2,029	3
15- 16	3.26	DM =	0.514	AI	22,754	· -	····					· · ·	
10 10	(2877)	DD =	0.694	DOH	3,915	·						•	
16- 17	2.80			AI	16,618	-	<u> </u>						
	(2438)	DD =	0.752	DOH	2,594	<u> </u>			• :	- 1 -		· · ·	
17- 18	3.48	DM =	0.448	AI	42,009		· —		· · · ·		11		
÷	(2872)			DOH	9,632	 .	-		·				
18- 19	3,43	DM =	0.251	AI	473,171	_	-			· .	· *	· · ·	
	(1279)	DD =	0.362	DOH	349,581		—			1.1.1.1	· ·		
19- 20	3,68		0.297	AI	237,187			· · · · ·					
	(1588)	DD =	0.436	DOH	124,648		-			1. K. L. K.	•		
=======		======	=======		=======================================			=======================================	~~~~~~~~~				
NOT	E										1.1		
[1]		: ROU0						$(x,y) \in \mathbb{R}^{n \times n}$			1997 - E. S. 1998		
[2]	DM	: MEAS	SURED DE	FLECTION	(ADJUSTED E (AVE. + 1.5	Y TEMPER	RATURE)			100 C	н. Т	1	

- : OVERLAY IS NOT REQUISITE. [5]

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APPENDIX 4.8.3 1/8

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STUDY ROUTE : RH - 21 (304 - 0904)

فسأخطأ مسا

· 医肠管理 · 医门口 · 医脑的 · 计输出 · 不能推动 · 计输出 ·

••	н н н	EXISTIN			DESIGN	na manana ang mang atao na sang m Kanang mang mang mang mang mang mang mang	a porte da contratar A	ente estructures. N	ta ing tang tang tang tang tang tang tang ta	• • •	OVE	RLAY DES	IGN		
		PSI	n in exercitie N	ECTION	DESIGN	CUMULATIVE		18	T OVERLAY				21	ID OVERLAY	
:	SECTION					NO. OF ESA SINCE 1985	DESIGN	YEAR OF	CUMULATI	VE	UVERLAY	DESIGN		CUMULATIVE	OVERLAY
	an far syn ar far syn ar 1995 - Syn		BATE KAN	(MM) (MM)	METHOD	TILL PS1=2 (X 1000)			NO. OF E: (X 1000			PERIOD	OVERLAY	NO. OF ESA (X 1000)	THICKNESS (MM)
•	120-121	3.81		0.329	AI	156,457					···· ···	n y sea in the A		and the second sec	
	· · · ·	(1192)	DD =	0.597	DOH	67,123	· · ·	_							
	121-122	3.87	DM =	0.181	AI	1,879,810	·	-				· · · 1			
		(946.)	DD =	0.317	DOH	2,661,620		· · · · ·	and the second		4 - 1 				
	122-123	3.86	DM =	0.186	AI	1,690,060									
		(1106.)	DD =	0.378	DOH	2,274,080	-								
1	123-124	3.91	DM =		AI	5,243,460	-								
		(990.)	DD =	0.255	DOH	12,141,700		-					· · ·		
1	124-125	3.93	DM =	0.196	AI	1,352,670		-	-		- 		· · · · · · · ·		
		(994)	DD =	0.302	DOH	1,634,000	.	· · · · · ·							
1	125-126	3.75	DM =	0.204	AI	1,144,130	-	· · · · · · · · · · · · · · · · · · ·							
		(1535)	DD =		DÓH	1,279,130		· <u>-</u>					e ge ge	· · ·	
1	126-127	3,87	DM =	0.234	AI	644,961	· . –	· -			1.0	the second second	1997 - A	the second se	
		(1091)	DD =	0.427	DOH	546,343		—			. :		2 - E.		
]	127-128	3.58	DM =	0.261	AI	405,373	·				1 e.u. 1		an an a' d		
		(1371)	DD =	0,435	DOH	276,462			<i>i</i>			41			
1	128-129	3.61	DM =	0.225	AI	751,272						1. j.	÷	- 1	
	129-130	(1501) 2.20	DD = DM =	0.403	DOH	688,533 476,042	•••	_		1. J.	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		4.11 ¹		
Ŀ	129-130	(2337)	DD =	0.199	AI	···-• - ·		-			5		i de la companya de	· · · ·	
	130-131	3.70	DD = DM =	0.278	DOH AI	560,552 186,296		· -						1. A.	
1	130-131	(1159)	DD =	0.315	DOH	87,109	-	-	$\int_{\mathbb{T}^{n}} f_{n}(x) = \int_{\mathbb{T}^{n}} f_$		1 (1 () () () () () () () () ()		$1 \leq k \leq 2$		
	131-132	2.98	DM =	0.430		44,774	·	. · · · .	· · · . · ·		1 · · · · · · · · ·			e e production de la companya de la	
	01-102	(2269)	DD =	0.430	DOH	10,997		-							
4	132-133	3.05	DD =	0.349	AI	110,654						and the Steel	e e de la contra		
1	102-100	(1946)	DD =	0.541	DOH	41,752			(1,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2	$i \in \mathbb{R}^{d}$	e des Arres	$(r_{i}, f_{i}) = r_{i} + \frac{1}{2} r_{i}$	1.1.1	1	

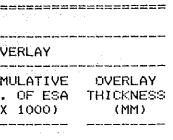
NOTE

[1] () : ROUGHNESS

[2] DM : MEASURED DEFLECTION (ADJUSTED BY TEMPERATURE) [3] DD : DESIGN DEFLECTION (AVE. + 1.5 * SIGMA) [4] > ## : OVERLAY DESIGN LIFE IS GREATER THAN ## YEARS. [5]

- : OVERLAY IS NOT REQUISITE.

APPENDIX 4.8.3 2/8



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STUDY ROUTE : RH - 22 . (2023 - 0100)

STUDY LENGTH : S KM

WIDTH OF ROAD : 5 M SURFACE TYPE : PM

	· · ·	EXISTIN	IG CONT	DITION						OVE	RLAY DES	IGN
					DESIGN	CUMULATIVE		13	T OVERLAY		porta da	21
SECTI	LIN	PSI 1994 1994		ECTION		NO. OF ESA SINCE 1985 TILL PSI=2 (X 1000)	DESIGN	OVERLAY		THICKNESS		YEAR OF OVERLAY
0-	1	2.83	DM =	0.602	AI	10,062	· · ·	-				
		(4393)	DD =	0.817	DOH	1,221		· •••			N	- -
1-	2	2,91	DM =	0.635	AI	8,278	· 🛶	- , 			. ·**	
		(3597.)	DD =	0.901	DOH	900		~		•	x ¹	· · · ·
2-	З	2.57	DM =	0.788	AI	2,579	~~ , ·					
		(3780)	DD =	1.078	DOH	172	7	1986	778	55		
							4	1986	424	35	5	1990
3-	4	2.83	DM =	0.572	AI	12,460	·			2 ₁	d.	£.,
		(2288:)	DD =	0.770	DOH	1,679	· ~	·		e de la c	. A	a ta second
4-	5	2.70	DM =	0.552	AI	13,315	~	 -				·
		(2675)	DD =	0.788	DOH	1,917		· –.		1		
5-	6	2.68	DM =	0.767	AI	3,208						a dina di
		(3640)	DD =	1.026	DOH	230	7	1987	809	45	.1.1	
				-			5	1987	576	35	6	1992
6-	7	2.76	DM =	0.682	AI	5,612	-	-		e e e e		· · · · · · · ·
		(3828)	DD =	0.835	DOH	519	14	1990	2,039	35		
7	8	2.87		0.583	AI	11,730		-	and a second second	1.1		
		(3432)	DD =	0.767	DOH	1,525	-					

[1] (): ROUGHNESS

[2] DM : MEASURED DEFLECTION (ADJUSTED BY TEMPERATURE)

[3] DD : DESIGN DEFLECTION (AVE. + 1.5 * SIGMA)

[4] > ## : OVERLAY DESIGN LIFE IS GREATER THAN ## YEARS.

- : OVERLAY IS NOT REQUISITE. [5]

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APPENDIX 4.8.3 3/8

. الله وجب وحلو وجو ويور الحار مسل منيو ودي مدير والي ولين ويور حمل الحد مطو ويسر وربار وجر مريو ويور ويور وي 2ND OVERLAY الله عليه بعن الله الله الله عليه الله عن الله عنه الله الله الله الله الله عليه الله عنه الله الله الله الله ا OF CUMULATIVE OVERLAY LAY NO. OF ESA THICKNESS (X 1000) (MM) المله المحاجبين وعاورون محاد محاد الماد محب 190 629 35 <u>____</u> .

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STUDY ROUTE : RH - 5 (201 - 0102) ,

WIDTH OF ROAD : 6 M SURFACE TYPE : PM STUDY LENGTH : 19 KM

	EXISTIN	IG COND	ITION	ren a la secolo Alexandra de la secolo		e da ante da este de la composición de La composición de la c		n sugaging sa shini shini T	OVE	RLAY DES	SIGN	
		و میں میں است وربع بیس <u>میں میں</u> ت	ang lalat ang ang Kari Sang Ji	DESTUN	CUMULATIVE NO. OF ESA		19	T OVERLAY			2	
BECTION	PSI	DEFL	ECTION		NO. OF ESA SINCE 1985	n <u>a ann a stài</u>		CLIM # ATTUC		TICGTON	YEAR OF	
	1		a fara sa na na		JINCE 1700	DESTON			THICKNESS	PERIOD	OVERLAY	NO.
	a de la composición d	14 M A	MMO		TILL PSI=2 (X 1000) 293,621 171,037 109,488 40,691 181,419 84,198 233,759		terioù a la ter E	(X 1000)	e e i e (MM) e e i	· ·		, C
		·			<u> </u>	<u> </u>		···· ··· ··· ··· ··· ··· ··· ··· ···				
20- 21	3.67	<u>ت</u> M =	0.282	AI	293,621	-	<u> </u>					
	(2361)			DOH	171,037		-	· · · · · · ·				
21- 22	3.15		0.352	AI	109,488	· -			•			
	(2979)		0.499	DOH	40,691		· - ·		1000 1004 1000		1.111.	
22- 23	3.52		0.316	AI	181,419	·		1				
	(2216)		0.421	DOH	84,198		. –				100 1	
23- 24	2.92		0,289				, ·					
	(2713)		0.452	DOH	128,895		· · · · ·					
24- 25	3.23		0.256	AI	420,880	· •	. –			. * *		
	(2964)	DD =	0.565	DOH	297,507					· _ ·	21. 	4 C
25- 26	3.22	DM =	0.330	AI	145,787			÷				· · ·
	(2839)	DD =	0.514	DOH	61,855	_		general a		1 •	· · · .	1.1
26- 27	3.63		0.335	AI	142,575	· -	ee tij te		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	· . ·		and the part
	(2718)	とうまでも 一般	0,475	DOH	58,716							
27- 28	3.42		0.280	AI	299,408	- <u> </u>			2		14 ¹ .	
	(3288)		0.369	BOH	177,568 647,042	Ξ.,	<u> </u>			1. N. 1. 1.		· · ·
28- 29	3.37	DM =	0.232	AI	557,494			per en ante		1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	1.5	
	(2713) 3.10		0.313	DOH AI	118,806	_	 `	10 March 10 March 10				
29- 30	(3597)		0.481	DOH	46,162	-		$(1,1,2,\ldots,n,n) \in \{1,2,\ldots,n\}$	100 A.	-,	·	
30- 31	3.53		0.377	AI	86,588	·	_					
	(3408)	-	0.534	DOH	28,114	·	_				$(x_{i}) = (x_{i}) + (x_{$	
31- 32	3.13		0.313	AI	178,130		an an <u>a</u> ar		and an early set.		1	
	(4060)	DD =	0.490	DOH	83,923	-	, [.]		1811 - 18 - 18 - 18 - 18 - 18 - 18 - 18	÷.,	to a second s	1 A 1
32- 33	3.44		0.280	AI	297,517		(a) (b) (b) (b) (b)	Construction of the second	and the second	and the second second	1	
	(1839)		0.413	DOH	177,548		. -			4 8 C 18		
33- 34	3.02		0.519	AI	20,425	_						
	(3775)		0.743		3,406	· 						
34- 35	3.56		0.488	AI	27,640	· _						
	(2988)	DD =		DOH	5,723							
35~ 36	2000			AI	45,064							
	(.3423)			DOH	10,799		-					
36- 37	3.35	DM =		AI	20,898	· 						
	(3717)			DOH	3,432							
37- 38	3,31	DD ≕		AI	21,274		🛋					
	(4577)			DOH	3,530							
38- 39	(45/7)	DM ≕	0.447	AI	39,294		·					
	(3630)			DOH	8,941							

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[1] () : ROUGHNESS [2] DM : MEASURED DEFLECTION (ADJUSTED BY TEMPERATURE)

DD : DESIGN DEFLECTION (AVE. + 1.5 * SIGMA) [3]

[4] > ## : OVERLAY DESIGN LIFE IS GREATER THAN ## YEARS.

 - : OVERLAY IS NOT REQUISITE. [5]

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APPENDIX 4.8.3 4/8

_____ OVERLAY UMULATIVE OVERLAY IO. OF ESA THICKNESS (X 1000) (MM)

OVERLAY DESIGN : OVERLAY TIMING AND THICKNESS

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STUDY ROUTE : RH - 12 (207 - 0202)

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STUDY LENGTH : 10 KM WIDTH OF ROAD : 6.2 M SURFACE TYPE : DT/ST

	EXISTI	NG CON	DITION	DESIGN					OYE	RLAY DES	IGN	· · · · · · · · · · · · · · · · · · ·	
 a de la composition de la comp			FOTION	DESIGN	CUMULATIVE NO. OF ESA			T OVERLAY			21	ID OVERLAY	· .
SECTION	PSI	DEFI	ECTION	METHOD	SINCE 1985		YEAR OF	CUMULATIVE	OVERLAY THICKNESS		YEAR OF OVERLAY	CUMULATIVE NO. OF ESA	OVERLAY THICKNES
	and an	ا مىلىمى	(MM)		(X 1000)	an An tao an tao	n in an	(X 1000)	(MM)	· · · ·		(X 1000)	(MM)
488-489	1.50	DM =	0.873	AI	0	13	1985	1,095	35		*		
100 107	(4132)		1.304	DOH	0	7	1985	498	85				
						4	1985	268	55	3	1989	230	40
489-490	1.50	DM =	0.705	ÂI	9 Mar - 0	> 14	1985	3,554	35			. 1	
	(5494)	DD =	0.949	DOH	0	12	1985	927	.35				
490-491	1.66	DM =	0.504	AI	. 0	> 14	1985	4,981	35	n trê kirin.			
	(4977)	DD =	0.898	DOH	0	> 14	1985	1,304	35			. *	
491-492	2.74	DM =	0.691	AI	5,258	-			•				
	(4282)	DD =		DOH	472	7	1991	634	50				
		s al t	· · · ·	1.5.5	the state of the s	5	1991	403	35	5	1996	598	35
492-493	2.26	DM =	0.546	AI	7,241							· · · · · ·	
· · · ·	(4702)	DD =	0.911	DOH	1,032		. 		1941 ¹				
493-494	2.20	DM =		AI	1,492	-	· .						
	(4997)		1.196	DOH	108	7	1986	519	60		an gan an a	<i>t</i>	
						4	1986	278	40	4	1990	348	35
494-495	1.59	DM =	0.730	AI	0	> 14	1985	1,623	35				
	(6112)	DD =	1.176	DOH	0	. 7	1985	493	55				
						4	1985	268	40	5	1989	377	35
495-496	2.25	DM =	0.669	AI	2,910							1	
	(5166)	DD =	1.014	DOH	268	8	1983	617	35				
496-497	1.98	DM =	0.627	AI	0	> 14	1985	4,437	35				
 	(4437)	DD =	0,919	DOH	0	14	1985	1,133	35	 			
497-498	2.17	DM =	1.118	AI	221	7	1988	562	45			and the second	
						5	1983	376	35	7	1993	672	35
	(4369)	DD =	1.723	DOH	6	.7	1985	498	155		1 • •		•
						4	1985	268	130	3	1989	230	50

[1] () : ROUGHNESS

[2] DM : MEASURED DEFLECTION (ADJUSTED BY TEMPERATURE)

[3] DD : DESIGN DEFLECTION (AVE. + 1.5 * SIGMA)

[4] > ## : OVERLAY DESIGN LIFE IS GREATER THAN ## YEARS.

[5] - : OVERLAY IS NOT REQUISITE.

APPENDIX 4.8.3 5/8 OVERLAY DESIGN : OVERLAY TIMING AND THICKNESS المراقب المراقب

STUDY ROUTE : RH - 16 (214 - 0100)

STUDY LENGTH : 10 KM WIDTH OF ROAD : 6 M SURFACE TYPE : DT/ST

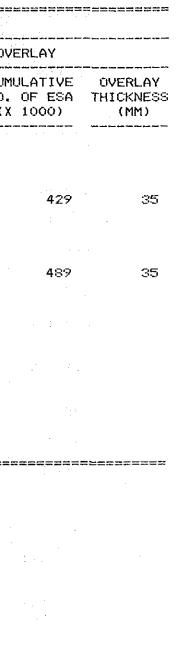
	EXISTIN	NG CONDITION	DESIGN					OVE	RLAY DES	IGN	
اند انداد والدون الدين و ريخ بو موريز متورير			DESTON	CUMULATIVE		15	T OVERLAY	an na torra. Bantana		2NI	p ov
SECTION	PSI	DEFLECTION (MM)	METHOD	NO. OF ESA SINCE 1985 TILL PSI=2 (X 1000)		 A the second seco	CUMULATIVE NO. OF ESA (X 1000)		DESIGN PERIOD	YEAR OF OVERLAY	CUM NO. (X
7+ 8	2.82	DM ≈ 0.786	AI	3,185			an an Thursday an an An Anna Anna Anna Anna Anna Anna			an di An an An An	• •
	(3350)	$DD \approx 1.038$	DOH	219	8	1989	534	35	÷		
8- 9	2.04	DM = 0.743	AI	338	> 14	1991	1,738	35			
	(4176)	DD = 1.147	DOH	24	7	1985	385	.45	a transfer	1.14	
			1.14		5	1985	289	35	7	1990	
9- 10	2.24	DM = 0.644	AI	3,389	—			- -	19 A. A.	1. A. 1997 A.	
	(4234)	DD = 0.999	DOH	339	9	1991	679	35	· .	· · ·	
10- 11	2.00	DM = 0.715	AI	0	> 14	1985	1,931	35			-
	(4866)	DD = 1.123	DOH	$\mathbf{O}_{\mathbf{A}}$. 7 6	1985 1985	385 330	40 35	7	1991	e de la
11- 12	2,11	DM = 0.699	AI	1,188	-	1705	0.00		1	1771	
	(3022)	DD = 1.039	рон	98	.9	1986	532	35	· · · ·	1997 - 1997 1997 - 1997 - 1997	
12- 13	2.40	DM = 0.607	AI	6,344	-		UUL			111	
	(3770)	DD = 0.957	DOH	730	· · ·		Later and				
13-14	2.68	DM = 0.546	AI	13,861	. <u> </u>				11.11		
	(3157)	DD = 0.696	DOH	2,044							
14- 15	3.18	DM = 0.404	AI	61,463		· · · <u>-</u> ·		· · · · ·	1. 1. T	25 (C)	
	(2641)	DD = 0.582	DOH	17,240	_ ** .			1+ (1
15- 16	2.87	DM = 0.544	AI	15,760	<u> </u>	·					
	(2940)	DD = 0.788	DOH	2,366	_				2		
16- 17	3,06	DM = 0.502	AI	23,308			1.		a the second	• •	
	(2955)	DD = 0.753	BOH	4,233			the second second			1	

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NOTE

[1] () : ROUGHNESS DM : MEASURED DEFLECTION (ADJUSTED BY TEMPERATURE) DD : DESIGN DEFLECTION (AVE. + 1.5 * SIGMA) [2] .031 [4] > ## : OVERLAY DESIGN LIFE IS GREATER THAN ## YEARS. [5] - : OVERLAY IS NOT REQUISITE.

APPENDIX 4.8.3 6/8



STUDY ROUTE : RH - 25 (2071 - 0100). A Deer state state state of Non-Sector Balance State and Sector Sector Sector

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STUDY LENGTH : 100 KM & State WIDTH OF ROAD : 5 M 200 CHEER (SURFACE TYPE : DT/STADA FOUL AT T

EXISTI	NG CONDITION					من مند مند مند مند مند مند مند مند مند م	OVE	RLAY DES	IGN
		DESIGN	CUMULATIVE	动行动。	18	TOVERLAY			2ND
SECTION PSI	DEFLECTION								YEAR OF
	n an								
in tett i so	(MM)		(X 1000)			(X 1000)			
				·					
7-8 2.35	DM = 0.302	AI	118,761		,	A State of the second sec	1 A.		1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -
	DD = 0.464		59,312				E a compañía de la co		99 A. 199 A.
	DM = 0.283		210,797	⁻	- ·				
•	DD = 0.381		120,820					1	
9-10 2.04	DM = 0.368	AI	7,330	- -			1997 - 19		 A second sec second second sec
	DD = 0.552	DOH	2,3/8			. ويؤير بيري			
10-11 1.78	DM = 0.347	AI	0	> 14					
	DD = 0.496	DOH	0	> 14		· · · · · · · · · · · · · · · · · · ·	35		
11-12 1.72	DM = 0.364	AI	. 0	> 14			35		
	DD = 0.554	DOH	0	> 14	1985	25,485	35		
12-13 1.53	DM = 0.428	AI	0	> 14		21,875	35		
	DD = 0.594	DOH	0	> 14	1985	16,648	35		
13-14 1.90	DM = 0.321	AI	0		1985	33,905	35		
	DD = 0.508	DOH	0		1985	43,553 17,274			
14-15 1.72	DM = 0.400	AI	0	> 14					
	DD = 0.637	DOH	. 0			10,799	35 35		
15-16 1.73	DM = 0.292	AI	0		1985	54,596	ათ 35		
	DD = 0.414	DOH			1985	153,285			1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
16-17 1.67	DM = 0.366	AI	0		1985 1985	12,070 6,257	35 35		
	DD = 0.696	DOH =======			-		-	*******	
NOTE	_		-	н					
	: ROUGHNESS				· · · · · · · · · · · · · · · · · · ·		20 .	· · · ·	· · ·
	MEASURED DEF								
	: DESIGN DEF					11 T	5 a.		
	: OVERLAY DESI			THAN ## \	EARS.				
[5] -	: OVERLAY IS N	IOT REQU	ISITE.				8 1. T. S		
· •		· .							
			1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -				• *		
	•	4.4.5	the second second	1 - s.	19 - A				

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APPENDIX 4.8.3 7/8

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ID OVERLAY	
CUMULATIVE NO. OF ESA (X 1000)	QVERLAY THICKNESS (MM)
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	-=********
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STUDY ROUTE : RH - 27 (2160 - 0100) . Reading a structure events of the state of the state of the state of the

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STUDY LENGTHS: 100 KM THE SAME WIDTH OF ROAD : 5 MEAN AND SURFACE TYPE : DT/STEARED TO DE

an gar a	-		DITION)	** *** *** *** *** *** ***		QVE	RLAY DES		
SECTION	native explo- PS1 and		ECTION		CUMULATIVE NO. OF ESA		15	TOVERLAY		معر متعر بدي شر عدر	21	ND OVE
	and the		8994 (1993) (1993) 2013 (1997)		SINCE 1985 TILL PSI=2	DESIGN	OVERLAY		THICKNESS			
9- 10	2.30	DM =	0.829	AI	2,504		_				·	······································
	(4606)	DD =	1.331	DOH	153	7	1988			inter de la companya		
10- 11	1.67	тім —	0.909	AI	0	4 > 14	1988 1985	183 1,110	and the second se	37 1971 - 1971	1992	
10- 11	(5529)		1.300	DOH	- O	7	1985	303				an an tao an Tao
	1 55297	<u>пп</u> –	1.300	DON	0	, A	1985	163		4	1989	
11- 12	1.83	тим	1.189	AI	0	7			50		2 1707	• • •
** **	1.00	1941) (P.	1.1.1.1.1		an a		1985	167	350	7	1989	
	(7246)	DD =	2 202	DOH	0	7		303	190			-
	()210)	00				4		163	170	3	1989	
12-13	2.14	⊓м =	1.184	AI	150	7	' _	341	45			$ h = \mu = 1$
		2.1				6			35	8	1994	tette i p
	(3790)	DD =	1.938	DOH	4	.7		303	165			
						4		163	140	3	1989	
13- 14	3,10	DM =	1.407	AI	309	_	1997 - <mark>H</mark> an		<i>1</i> ,			
	(3572)		2.582	DOH	5 a 1 a 1 a 1	7			215		i en este das	
					15 11	4	1985		200	3	1989	
14- 15	1.85	DM =	1.401	AI	0 	7	1985	303	65			· .
				5 T.S.	the second	4	1985	163	45	5	1989	et en
	(6020)	DD =	2.562	DOH	0 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	7	1985	303	215	1		·
· .	the second	$1 \leq x \leq 1$	and are a dam	an ta an an th	and the second second		1985	163 and 163	200	. 3	1989	
15- 16	2.41	DM =	0.802	AI	1,952		-	100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100				
	(4760)	DD =	1.560	рон	124	7	1988	341	115	11. 11. 14. 14. 19. 19. 19.	te a substances	2
						4	1988	183		3 ⊃	1992	·· .
16- 17	2.08	DM =	1.004	AI	174	7	1989	355	40	te generation sources	1	1 + 1
						6	1989	317	35		1925	÷
	(5339)	DD =	1.837	DOH	6	7	1985	303 (150	Radia di Santa	s ha general de	
						4	1985	163		3	1989	
17- 18	2.00	DM =	1.245	AI	. 0	7	1985	303	55			
						4	1985	163	40	6	1989	
	(5586)	DD =	2.296	DOH	0	7	1985	303	195	_		
						4	1985	163	175	3	1989	۹.
18- 19	1.17	DM =	1.113	AI	O _	7	1985	303	50	-		
		_				4	1985	164	35	6	1989	
	(9789)	DD =	2,222	DOH	0	7	1985	303	190	_	1	
						4	1985	163	170	3	1939	

[3] DD : DESIGN DEFLECTION (AVE. + 1.5 * SIGMA)

[4] > ## : OVERLAY DESIGN LIFE IS GREATER THAN ## YEARS.

[5] - : OVERLAY IS NOT REQUISITE.

APPENDIX 4.8.3

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		و المحمد المحم
OVER		
10.0 10.0 (X 1	ATIVE F ESA 000)	OVERLAY THICKNESS (MM)
	183	. 35
	208	35
	332	35
 	140	55
n en	507	35
-	140	50
	. 140	55
	261	35
•	140	55
į.	158	45
	528	35
	140	50
	288	35
	140	55
	315	35
=====	140	55

APPENDIX 4.8.4 ECONOMIC EVALUATION FOR OVERLAY DESIGN

SECTION : 14 - 15

STUDY ROUTE : RT - 224 (224 - 0100)

WIDTH OF ROAD : 6.0 M

SURFACE TYPE : AC

DOH (CALIFORNIA) METHOD _____

		CUMU-		COSTS		BENEFITS	8		AADT	CUMU-	PSI	COSTS	I	BENEFITS	;
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C Saving	R M C SAVING	TOTAL	YEAR	HHUI	E S A (X1000)		OVERLAY COST	V Q C SAVING	R M C SAVING	TOTAL
1987 1988 1989 1990 1991 1992 1993	4187 4382 4548 4721 4900 5087 5280	289 592 907 1234 1573 1925 2291	3.6 3.0 2.7 2.5 2.3 2.2 2.1	642,802 0 0 0 0 0 0 0		3,696 3,079 2,438 1,773 1,083	2,840,900 2,631,300 2,730,890 2,833,450 2,940,770	1987 1988 1989 1990 1991 1992 1993	4187 4382 4548 4721 4900 5087 5280	289 592 907 1234 339 691 1057	3.4 2.7 2.4 2.2 3.5 2.9 2.5	473,074 0 0 473,074 0 -236,537	2,939,690	3,060 2,514 4,194 3,797	2,536,23 2,631,28 2,730,97 3,176,39 2,943,49
TOTAL				642,302	19,729,300	16,721	19,746,100	TOTAL				709,611	19,765,300	24,629	19,789,90
niscou	NTED T	OTAL		512,438	10,176,000	9,754	10,185,800	DISCÓU	NTED 1	TOTAL		540,647	10,136,500	12,854	10,149,40

NET PRESENT VALUE	:	9,673,360
DENELTI COOLINILAV	1 4 1	19.9
INTERNAL RATE OF RETURN	.	425.3 %

NET PRESENT VALUE : 9,608,730 BENEFIT COST RATIO : 18.8 INTERNAL RATE OF RETURN : 568.8 %

STUDY ROUTE : RH - 22 (2023 - 0100)

SURFACE TYPE : PM

WIDTH OF ROAD : 5.0 M

SECTION: 2 - 3

DOH (CALIFORNIA) METHOD

		CUMU-	****	COSTS		BENEFITS		VEAD		CUMU-	DOT	COSTS		BENEFITS)
E	LATIVE E S A (X1000)	PSI	OVERLAY COST	V D C SAVING	R M C SAVING	TOTAL	YEAR	ΑΑΦΤ	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	
1986 1987 1988 1989 1990 1991 1992	2707 2856 3014 3150 3293 3445 3603	98 201 308 419 534 654 778	3.7 3.1 2.8 2.5 2.3 2.2 2.1	582,816 0 0 0 0 0 0 0	1,414,790 1,491,930 1,404,820 1,467,230 1,532,280 1,602,210 1,674,610	3,697 3,079 2,433 1,773 1,082	1,419,070 1,495,630 1,407,900 1,469,670 1,534,050 1,603,300 1,674,970	1784 1787 1788 1789 1790 1990 1991 1992	2707 2856 3014 3150 3293 3445 3603	98 201 308 419 115 235 359	3.5 2.7 2.4 2.1 3.6 2.9 2.5	394,228 0 0 394,228 0 -157,691	1,414,790 1,332,160 1,404,820 1,467,230 1,467,230 1,715,900 1,602,210 1,674,610	3,492 2,914 2,315 4,157 3,721	1,418,83 1,335,44 1,407,74 1,469,55 1,720,06 1,605,93 1,677,87
TOTAL.					10,587,900		10,604,600	TOTAL				630,765	10,611,700	23,915	10,635,60
018000	NTED 1	TOTAL			6,092,530		6,103,460	and the second		OTAL		518,820	6,071,840	13,987	6,085,82

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APPENDIX 4.8.4 1/25

STUDY ROUTE .: RH - 22 (2023 - 0100) SECTION : 5 - 6

SURFACE TYPE : PM

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WIDTH OF ROAD : 5.0 M

DOH (CALIFORNIA) METHOD

化合物性 的复数形式 医闭肠管 医脊髓管理 医水平子 法实际分子

		CUMU-	n a t	COSTS	1	BENEFITS			A	CUMU-	DOT	COSTS	l gebot ji	BENEFITS	
YEAR	AADT	LATIVE ESA (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1987	2856	103	3.7	488,522	1,491,930	4,285	1,496,220	1987	2856	103	3.6	394,228	1,491,930	4,167	1,496,10
1988	3014	210	3.1	0	1,573,240	3,691	1,576,930	1988	3014	210	2.2	0	1,404,820		
1989	3150	321	2.8	<u>,</u> 0	1,467,230	3,074	1,470,310	1989	3150	321	2.5	. 0	1,467,230		
1990	3293	436	2.5	0	1,532,280	2,435	1,534,710	1990	3293	436	2.3		1,532,280		;1,535,12
1991	3445	556	2.3	0	1,602,210	1,770	1,603,980	1991	3445	556	2.1	Ŏ	1,602,210		1,604,58
1992	3603	630	2.2		1,674,610	1,080	1,675,690	1992	3603	124	3.6	394,228	1,875,230	4,244	, 1, 879, 4 8
1993	3768	809	2.1		1,749,690	365	1,750,050	1993	3768	253	3.0	-262,819	1,959,250	3,898	1,963,15
TOTAL				488,522	11,091,200	16,700	11,107,900	TOTAL				525,638	11,333,000	24,568	11,357,50
DISCOU	NTED	TOTAL		389,447	5,702,660	9,742	5,712,400	DISCOU	NTED T	OTAL		407,985	5,752,230	12,851	5,765,08

NET PRESENT VALUE : 5,322,950 BENEFIT COST RATIO : 14.7 INTERNAL RATE OF RETURN : 309.3 %

NET PRESENT VALUE : 5,357,100 BENEFIT COST RATIO : 14.1 INTERNAL RATE OF RETURN : 375.6 %

STUDY ROUTE : RH - 22 (2023 - 0100) SECTION : 6 - 7

WIDTH OF ROAD : 5.0 M SURFACE TYPE : PM

DOH (CALIFORNIA) METHOD المترجمة ومرجعة لمترجبة فترجعه فتناحيه الترجية المرجبي ويرجون ويرجعه ورجع ويرجع ويرجع

	(a) A substant of the second state of the s	
ONE OVERLAY CASE	(UNIT OF COST & BENEFIT	: BAHT)
		- 11 - FFA 11 - FA 12 -

		CUMU-		COSTS		BENEFIT	3
YEAR	AADT	LATIVE ESA (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL.
1990	3293	115	4.0	374,228	1,715,900	4,447	1,720,350
1991	3445	235	3.5	•••••••••••••••••••••••••••••••••••••••	1,794,180	4,183	1,798,370
1992	3603	359	3.2	0	1,875,230	3,910	1,879,140
1993	3768	488	3.0	Ó,	1,749,690	3,626	1,753,320
1994	3941	622	2.8	- 0	1,829,290	3,331	1,832,620
1995	4120	761	2.7	0	1,910,530	3,024	1,913,560
1996	4311	905	2.6	-197,114	1,997,890	2,707	2,000,600
TOTAL				197,114	12,872,700	25,227	12,898,000
DISCOU	NTED T	OTAL		178,522	4,720,280	9,668	4,729,950

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INTERNAL RATE OF RETURN :

NET PRESENT VALUE : 4,551,430 BENEFIT COST RATIO : 26.5 440.6 %

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APPENDIX 4.8.4

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	-	
FIT COST RATIO		2.8
RNAL RATE OF RETURN	:	41.6 %

NET PRESENT VALUE	:	1,760,050
BENEFIT COST RATIO	1	2.8
INTERNAL RATE OF RETURN	:	41.6 %

NET PRESENT VALUE	:	1,760,050
BENEFIT COST RATIO	1	2.8

ED	TO	TAL		991,156	2,738,	950-1	2,253
	===:	*******			*******		
I	NET	PRESEN	IT VALU	JE :	1,76	0,050	

		E S A (X1000)		OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	1038	63	3.8	1,435,910	570,608	4,287	574,395
1986	1084	128	3.1	0	596,610	3,698	600,308
1987	1135	196	2.8	0	565,958	3,087	569,045
1988	1186	268	2.5	0	592,159	2,444	594:603
1989	1233	341	2.3	0	615,582	1,778	617,360
1990	1282	418	2.2	0	639,910	1,089	640,998
1991	1334	498	2.1	-1,101,200	665,863	368	666,230
TOTAL	~	یسے شہر ہون ڈیٹ میں اس میں		334,711	4,246,690	16,751	4,263,440
DISCOL				991,156	2,738,950	12,253	2,751,200

ONE OV	ERLAY	CASE		(UN	IT OF COST	& BENEF	IT : BAHT)
		CUMU-		COSTS	DSTS BENEFITS		
YEAR AADT	LATIVE PSI ESA (X1000)		OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	
1985	1038	63	3.8	1,435,910	570,608	4,287	574,395
1986	1084	128	3.1	0	596,610	3,698	600,303
1987	1135	196	2.8	0	565,958	3,087	569,045
1988	1186	263	2.5	0	592,159	2,444	594:603
1929	1233	341	22	n	615,582	1.778	617,360

	====		====		===
· · · ·			÷.	•	1
RESENT VALUE	:	1,845,690			
TT COST RATIO	2	2.9			
NAL RATE OF RETURN	:	42.8 %			
				•	

DISCOUNTED TOTAL	991,156	2,819,890 16	•
		205223355679	=:
NET PRESENT VALUE	:	1,845,690	
BENEFIT COST RATI	0 :	2.9	
INTERNAL RATE OF	RETURN :	42.8 %	

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TOTAL	991,156			
=======================================		=====		
IET PRESENT VALUE	:	1,	845,69	0
RENEETT COST RATH	0 :		2.9	

DOH (CALIFORNIA) METHOD

IUIAL	771,100	2,317,370	102
		=================	===
· · · .			
IET PRESENT VALUE	:	1,845,69	0
SENEFIT COST RATIO	0 :	2.9	

TO"	TAL		991,156	2,3	319,890	16,9
==:		======	**********	====	========	
ЕT	PRESEN	T VALU	JE :		1,845,69	70

		00-17711	110001770	
OTAL		991,156	2,819,890	16,
	======	*********	=============================	1222
	1 e .			

1330	1202	413	£.1		0021210	41707	0421077	
1991	1334	498	2.6	-1,101,200	665,863	2,661	668,524	
					<u></u>			
TOTAL				334,711	4,366,990	25,080	4,392,070	
DISCOU	NTED 1	TOTAL		991,156	2,819,890	16,957	2,836,840	

		(X1000)		COST	SAVING	SAVING	agus Malan an an Al
				·	المستعوية كريستين بناعد مناسب من		
1985	-1038	63	4.1	1,435,910	570,608	4,444	575,053
1986	1084	128	3.5	Ô	596,610	4,177	600,787
1987	1135	176	3.2	0	624,724	3,879	628,623
1988	1186	263	3.0	0	653,695	3,606	657,301
1989	1233	341	2.8	· 0	615,582	3,303	618,885
1990	1282	418	2.7	0	639,910	2,989	642,899
1991	1334	498	2.6	-1,101,200	665,863	2,661	668,524

			ASPHAL	r INSTITU	TE METHOD		1997 - 1997 - 1997 1997 -
ONE OV	ERLAY	CASE		(U	NIT OF COS	T & BENEFIT	: BAHT)
	AADT	CUMÚ-		COSTS		BENEFITS	
YEAR AADT	LATIVE E S A	PSI -	OVERLAY	VOC	R M C	TOTAL	

		1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		
STUDY ROUTE : RH - 12 (207 -	0202)	SECTION *	488 - 489	
SURFACE TYPE : DT/ST		WIDTH OF	ROAD : 6.2 M	¢

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de la servicie de 1946. Esta compositor de la servicie de la

STUDY ROUTE : RH - 12 (207 - 0202)

SURFACE TYPE : DT/ST

VEAD	AADT	CUMU-	001	COSTS.	1	BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	1038	63	4.3	488,843	570,603	4,535	575,144
1986	1084	128	4.0	Ō	596,610	4,453	601,063
1987	1135	196	3.7	0	624,724	4,367	629,09
1988	1186	268	3.6	0	653,695	4,277	657,97
1989	1233	341	3.4	0	679,573	4,184	683,75
1990	1282	418	3.3	0	706,389	4,087	710,47
1991	1334	498	3.2	-244,421	735,031	3,986	739,01
TOTAL				244,421	4,566,630	29,891	4,596,520
DISCOU	NTED 1	TAL		390,125	2,921,160	19,674	2,940,840

NET PRESENT VALUE

BENEFIT COST RATIO :

INTERNAL RATE OF RETURN :

DOH (CALIFORNIA) METHOD _____

YEAR	AADT	CUMU-	PSI	COSTS	1	BENEFITS	3
T C.HR	HHUI	E S A (X1000)	гэı	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	1038	63	4.0	488,843	570,608	4,420	575,02
1986	1084	128	3.5	0	596,610	4,104	600,71
1987	1135	196	3.1	0	624,724	3,776	628,50
1988	1186	263	2.9	Ó	592,159	3,430	595,59
1989	1233	341	2.7	, O	615,582	3,073	618,65
1990	1282	418	2.6	0	639,910	2,702	642,61
1991	1334	498	2.5	~203,685	665,863	2,315	668,17
TOTAL		· · ·		285,158	4,305,460	23,821	4,329,28
DISCOL	INTED 1	TOTAL		406,578	2,780,780	16,246	2,797,020

NET PRESENT VALUE BENEFIT COST RATIO . 1 INTERNAL RATE OF RETURN :

APPENDIX 4.8.4 3/25

SECTION : 489 - 490

WIDTH OF ROAD : 6.2 M

ASPHALT INSTITUTE METHOD

2,550,710 7.5 122.1 %

: 2,390,450 6.9 120.8 %

STUDY ROUTE : RH - 12 (207 - 0202) SECTION : 490 - 491 SURFACE TYPE : DT/ST WIDTH OF ROAD : 6.2 M

n and set of states and states.

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	an a	CUMU-	1.1.1.2	COSTS		BENEFITS							
	i Senti di di di	LATIVE E S A (X1000)	PSI	OVERLAY COST	SAVING	SAVING			t es			· · ·	
1985 1986 1987 1988 1989 1989	1038 1084 1135 1186 1233 1282 1334	63 128 196 268 341	4.4 4.1 3.9 3.7 3.6 3.5 3.4	0 0 0 0	570,608 596,610 624,724 653,695 679,573 706,389	4,547 4,488 4,427 4,363 4,296 4,227	575,155 601,098 629,151 658,058 683,870 710,616 739,186	1999 - 1999 1999 - 1999 1999 - 1999 1999 - 1999 1999 - 1999					
				244,421	4,566,630	30,504	4,597,130	•		•	t A Z		
DISCOU	INTED	TOTAL		390,125	2,921,160	20,021	2,941,180		· .				

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NET PRESENT VALUE : 2,551,060 BENEFIT COST RATIO : 7.5 INTERNAL RATE OF RETURN : 122.1 %

DOH (CALIFORNIA) METHOD ____

		CUMU~	001	COSTS	·	BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)	P\$1	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	1038	63	4.1	488,843	570,608	4,465	575,07
1986	1084	128	3.6	· · O	596,610	4,241	600,85
1987		196	3.3	0	624,724	4,007	628,73
1988	1186	263	3.1	Q	653,695	3.762	657,45
1989	1233	341	2.9	0	615,582	3,507	612,08
1990	1282	418	2.8	0	639,910	3,244	643,15
1991	1334	498	2.7	-244,421	665,863	2,969	.663,83
TOTAL			<i>-</i>	244,421	4,366,990	26,176	4,393,19
DISCOU	NTED	TUTAL		390,125	2,819,890	17,587	2,837,47

NET PRESENT VALUE : 2,447,350 BENEFIT COST RATIO : 7.3 INTERNAL RATE OF RETURN : 121.5 % INTERNAL RATE OF RETURN : 121.5 %

APPENDIX 4.8.4

4/25

STUBY ROUTE : RH - 12 (207 - 0202)

SURFACE TYPE : DT/ST

SECTION : 491 - 492

WIDTH OF ROAD : 6.2 M

DOH (CALIFORNIA) METHOD

		CASE		(U)	IT OF COST	& BENEF	FIT : BAHT)	TWO OV		CASE	P. A. F	(UN	NT OF COST	& BENE	TT : BAHT
		CUMÚ- LATIVE		COSTS	1	BENEFITS				CUMU-		COSTS		BENEFIT:	922228423 3
	•••••	E S A (X1000)		OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	TEAR	ннит	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	RMC	TOTAL
1992 1993 1994	1444 1502 1562 1625	80 164 250 340 434 532 634	3.8 3.1 2.8 2.5 2.3 2.2	664,229 0 0 0 0 0	735,031 765,457 721,244 749,774 779,554 811,712	4,287 3,695 3,082 2,447 1,783 1,090	739,318 769,152 724,326 752,221 781,336 812,802	1992 1993 1994 1995 1996		80 164 250 340 434 98	3.Ç	0 0 0 488, 843	749,774 779,554	3,645 3,157 2,647 2,113	739,153 697,032 724,402 752,420 781,667 900,295
TOTAL			2.1		842,818		843,186 		1689	200	2.9		842,818 5,417,900		846,629
DISCOU				336,519		6,208	1,774,950	DISCOU		OTAL		328,178	1,761,290	7,886	1.769.180
	BE	NEFIT CO	ST RAT		1,438,43 5.3 112.1	-		· ·	BE	T FRESEN NEFIT CO TERNAL R	ST RAT		1,441,00 5,4 147,9		
STUI	OY ROU	TE RH	- 12	(207 - 02))2)		·	SEC	TION :	493 - 4	94				
SURF	FACE T	YPE : DT.	/51				ан сайта сайта На	WID	TH OF	ROAD : 6	.2 M				
	. · ·			an an tagt		с. 1914 г. 1914 г. – Р	DOH (CALIFO	RNIA) MET	THOD	 		an an thair			
				(U)	IIT OF COST	& BENER	FIT : BAHT)	TWO OV	ÆRLAY	CASE	•	Constant Constant	VIT OF COST	& BENE	FIT : ВАНТ
		CUMU-		COSTS	•	BENEETTS				CUMU-	*====	COSTS		BENEFIT:	
		ESA	• • •	OVERLAY	V.0.C	RMC	TOTAL	YEAR	AAUT	LATIVE E S A	PSI		V. a. c		TOTAL

YEAR	AADT	CUMU-	PSI	COSTS		BENEFITS	8	YEAR	AADT	CÚMU-		COSTS		BENEFITS	======================================
 	· · · · · · · · · · · · · · · · · · ·	ESA (X1000)		OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL) ERK	AADT	LATIVE E S A (X1000)	FSI	OVERLAY COST	V Q C SAVING	R M C SAVING	TOTAL
1986 1987 1988 1989 1990 1991 1992	1084 1135 1186 1233 1282 1334 1389	65 133 205 278 355 435 519	3.8 3.1 2.8 2.5 2.3 2.2 2.1	781,154 0 0 0 0 0 0	596,610 624,724 592,159 615,582 639,910 665,863 693,386	3,703 3,086 2,447 1,785 1,093	600,899 628,427 595,245 618,029 641,695 666,956 693,757	1986 1987 1988 1989 1989 1990 1991 1992	1334	65 133 205 278 77 157 241	3.5 2.8 2.4 2.1 3.5 2.8 2.4	547,305 0 0 488,843 0 -122,211	596,610 565,958 592,159 615,582 706,389 665,863 693,386		600,65 569,43 595,04 617,87 710,45 669,40 676,37
TOTAL				781,154	4,428,230	16,774	4,445,010	TOTAL				913,937	4,435,950	23,302	4,459,25
DISCOU	NTED 1	OTAL		697,459	2,551,350	10,954	2,562,310	DISCOU	NTED T	OTAL		721,973	2,543,210	13,706	2,556,910

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BENEFIT COST RATIO : INTERNAL RATE OF RETURN : \$

3.7 77.1 %

NET PRESENT VALUE:1,834,930BENEFIT COST RATIO:3.5INTERNAL RATE OF RETURN:103.5 %

APPENDIX 4.8.4 5/25

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STUDY ROUTE : RH - 12 (207 - 0202)

SURFACE TYPE : DT/ST

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ASPHALT INSTITUTE METHOD

in the second officer

ONE OV	ERLAY CASE		(UN	IT OF COST	& BÈNEF	IT : BAHT)	en finale An finale						•
*****	CUMU-				BENEFITS		ning Aning ang ang ang		en de la composition de la composition de la composition de la composition de		 n segura de		•
YEAR	AADT LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	un suñ Noise Las graint	n Maria Maria Maria Maria Maria					
1985 1986 1987	1038 63 1084 128 1135 196	4.2 3.7 3.4	488,843 0 0	570,608 596,610 624,724	4,307	600,917 628,843			an tha an teach an An Airte an teach An Airte An Airte Airte Airte An				
1988 1989 1990 1991	1186 268 1233 341 1282 418 1334 498	3.2 3.1 2.9 2.3	0 0 0 -244,421	653,695 679,573 639,910 665,863	3,717 3,506	657,617 683,291 643,416 669,147		ی این این این این این این این این این این این این این			 	• • •	1 ¹¹
TOTAL		·····	244, 421	4,430,980	27,343	4,458,330	1. · · ·		· · · · · · · · · · ·	· · · ·	÷.,	· . ·	•
)1SCOU	NTED TOTAL		390,125	2,856,200	18,236	2,874,430	. •					1. 1.	

NET PRESENT VALUE	:	2,484,310
BENEFIT COST RATIO	:	7.4
INTERNAL RATE OF RETURN	\$.	121.8 %

~		$(x_{i})_{i \in \mathbb{N}}$	19.0	DOH	(CALIF	ORNIA)	METHOD
-		1.1		 			

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 $(x_1, \dots, x_n, \theta_{n-1}, \dots, \theta_{n-1}, \dots, \theta_{n-1}, \dots, \theta_{n-1}, \theta_{n-1}, \theta_{n-1}, \dots, \theta_{n-1}, \theta_{n-1}, \dots, \theta_{n-1})$

SECTION : 494 - 495

WIDTH OF ROAD : 6.2 M

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IOD

		CUMU-		COSTS		BENEFITS				CUMU-		COSTS	Į	BENEFITS	
YEAR	ΑΑρτ	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	YEAR	AADT	LATIVE E S A (X1000)	PSI	ÖVERLAY COST		R M C SAVING	TOTAL
1985 1986 1987 1988 1989 1990 1991	1038 1084 1135 1186 1233 1282 1334	63 128 196 268 341 418 498	3.8 3.1 2.8 2.5 2.3 2.2 2.1	722,691 0 0 0 0 0 0 0	570,608 596,610 565,958 592,159 615,582 639,910 665,863	3,698 3,087 2,444 1,778 1,089	574,825 600,308 569,045 594,603 617,360 640,928 666,230	1985 1986 1987 1988 1989 1990 1990	1038 1084 1135 1186 1233 1282 1334	63 128 196 268 73 150 230	3.5 2.8 2.4 2.1 3.6 2.9 2.5	547,305 0 0 488,343 0 -195,537	570,608 540,510 565,958 592,159 679,573 639,910 665,863	3,483 2,903 2,288 4,133	574,64 543,99 568,86 594,44 683,70 643,57 669,04
TOTAL				722.691	4,246,690	16,751	4,263,440	TOTAL	··········			840,611	4,254,580	23,693	4,278,28
DISCO	INTED 1	OTAL	a tog	722,691	2,738,950	12,253	2,751,200	DISCOU	NTED T	OTAL		778,999	2,730,540	15,545	2,746,080

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APPENDIX 4.8.4 6/25

SECTION : 495 - 496 STUDY ROUTE : RH - 12 (207 - 0202)

WIDTH OF ROAD : 6.2 M SURFACE TYPE : DT/ST

DOH (CALIFORNIA) METHOD

		CUMU-		COSTS	tan Tana arawa	BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)		OVERLAY COST	V O C SAVING		TOTAL
1988	1186	72	3.8	488,843	653,695	4,309	658,004
1989	1233	145	3.2	0	679,573	3,771	683,340
1990		222			639,910		
	1334	302			665,863		
	1389	386		- O -	673,386		
1993	1444	472	2.3	Q -	721,244	1,395	
1994	1502	562	2.1	-61,105	749,774	742	750,516
OTAL				427,738	4,803,450	18,091	4,821,540
ISCOL	NTED	TOTAL		330,382	2,207,990	.9,258	2,217,240

,

STUDY ROUTE : RH - 12 (207 - 0202) SURFACE TYPE : DT/ST

ASPHALT INSTITUTE METHOD

	CUMU-		COSTS		BENEFITS	
Year aadt	LATIVE E S A (X1000)		OVERLAY COST	V Q C SAVING		TOTAL
1985 1038	63	4.4	488,843	570,603	4,544	575,152
1986 1084	128	4.0	0	596,610	4,478	601,087
1987 1135	196	3.8	0	624,724	4,402	629,133
1988 1186	268	3.7	. "O	653,695	4,337	658,032
1939 1233	341	3.5	0	679,573	4,262	683,835
1990 1282	418	3.4	0	706,389	4,185	710,570
1991 1334	498	3.3	-244,421	735,031	4,104	739,135
TOTAL			244,421	4,566,630	30,317	4,596,950
DISCOUNTED T	OTAL		390,125	2,921,160	19,915	2,941,080

BENEFIT COST RATIO : 7.5 INTERNAL RATE OF RETURN : 122.1 ?

DOH (CALIFORNIA) METHOD _____

		CUMU-	6 .5.7	COSTS		BENEFITS	
YEA	r aadt	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
198	5 1038	63	4.1	488,843	570,608	4,449	575,05
198	6 1084	128	3.5	• 0	596,610	4.190	600,80
198		1	3.2	0	624,724	3,922	628,64
198	· · · · · · · · · · · · · · · · · · ·	263	з.о	-0	653,695	3,632	657,33
198	9 1233	341	. 2.9	0	615,582	3,347	618,92
192	0 1282	418	2.7	· 0	639,910	3,044	642,95
199	1 1334	498	2.6	-244,421	665,863	2,727	668,59
тота	 L			244,421	4,366,990	25,318	4,392,310
DISC	OUNTED	TOTAL		390,125	2,819,890	17,092	2,834,98

BENEFIT COST RATIO : 7.3 INTERNAL RATE OF RETURN

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APPENDIX 4.8.4 7/25

SECTION : 496 - 497 WIDTH OF ROAD : 6.2 M

122.1 %

121.5 %

STUDY ROUTE : RH - 12 (207 - 0202) SURFACE TYPE : DT/ST

the second second second second second

SECTION : 497 - 498

WIDTH OF ROAD : 6.2 M

ASPHALT INSTITUTE METHOD

	BENÉFITS	1	COSTS	PSI -	CUMU-		VEAD
TOTAL	R M C SAVING	V O C SAVING	OVERLAY COST		E S A (X1000)	AADT	YEAR
657,97	4,283	653,695	605,767	3.8	72	1186	1988
683,26	3,693	679,573	0	3.1	145	1233	1989
642,99	3,082	639,910	0	2.8	222	1282	1990
668,30	2,443	665,863	Č 0	2.5	302	1334	1991
695,16	1,775	693,386	o la co	2.3	386	1389	1992
722,32	1,083	721,244	0	2.2	472	1444	1993
750,14	366	749.774	0	2.1	562	1502	1994
4,820,17	16,724	4,803,450	605,767		· · · · · · · · · · · · · · · · · · ·		OTAL
2,216,70	8,709	2,207,990	431,173		OTAL	NTED T)ISCOU

	inas in Lines -	CUMU-	na di kacala Nimma	COSTS	n the second	BENEFIT
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V Ú C SAVING	
1988	1186	72	3.6	488,843	653,695	4,138
1989	1233	145	2.9	o de la composición de	615,582	3,695
1990	1282	222	2.5	0	639,910	3,226
1991	1334	302	2.3	0	665,863	2,740
1992	1389	386	2.1	0.1	693,386	2,229
1993	1444	86	3.7	488,843	796,214	4,283
1994	1502	176	3.i	-349,174	327,671	3,977
TOTAL				628,512	4,892,320	24,289
DISCOU	NTED 1	IOTAL.		445,005	2,223,790	11,326

INTERNAL RATE OF RETURN 131.2 %

NET PRESENT VALUE : 1,785,520 BENEFIT COST RATIO : 5,1 INTERNAL RATE OF RETURN : 109.2 %

DOH (CALIFORNIA) METHOD

•		CUMU-		COSTS		BENEFIT	3			CUMU-		COSTS	1	BENEFITS	í
YEAR	AADT	LATIVE E S A (X1000)	FSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAÝ COST	V O C SAVING	R M C SAVING	-
1985	1038	63	3.8	1,210,190	570,608	4,287	574,895	1985	1038	63	3.5	1,084,780	570,608		
1986	1084	128	:3 , 1	о с о с	596,610	3,698	600,308	1986	1034	128	2.8	0	540,510		
1987	1135	196	2.8	0	565,958	3,087	569,045	1987	1135	196	2.4	Q .	`565,95 8		
1988	1186	268	2.5	Ŭ (592,159	2,444	594,603	1988	1186	268	2.1	0	592,159		
1989	1233	341	2.3	· 0	615,582	1,778	617,360	1989	1233	73	3.3	664,229	679,573	3,850	
1990	1282	418	2.2	· · O	639,910	1,039	640,998	1990	1282	150	2.5	0	639,910		
1991	1334	498	2.1	0	665,863	368	666,230	1991	1334	230	2.1	· · O	665,863	2,288	
TOTAL				1,210,190	4,246,690	16,751	4,263,440	TOTAL				1,749,010	4,254,580	21,934	
DISCOU	NTED 1	TAL	· · · · · · · · · · · · · · · · · · ·	1,210,190	2,738,950	12,253	2,751,200	DISCOU	INTED 1	TOTAL		1,506,910	2,730,540	14,684	•

BENEFIT COST RATIO 2.3 INTERNAL RATE OF RETURN : 45.3 %

1.8 BENEFIT COST RATIO INTERNAL RATE OF RETURN 43.3 % APPENDIX 4.8.4

8/25

T & BENEFIT : BAHT)	
BENEFITS	
R M C TOTAL SAVING	
25 4,138 657,833 32 3,695 619,276 0 3,226 643,136 33 2,740 668,603 36 2,229 695,616 4 4,283 800,498 1 3,977 831,648	-
0 24,289 4,916,610	
0 11,326 2,235,120 110 0 2 %	
T & BENEFIT : BAHT) BENEFITS	

10 63	3,084 2,283	642,993 668,151
 80	21,934	4,276,520
40 ===	14,684	2,745,220

STUDY ROUTE :	RH - 16	(214 - 0100)	SECTION :	7		8
SURFACE TYPE :	DT/ST		WIDTH OF ROA	Ð	1	6.0 M

DOH (CALIFORNIA) METHOD

		CUMU-		COSTS	İ	BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1989	1736	58	3.8	473,074	834,572	4,328	838,879
1990	1801	117	3.2	0	865,244	3,827	869,071
1991	1870	179	2.9	0	811,713	3,309	815,022
1992	1941	243	2.6	0	842,519	2,769	845,288
1993	2013	307	2.5	0	873,584	2,213	875,797
1994	2091	378	2.3	0	907,282	1,635	908,917
1995	2171	450	2.2	-59,134	942,503	1,031	943,534
DTAL				413,940	6,077,420	19,111	6,096,530
niscoù	INTED	TOTAL		285,469	2,497,470	8,630	2,506,100

NET PRESENT VALUE	:	2,220,630
BENEFIT COST RATIO	:	8.8
INTERNAL RATE OF RETURN	:	178.5 %

6

STUBY ROUTE : RH - 16 (214 - 0100)

SURFACE TYPE : DT/ST

DOH (CALIFORNIA) METHOD

		CUMU-	je. Rođe	COSTS	BENEFITS					
YEAR	AADT	LATIVE ESA (X1000)	PSI	OVERLAY COST	V Q Č SAVING	R M C SAVING	TOTAL			
1991	1870	62	3.9	473,074	878,433	4,367	902,80			
1992	1941	126	3.3	0	932,511	3,943	936,45			
1993	2013	192	3.0	· 0	873,584	3,505	377,08			
1994	2091	261	2.7	0	907,282	3,050	210,33			
1995	2171	333	2.6	0	942,503	2,575	945,07			
1996	2253	407	2.4	.0	978,221	2,083	980,30			
1997	2339	485	2.3	-105,128	1,015,540	1,571	1,017,11			
TOTAL				367,946	6,548,070	21,092	6,569,17			
DISCOU	NTED 1	TOTAL		218,163	2,144,940	7,448	2,152,39			

NET PRESENT VALUE : 1,934,230 BENEFIT COST RATIO : 9,9 INTERNAL RATE OF RETURN :

 $\frac{1}{2} \left(\frac{1}{2} - \frac{1}{2} \right) = \frac{1}{2} \left(\frac{1}{2} - \frac{1}{2} \right) \left(\frac{1}{2}$ SECTION : 11 - 12

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STUDY ROUTE : RH - 16 (214 - 0100)

SURFACE TYPE : DT/ST

WIDTH OF ROAD : 6.0 M

DOH (CALIFORNIA) METHOD

ONE OVERLAY CASE (UNIT OF COST & BENEFIT : BA	ңг х

and the second		CUMU-	· ·	COSTS	BENEFIT	S
YEAR	AADT	ESA OVE		OVERLAY COST	VOC RMC SAVING SAVING	TOTAL.
1986	1539	50	3.9	473,074	738,735 4,361	743,096
1987	1604	102	3.3	0	770,058 3,923	773,980
1988	1671	158	3.0	0	725,275 3,459	728,734
1989	1736	216	2.7	. 0	753,984 2,969	756,953
1990	1801	275	2.5	0	781,738 2,466	734,204
1991	1870	337	2.4	0	811,713 1,946	813,659
1992	1941	401	2.3	-105,128	842,519 1,405	843,924
TOTAL			<u></u>	367,946	5,424,020 20,529	5,444,550
 DISCOU	NTED 1	TOTAL		384,477	3,129,290 12,849	3,142,140

NET PRESENT VALUE	:	2,757,670
BENEFIT COST RATIO	z	8.2
INTERNAL RATE OF RETURN	:	158.6 %

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APPENDIX 4.8.4 9/25

SECTION: 9 - 10

WIDTH OF ROAD : 6.0 M

192.2 %

STUDY ROUTE : RH - 16 (214 - 0100)

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SURFACE TYPE : DT/ST

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	ASPHAL	T INSTITUTE METHO)
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NE OVERLAY (ASE		VIT OF COST & BENEF	IT : BAHT)	an a		an a	 A start of the sta
	 CUMU- LATIVE PSI	COSTS	BENEFITS		··· ··			
	LATIVE PSI E S A X1000)	OVERLAY COST	V O C R M C SAVING SAVING	TOTAL			han an Arabi An Santa (Santa) An Santa (Santa) An Santa (Santa) An Santa (Santa)	
1991 1870 1992 1941 1993 2013 1994 2091	62 4.2 126 3.7 192 3.5 261 3.3	473,074 0 0	898,433 4,494 932,511 4,329 966,924 4,157 1,004,220 3,980	902,928 936,840 971,082 1,008,200				
1995 2171 1996 2253 1997 2339	333 3.1 407 3.0 485 2.9	0 0 -236,537	1,043,220 3,794 978,221 3,602 1,015,540 3,402	1,047,020 981,823 1,018,940		filmen og som	an Arago (Arago) Ara Arago (Arago)	n 1995 - Santa Santa 1995 - Santa Santa Santa
			6,839,070 27,759	4.866.830	· · · · · · ·			

NET PRESENT VALUE	:	2,056,850
BENEFIT COST RATIO	:	11.8
INTERNAL RATE OF RETURN	:	194.5 %

DOH (CALIFORNIA) METHOD

	BENEFITS	• 1	COSTS		CUMU- LATIVE				BENEFITS	I	COSTS		CUMU-		
TOTAL	R M C SAVING	V O C SAVING	OVERLAY COST		E S A (X1000)		YEAR	TOTAL	AADT LATIVE PSI E S A OVERLAY V D C R M C TOTAL (X1000) COST SAVING SAVING	YEAR					
711,122	4,197	706,926	473,074	3.7	43	1475	1985	711,217	4,291	706,926	586,226	3.8	48	1475	1985
671,329	3,801	667,528	0	3.0	98	1539	1986	742,444		738,735	0	3.2	93	1539	1986
699,167	3,390	695,777	0	2.6	150	1604	1987	698,879	3,102	695,777	ò	2.3	150	1604	1987
728,223	2,948	725,275	· Q	2.4	206	1671	1988	727,735	2,460	725,275	Ö	2.6	206	1671	1988
756,470	2,489	753,984	Ø	2.2	264	1736	1,989	755,767	1,783	753,984	0	2.4	264	1736	1989
869,505	4,261	865,244	473,074	3.7	59	1801	1990	782,826	1,088	781,738	Ō	2.2	323	1801	1990
902,364	3,931	898,433	-337,910	3.1	121	1870	1991	812,082	368	811,713	. 0	2.1	385	1870	1991
5,338,180	25,017	5,313,170	608,238				TOTAL	5,230,950	16,800	5,214,150	586,226				TOTAL
3,408,510	16,413	3,392,090	605,032		OTAL	NTED T	DISCOL	3,379,610	12,288	3,367,330	586,226		OTAL	 NTED 1	DISCOU

BENEFIT COST RAT	10 :	2,793,390 5.8 122.5 %	NET PRESENT VAL BENEFIT COST RA INTERNAL RATE OF
	:		an golden donated been
	internet and a second		

NET INCOUNT VALOE		
BENEFIT COST RATIO	:	•
INTERNAL RATE OF RETURN	:	

Contract Magnetic education of SECTION: 8 - 9

WIDTH OF ROAD : 6.0 M

A set of the set of

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APPENDIX 4.8.4 10/25

5.6

147.3 %

STUDY ROUTE : RH - 16 (214 - 0100)

SURFACE TYPE : DT/ST

ASPHALT INSTITUTE METHOD است. است هذه ۲۰۰۹ الاس معد علم الفتر التي يون جود جمل منه التاريخي وي بوت عند متر <u>من وي بوت بوت ا</u>

VEAD	AADT	CUMU-	PSI	COSTS		BENEFITS	
YEAR	AADT	E S A (X1000)	691	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	1475	43	4.3	473,074	706,926	4,519	711,445
1986	1539	98	3.9	0	738,735	4,403	743,13
1987	1604	150	3.6	0	770,058	4,282	774,340
1988	1671	206	3.4	0 N	802,771	4,154	806,925
1989	1736	264	3.3	O	834,572	4,019	838,591
1990	1801	323	3.2	0	865,244	3,881	869,125
1991	1870	385	3.1	-236,537	898,433	3,737	902,170
OTAL				236,537	5,616,740	28,995	5,645,730
)ISCOU	7 NTED 7	OTAL.		377,540	3,596,710	19,170	3,615,880

NET PRESENT VALUE : 3,238,340 BENEFIT COST RATIO : 9.6 INTERNAL RATE OF RETURN : 154.7 %

DOH (CALIFORNIA) METHOD _____

	00DT	CUMU-	- 	COSTS	BENEFITS			YEAR	AAUT	CUMU LATIVE	PSI	COSTS		BE
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V D C SAVING	R M C SAVING	TOTAL	TEHN	HHD I	E S A (X1000)	101	OVERLAY COST	V 0 C SAVING	
1985	1475	43	3.8	529,650	706,926	4,291	711,217	1985	1475	48	3.7	473,074	706,926	
1986	1539	93	3.2	0	738,735	3,708	742,444	1986	1539	98	3.1	0	738,735	
1987	1604	150	2.8	0	695,777	3,102	698,879	1987	1604	150	2.7		695,777	
1988	1671	206	2.6	0	725,275	2,460	727,735	1988	1771	206	2.4	Q	725,275	
1989	1736	264	2.4	0	753,984	1,783	755,767	1989	1736	264	2.2	. ·	753,984	
1990	1801	323	2.2	0	781.738	1.088	782,826	1990	1801	323	2.1	. Q	781,738	
1991	1370	385	2.1	0	811,713	368	812,082	1991	1870	62	3.8	67,582	878,433	
TOTAL				529,650	5,214,150	16,800	5,230,950	TOTAL				1,013,730	5,300,870	2
DISCOU	NTED 1	TOTAL		529,650	3,367,330	12,288	3,379,610	DISCOU	NTED 1	TOTAL		534,608	3,406,550	1

NET PRESENT VALUE	:	2,849,960
BENEFIT COST RATIO	:	6.4
INTERNAL RATE OF RETURN	:	135.6 %

BENEFIT COST RATIO 6.4 151.7 %

SECTION : 10 - 11 WIDTH OF ROAD : 6.0 M

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& BENEF	IT : BAHT)
BENEFITS	
R M C SAVING	TOTAL
4,243 3,897 3,537 3,149 2,747 2,338 4,286	711,169 742,632 699,313 728,424 756,730 784,076 902,719
24,196	5,325,060
16,095	3,422,650

3,040

STUDY ROUTE. :	RH - 25	(2071 - 0100) SE
SURFACE TYPE :	DT/ST	en November 1974 aug	WI

ASPHALT INSTITUTE METHOD

	in in the second se Second second	CUMU-		COSTS	1	BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST		R M C SAVING	TOTAL
1985 1986 1987 1988 1989 1989 1990 1991	1206 1271 1339 1414 1478 1544 1614	111 229 352 431 616 757 904	4.5 4.3 4.1 4.0 3.9 3.8 3.7	394,228 0 0 0 0 0 0 -197,114	727,418 766,462 806,161 851,450 890,090 929,059 970,513	4,547 4,527 4,505 4,483 4,483	731,984 771,003 810,683 855,955 894,573 933,518 974,947
TOTAL				197,114	5,941,150	31,521	5,972,68
DISCOU	NTED 1	FOTAL.		314,617	3,790,180	20,596	3,810,78

BENEFIT COST RATIO : 12.1 INTERNAL RATE OF RETURN : 191.0 % 1. 1. 1.

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DOH (CALIFORNIA) METHOD

i de la composición d Composición de la composición de la comp		CUMU-		COSTS	1	BENEFITS	;
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	1206	111	4.5	394,228	727,418	4,566	731,98
1986	1271	229	4.3	. 0	766.462	4,545	771,00
1987	1339	352	4 1		806,161	4,524	810,68
1988	1414	481	4.0	0	851,450	4,501	855,95
1989	1478	616	3.9	0	890,090	4,478	394,56
1990	1544	757	3.8	0	929,059	4.453	933,51
1791	1614	904	3.7	-197,114	970,513	4,427	974,94
TOTAL	 .	e vogun	 -	197,114	5,941,150	31,494	5,972,65
DISCOU	NTED	TOTAL	······································	314,617	3,790,180	20,580	3,810,76

	NET PRESENT VALUE		3	, 496
÷	BENEFIT COST RATIO	. 1		12
	INTERNAL RATE OF RETURN			191

WIDTH OF ROAD : 5.0 M SURFACE TYPE : DT/ST

ASPHALT INSTITUTE METHOD

		CUMU		COSTS		BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V D C SAVING	R M C SAVING	TOTAL
1985	1206	111	4.6	394,228	727,418	4,569	731,98
1986	1271	229	4.3	. O	766,462	4,554	771,01
1987	1339	352	4.2	0	806,161	4,539	810,70
1988	1414	481	4.1	0.	851,450	4,523	855,97
1989	1478	616	4.0	0	890,090	4,506	894,59
1990	1544	757	3.9	0	929,059	4,489	933,54
1991	1614	904	3.8	-197,114	970,513	4,470	974,98
TOTAL				197,114	5,941,150	31,650	5,972,80
uscou	NTED 1	TOTAL		314,617	3,790,180	20,668	3,810,85

NET PRESENT VALUE	1	3,496,230
BENEFIT COST RATIO	:	12.1
INTERNAL RATE OF RETURN	:	191.0 %

DOH (CALIFORNIA) METHOD _____

(UNIT OF COST & BENEFIT : BAHT) ONE OVERLAY CASE

	BENEFITS		COSTS	a tera	CUMU-		
TOTAL	R M C SAVING	V D C SAVING	OVERLAY COST	PSI ·	LATIVE E S A (X1000)	AADT	YEAR
731,989	4,571	727,418	394,228	4.6	111	1206	1985
771.023	4,560	766,462	0	4.4	229	1271	1986
810,711	4,550	806,161	0	4.2	352	1339	1987
855,988	4,538	851,450	0	4.1	481	1414	1988
394,616	4,526	870,020	0	4.1	616	1473	1989
933,573	4,513	929,059	· · · · ·	4.0	757	1544	1990
975,013	4,500	970,513	-197,114	3.9	904	1614	1991
,972,910	31,759	5,941,150	197,114				TOTAL
,810,910	20,730	3,790,180	314,617		TOTAL	NTED 1	DISCOU

NET PRESENT VALUE : 3,496,300 BENEFIT COST RATIO : 12.1 12.1 191.0 % INTERNAL RATE OF RETURN

APPENDIX 4.8.4

12/25

ECTION : 11 - 12 IDTH OF ROAD : 5.0 M

5,150 2.1

.0%

SECTION : 12 - 13 STUDY ROUTE : RH - 25 (2071 - 0100) WIDTH OF ROAD : 5.0 M SURFACE TYPE : DT/ST

ASPHALT INSTITUTE METHOD

(UNIT OF COST & BENEFIT : BAHT)					ONE OVERLAY CASE				
	BENEFITS	l	COSTS	PGT	CUMU- LATIVE	AADT	YEAR		
TOTAL	R M C SAVING	V Q C SAVING	OVERLAY COST	101	E S A (X1000)		TERK		
731,982	4,564	727,418	394,228	4.5	111	1206	1985		
771,003	4,540	766,462	0	4.2	229	1271	1986		
810,676	4,515	806,161	0	4.1	352	1339	1987		
855,932	4,482	851,450	· 0	3.2	481	1414	1788		
894,552	4,461	390,090	0	3.8	616	1473	1989		
933,492	4,432	929,059	0	3.7	757	1544	1990		
974,915	4,402	970,513	-197,114	3.7	904	1614	1991		
5,972,560	31,405	5,941,150	197,114		.*.		TOTAL		
3,810,710	20,530	3,790,180	314,617		OTAL	NTED T	DISCOU		

NET PRESENT VALUE BENEFIT COST RATIO : 3,496,100 : 12.1 INTERNAL RATE OF RETURN 191.0 %

DOH (CALIFORNIA) METHOD -----

		CUMU-	A a t	COSTS		BENEFITE	;
YEAR	AADT	LATIVE ESA (X1000)	FSI	OVERLAY COST	V Q C SAVING	R M C SAVING	TOTAL
1285	1206	111	4.5	394,228	727,418	4,561	731,979
1986	1271	229	4.2	0	766,462	4,529	770,991
1987	1339	352	4.0	0	806,161	4,496	810,652
1988	1414	481	3.8	0	851,450	4,462	855,912
1982	1478	616	3.7	0	890,090	4,425	894,510
1990	1544	757	3.6	0	929,059	4,387	933-444
1991	1614	904	3.6	-197,114	970,513	4,348	974,86
OTAL				197,114	5,941,150	31,208	5,972,360
18000	NTED	TOTAL	·····	314,617	3,790,180	20,419	3,310,600

NET PRESENT VALUE :	3,495,990
BENEFIT COST RATIO :	12.1
INTERNAL RATE OF RETURN :	190.9 %

SECTION : 13 - 14 STUDY ROUTE : RH - 25 (2071 - 0100) WIDTH OF ROAD : 5.0 M SURFACE TYPE : DT/ST

ASPHALT INSTITUTE METHOD

		CUMU-	DOT	COSTS	. I	BENEFITS			
YEAR	AADT	LATIVE ESA (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL		
1985	1206	111	4.6	394,228	727,418	4,569	731,986		
1986	1271	229	4.3	0	766,462	4,553	771,015		
1987	1339	352	4.2	· 0	806,161	4,537	810,698		
1988	1414	481	40	0	851,450	4,520	855,970		
1989	1478	616	4.Ŭ	0	820,090	4,502	894,592		
1990	1544	757	3.9	0	929,059	4,483	933,543		
1991	1614	904	3.8	-197,114	970,513	4,464	974,977		
TOTAL				197,114	5,941,150	31,627	5,972,780		
DISCOL	INTED	TOTAL		314,617	3,790,180	20,655	3,810,840		

NET PRESENT VALUE BENEFIT COST RATIO : 12.1 INTERNAL RATE OF RETURN : 191.0 %

DOH (CALIFORNIA) METHOD

:		CUMU-	• .	COSTS	COSTS BENEFITS				
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL		
1985	1206	111	4.6	394,228	727,418	4,570	731,988		
1986	1271	229	4.4	0	766,462	4,558	771,020		
	1339	352	4.2	0	806,161	4,545	810,707		
1988	1414	481	4.1	0	851,450	4,532	855,983		
1989	1473	616	4.0	0	890,090	4,518	894,609		
1990	1544	757	3.9	0	929,059	4,504	933,563		
1991	1614	904	3.9	-197,114	970,513	4,489	975,002		
TOTAL		· · · · · · · · · · · · · · · · · · ·		197,114	5,941,150	31,717	5,972,870		
DISCOL	INTED	TOTAL		314,617	3,790,180	20,706	3,810,890		

BENEFIT COST RATIO : INTERNAL RATE OF RETURN

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APPENDIX 4.8.4

13/25

: 3,496,220 **:**

12.1 191.0 %

STUDY ROUTE : RH - 25 (2071 - 0100) SECTION : 15 - 14 SURFACE TYPE : DT/ST WIDTH OF ROAD : 5.0 M

ASPHALT INSTITUTE METHOD

- 19 - 19 - 19 - 19 - 19 - 19 - 19 - 19	ONE OVERLAY	UA31. 222222			IIT OF COST	& DCNCC ========	
n en seus de la compañía. Na		CUMU-	D D T	COSTS	1	BENEFITS	
an taon 19 19 - Anna Anna Anna 19 - Anna Anna Anna Anna Anna Anna Anna An	YEAR AADT	LATIVE E S A (X1000)	PSI Ange Po Ange Po	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
	1985 1206 1986 1271 1987 1339 1988 1414 1989 1478 1990 1544 1991 1614	229 352 481 616 757	4.6 4.4 4.3 4.2 4.1 4.0 3.9	394,223 0 0 0 0 0 -197,114	727,418 766,462 806,161 851,450 890,090 929,059 970,513	4,562 4,552 4,541 4,530 4,518	731,989 771,024 810,713 855,991 894,620 933,578 975,019
	TOTAL			197,114	5,941,150	31,781	5,972,940
	DISCOUNTED	TOTAL	ant an th	314,617	3,790,180	20,742	3,810,930

NET PRESENT VALUE : 3,496,310 BENEFIT COST RATIO : 12.1 INTERNAL RATE OF RETURN : 191.0 %

DOH (CALIFORNIA) METHOD

		CUMU-		COSTS	BENEFITS			
YEAR	AAD1	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	ATOT	
1985	1206	111	4.7	394,228	727,418	4,574	731,	
1986	1271	229	4.5	· 0	766,462	4,571	771,	
1937	1332	352	4.4	0	806,161	4,567	810,	
1938	1414	481	4.3	0	851,450	4,564	856,	
1939	1478	616	4.3	· 0	890,090	4,560	894,	
1990	1544	757	4.2	0	.929,059	4,556	933,	
1991	1614	904	4.2	-197,114	970,513	4,551	975,	
TOTAL				197,114	5,941,150	31,943	5,973,	
DISCOU				314,617	3,790,180	20,833	3,811,	

NET PRESENT VALUE : 3,496,400 BENEFIT COST RATIO : 12.1 INTERNAL RATE OF RETURN : 191.0 %

STUDY ROUTE : RH - 25 (2071 - 0100) SECTION: 14 - 15 WIDTH OF ROAD : 5.0 M SURFACE TYPE : DT/ST

ASPHALT INSTITUTE METHOD

· · · ·	•	CUMU-		COSTS		BENEFITS	t e t j
YEAR	AADT	E S A (X1000)	i para s	OVERLAY	V O C SAVING	R M C SAVING	TOTAL
1985	1206	111	4 5	394,228			731,979
	1271	229	4.2	- O	766,462	4,531	770,993
1987	1332	352	4.0	0	806,161	4,499	810,660
1988	1414	481	3.9	0	851,450	4,466	855,914
1989	1478	616	3.8	0	890,090	and the second second	894,521
199Ò -	1544	757	3.7	0	929,059		933,453
1991	1614	7Q4	3.6	-197,114	970,513	4,356	974,869
OTAL		. :	· <u> </u>	197,114	5,941,150	31,238	5,972,390
tscoll	 NTED 1	OTAL		314,617	3,790,180	20,436	3,810,620

NET PRESENT VALUE 3,496,000 BENEFIT COST RATIO 12.1 INTERNAL RATE OF RETURN : 190.9 %

DOH (CALIFORNIA) METHOD _____

-	CUMU~					BENEFITS			
YEAR	AADT	LATIVE E SA (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL		
1985	1206	111	4.4	394,228	727,418	4,552	731,970		
1936	1271	229	4.1	0	766,462	4,504	770,960		
1987	1339	352	3.9	O .	806,161	4,453	810,614		
1988	1414	481	3.7	0	851,450	4,400	855,850		
1989	1478	616	3.6	0	870,090	4,344	394,434		
1990	1544	757	3.5	0	929,059	4,285	933,344		
1991	1614	904	3.4	-197,114	970,513	4,224	974,737		
FOTAL				197,114	5,941,150	30,762	5,971,920		
)ISCOU	NTED T	OTAL	······································	314,617	3,790,180	20,167	3,810,350		

NET PRESENT VALUE	2	3,495,730
BENEFIT COST RATIO	1 1	12.1
INTERNAL RATE OF RETURN	÷.	190.9 %

APPENDIX 4.8.4

 STUDY ROUTE
 : RH - 25 (2071 - 0100)
 SECTION : 16 - 17

 SURFACE TYPE : DT/ST
 WIDTH OF ROAD : 5.0 M

ASPHALT INSTITUTE METHOD

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	CUMU			COSTS	- 1 - I	BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	1206	111	4.4	394,228	727,413	4,555	731,973
1986	1271	229	4.1	. 0	766,462	4,512	770,974
1987	1339	352	3.9	0	806,161	4,466	810,627
1988	1414	481	3.7	0	851,450	4,418	855,869
1989	1478	616	3.6	0	870,090	4,368	894,458
1990	1544	757	3.5	0	929,059	4,316	933,375
1991	1614	904	3.4	-197,114	970,513	4,261	974,774
FOTAL				197,114	5,941,150	30,875	5,972,050
 3ISCOU	NTED 1	TOTAL		314,617	3,790,180	20,243	3,810,430

4.4	NET PRESENT VALUE	:	3,495,810
	BENEFIT COST RATIO	:	12.1
	INTERNAL RATE OF RETURN	:	190.9 %

DOH (CALIFORNIA) METHOD

		CUMU-		COSTS	1	BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	1206	111	4.3	394,228	727,413	4,535	731,95
1986	1271	229	3.7	0	766,462	4,452	770,91
1787	1339	352	3.7	Q	306,161	4,364	810,52
1988	1414	481	3.5	0	851,450	4,271	855,72
1989	1473	616	3.4	· 0	890,090	4,175	894,26
1990	1544	757	3.3	0	929,059	4,074	933,13
1991	1614	904	3.2	-197,114	970,513	3,969	974,48
TOTAL				197,114	5,941,150	29,839	5,970,99
 DISCOU	NTED T	TOTAL		314,617	3,790,180	19,647	3,809,83

NET PRESENT VALUE	:	3,495,210
BENEFIT COST RATIO	:	12.1
INTERNAL RATE OF RETURN	- 1	190.9 %

-147 --

APPENDIX 4.8.4 15/25

the second second

SECTION: 9 - 10

STUDY ROUTE : RH - 27 (2160 - 0100) SURFACE TYPE : DT/ST

WIDTH OF ROAD : 5.0 M

DISCOUNTED TOTAL

. 1 ,

ONE OV	ERLAY	CASE			TWO OVERLAY CASE						
******		CUMU-		COSTS		BENEFITS	;======================================	YEAR	AADT	CUMU- LATIVE PS	
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL			ESA (X1000)	
1988	941	43	3.8	724,256	483,767		488,054	1988	941	43 88	3.5 2.8
1989	979	88	3.2	0	504,233	1. 1. S.	507,930	1989	979 1021	135	2.4
1990	1021	135	2.8	0	467,034		470,163		1021	54 C	2.1
1991	1062	183	2.6	0 -	485,360		487,802	1991	11062	50	3.4
1992	1106	233	2.4	0	505,741		507,526	1992		103	2.7
1993	1152	286	2.2	Ó	527,037		528,131	1993	1152		
1994	1200	341	2.1	O	550,392	369	550,761	1994	1200	158	2.3
TOTAL				724,256	3,523,610	16,754	3,540,370	TOTAL			

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DOH (CALIFORNIA) METHOD

1988	941	43	3.8	724,256	483,767	4,287	488,054
1989	979	88	3.2	0	504,233	3,697	507,930
1990	1021	135	2.8	ò	467,034	3,080	470,163
1990	1023	183	2.6	õ.	485,360		487,802
		233	2.4	ŏ	505,741	5 C - 2 C - 2 C - 2 C - 2	507,526
1992	1106		- • •	ŏ	527,037	1,094	528,131
1993	1152	286	2.2	-	550,392	369	550,761
1994	1200	341	2.1	0	2003-372	202	
							3,540,370
TOTAL				724,256	3,523,610	16,704	3,540,570
,							
DISCO	INTED	TOTAL		515,511	,1,621,280	8,722	1,630,000
	======	****=====	======	**********	***********		***********

NET PRESENT VALUE	:	1,114,490	
BENEFIT COST RATIO	:	3.2	
INTERNAL RATE OF RETURN	:	66.2 %	

===		===:		
	and the second state of the second			
	NET PRESENT VALUE	2	1,065,980	
	BENEFIT COST RATIO	:	2.9	
	INTERNAL RATE OF RETURN	:	83.1 %	

OVERLAY

APPENDIX 4.8.4

т								
	COSTS			1	BEN	EFITS		
==	**********	====	====		===	,== = =====	=====	
	CUN	IΤ	ΟF	COST	8	BENEFIT	:	BAHT)

OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
535,669	483,767	4,033	487,805
0	447,198	3,476	450,674
ŏ	467,084	2,888	469,972
Ō	485,360	2,288	487,648
394,228	570,156	3,950	574,106
0	527,037	3,287	530,324
0	550,392	2,599	552,991
929,897	3,530,990	22,526	3,553,520
559,607	1,614,930	10,654	1,625,580

SURFACE TYPE : DT/ST

SECTION : 10 - 11 WIDTH OF ROAD : 5.0 M

ASPHALT INSTITUTE METHOD

VE		0.0517	CUMU-		COSTS	s e ser e	BENEFITS	
TCF	1 F C 1	AADT	LATIVE ESA (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
195	5		38	4.2	394,228	417,589	4,498	422,08
198	6	853	78	3.8	0	438,589	4,337	442,920
198	7.	897	120	3.5	5 O	461,742	4,168	465,910
199	3	241	163	3.3	0	483,767	3,993	487,759
199	9	979	208	3.2	0	504,233	3,811	508,044
197	Ū.	1021	255	3.0	· . • •	526,646	3,622	530,268
197	1	1062	303	2.7	-197,114	435,360	3.426	488,780
TOTA	L,				197,114	3,317,930	27,855	3,345,780
DISC	ວັບ	NTED T	OTAL		314,617	2,131,070	18,525	2,149,600

NET FRESENT VALUE	:	1,834,980
BENEFIT COST RATIO	.1	6.8
INTERNAL RATE OF RETURN	1 1	111.7 %

DOH (CALIFORNIA) METHOD _____

VEAD	0.0DT							いてん	D AADT	CUMU-	on en el compositor de la compositor de	COSTS	
YEAR	÷	LATIVE E S A (X1000)	PSI	OVERLAY	VOC		TOTAL	YEF	R AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V D C SAVING
1985	813	- 38	-3.8	629,962	417,589	4,289	421,878	198	5 813	38	3.6	441,375	417,589
1986	853	78	3.2	0	438,589	3,700	442,289	198	6 853	78	2.8	0	388,961
1987	897	120	2.8	0	409,487	3,081	412,567	198	7 897	120	2.4	0	`402,487
1988	941	163	2.6	0	429,059	2,439	431,498	198	8 941	163	2.1	0	429,059
1989	979	208	2.4	0	447,198	1,775	448,973	1.98	9 979	45	3.6	394,228	504,233
1990	1021	255	2.2		467,084	1,080	468,163	199	0 1021	92	2.8	0	467,084
1991	1062	303	2.1	• • •	485,360	362	485,722	122	1 1062	140	2.4	-98,557	485,360
TOTAL	-		· · · · · ·	629,962	3,094,360	16,726	3,111,090	TOTA	L			737,046	3,101,770
DISCOL	JNTED	TOTAL		629,962	1,996,570	12,240	2,008,810	DISC	OUNTED	TOTAL	7-99-	652,109	1,989,370

NET PRESENT VALUE	:	1,378,850	
BENEFIT COST RATIO	1	3.2	
INTERNAL RATE OF RETURN	2 .	66.4 %	
and the second		e en entre entre entre entre e	

 a dia sina gala si da su su statuta di su /li>	1 A A	
NET PRESENT VALUE	2	1,
BENEFIT COST RATIO	:	
INTERNAL RATE OF RETURN	:	

4

OF COST & BENEFIT : BAHT) *********************** BENEFITS

Y D C SAVING	R M C SAVING	TOTAL
417,589	4,043	421,632
388,961	3,431	392,442
402,487	2,892	412,378
429,059	2,288	431,347
504,233	4,080	508,312
467,084	3,562	470,645
485,360	3,033	488,392
101,770	23,378	3,125,150
989,370	15,388	2,004,760

,352,650 3.1 37.9 %

STUDY	ROUTE	:	RH -	27 .	(2160	 0100)

SURFACE TYPE : DT/ST

ONE OVERLAY CASE

ESA

(X1000)

38

78

163

208

255

303

NET PRESENT VALUE

BENEFIT COST RATIO

· 120

3.8

3.2

2.8

2.6

2.4

2.2

2.1

INTERNAL RATE OF RETURN :

YEAR AADT LATIVE PSI

813

897

941

979

1021

1062

DISCOUNTED TOTAL

. 853

-CUMU--

1985

1986

1987

1988

1989

1990

1991

TOTAL

_____ ____

SECTION : 11 - 12

WIDTH OF ROAD : 5.0 M

ASPHALT INSTITUTE METHOD

		CUMU-		COSTS		BENEFITS				CUMU-	· · · · ·	COSTS	IT OF COST	BENEFITS	:
YEAR	AAUT	LATIVE E S A (X1000)	PSI	OVERLAY COST		R M C SAVING		in the s	fri gese	LATIVE E S A (X1000)		OVERLAY	V D C	RMC	
1985 1986 1987 1988 1989 1989 1990 1991	813 853 897 941 979 1021 1062	38 78 120 163 208 255 303	3.8 3.2 2.8 2.6 2.4 2.2 2.1	535,669 0 0 0 0 0 0 0	417,589 438,589 409,487 429,059 447,198 467,084 485,360	3,700 3,081 2,439 1,775 1,080	421,373 442,289 412,567 431,498 448,973 468,163 485,722	1985 1986 1987 1988 1989 1989 1990 1991	853 897 941 979 1021	38 78 120 163 45 92	3.6 2.8 2.4 2.1 3.8 3.1	394,228 0 0 394,228 0	417,589 388,961 409,487 429,059 504,233	4,055 3,507 2,932 2,343 4,266 3,942	421,64 392,46 412,41 431,40 508,49 530,58 488,97
TOTAL			•••••	535,669	3,094,360	16,726	3,111,090	TOTAL				563,183	3,161,330	24,656	3,185,99
DISCOU	NTED T	OTAL		535,669	1,996,570	12,240	2,008,810						2,019,550		
	BE	NEFIT CO	ST RAT		1,473,14 3.8 78.8				NE PE It	ENEFIT C	NT VALU DST RAT	10 (S S S S	1,481,8 3.7 100.0		=======

	1. 1. A.		1.11
 NET FRESENT VA	LUELENS	1	,481
BENEFIT COST R	ATIO 🚲 🖓	19 8 - 1953	3
INTERNAL RATE	OF RETURN	:	100

COSTS

OVERLAY

COST

1,099,770

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(UNIT OF COST & BENEFIT : BAHT)

417,589 4,289

438,589 3,700

429,059 2,439

447,198 1,775

467,084 1,080

1,079,770 3,094,360 16,726 3,111,090

1,099,770 1,996,570 12,240 2,008,810

909,037

1.8

34.6 %

VOC

SAVING

409,487

485,360

BENEFITS

RMC

SAVING

3,081

362

TOTAL

421,878

442,289

412,567

431,498

448,973

468,163

485,722

1.21.

DOH (CALIFORNIA) METHOD TWO OVERLAY CASE (UNIT OF COST & BENEF

BENEFIT COST RATIO

INTERNAL RATE OF RETURN :

NET PRESENT VALUE

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-150-

APPENDIX 4.8.4 18/25

YEAR AADT LATIVE	PSI	COSTS	upanay (All	BENEFITS	
YEAR AADT LATIVE E S A (X1000)		OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985 813 38	3.6	1,021,020	417,589	4,043	421,633
1986 853 78	2.8	·	388,961	3,481	392,442
1987 897 120	2.4	· · · · · · · · · · · · · · · · · · ·	409,487	2,892	412,378
1988 - 941 - 163	2.1	- 1 - 1 - 1 - O	429,059	2,288	431,347
1989 979 45	ാ.4	582,816	504,233	3,341	508,070
1990 1021 92	2.5	0.0	467,084	3,072	470,158
1991 1062 140	2.1	0	485,360	2,288	487,648
TOTAL		1,603,840	3,101,770	21,904	3,123,680
DISCOUNTED TOTAL		1,391,410	1,989,370	14,668	2,004,040

612,626

1.4

29.2 %

SURFACE TYPE : DT/ST

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11 A.

SECTION : 12 - 13

WIDTH OF ROAD : 5.0 M

		CUMU		COSTS	1	BENEFITS	:			CUMU-	Ó.D.T.	COSTS	. 1	BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V Q C SAVING			YEAR	AADT	LATIVE E S A (X1000)	P51	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1988	941	43	3.8	488,522	483,767	4,287	488,054	1988	941	43	3.7	394,228	483,767	4,200	437,967
1989	979	88	3.2	· 0	504,233	3,697	507,930	1939	979	88	3.0	0	504,233	3,806	508,039
1990	1021	135	2.8	0	467,084	3,080	470,163	1990	1021	135	2.6	0	467,084	3,395	470,479
1991	1062	183	2.6	0	485,360	2,442	487,802	1991	1062	183	2.4	0	485,360	2,976	488,335
1992	1106	233	2,4	0	505,741	1,785	507,526	1992	1106	233	2.2	0	505,741	2,533	508,279
. 1993.	1152	286	2.2		527,037	1,094	528,131	1993	1152	286	2.0	0	527,037	2,075	529,112
1994	1200	341	2.1	0	550,392	369	550,761	1994	1200	55	3.8	49,279	620,434	4,328	624,812
TOTAL	<u>_</u>			488,522	3,523,610	16,754	3,540,370	TOTAL				837,735	3,593,710	23,318	3,617,020
DISCOU	NTED T	OTAL		347,720	1,621,280	8,722	1,630,000	BISCOU	NTED T	OTAL	-	312,541	1,643,840	11,062	1,654,910
	BE	T PRESEN NEFIT CO TERNAL R	ST RAT		1,282,28 4.7 100.0				BE	NEFIT CO	ST RAT	E : IO : RETURN :	5.3		

ASPHALT INSTITUTE METHOD

		CUMU-				BENEFITS		CUMU-		COSTS		BENE		
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING		TOTAL	YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V Q C SAVING	R SAV
1985	813	38	3.8	1,001,330	417,589	4,289	421,878	1985	813		3.6	902,893	417,589	4,
1986	853	78	3.2	0	438,589	3,700	442,289	1986	853	78	2.8	0	388,961	3.
1987	897	120	2.8	0	402,487	3,081	412,567	1987	897	120	2.4	Ó	°409,487	2,
1988	941	163	2.6	0	429,059	2,439	431,498	1988	941	163	2.1	0	429,059	2,
1989	979	208	2.4	0	447,198	1,775	448,973	1989	979	45	3.4	535,669	504,233	з,
1990	1021	255	2.2	0	467,084	1,080	468,163	1990	1021	92	2.6	0	467,084	з,
1991	1062	303	2.1	0	485,360	362	485,722	1991	1062	140	2.1	0	485,360	_2,
TOTAL				1,001,330	3,094,360	16,726	3,111,090	TOTAL				1,438,560	3,101,770	21,
DISCOU	INTED 1	TAL		1,001,330	1,996,570	12,240	2,008,810	DISCOU	NTED 1	TAL		1,243,320	1,989,370	14,

NET PRESENT VALUE	:	1,007,480	1	NET PRESENT VALUE	:	760,717
BENEFIT COST RATIO	:	2.0		BENEFIT COST RATIO	:	i.6
INTERNAL RATE OF RETURN	:	39.0 %		INTERNAL RATE OF RETURN	:	35.6 %

APPENDIX 4.8.4 19/25

	T : BAHT)
EFITS	
M C VING	TOTAL
,043 ,481 ,289 ,288 ,841 ,072 ,288	421,632 392,442 412,378 431,347 508,073 470,156 487,648
, 904	3,123,680
	2,004,040

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INTERNAL RATE OF RETURN :

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WIDTH OF ROAD : 5.0 M

SECTION : 13 - 14

사람이 이 아이가 제품을 가장했다. 옷이

DOH (CALIFORNIA) METHOD

ONE OV	ERLAY	CASE		(UN	IT OF COST	& BENEF	IT : BAHT)	TWO OV	ERLAY	CASE	- : 	. ON	IT OF COST	& BENER	IT : BAHT)
20000		CUMU-		COSTS		BENEFITS		YEAR	AADT	CUMU-	PSI	COSTS		BENEF1TS	3
YEAR	AADT	LATIVE ESA (X1000)	PSI	OVERLAY COST	V O C SAVING	R M.C SAVING	TOTAL	ICHA	нны	E S A (X1000)	ro1	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	813	38	3.8	1,198,210	417,589	4,289	421,878	1985	813	33	3.6	1,139,150	417,589	4,043	421,632
1986	853	78	3.2	.0	438,589	3,700	442,289	1986	853	78	2.8	• 0 .	388,961	3,481	392,442
1987	897	120	2.8	Ö	409,487	3,081	412,567	1987	897	120	2.4	0	409,487	2,392	412,378
1988	941	163	2.6	. . .	429,059	2,439	431,498	1988	941.	163	2.1	0	429,059	2,288	431,347
1939	979	208	2.4	Ő.	447,193	1,775	448,973	1989	. 979	45	3.4	582,816	504,233	3,841	508,073
1990	1021	255	2.2	0	467,084	1,080	468,163	1990	1021	92	2.6	· 0	467,084	3,072	470,156
1991	1062	303	2.1	0	485,360	362	485,722	1991	1062	140	2.1	0	485,360	2,288	437,648
TOTAL				1,198,210	3,094,360	16,726	3,111,090	TOTAL				1,721,960	3,101,770	21,904	3,123,680
DISCOU	NTED 1	TOTAL		1,198,210	1,996,570	12,240	2,008,810	DISCOL	NTED T	TOTAL		1,509,540	1,989,370	14,668	2,004,040

	NE	T PRESE	NT VAL	UE :	810,59	7 -	and the second			PRESENT
DISCOL	NTED T	DTAL	222222	1,198,210	1,996,570	12,240	2,008,810	DISCOUR	VTED TE ======)TAL ========
TOTAL				1,198,210	3,094,360	16,726	3,111,090	TOTAL		
1991	1062	303	2.1	0	485,360	362	485,722	1991	1062	140
1990	1021	255	2.2	0	467,084	1,080	468,163	1990	1021	92
1989	979	208	2.4	Ŏ,	447,198	1,775	448,973	1989	979	45

30.8 %

3,111,090 T	OTAL		 1,721,960	3,101,770	21,9
2,008,810 D	ISCOUNTEI) TOTAL	1,509,540	1,989,370	14,6
	· · · · · · · · · · · · · · · · · · ·		JE : TIO :		·====

INTERNAL RATE OF RETURN :

98,210	3,094,360	16,726	3,111,090		TOTAL
28,210	1,996,570	12,240	2,008,810	- 1 ² -	DISCOUNTED TOTAL
	810.59	7			NET PRESEN

-152-

371117070	101110		
2,008,810	DISCOUN	NTED TOTAL	1,509,54
	======		**
and the second		NET PRESENT	VALUE
	14. J. M. H.	BENEFIT COS	T RATIO

		1,989,370 14,6	
NET PRESENT	VALUE :	494,493	۰.

<u> </u>		 	 		 		 	
	TOTAL		 		 		 	
		 ====	 	====	 흐ㅋㅎ	===	 	==
·			 ·. ·					

24.7 %

(b) successful and the second seco

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[15] F. B. Sender, "A set of the property of the set

APPENDIX 4.8.4

SECTION : 14 - 15 WIDTH OF ROAD : 5.0 M

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SURFACE TYPE : DT/ST

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ASPHALT INSTITUTE METHOD

		CÚMU-	DON T	COSTS	<u></u>	BENEFITS			AADT	CUMU- LATIVE	FSI	COSTS	. 1	BENEFITS		
YEAR	AAUT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	TCHK	AADT	E S A (X1000)		OVÉRLAY COST	V O C SAVING	R M C SAVING	TOTAL	
1985	813	38	3.8	677,109	417,589	4,289	421,878	1985	813	38	3.6	488,522	417,589	4,043	421,63	
1986	853	78	3.2	0	438,589	3,700	442,289	1986	853	78	2.8	, , O	388,961	3,481	392,44	
1987	897	120	2.8	0	409,487	3,081	412,567	1987	897	120	2.4	0	409,487	2,892	412,37	
1988	941	163	2.6	0	429,059	2,439	431,498	1988	941	163	2.1	0	429,059	2,288	431,34	
1989	979	208	2.4	0	447,193	1,775	448,973	1989	979	45	3.7	394,228	504,233		508,41	
1990	1021	255	2.2	0	467,084	1,080	468,163	1990	1021	92	3.0	0	467,084	3,769	470,85	
1991	1062	303	2.1	0	485,360	362	485,722	1991	1062	140	2.6	-157,691	485,360	3,348	488,70	
TOTAL	· · · · · · · ·			677,109	3,094,360	16,726	3,111,090	TOTAL		· · · ·		725,059	3,101,770	24,001	3,125,77	
)ISCOU	NTED T	OTAL		677,109	1,996,570	12,240	2,008,810	DISCOU	NTED T	OTAL		675,372	1,989,370	15,693	2,005,06	
	*****		*******					***===	======================================		=====	*20		inanaani No		
		T PRESEN			1,331,70	JO		•		NEFIT CO			1,329,69			
		NEFIT CO		FIO FRETURN	3.0 61.4		· · · · · · · · ·	1.1				RETURN :				

DOH (CALIFORNIA) METHOD

VEAD	AADT	CUMU-	001	COSTS		BENEFITS	; 	YEAR	AADT	CUMU-	PSI	COSTS	1	BENEFITS	
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	TEAN	нны	E S A (X1000)	LOT	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL.
1985	813	38	3.8	1,198,210	417,589	4,289	421,878	1985	.813	38	3.6	1,139,150	417,589	4,043	421,63
1986	853	78	3.2	0	438,582	3,700	442,289	1986	853	78	2.8	0	388,961	3,431	392,44
1987	897	120	2.8	• 0	409,487	3,081	412,567	1987	897	120	2.4	· Ō	`4 09,487	2,892	412,37
1988	941	163	2.6	0	429,059	2,439	431,498	1988	941	163	2.1	Û	429,059	2,283	431,34
1989	979	208	2.4	0	447,198	1,775	448,973	1989	979	45	3.4	582,816	504,233	3,841	508,07
1990	-1021	255	2.2	0	467,084	1,080	468,163	1990	1021	92	2.6	0	467,034	3,072	470,15
1991	1062	303	2.1	0	485,360	362	485,722	1991	1062	140	2,1	0	485,360	2,288	487,64
TOTAL				1,198,210	3,094,360	16,726	3,111,090	TOTAL		- 		1,721,960	3,101,770	21,904	3,123,68
 DISCOU	INTED 1	OTAL		1,198,210	1,996,570	12,240	2,008,810	DISCOU	NTED 1	TAL		1,509,540	1,989,370	14,663	2,004,04

NET PRESENT VALUE	:	310,597
BENEFIT COST RATIO	:	1.7
INTERNAL RATE OF RETURN	:	30.8 %

NET PRESENT VALUE	:	494,498
BENEFIT COST RATIO	:	1.3
INTERNAL RATE OF RETURN	:	24.7 %

APPENDIX 4.8.4 21/25

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			5	1.4.1	1.2.1		1.16	
	·.	1.1		· · · ·				
		- 11				· ·		
11.0	4.5							
						•		

812,462

2.0

38.9 %

NET PRESENT VALUE 1 BENEFIT COST RATIO INTERNAL RATE OF RETURN :

		CUMU-	DOT	COSTS]	BENEFITS		VEAD	AADT	CUMU-	DOT	COSTS		BENEF
YEAK	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V D C SAVING	R M C SAVING	TOTAL	YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M SAVI
1988 1989	941 979	43 88	3.8 3.2	i,148,580 0	483,767	4,287	488,054 507,930	1988 1989	941 979	43 88	3.5 2.8	912,844	483,767 447,198	
1790 1791	1021 1062	135 183	2.8 2.6	• • • • • • • • • • • • • • • • • • •	467,084 485,360	2,442	470,163 487,802	1990 1991	1021 1062	135 183	2.4 2.1	0 0	467,084 485,360	2,2
1992 1993 1994	1106 1152 1200	233 286 341	2.4 2.2 2.1	0	505,741 527,037 550,392	10.10	507,526 528,131 550,761	1992 1993 1994	1106 1152 1200	50 103 158	3.4 2.6 2.1	488,522 0 0	570,154 527,037 550,392	3,0
TOTAL				1,148,580	3,523,610		3,540,370	TOTAL		· · · · · · · · · · · · · · · · · · ·		1,401,370	3,530,990	
DISCOU	INTED 1	TOTAL		817,535	1,621,280	8,722	1,630,000	DISCOU	INTED 1	FOTAL		870,727	1,614,930	10,4/

DOH (CALIFORNIA) METHOD T & RENEETT -

SECTION : 15 - 16 WIDTH OF ROAD : 5.0 M

STUDY ROUTE : RH - 27 (2160 - 0100)

NET PRESENT VALUE : BENEFIT COST RATIO :

INTERNAL RATE OF RETURN :

SURFACE TYPE : DT/ST

1. A. 1. A. 1. A.

APPENDIX 4.8.4

22/25

& BENEF ENEFITS	IT : BAHT)
R M C SAVING	TOTAL
4,038 3,476 2,888 2,288 3,852 3,852 3,084 2,288	487,805 450,674 469,972 487,648 574,008 530,122 552,680
21,915	3,552,910
10,442	1,625,370

ma un la care a c

754,644 1.9

43.7 %

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approximate a state of the protocol state of the second state of the seco

SURFACE TYPE : DT/ST

SECTION : 16 - 17

WIDTH OF ROAD : 5.0 M

11	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		
	ASPHALT I	NSTITUTE	METHOD

	ONE OV	ERLAY	CASE	call is Sine di e	e oraneza era eta a CUN	IT OF COST	& BENEF	IT : BAHT)		τωο άν	ERLAY	CASE		(UN	IT OF COST	& BENEF	TT: BAHT)
					COSTS		BENEFITS)				CUMU-		COSTS		BENEFITS	
		AADT	E S A		OVERLAY COST	V O C SAVING	R M C SAVING		5. 1975 -		1.4.1.1.1	LATIVE ESA (X1000)		OVERLAY	V O C SAVING		
· · ·	1990 1991 1992 1993 1994	1021	243 298		441,375 0 0 0 0 0 0	504,233 526,646 485,360 505,741 527,037 550,392 572,840	4,286 3,693 3,081 2,449 1,785 1,089 367	530,339 488,440 508,190 528,823 551,481 573,207		1991 1992	1021 1062 1106 1152 1200	140 190 243 298	3.8 3.1 2.7 2.5 2.3 2.1 3.8	394,228 0 0 0 0 49,279	504,233 526,646 485,360 503,741 527,037 550,392 645,750	3,913 3,567 3,207 2,825 2,428	488,927
	TOTAL.	. 						3,689,000									3,769,680
· .	DISCOU	INTED	TOTAL		280,502	1,508,690	7,786	1,516,470	· · ·						1,529,650		1,540,000
		NE BE	ET PRESEN ENEFIT CC	IT VALI. IST RAT	JE : IO : RETURN ;	1,235,9 5.4			·		Et	ENEFIT CO	ST RAT	FIO	1,260,9 5.5 129.6		

DOH (CALIFORNIA) METHOD _____

		CUMU-					;		VEAD]		
YEAR	AADT	E S A (X1000)		OVERLAY COST	V O C SAVING	R M C SAVING	· .	·					OVERLAY COST	V O C SAVING	RMC	TOTAL
1985	813		3.8	942,269			421,878	e u t Stra	1985	813	38	3.6	843,829	417,589	4,043	421,632
1986	853	78	3.2	· O .	438,589	3,700	442,289		1986:	853	78	2.8	0	388,961	3,481	392,442
1987	897	120	2.8	Q	409,487	3,081	412,567		1987	897	120	2.4	0	409,487	2,892	412,378
1988	941	163	2.6	0	429,059	2,439	431,498	÷ .	1988	941	163	2.1	0	429,059	2,283	431,343
1989	979	208	2.4		447,198	1,775	448, 273	:	1989	979	45	3.4	535,669	504,233	3,841	508,073
1990	/1021	255	2.2	.0	467,084	1,080	468,163		1990	:1021	92	2.6	0	467,084	3,072	470,156
1991	1062	303			485,360				1991	1062	140	2.1	• • •	485,360	2,288	487,648
				942,269		16,726	3,111,090							3,101,770		3,123,680
							2,008,810							1,989,370		2,004,040

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NET PRESENT VALUE	: 1,066,540
BENEFIT COST RATIO	2.1
INTERNAL RATE OF RETU	URN: 42.1 %

APPENDIX 4.8.4

23/25

SURFACE TYPE : DT/ST

SECTION : 17 - 18 WIDTH OF ROAD : 5.0 M

ASPHALT INSTITUTE METHOD

	CUMU-		COSTS		BENEFIT	Station and	 YEAR	аарт	CUMU-		COSTS		BENEFITS
YEAR AAI	T LATIVE E S A (X1000)	• •	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL	JEHR	HHU	E S A (X1000)		OVERLAY COST	V OCC SAVINO	R M Č SAVING
1987 8	53 78 27 120 11 163 29 208 21 255	3.8 3.2 2.6 2.6 2.4 2.2 2.1	0	417,589 438,589 409,487 429,059 447,198 467,084 485,360	3,700 3,081 2,439 1,775 1,080	442,289 412,567 431,498 448,973 468,163	1985 1986 1987 1988 1989 1989 1990 1991	897 941 979 1021	120 163 45 92	3.6 2.8 2.4 2.1 3.7 3.0 2.7	441,375 0 0 394,228 0 -197,114	388,961 409,487 429,059 504,233 526,646	1 3,481 7 2,892
TOTAL	···· ; _·······	. <u></u>	582,816	3,094,360	16,726	3,111,090	TOTAL				638,487	3,161,330) 24,228
DISCOUNTER) TOTAL	···	582,816	1,996,570	12,240	2,008,810	DISCOU	NTED	TOTAL		612,303	2,019,550	0 15,804

BENEFIT COST RATIO : 3.4 INTERNAL RATE OF RETURN : 72.2 % NET PRESENT VALUE : 1,423,050 BENEFIT COST RATIO : 3.3 INTERNAL RATE OF RETURN : 88.6 %

DOH (CALIFORNIA) METHOD

	CUMU-		COSTS		BENEFITS			6 AADT	2. A set of the set		COSTS	1997 - 1997 -	BENEFITS	
EAR AADT	LATIVE E \$ A (X1000)	PSI	OVERLAY COST	V O C SAVING		TOTAL	ΥEA	r aadt	ESA		OVERLAY COST	V O C SAVING		TOTAL.
985 813 986 853 987 897 988 941 989 979 990 1021 991 1062	78 120 163 208 255	3.8 3.2 2.8 2.6 2.4 2.2 2.1	1,119,460 0 0 0 0 0 0 0 0	417,587 438,587 409,487 429,059 447,198 467,084	3,700 3,081 2,439 1,775	412,567 431,498 448,973 468,163	198 198 198 198 198 199	7 897 8 941	78 120 163 45 92	3.6 2.8 2.4 2.1 3.4 2.6 2.1	1,040,710 0 0 582,816 0 0	409,487 429,059 504,233 467,084	3,481 2,892 2,288 3,841 3,072	392,44 412,37 431,34 508,07
 TAL	· <u> </u>	<u></u>	1,119,460	3,094,360	16,726	3,111,090	TOTA	L,		•	1,623,520	3,101,770	21,904	3,123,68
SCOUNTED			1,119,460			and the second	DISC	OUNTED	TOTAL		1,411,100	1,989,370	14,668	2,004,04

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-	÷	<u>.</u>	-	_	===	=		2 •	

	TOTA	
	421, 392, 412, 431, 508, 530, 488,	442 378 347 451 491
2,	185, 035,	350

 STUDY ROUTE : RH - 27 (2160 - 0100)
 SECTION : 18 - 19

 SURFACE TYPE : DT/ST
 WIDTH OF ROAD : 5.0 M

ASPHALT INSTITUTE METHOD

	BENEFITS	F	COSTS		CUMU-		
TOTAL	R M C SAVING	V Ü C SAVING	OVERLAY COST	PSI	LATIVE E S A (X1000)	AADT	YEAR
421,87	4,289	417,589	1,487,750	3.8	38	813	1985
442,28	3,700	438,589	. 0	3.2	78	853	1986
412,56	3,081	409,487	0	2.8	120	897	1987
431,49	2,439	422,059	0	2.6	163	941	1988
448,97	1,775	447,198	0	2.4	208	979	1989
468,16	1,080	467,084	· · · •	2.2	255	1021	1990
485,72	362	485,360	-1,054,800	2.1	303	1062	1991
3,111,09	16,726	3,094,360	432,957				TOTAL
2,008,810	12,240	1,996,570	1,061,740		TOTAL	NTED 1	Discov

NET FRESENT VALUE	1	947.071
BENEFIT COST RATIO	:	1.9
INTERNAL RATE OF RETURN	:	28.8 %

DOH (CALIFORNIA) METHOD

ONE OV	ERLAY	CASE		(UN	IT OF COST	& BENEF	IT : BAHT)
	AART			COSTS]	BENEFITE	;
YEAR	AADT	LATIVE E S A (X1000)	PSI	OVERLAY COST	V O C SAVING	R M C SAVING	TOTAL
1985	813	38	3.8	1,487,750	417,58?	4,289	421,878
1986	853	78	3,2	0	438,589	3,700	442,289
1987	897	120	2.8	0	407,487	3,081	412,567
1988	941	163	2.6	0	429,059	2,439	431,498
1939	979	208	2.4	Q .	447,198	1,775	448,973
1990	1021	255	2.2	0	467,084	1,080	468,163
1991	1062	303	2.1	-1,054,800	485,360	362	485,722
TOTAL			fina era fari aka fi	432,957	3,094,360	16,726	3,111,090
DISCOU	NTED	FOTAL		1,061,740	1,996,570	12,240	2,008,810

NET PRESENT VALUE	5	947,071
BENEFIT COST RATIO	:	1.9
INTERNAL RATE OF RETURN	:	28.8 %

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