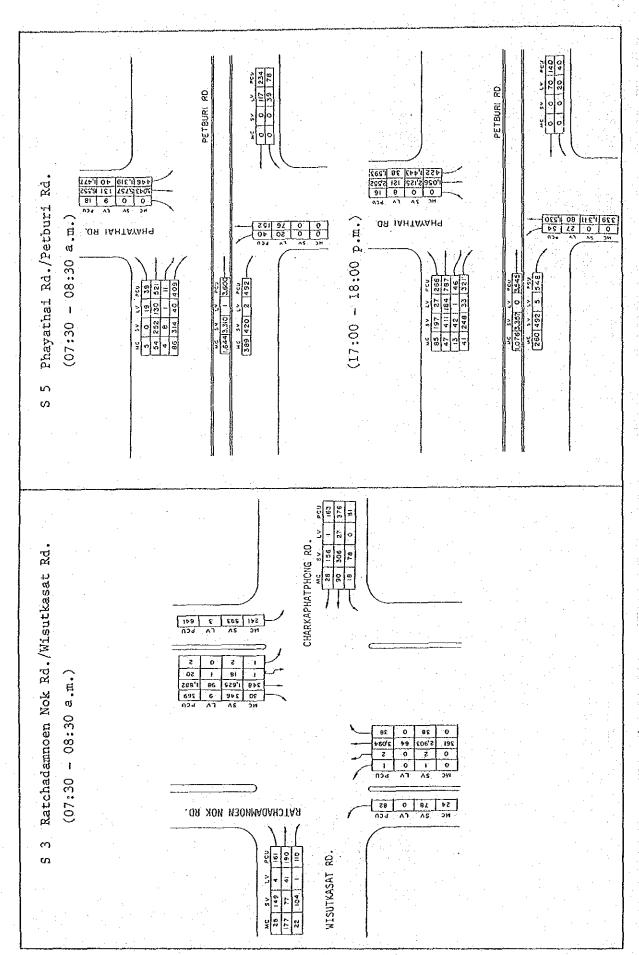
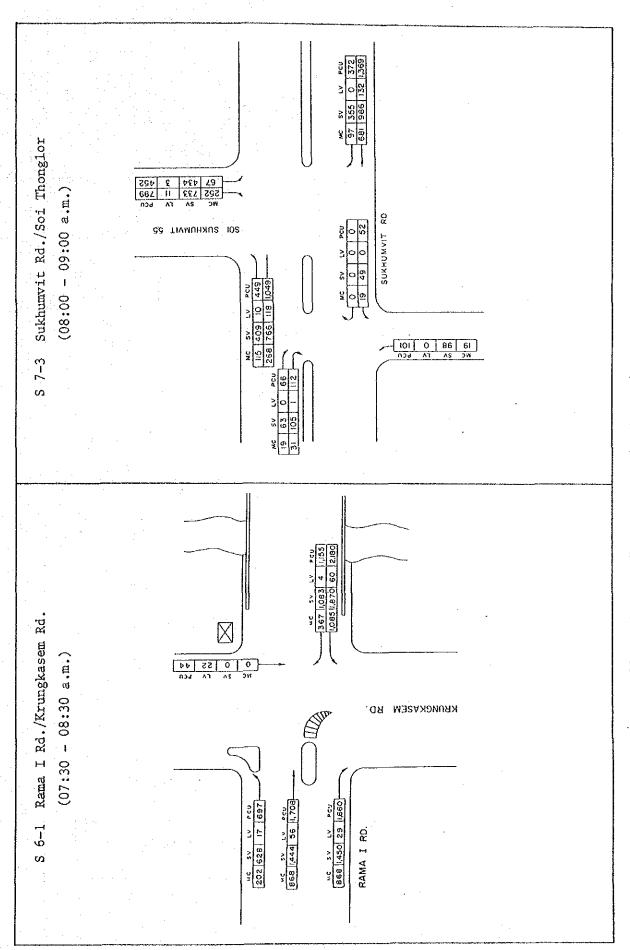


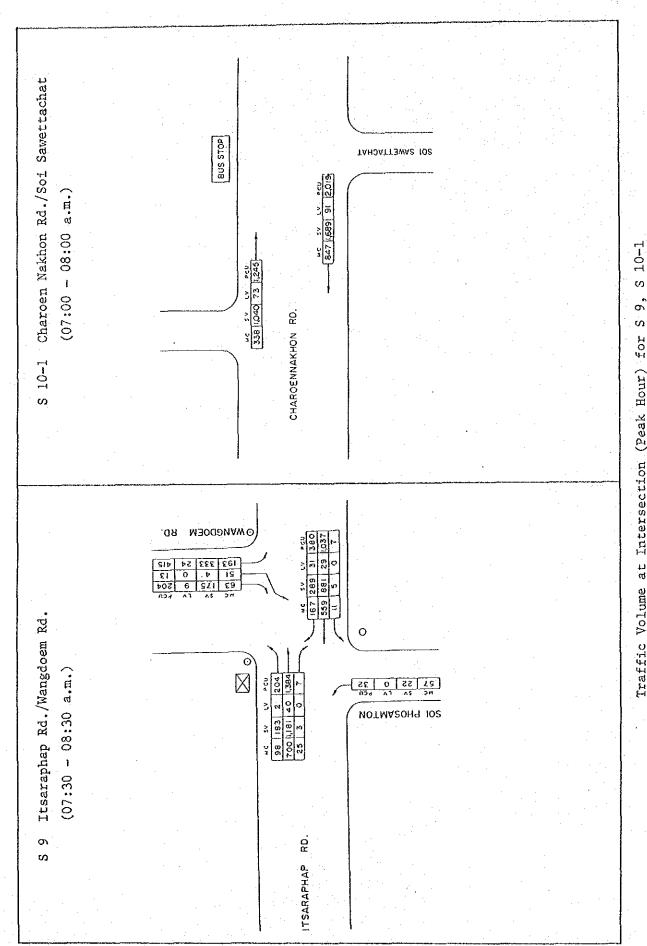
A-61



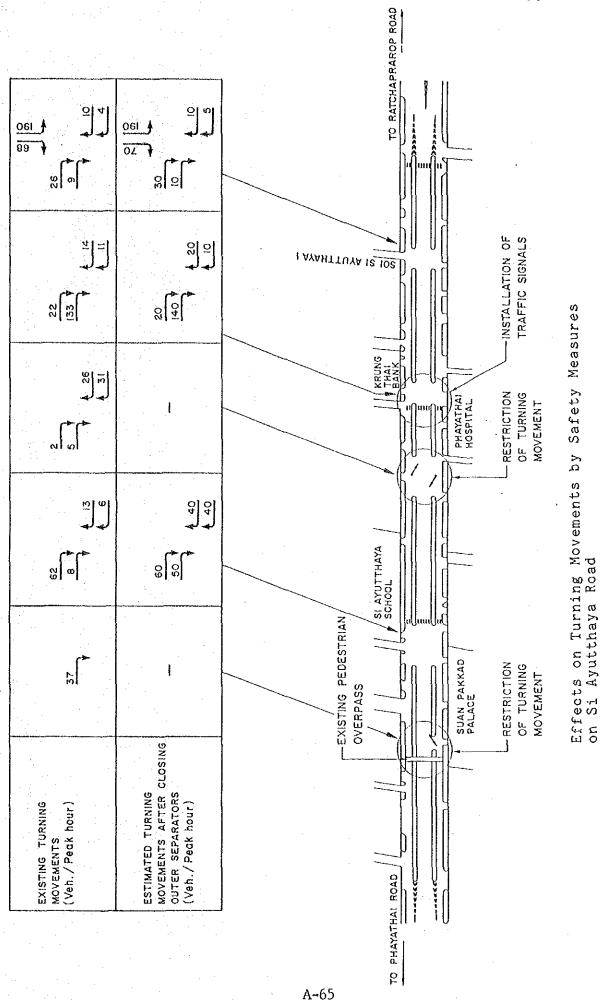
Traffic Volume at Intersection (Peak Hour) for S 3, S 5

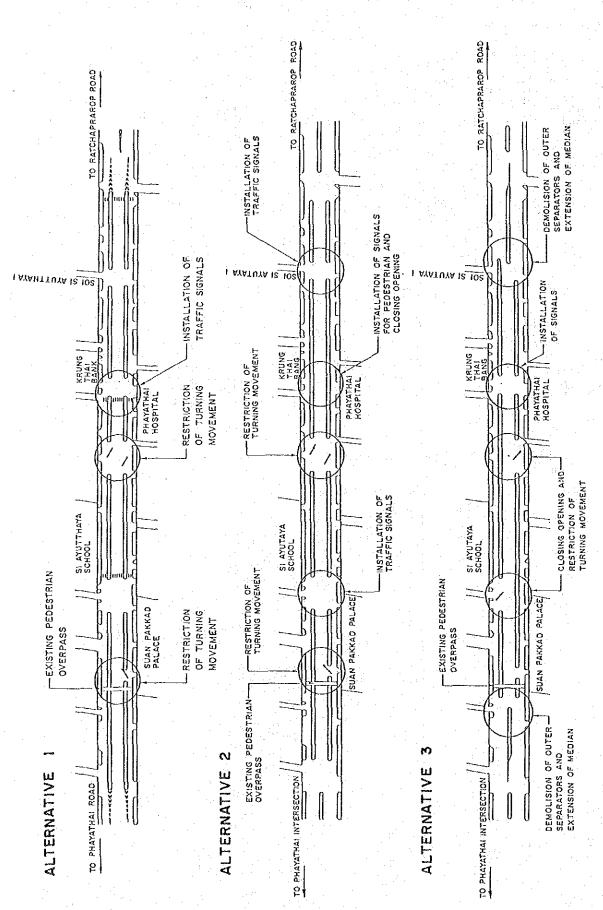


Traffic Volume at Intersection (Peak Hour) for S 6-1, S 7-3

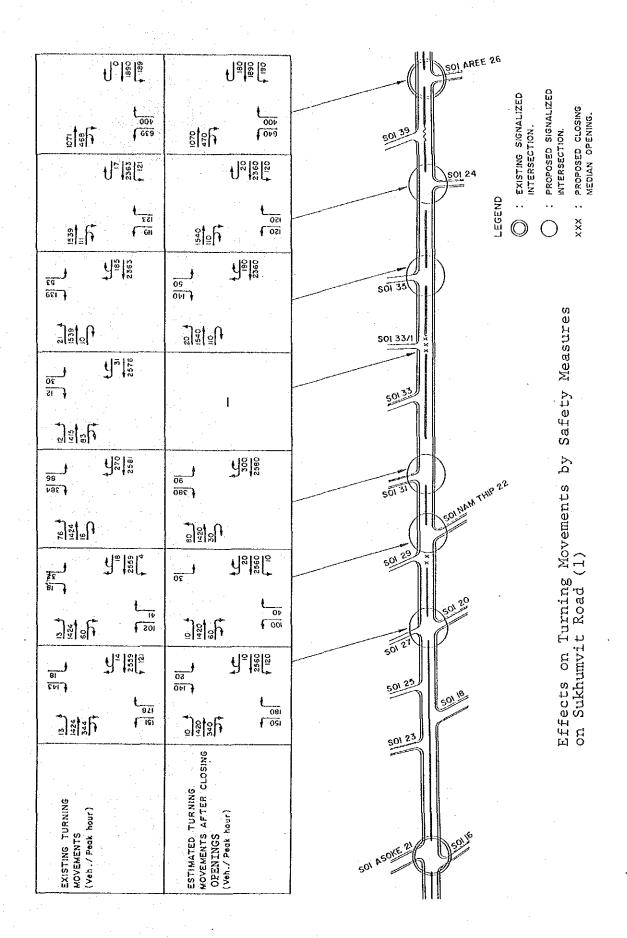


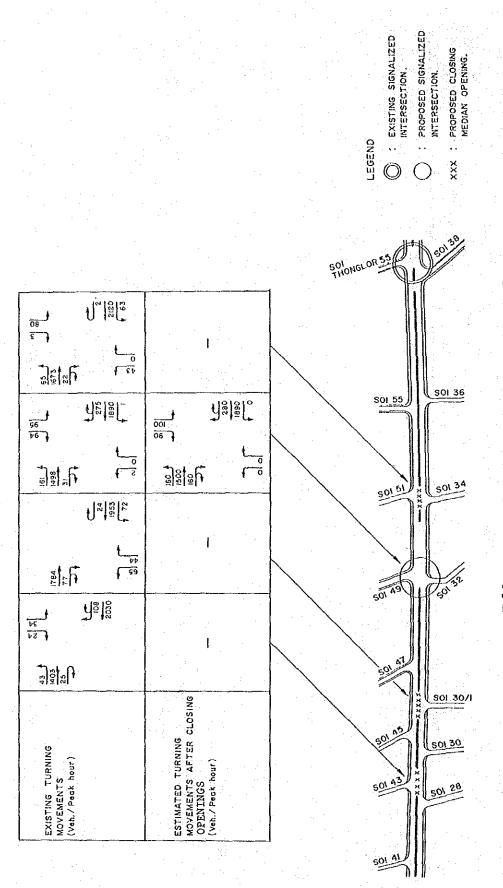
Traffic Volume at Intersection (Peak Hour) for





Alternatives for the Restriction of Turning Movements on Si Ayutthaya Road





Effects on Turning Movements by Safety Measures on Sukhumvit Road (2)

Unit Cost for Remedy Works for Traffic Safety

Item	Unit	Cost (Baht)	Remark
Pavement Marking - Thermoplastic paint	2 m	260	
Traffic Sign			
- Post	pcs.	400	
- Warning sign board	pes.	590	0.45 m x 0.45 m
- Regulatory sign board	pcs.	490	0.45 m x 0.45 m
Raised Pavement Marker			
- Chatter bar	pcs.	1,500	
Guard Fence	- <del></del>		
- for pedestrian	m	900	Steel type
- for vehicle	· m	1,500	Steel type
Traffic Signal			
- Post with arm	set	8,000	
- Conduit & cable	m	1,200	
- Display for vehicle	set	10,000	
- Display for pedestrian	set	7,000	
- Vehicle control board	set	220,000	
- Pedestrian control board	set	115,000	
Pedestrian Overpass			
- 1 span 0 22 m	set	1,230,000	Concrete bridge
- 2 span @ 18 m	set	1,710,000	Concrete bridge
Pavement	2		
- Cement concrete surface	<sup>m</sup> 2	480	Incl. Base & Subbase
- Asphalt surface	$^{\mathrm{m}}_{2}^{2}$	370	Incl. Base & Subbase
- Sidewalk	m Z	300	Interrock surface
Embankment	3 m	140	Compacted sand
Excavation	<sub>m</sub> 3	70	·
Gutter	m	400	
Retaining wall H=2.2 m	m	15,000	
Lighting (Single arm)	set	50,000	
Demolition of concrete	m <sup>2</sup>	100	Thickness > 0.25 m
Bridge widening	2 m	8,000	
Land acquisition	2 m	3,750	Pracha Chuen Rd.

## Required Maintenance for Safety Devices

Safety Devices	Durable Year	Required Maintenance
Pavement Marking	2 - years	replace every 2 years
Traffic Sign	7 - years	replace every 7 years
Delineater	10 - years	replace every 10 years
Raised Pavement Marker	10 - years	replace every 10 years
Guardfence	10 - years	2% of installation cost per annum
Street Lighting	10 - years	10% of installation cost per annum
Traffic Signal	10 - years	10% of installation cost per annum
Pedestrian Overpass	50 - years	3% of installation cost per annum
Median, Right-turn Lane, Sidewalk	<u>-</u>	- -

Accident Reduction Rates by Safety Device (Mid-block Section)
- Study in Japan -

		Data A		: 	Data B			Data C			Data D	
Safety Devices	Before	After	Reduction Rate	Before	After	Reduction Rate	Before	After	Reduction	Before	After	Reduction Rate
Traffic Signal for Pedestrian	1	1	-	1,170	587	50	j.	ı	ł	136	85	38
Crosswalk	110	84	24	3,936	2,667	32	2,039	1,277	37		1	-
Overpass	70	33	53		1	1	439	203	54	137	96	30
Sidewalk	44	rt	75	ı	ı	I	92	51	45	ı	14	_
Guardfence	1,337	541	9	1	1	1	5,037	2,976	41	I	_	ı
Lighting	1,506	1,333	12	ı	1	1	5,837	4,154	29	-	-	-
Curve Mirror	121	41	99	1	ı	1	829	215	89	1	·	
Median Island	4	r	75	1	ł	1	3, 422	2,765	19	-	1	1
Bdge Line	106	78	26	1	l	1	337	242	28	29	38	43
Traffic Sign	1	1	·	2,616	2,278	13	259	113	56	ı	1	. 1
Restriction of Parking	_	1	-	1	l	1	5,696	4,394	23	-	1	1
Restriction of Speed	-	1	-	J	ı	1	1,533	1,211	21	1	-	ı
Restriction of Overtaking	1	1	ı	I	ı	ı	1,246	935	25	ı	1	i
												,

Accident Reduction Rates by Safety Device (Intersection)
- Study in Japan -

						·
ы	Reduction		ŧ	-	17	72
Data E		ı	1	1	1	65
	Before	-	-	-	1	230
	Reduction Before After		*8£	ı	ı	-
Data D	[	1	30	1	l	ı
	Before After	_	48	l	1	17
	Reduction Rate	48			57	60
Data C		2,412	. <b>1</b>	ł	565	343
ρ	Before After	4,612	1.	I	1,325	853
	Reduction	31	1	ı	1	1
Data B	After	4,290	-	<b>—</b>	_	1
	Before	6,216	-	1	_	1
	Reduction Rate	45	-	48	69	ı
Data A	After	260	-	57	11	
	Before	473	1	601	36	١
	Safety Devices	Traffic Signal	Lighting	Channelization	Improvement of Skid Resistance	Stop Control

Note; \* Only vehicle vs. pedestrian

Reference;

- M. Koshi "Traffic Accident Reduction Policies by Safety Devices"

Traffic Engineering Vo.15 No.2

Data A 1966, Metropolitan Police Board

Data B 1967, Metropolitan Police Board

Data C 1964, Prime Minister Office

Data D Others

- Japan Traffic Engineering Society "Traffic Accident Reduction Policies on Roadway and Intersection", 1975

Data E 1973, Saltama Prefecture

Summary of Accident Reductions by Experimental Works

	Remerica	Over Speed Limit; Before 2, After 0 Rear End Collision; Before 3, After 1	Over Speed Limit; Before 2, After 0 Off Carriagoway; Before 3, After 1	Vebicle VS Pedestriand Before 2, After 0	Immediate Crossing; Before 8, After 3 Rear End Colliston Before 12, After 17	Over Speed Limit; Before 6, After 1 Off Carriageway; Before 6, After 1
ries	Reduction Rate	1	0.57	1.00	0,60	0.63
Number of Injuries	After	0	N	0		m
Numbe	Before	0	<b>t-</b>	v)	vs	ω
ties	Reduction Rate	ı	ı	1	,	ı
Number of Fatslittes	After	O	٥	0	0	۰ .
Number	Before		٥	0	o <sup>.</sup>	0
ident	Reduction Rate	0, 40	05.0	0.67	0.48	٥ ۵ ۵
Number of Accident	After	m	ဗ		91	מו
Numb	Ветоге	ν <b>7</b> ,	ъ	φ	31	ri ri
	Traific	009'6	15,700	17,700	34, 600	9,200
Area	Kilome- ter Post	48+000-	2+900- 3+200	13+500-	Soi 39 Soi 53	1+000-1
Survey Area	Route	τ	306	306	336	1141
	Improvement Type	Improvement of Lane Line Marking	Improvement of a Sub- standard Curve by Visual Guidance	Safeguard of Pedestrian	Improvement of Turning Traffic by Signalization	Intersection Improvement by Channelization

Source : Final Report, January 1985, JICA Traffic Safety Plan for Roads in the Kingdom of Thailand

Results of Before and After Survey
Concerned with Installation of Chatter-Bars
Conducted by DOH

		Before Inst	Before Installation (6 months)	months)	After Inst	After Installation (6 months)	months)
Route	Kilometer Post	No. of Accident	Fatality	Injury	No. of Accident	Fatality	Injury
34	89 - 92	11	ιĎ	19	೮೮	ည	20
34	93 – 97	23	2	32	<u>,  </u>	4	2
34	104 - 105	ဇ	Ţ	1	2	0	3
34	111 - 113	2	0	H	0	0	0
34	115 - 118	7	1	æ	က	<b>:</b> 4	Ø
ĮI	Total	46	6	61	29(0.63)	10(1.11)	39(0,63)

Source: Department of Highways
Note: Numbers in ( ) are reduction rate

Benefit/Cost Computation on Safety Plans (1)

<u></u>	<u>.                                    </u>	1							·							 
	B/C	(19)							1.02							1.45
Net	(3-C)	(15)			٠.				0.023							0.761
	νď	(14)		0,305	0.230	0.275	0.262	0.248	1.380	0.236	0.224	0.213	0.203	0.192	1.063	2.448
	Total	(13)	:	0.305	0.305	0.305	0.305	0.305	1.525	0.305	0.305	0.305	0.305	0.305	1.525	3.050
(Saved)	Prop. Dam.	(21)		0.08	0.08	0.08	0.08	80.0	0.40	80.0	80.0	0.08	80.0	80.0	0.40	 03:0
Benefit (Saved)	Injury	(11)		(2.5) 0.225	(2.5) 0.225	(2.5) 0.225	(2.5) 0.225	(2.5) 0.225	(12.5) 1.125	(2.5) 0.225	(2.5) 0.225	(2.5) 0.225	(2.5) 0.225	(2.5) 0.225	(12.5) 1.125	(25.0) 2.250
	Fatality	(10)		0	0	0		0	0	0	0	· :	0	0	0	O
Reduc-	110n Rate(%)	(6)		50	20	50	20	50		000	0 20	20	20	30	<del></del>	
	ÞΛ	(8)		1.002	0.058	0.129	0.052	0.116	1.357	0.047	0.105	0.045	0.095	0.038	0.330	1.687
Cost	Total	(2)		1,002	0.061	0.143	0.061	0.143	1.410	0.061	0.143	0.065	0.143	0.061	0.473	1.883
ပိ	W/0	(9)			0.061	0.143	0.061	0.143	0.408	0.061	0.143	0.065	0.143	0.061	0.473	0.881
	Inst.	(3)		1.002	ı	i	ı	1	1.002	,1	ī	r	ì	.1	0	 1.002
:	Injury	<del>.</del>		w	ъ	ហ	מו	ស	25	ស	ທ	ເດ	1/2	ะก	25	20
ent	Fatality	<u>ල</u>		0	0	0	0	0	0	0	0	0	0	0	0	0
Accident	CasualtyFatality Injury	8		ın	ທ	ro.	ĸ	ហ	25	'n	ស	u)	ю	so.	25	30
	No.	$\mathfrak{S}$		00	ò	60	∞	α)	6	œ	හ	ø	α,		3	80
	Year			н	6.5	ო	4	ы	SH	9	7	æ	<b>о</b>	01	ST	Total
Road	31 t	Ok						ri ss	Pracha	Chuen	Road					-

Source : JICA Team Estimation

 Nos. of accident and casualty are based on 1986 survey by JICA Team.
 The costs and benefits are calculated at 1986 price.
 Unit values of fatality, injury and property damage are;
 fatality = \$0.9 million
 injury = \$0.09 million
 property damage = \$0.02 million Renarks

4. Traffic volume is set at 1986 level.
5. Rate of Discount: 5% per annum
6. Number in ( ) indicates the number of persons saved from fatality.
7. O/M means "Operation and Maintenance"
8, PV means "Present Value"

Benefit/Cost Computation on Safety Plans (2)

										hûn silven								··········
11110n)	٠.	D/8	(16)	-						1,31			1					1.82
Babt in m	Net	denerate (B-C)	(27)		:				47	0.319								1.060
(Unit : Cost, Benefit : Baht in million)		Λď	(14)		0.295	0.280	0.268	0.253	0.240	1.334	0.228	0.217	0.206	0.196	0.186	1.033		2.367
: Cost,		Total	(13)		0.295	0.295	0.295	0.295	0.295	1.475	0.295	0.295	0.295	0.295	0.295	1.475		0.295
(UD1:	Benefit (Saved)	Prop.Dam.	(12)		0.160	07.160	0.160	0.160	0.160	0.800	0.160	0.160	0.160	0.160	0.160	0.800	· · · · ·	1.600
	Benefit	Injury	(11)		(1.5) 0.135	(1.5) 0.135	(1.5) 0.135	(1.5) 0.135	(1.5) 0.135	(7.5) 0.675	(1.5) 0.135	(1.5) 0.135	(1.5) 0.135	(1.5) 0.135	(1.5) 0.135	(7.5) 0.675		(15,0) 1.350
		Fatality	(10)		0	0	0	0	0	0	0	0	0	0	0	0		0
	Reduc-	Rate(%)	(6)		50	20	20	20	20		50	50	20	20	20			
		γď	(8)		0.698	0.048	0.118	0.044	101.0	1.015	0.039	0.036	0.038	0.087	0.032	0.232		1.307
	Cost	Total	6		0.698	0.051	0.131	0.051	0.131	1.062	0.051	0.131	0.054	0.131	0.051	0.418		1.480
. ]	သ	M/O	(9)		-1	0.051	0.131	0.051	0.131	0.364	0.051	0.131	0.054	0.131	0.051	0.418		0.782
		Inst.	9		0.698	1	1	ı	ı	0.698	ı	1.	1	1	1	Ö		869.0
		Trjury	<del>(</del> 4)		ო	19	ო	က	ო	15	ო	ო	ო	ო	က	15	:	8
	lent	Casualty Fatality Injury	(e)		0	0	0	0	0	0	0	a	0	0	0	٥		0
	Accident	Casualty	(3)		ო	m	რ	ო	m	25.	'n	ო	ო	m	m	1.5		30
		No.	£		91	16	1.6	91	9	8	91	16	76	91	91	8	·.	160
		Year	· .		н	63	ო	4	ம	S.	ý	*	80	O)	10	ST		Total
		Road Sexment	No.						.82-1	Techa	Wanit	Road				·		

1. Nos. of accident and casualty are based on 1986 survey by JICA Team.
2. The costs and benefits are calculated at 1986 price.
3. Unit values of fatality, injury and property damage are;
1) fatality = \$0.9 million
2) injury amage = \$0.09 million
3) property damage = \$0.02 million Remarks

Traffic volume is set at 1986 level. 5. Rate of Discount : 5% per annum

Number in ( ) indicates the number of persons saved from fatality.
 O/M means " Operation and Maintenance"
 PV means "Present Value"

Benefit/Cost Computation on Safety Plans (3)

	D/G	(16)						7.06							********	10.25
Ne to	(B-C)	(31)						5.961								11.112
	ÅΔ	(14)	1.535	1.458	1.385	1.316	1,250	6.944	1.188	1.128	1.072	1.018	0.967	5,368		12.312
	Total	(13)	1.535	1.535	1.535	1.535	1.535	7.675	1.535	1,535	1.535	1.535	1.535	7,675		15.350
(Saved)	Prop.Dam.	(12)	0:140	0.140	0.140	0.140	0.140	0.700	0.140	0.140	0.140	0.140	0.140	00.700		1.400
Benefit (Saved)	Injury	(11)	(5.5) 0.495	(5.5) 0.495	(5.5) 0.495	(5.5) 0.495	(5.5) 0.495	(27.5) 2.475	(5.5) 0.495	5) 0.495	(5.5) 0.495	5) 0.495	5) 0.495	(27.5) 2.475		(55.0) 4.950
	Fatality	(0)	0.900 (5.	0.900 (5.	0.900 (5.	0.900 (5.	0.900 (5.	4.500 (27	0.900 (5.	0.900 (5.5)	0.900 (5.	0.900 (5.5)	0.900 (5.5)	4.500 (27		
		(10)	ਰ	ਦੇ ਦ	<del>2</del>	3	£	(5)	3	(1)	<del>(</del> 3)	(5)	(ĵ)	(5)		(10) 9.000
Reduc-	Rate(%)	6)	50	- S	20	20	50	·	30	20	50	50	50			
	ρv	(8)	0.753	0.031		0.028	0.081	0 983	0.026	0.074	0.031	0.066	0.021	0.218		1.201
Cost	Total	8	 0.753	0.033	0.100	0.033	0.100	1,019	0:033	001.0	0.044	0,100	0.033	0.308		1.327
0	M/O	9		0.033	001.0	0.033	001.0	0.266	0.033	00.100	0.044	001.0	0.033	0.308		0.576
	Inst.	(2)	0,753	ı	i 	ı	1	0.753	ı	1	1	1	. 1	0		0.753
	Injury	(4)	11	ដ	Ħ	11	Ħ	55	11	11	נו	Ħ	11	55		110
dent	Casualty Fatality Injury	ලි	N	69	01	71	C3	10	~	61	63	N	01	10		20
Accident		(3)	 133	133	13	e) r1	13	. 65	13	13	13	13	13	65		130
	No	£	1.4	14	74	14	14	ဥ	1,4	14	7,4	4	74	2		140
	Year		7	77	ო	4	w	ST	ဖ	7	ω,	თ	10	ST		Total 140
	Segment	Vo					\$2-2	Techa	Wanit	Road				-		

Source : JICA Team Estimation

1. Nos. of accident and casualty are based on 1986 survey by JICA Team.
2. The costs and benefits are calculated at 1986 price.
3. Unit values of fatality, injury and property damage are;
1) fatality = \$0.9 million
2) injury \$0.09 million
3) property damage = \$0.02 million Remarks

4. Traffic volume is set at 1986 level.
5. Rate of Discount: 5% per annum
6. Number in ( ) indicates the number of persons saved from fatality.
7. O/M means "Operation and Maintenance"
8. PV means "Present Value"

Benefit/Cost Computation on Safety Plans (4)

		, *		4.					÷									
(llion)		3/g	(19)	,						3.20								4,19
Baht in million)	Net	(B-C)	(12)							2,395							-	4.704
[		ÞV.	(14)		0.770	0.732	0.695	0.660	0.627	3.484	0.596	0.566	0.538	0.571	0.485	2.696		6.180
(Unit : Cost, Benefit		Total	(13)		0.770	0.770	0.770	0.770	0.770	3.850	0.770	0.770	0.770	0.770	0.770	3.850		7.700
(Unit	Benefit (Saved)	Prop.Dam.	(12)		0.320	0.320	0.320	0.320	0.320	1,600	0.320	0.320	0.320	0.320	0.320	1.600		3.200
	Benefit	Injury	(11)		(5) 0.450	(5) 0,450	(5) 0.450	(5) 0.450	(5) 0.450	(25) 2.250	(5) 0.450	(5) 0.450	(5) 0.450	(5) 0.450	(5) 0.450	(25) 2,250		(50) 4.500
		Fatality	(10)		0	0	0	0	0	0	0	0	0	0	0	0		0
	Reduc-	Rate(%)	(6)		20	50	000	50	20	ı	20	000	20	20	50.	ı		ı
	. !	Λď	(8)		0.640	0.025	0.211	0.022	0.191	1.009	0.020	0.172	0.024	0.155	0.016	0 387		1.476
	Cost	Total	3		0,640	0.026	0.234	0.026	0.234	1.164	0.026	0.234	0.030	0.234	0.026	0.550		1.714
	<b>റ്</b>	W∕0	(9)			0.026	0.234	0.026	0.234	0.524	0.026	0.234	0.030	0.234	0.026	0.550		1.074
		Inst.	(5)		0.640	ı	ì	1	ı	0.640	• <b>i</b>	1.		ï	1	0		0.640
		In jury	(4)		91	01	10	10	97	50	ដ	ដ	01	10	Ġ.	20		100
	len t	Casualty Fatality Injury	(3)		0	0	0	0	0	0	0	o	0		0	0		0
	Accident	Casual ty			21	ទ	10	.01	ព្	50	2	ទ	10	ន	91	20		100
		Ño.	Ð		88	8	8	32	32	160	23	83	32	25	ខ្ព	160		320
		Year			ਂ ਜ	61	က	₹.	'n	S	φ	7	œ	<b>o</b>	01	ST	<u>.</u>	Total
		Road Segment	No.						83	Racha-	damnoen	Nok	Road					

Remarks

4. Traific volume is set at 1986 level.

) indicates the number of persons saved from fatality.

7. O/M means "Operation and Maintenance" 8. PV means "Present Value"

Benefit/Cost Computation on Safety Plans (5)

				. :													
	5/C	(19)							66.0		• • • •						1.27
Xe t	Benefit	(15)		i.					010.00								0.415
	۵	(34)		0.246	0,234	0.222	0.211	0.200	1.113	0.190	0.181	0.172	0.163	0.155	0.861		1.974
	Totta			0.246	0,246	0.246	0.246	0.246	1,230	0.246	0.246	0.246	0.246	0.246	1.230		2.460
Benefit (Saved)	Prop Dam	(12)		0.120	0.120	0.120	0.120	0.120	0.600	0,120	0.120	0.120	0.120	0 120	0.600		1.200
Benefit	Injury	(11)		0.126		1) 0.126	0.126	0.126	0 630	0.126	0.126	0.126	0.126	0.126	0.630		(14.0) 1,260
		1.	ļ	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(4.0)	(1.4)	(1.4)	(1.4)	(1,4)	(1.4)	(7.0)		(14.0
	Fatality	(10)		° 0	Ó	0	. 0	0	0		0	0	0	0	0		0
Reduc-	tion Rate (2)	(6)		46	46	9,4	\$	46		46	46	46	46	46			
	Λα	(8)		0.650	0.041	0.208	0.037	0.187	1.123	0.033	0.169	0.054	0.153	0.027	0.436		1.559
Cost	Total	E		0 650	0.043	0.230	0.043	0.230	1.196	0.043	0.230	0.078	0.230	0.043	0.624		1.820
0	ie 0	(6)			0.043	0.230	0.043	0.230	0.546	0.043	0.230	0.078	0.230	0.043	0.624		1.170
	Inst	(§)		0.650	!	1	1	ı	0.650	1	ı	1	+	1	0		0.650
	Injury	<u>\$</u>		ь	ო	ю	ო	m	15	m	ო	ო	m	m	15		30
Accident	CasualtyFatality Injury	ව		0	0		0	0	0	•	0	Ö	0	0	0		0
Acci	Casualty	8		m	ო	ო	ന	ဗ	15	ო	es	ო	n	ო	15	<b>10.10</b> mm -	30
	No.	9		13	ដ	E1	e E	ដ	3	ដ	13	13	13	ដ	65	<del></del>	130
	Year			rd	Ø	ო	4	и»,	S.	<b>6</b>	<u>ب</u>	ω	თ	ដ	S.		Total 130
	Road Segment	, o						& 4,	Si Ayut	thaya	Road						

Source : JICA Team Estimation

Remarks 1. Nos. of accident and casualty are based on 1986 survey by JICA Team.

2. The costs and benefits are calculated at 1986 price.

3. Unit values of fatality, injury and property damage are;

1) fatality = \$0.09 million

2) injury

3) property damage = \$0.02 million

4. Traffic volume is set at 1986 level.

5. Rate of Discount: 5% per annum 6. Number in ( ) indicates the number of persons saved from fatality. 7. O/M means "Operation and Maintenance" 8. PV means "Present Value"

Benefit/Cost Computation on Safety Plans (6)

		<del></del>						<u>.</u>							<u>.</u>			
(noilli		3/2	(16)							3,97								4.94
Baht in million)	Wet	Senerit (B-C)	(15)							2,318								4.385
		ÞΥ	(14)		0.685	0.651	0.618	0.587	0.558	3,099	0.530	0.504	0.478	0,454	0.432	2.398		5.497
(Unit : Cost, Benefit		Total	(13)		0.685	0.685	0.685	0.685	0.685	3,425	0.685	0.685	0.685	0.685	0.685	3.425	. A.,	6.850
(Unit	(Saved)	Prop.Dam.	(12)		0.100	0.100	0.100	001.0	0.100	0.500	001.0	0.100	001:0	0.100	0.100	0.500		1.000
	Benefit (Saved)	Injury	(11)		0.135	5) 0.135	5) 0.135	5) 0:135	5) 0.135	5) 0.675	5) .0.135	5) 0.135	5) 0.135	5) 0.135	5) 0.135	3) 0.675		(5.0) 4.500 (15.0) 1.350
					(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(7.5)	(1.5)	(1.5)	(1.5)	(1.5)	(1.5)	(7.5)		(15.
		Fatality	(10)		) 0.450	0.450	0.450	0.450	0.450	) 2.250	0.450	) 0.450	(0.5) 0.450	) 0.450	0.450	) 2,250		4.500
. *		<u>.</u>			(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(2.5)	(0.5)	(0.5)	<u></u>	(0.5)	(0.5)	(2.5)		(5.0
	Reduc-	Rate(%)	(6)		20	50	20	20	20	: \	50	20	50	20	20			
		Λď	(8)		0.385	0.009	0.199	0.008	0.180	0.781	0.007	0.162	600.0	0.147	900.0	0.331		1.112
	Cost	Total	(7)		0.385	0.009	0.221	0.009	0 221	0.845	0.00	0.221	0.013	0,221	600.0	0.473		1.318
¥	ŏ	M/0	(9)			600.0	0.221	600.0	0.221	0.460	0.009	0.221	0.013	0.221	0.009	0.473		0.933
		Inst.	(2)		0.385	ı		1.	1	0.385	. I.	1	1		1	0		0.385
t. *		Tajury	(4)		m	m	ო	ო	n	15	m	<u>ო</u>	(O)	m	m'	15	· · · ·	30
	dent	Fatality	(3)		<b>.</b>	<b>-</b> 1	a	H	H	ΙΩ	rl	н	⊢t	H	н.	ம		22
y.	Accident	Casualty Fatality I	(2)		쟉	₩.	ਚ	4	4	50	4	맹	Фſ	4	ঝ	80		40
		No.	(1)		ន	Я	20	97	OI.	20	9	01	위	07	10	80		оот
		Year			, -1	NI.	m	Ąř	10	rs.	ø	۲۰	0)	ø	or.	ST		Total 100
		nent Pent	žo.	. · .					83	Phays	Thai	Road						

1. Nos. of accident and casualty are based on 1986 survey by JICA Team.
2. The costs and benefits are calculated at 1986 price.
3. Unit values of fatality, injury and property damage are; Remarks

1) fatality = F 0.9 million 2) injury | F 0.09 million 3) property damage = F 0.02 million

Traffic volume is set at 1986 level. 4. Traffic volume is set at 1986 le 5. Rate of Discount : 5% per annum

6. Number in ( ) indicates the number of persons saved from fatality.

7. O/M means "Operation and Maintenance" 8. PV means "Present Value"

Benefit/Cost Computation on Safety Plans (7)

·				·	A-1-4-1-4-1-4-1-4-1-4-1-4-1-4-1-4-1-4-1-									·	
	B/C						2.49					:			3.96
Ne t	(B-c) (15)						2.252								4.983
	PV (14)	0.831	0.789	0.750	0.712	0.677	3,759	0.643	0.611	0.580	0.551	0.524	2,909		6.668
	Total (13)	0.831	0.831	0.831	0.831	0.831	4,155	0.831	0.831	0.831	0.831	0.831	4.155		8.310
(Saved)	Prop. Dam. (12)	0.120	0.120	0.120	0.120	0.120	0.600	0.120	0.120	0.120	0.120	0.120	0.600		1.200
Benefit	Injury (11)	3) 0.351	3) 0.351	0.351	0.351	0.351	5) 1.755	0.351	0.351	0.351	0.351	0.351	5) 1.755		(39.0) 3.510
	7	(3.9	(3.9	(3.9	(3.9	(3.9	(19,	(3.9	(3.9	(3.9	(3.9	(3.9	(19.		(39.
	ality 10)			0.360	0.360	0.360	1.800	0.360	0.360	0.360	0.360	0.360	1.800		3.600
	) Tat	(6.4)	(0.4)	(0.4)	(0.4)	(0.4)	(2.0)	(0.4)	(0,4)	(0.4)	(0.4)	(0.4)	(2.0)		(4.0)
Reduc-	Rate (%)	35	35	38	38	35		35	35	35	35	335			
	PV (8)	1.290	0	0.114	0	0.103	1.507	0	0.093	0.001	0.084	0	0.178		1.685
ost	Total (7)	1.390	0	0.126	0	0.126	1.542	•	0.126	0.001	0.126	٥	0.253		1.795
ဎ	(9) W/0		0	0.126	0	0.126	0.252	٥	0.126	0.001	0.126	•	0.253		0.505
	Inst. (5)	1.290	. 1		1	1	1.290	1:	•	-1	1	1	0.		1.290
	Injury (4)	- <del>1</del>	디	Ħ	T.	#	ស	11	11	11	īī	11	55		110
len t	Fatality (3)	H	٦	r4	+-1	Ħ	Ŋ	н	н	ત	н	н	ຜ		10
Acci		12	21	ឌ	12	12	90	73	12	12	22	12	90		120
	No. (1)	17	11	7.7	17	11	82	11	17	17	11	17	85		סגד
: 2	Year	r1	77	m	4	ະກ	ST	9	7	œ	0	97	ST		rotal 170
Road Segment No.						S6	Rama I	Road							
	Accident (Saved)	d Year No. CasualtyFatality Injury Inst. O/N Total PV Rate(%) Fatality Injury (15) (6) (7) (8) (9) (10) (11) (12) (12) (13) (14) (15)	d Year No. CasualtyFatality Injury Inst. O/M Total PV Rate(%) Fatality Injury (12) (3) (4) (5) (6) (7) (8) (9) (3.9) 0.351 0.120 0.831 Net  1 17 12 1 11 1.290 - 1.290 1.290 35 (0.4) 0.360 (3.9) 0.351 0.120 0.831 0.831	Accident Accident Cost tion Enduction	Accident round rou	Action Tion No. CasualtyFatality Injury Injury (5) (6) (7) (8) (8) (3) (3.9) (3.5) (3.9) (3.8) (3.8) (	Total   Total   Total   Total   PV   Rate (%)   Fatality   Injury   Inst.   O/M   Total   PV   Rate (%)   Fatality   Injury   Total   PV   Rate (%)   Fatality   Total   PV   Rate (%)   Fatality   Total   PV   Rate (%)   Fatality   Injury   Pv   Total   PV   Rate (%)   Fatality   Injury   Total   PV   Rate (%)   Fatality   Injury   Total   PV   Rate (%)   Fatality   Total   PV   PV   Total   PV   Total	Year   No.   Casual No.   Injury   In	Heat   Heat	Heat   Heat   Mo.   Casually Fatallity   Injury   Injur	Moritian   Moritian	No.   Casumal by Fartality   Injury   Inst.   Coff   Cof	Act   Act	Mo.	Net   Net

 Nos. of accident and casualty are based on 1986 survey by JICA Team.
 The costs and benefits are calculated at 1986 price.
 Unit values of fatality, injury and property damage are;
 fatality = \$0.09 million
 injury \$0.09 million
 property damage = \$0.02 million Remarks

4. Traffic volume is set at 1986 level.
5. Raterof Discount: 5% per annum
6. Number in ( ) indicates the number of persons saved from fatality.
7. O/M means "Operation and Maintenance"
8. PV means "Present Value"

Benefit/Cost Computation on Safety Plans (8)

				~	:													 
illion)		B/C	(16)			٠.,				1.10							٠,	1.58
Baht in million,	Net	Benefit (B-C)	(15)							1.934								14.087
Semefit :		Λđ	(14)		4.771	4.532	4,306	4.091	3.886	21.586	3,692	3.507	3,332	3.165	3.007	16.703		38.289
(Unit : Cost, Benefit		Total	(13)		4.771	4.771	4.771	4.771	4.771	23.855	4.771	4.771	4.771	4.771	4.771	23.855		47.710
(Unit	(Saved)	Prop. Dam.	(12)		1.162	1.162	1.162	1.162	1.162	5.810	1.162	1.162	1.162	1.162	1.162	5.810		11.620
	Benefit (Saved)	Injury	(11)		(21.1) 1.899	(21.1) 1,899	(21.1) 1.899	(21.1) 1.899	(21.1) 1.899	(105.5) 9.495	(21.1) 1.899	(21.1) 1.899	(21.1) 1.899	(21.1) 1.899	(21.1) 1.899	(105.5) 9.495		(211.0)18.990
		Fatality	(01)		017.1 (6.1)	(1.9) 1.710	(1.9) 1.710	(1.9) 1.710	017.1 (6.1)	(9.5) 8.550	(1.9) 1.710	017.1 (6.1)	017.1 (6.1)	017.1 (0.1)	(1.9) 1.710 (	(9.5) 8.550		001.71(0.61)
	Reduc-	Rate(%)	(6)		37 (	37	37 (	37 (	37	<del></del>	37	37 (	37 (	37 (	37	<u> </u>		<u> </u>
		PV	(8)		14.759	0.839	1.733	0 757	1.564	19.652	0.683	1.411	0.626	1.274	0.556	4,550	٠.	24.202
	Cost	Total	(1)		14.759	0.083	1.920	0.883	1.920	20,365	0.883	1.920	0.896	1.920	0.883	6.502		26.867
	ပိ	M/0	(9)		ı	0.883	1.920	0.883	1.920	5.606	0.883	1.920	0.896	1.920	0.883	6.502	٠.	12,108
	·	Inst.	(5)		14.759	1 -	1	!	1	14.759	1	ı	1	ı	ı	0		14.759
		Injury	÷,		57	24	57	57	57	285	57	22	25	57	57	285		570
	den t	CasualtyFatality Injury	<u>(6</u>		ις	ıα	ις,	מי	ro.	25	Ŋ	v	מו	ю	່ເດ	25		50
	Accident	Casualty	(3)		62	62	62	62	. 62	310	85	62	62	62	62	310		620
		No.	6		157	157	157	157	157	785	157	157	157	157	123	785		1570
		Year			<b>~</b> 1	01	ო	4	. 2	E.	ဖ	~	8	on .	2	S.		Total 1570
		Road	No.		'				S.7	Sukhum-	vit	Road			1			

Remarks

4. Traific volume is set at 1986 level. 5. Rate of Discount : 5% per annum 6. Number in ( ) indicates the number of persons saved from fatality.

7. O/M means "Operation and Maintenance" S. PV means "Present Value"

Benefit/Cost Computation on Safety Plans (9)

		r			·	··	_,										 
	8/0	(16)							1.05								1.70
Net	(B-C)	(15)							0.973								15.611
Benefit (Saved)	·PV	(14)		4 724	4.448	4.263	4.050	3.848	21.373	3.655	3.473	3.299	3.134	2.977	16.538		37.911
	Total	(13)		4.724	4.724	4.274	4.724	4.724	23.620	4.724	4.724	4.724	4.724	4.724	23.620	<del></del>	47.240
	Prop. Dam.	(12)		0.944	775.0	776 0	776.0	776.0	4.720	776.0	0.944	776 0	776.0	776.0	4.720		9.440
	Injury	(11)		(26.0) 2,340	(26.0) 2.340	(26.0) 2.340	(26.0) 2.340	(26.0) 2.340	(130.0)11.700	(26.0) 2.340	(26.0) 2.340	(26.0) 2.340	(26.0) 2.340	(26.0) 2.340	(130.0)11.700		(260.0)23.400
	Fatality	(10)		(1.6) 1,440	(1.6) 1.440	(1.6) 1.440	(1.6) 1.440	(1.6) 1.440	(8.0) 7.200	(1.6) 1.440	(1.6) 1.440	(1.6) 1.440	(1.6) 1.440	(1.6) 1.440	(8.0) 7.200		(16.0)14.400
Reduc-	Rate (%)	(6)		07	0,7	. 40	0,4	07		0,7	07	0,7	07	07			
	Λď	(8)		18.486	0.516	0.490	0.466	0.442	20,400	0.420	0.399	0.379	0,360	0.342	1.990		22.300
s.t	Total	(3)		18.486	0.516	0.543	0.543	0.543	20.658	0.543	0.543	0.543	0.543	0.543	2.715		23.373
Cost	W/o	(9)		ı	0.543	0.543	0.543	0.543	2.172	0.543	0.543	0.543	0.543	0.543	2.715	·	4.887
	Inst.	(5)		18.486	ı	ı	1	t	18.486	ı	ı	1	1	ŀ	0		 18,486
	Injury	(4)		65	65	65	65	. 65	325	65	65	65	65	65	325		650
ent	Fatal1ty	(3)	-	4	7	4	4	4	20	7	4	ব	4	7	20		07
Accident	Casualty Fatality Injury	(2)		69	69	69	69	69	345	69	69	69	69	69	345		069
		ਹ		118	118	118	118	118	290	118	118	113	118	118	590		1180
	Year	- ;			61	m	4	'n	ST	φ	7	∞	o,	임	ST		Total
	Road Segment				-			ώ vs	Rama	ΔΙ	Road						

Source : JICA Team Estimation

Renarks

1. Nos, of accident and casualty are based on 1986 survey by JICA Team.
2. The costs and benefits are calculated at 1986 price.
3. Unit values of fatality, injury and property damage are;
1) fatality = \$0.9 million
2) injury \$0.09 million
3) property damage = \$0.02 million
4. Traffic volume is set at 1986 level.

5. Rate of Discount: 5% per annum 6. Number in ( ) indicates the number of persons saved from fatality.
7. O/M means "Operation and Maintenance"
8. PV means "Present Value"

Benefit/Cost Computation on Safety Plans (10)

_ 1	· ·						·			<del></del>			. ~				·	<u>1</u>
1111on)	1t B/C (16)					<u></u> .		7.90									11.80	
Baht in million)	Net	(B-C)	(15)						6.462									12:013
Benefit:		ΦΛ	(14)	1.635	1.553	1.476	1.402	1.332	7.398	1.265	1.202	1.142	1.085	1.033	5.727			13.125
(Unit : Cost, Benefit		Total	(13)	1,635	1.635	1.635	1.635	1.635	8.175	1.635	1.635	1.635	1.635	1.635	8.175			16.350
(Unit	Benefit (Saved)	Prop.Dam.	(12)	0.150	0.150	0.150	0.150	0.150	0.750	0.150	0.150	0.150	0.150	0.150	0.750			1.500
	Benefit	in jury	(11)	(6.3) 0.585	(6.5) 0.585	(6.5) 0.585	(6.5) 0.585	(6.5) 0.585	(32.5) 2.925	(6.5) 0.585	(6.5) 0.585	(6.5) 0.585	(6.5) 0.585	(6.5) 0.585	(32.5) 2.925			(65.0) 5.850
		Fatality	(10)	006.0 (0.1)	(1.0) 0.900	(1.0) 0.900	(1.0) 0.900	(1.0) 0.900	(5.0) 4.500	(1.0) 0.900	(1.0) 0.900	(1.0) 0.900	(1.0) 0.900	(1.0) 0.900	(5.0) 4.500			(10.0) 9.000
	Reduc-	Rate(%)	· (8)	20	22	. 50	8	50		. 50	20	20	50	20			:	
		Δď	(8)	0.739	0.018	0.086	0.016	0.077	0.936	0.015	0.070	0.016	0.063	0.012	0.176	· :	:	1.112
	Cost	Total	(7)	0.739	0.019	0.095	0.019	0.095	0.967	0.019	0.095	0.023	0.095	0.019	0.251			1.218
		м/о	(9)		0.019	0.095	0.019	0.095	0.228	0.019	0.095	0.023	0.095	0.019	0.251		. · 	0.479
		Inst.	(5)	0.739	1	1	I .		0.739	j	1		1	J	0			0.739
		Injury	<del>(</del> 3)	13	13	13	13	13	65	13	13	13	13	13	65			130
	ent	CasualtyFatality Injury	3	7	7	7	23	7	10	71	<b>74</b> ,	73		сı	21			20
	Accident	Casualty	(3)	1.5	113	15	15	15	7.5	1.5	15	13	15	53	75			150
ļ		No.	£	1.5	5.	15	1.5	15	75	51	13	2	15	13	75	·		150
		Year		14	73		4	٧	ST	•	1	ဆ	6	2	SŢ			Total
		Road Segment	No.						6 8	Itsara-	рћар	Road						

1. Nos. of accident and casualty are based on 1986 survey by JICA Team.
2. The costs and benefits are calculated at 1986 price.
3. Unit values of fatality, injury and property damage are;
1) fatality = F 0.9 million Renarks

1) fatality = # 0.9 million 2) injury # 0.09 million 3) property damage = # 0.02 million

4. Traffic volume is set at 1986 level.

6. Number in ( ) indicates the number of persons saved from fatality. 5. Rate of Discount : 5% per annum

7. O/M means "Operation and Maintenance" 8. PV means "Present Value"

Benefit/Cost Computation on Safety Plans (11)

2	·				····		·				·						 , <del></del> -
million		D/α	(16)							3.08						·	 5.00
: Beht in million)	Net	(B-C)	(15)		·					5.181							 10.882
Benefit:		Δď	(14)		1.695	1.610	1,530	1.453	1.386	7.669	1.312	1.246	1.184	1,124	1.068	5.934	13.603
(Unit : Cost, Benefit		Total	(13)		1.695	1.695	1.695	1.695	1,695	8.475	1.695	1,695	1.695	1.695	1.695	8,475	16.950
tau)	(Saved)	Prop.Dam.	(32)		0.264	0.264	0.264	0.264	0.264	1.320	0.264	0.264	0.264	0.264	0.264	1.320	2.640
	Benefit (Saved)	Injury	(11)		168.0 (6.6)	168.0 (6.6)	(9.9) 0.891	168.0 (6.6)	(9.9) 0.891	(44.5) 4.455	(9.9) 0.891	168.0 (6.6)	168.0 (8.6)	168.0 (6.8)	168.0 (6.6)	(44.5) 4.455	(99.0)44.550
		Fatality	(10)		(0.6) 0.540 (	0.540	0.540	0.540	0.540	2,700	0.540	0.540	0.540	0.540	0.540	2.700	 (6.0) 54.000 (9
	Reduc-	િ	6.	-	55 (0.	.55 (0.6)	55 (0.6)	55 (0.6)	55 (0.6)	(3.0)	55 (0.6)	55 (0.6)	55 (0.6)	55 (0.6)	55 (0.6)	(3.0)	 (6.
		ÞΛ	(8)		2.250	0.048	0.077	0.044	690.0	2.488	0.039	0.062	0.044	0.056	0.032	0.233	2.721
	Cost	Total	3		2.250	0.051	0.085	0.051	0.085	2.522	0.051	0.085	0.063	0.085	0.051	0.335	2.857
	ŏ	ぱつ	(9)		ı	0.051	0.085	0.051	0.085	0.272	0.051	0.085	0.063	0.085	0.051	0.335	0.607
		Inst.	69		2.250	ı	ı	ı	1	2.250	1	1	٠ 1	1	1	1	2.250
		Injury	÷		83	18	18	138	8	06	18	18	1.8	18	18	06	180
	dent	Fatality	<u>6</u>		н	н	н	rd	н	c,	н	rt	-	н	н	κ	10
	Accident	Casualty Fatality Injury	63	`	13	19	139	61	61	92	19	139	61	139	13	8 8	190
		No.	<u> </u>		22	4,	24	4,	42	120	24	4,	24	22	24	120	240
		Year			H	01	ო	4	ഗ	E S	60	2	αο.	თ	유	ST	Total 240
	ſ	Segment	, o						810	Charoen	Nakhon	Road				·	

 Nos. of accident and casualty are based on 1986 survey by JICA Team.
 The costs and benefits are calculated at 1986 price.
 Unit values of fatality, injury and property damage are;
 1) fatality = \$0.9 million
 injury \$0.09 million
 property damage = \$0.02 million Remarks

4. Traffic volume is set at 1986 level.
5. Rate of Discount: 5% per annum
6. Number in ( ) indicates the number of persons saved from fatality.
7. O/M means "Operation and Maintenance"
8. PV means "Present Value"

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