

link (Bagmati Corridor) will be determined in the succeeding feasibility study.

The alignment of West link (Bishnumati Corridor) was already studied in the KVUDPP by ADB, so that the Nepalese government might be able to commence the land/house acquisition along the proposed road.

2) Outer Ring Road and other new roads proposed outside the Ring Road

Elsewhere new roads will be required inside or outside the Ring Road - in the longer term - to serve the expansion of urban areas, the alignment for these roads should be identified as soon as possible and the land either safeguarded or acquired. Construction may be deferred until development takes place and the land kept in agricultural use until that time.

3) Widening of the Existing Roads

The city roads have mostly encountered problems of encroachment in the right-of-way and uncontrolled development adjacent thereto. Encroachment of buildings inside the right-of-way sometimes interfere with traffic flow and deteriorate the road function and capacity. DOR should be empowered to control these issues and commence the land/house compensation and acquisition immediately where the widening of the roads is proposed, especially the section between Old Baneswar and New Baneswar.

Table 9.6 Total and Sectoral Investment Requirement

	Seventh Plan (1986 - 90)		Eighth Plan (1993 - 1997)	
	Amount (NRs. million)	Share (%)	Amount (NRs. million)	Share (%)
Total Gross Fixed Investment	107,147	100.0	189,537	100.0
Agriculture	26,283	24.5	49,735	26.2
Manufacturing & Industry	7,876	7.4	17,751	9.4
Electricity	17,938	16.7	29,812	15.7
Construction	3,518	3.3	5,686	3.0
Trade & Restaurant	2,785	2.6	7,911	4.2
Transport & Communication	16,518	15.4	26,016	13.7
Finance & Real Estate	24,932	23.3	37,059	19.6
Social Services	7,297	6.8	15,567	8.2

Source: Approach to The Eighth Plan 1992 - 97, National Planning Commission, November, 1991.

(4) Viability of Implementation Plan

Total construction cost for all the projects proposed both in short-term and long-term (including middle-term) plans is about NRs.11,530 million, of which the total cost required for short-term plan and long-term plans are about NRs.3,080 and NRs.8,450 million respectively. The cost for short-term plan accounts for about 12% of total planned expenditure for transportation sector during the period of the Eighth Five Year Plan in Nepal. This figure suggests the projects proposed here are fully implementable in the budget of Nepal. Besides, the total cost required for the implementation of long-term plan, say 8,450 million, is deemed covered by the fund which will be prepared for the investment for transport sector in the forthcoming Five Year Plans after the ongoing one.

The issue of land acquisition is another matter to be considered carefully. Total land-acquisition cost for short-term and long-term plans are NRs.1,060 million and NRs.5,160 million respectively. Government of Nepal is responsible for the execution of land acquisition and cost required for it is to be catered by themselves. However, problem here is that there is no systematic land acquisition method in Nepal, although there is some land acquisition methods such as GLD method are fragmentary applied in the urban road development, most of the land acquisition here is conducted in disorganized and imperfect manner. Rational land acquisition system, such as one being adopted in land readjustment scheme in Japan, is to be urgently established in Nepal. Introduction of sophisticated land acquisition system, which stipulate means of land acquisition, compensation method including provision of substitutional land and so on, would greatly promote efficient achievement of land acquisition.

9.3 High Priority Projects for Feasibility Study

High priority projects are selected from the development plan proposed in the short-term. Selection was made taking into consideration the following factors:

- 1) Required amount of the construction fund
- 2) Required amount for land/house acquisition and compensation
- 3) Ease of construction from the view point of acquiring land
- 4) Urgency of the project
- 5) Improvement of local traffic movement
- 6) Reduction of the traffic accidents
- 7) Construction technology
- 8) Improvement of access to the public transport services

The Study team evaluated various development programmes of road, public transport and traffic management proposed in the short-term plan and the result of evaluation is

presented in Table 9.7. As the result, the following projects are recommended as a high priority project of which location is presented in Fig. 9.7 :

High priority projects to be Implemented

(A) Improvement of Bagmati Transport Corridor consisting of:

(A-1) Construction of South Link of Inner Ring Road

The project is located on south bank of Bagmati river and connect Dhobi Khola bridge on Arniko Highway at east end and Kuleswar-Kalimati Road at west end

(A-2) Construction of Teku Access from Teku bridge to the Ring Road

(A-3) Extension of East Bagmati Riverside Road along north bank of Bagmati river

(A-4) Construction of New Bagmati Bridge with 2 lanes at Kupandol

(A-5) Construction of Access from the south link of Inner Ring Road to Patan city

(B) Construction of Access to the New Bus Terminal at Balaju

(B-1) Construction of Access from Nayabazar to the Ring Road at Balaju

The required cost for implementation of the high priority projects mentioned above is summarized in Table 9.8.

The feasibility study will be conducted on the high priority projects to confirm the technical and economical viability.

Table 9.7 SELECTION OF HIGH PRIORITY PROJECTS TO BE CONDUCTED FOR FEASIBILITY STUDY

Evaluation Items	Proposed Road Network				
	CS-1: Improvement of Bagmati Transport Corridor	CS-2: Improvement of Access to the New Bus Terminal	CS-3: Improvement of Bishnumati Transport Corridor	CS-4: Widening of Old Baneswar New Baneswar	CS-5: Improvement of Patan Access
1. Required amount of Construction Cost	C	A	B	B	A
2. Required Local Fund for Land/House Acquisition	B	B	C	C	B
3. Ease of Construction from the View Point of Acquiring Land	A	A	C	C	B
4. Urgency of the Project	A	A	A	A	B
5. Improvement of Local Traffic Movement	A	A	A	A	A
6. Reduction of Traffic Accidents	A	B	A	A	B
7. Construction Technology	A	B	A	C	C
8. Improvement of Access to the Public Transport Services	A	A	A	A	A
Total Score	21	21	19	18	18
Priority	1	1	3	4	4
RECOMMENDED HIGH PRIORITY PROJECTS TO BE CONDUCTED FOR FEASIBILITY STUDY	0	0	(DOR is negotiating with ADB for implementation of this project)		

NOTE: MARK A = 3 point, MARK B = 2 point, MARK C = 1 point

Table 9.8 Proposed Investment Programme of High Priority Projects

High Priority Projects	High Priority projects to be Implemented in the Short-term Plan												Total				
	Target for Development:		1993		1994		1995		1996		1997			Land/House	Construction	Land/House	Construction
	(1) Improvement of Bottlenecks in Urban Traffic Conditions	(2) Relief of Transport-Poor	Construction	Land/House	Construction	Land/House	Construction	Land/House	Construction	Land/House	Construction	Land/House					
(A) Improvement of Bagnmati Transport Corridor																	
(A-1) Construction of South Link of the Inner Ring Road			30		350	60	350	20	300	0					1000	80	
(A-2) Construction of Toki Access				20											30	20	
(A-3) Construction of Riverside Road on North Bank of Bagnmati									120	30		120	30	240	60		
(A-4) Expansion of Bagnmati Bridge from 2 to 4 lanes									160	10		100	0	260	10		
(A-5) Access from Inner Ring Road to Patan												20	10	20	10		
(B) Improvement of Access to New Bus Terminal at Balaju			100	90													
(B-1) Construction of Access (Nayabazar - Ring Road at Balaju)			120	110	350	60	350	20	580	40		240	40	1650	270		
			380	330	1,050	180	1,050	60	1,720	120		710	120	4,910	810		
			Total (NRs.x Million):														
			Total (Equiv. to Yen x Million):														

Unit : NRs. x Million

LEGEND

High Priority Projects to be followed by feasibility study

(A) Improvement of Bagmati Transport Corridor

A-1: South Section of Inner Ring Road

A-2: Teku Access

A-3: New Bagmati Bridge with 2 lanes at Kulpandol

A-4: East Bagmati Riverside Road along north bank of Bagmati River

A-5: Access from Inner Ring Road to Patan

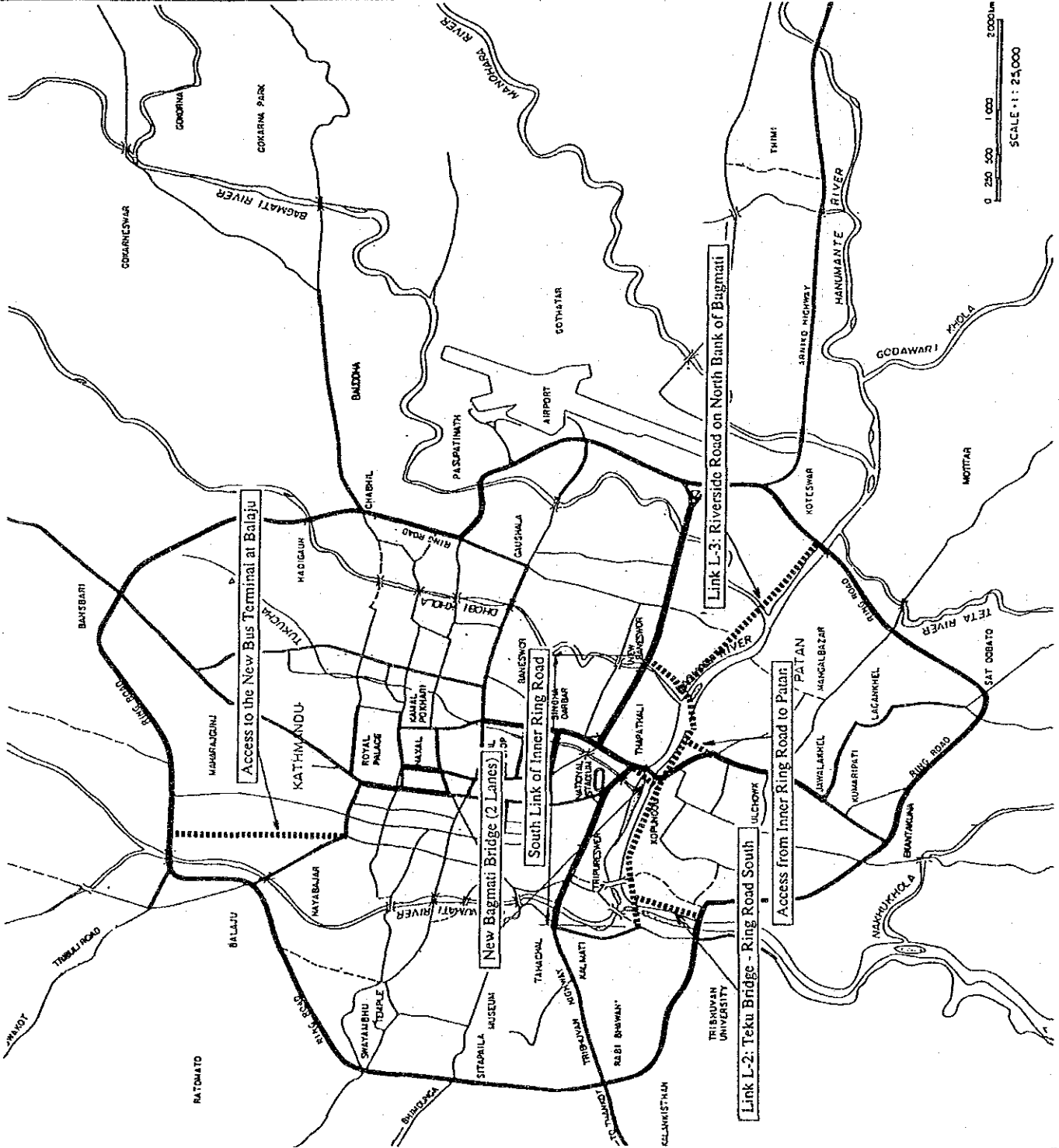
(B) Access to New Bus Terminal at Balaju

HIS MAJESTY'S GOVERNMENT OF NEPAL
(H.M.G)

KATHMANDU VALLEY
URBAN ROAD DEVELOPMENT
HIGH PRIORITY PROJECTS
TO BE FOLLOWED BY F/S

FIG. 9.7

JAPAN INTERNATIONAL COOPERATION
AGENCY (JICA)



APPENDIX

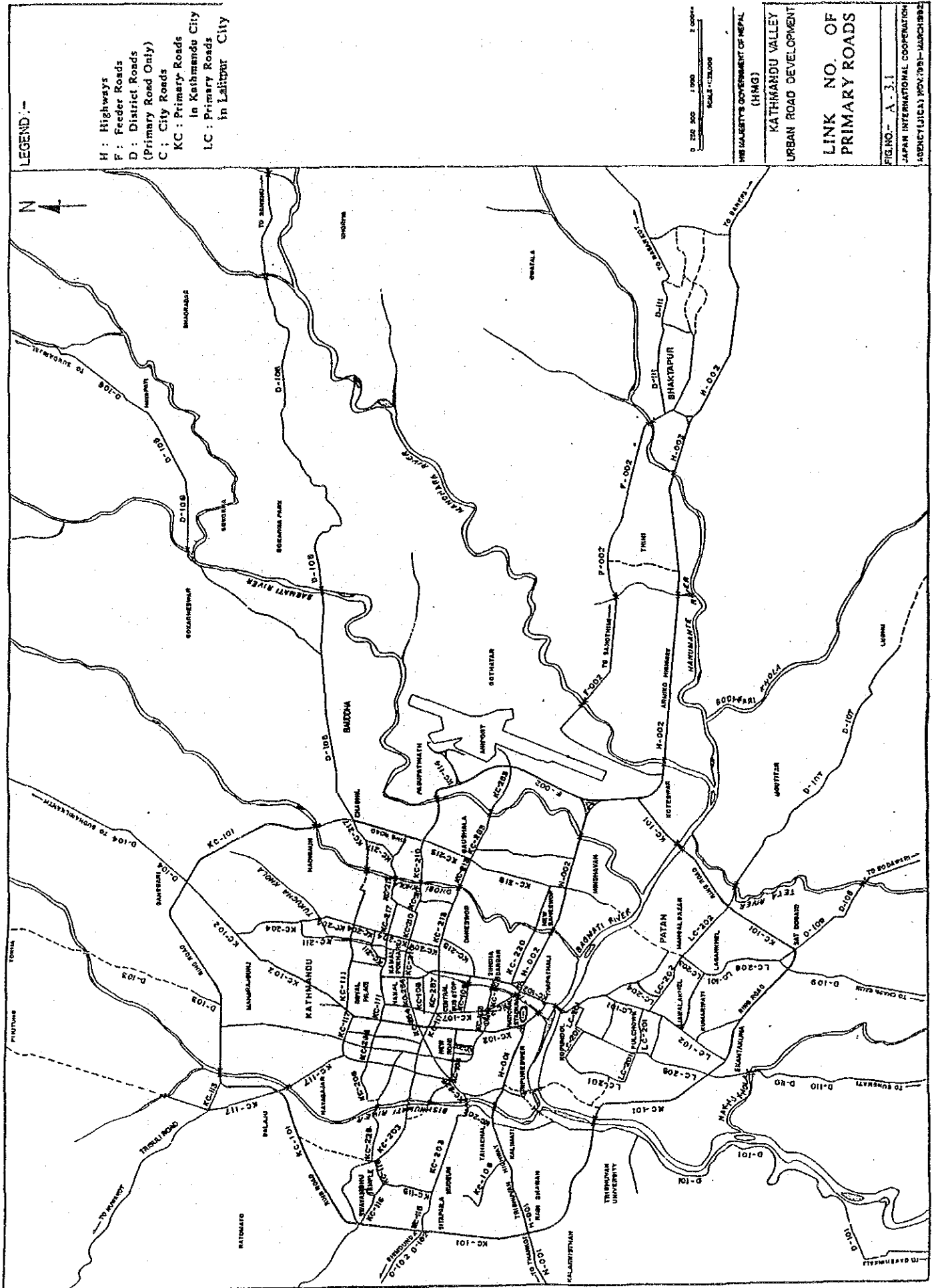


CHAPTER 3 PRESENT TRANSPORTATION SYSTEM

Appendix 3-1 Summary of Road Inventory

Appendix 3-2 Traffic Capacity of Existing Road

APPENDIX 3-1 SUMMARY OF ROAD INVENTORY



KATHMANDU VALLEY URBAN ROAD DEVELOPMENT STUDY

Name of Road Link

Link No.	Name of Road
(1) Highway	
H-001	Tribhuvan Highway
H-002	Amiko Highway
(2) Feeder Road	
F-001	Trisuli Road
F-002	Thimi Road
(3) District Road (Primary Road only)	
Kathmandu District	
D-101	R.R.(Tribhuban Univ.)- Pharping- Dakshinkali
D-102	R.R.(Kimdol) - Sitapaila- Bhimdhunga
D-103	R.R.(Maharajgunj) - Tokha
D-104	R.R.(Bansbari) - Budhanilkanth
D-105	R.R.(Chabahil)-Gokarna-Sankhu
D-106	Baralgaun (Jorpati)-Sundarjal
D-107	Balaju - Phutung
D-108	R.R.(Gwarko)-Lubhu-Lamatar
D-109	R.R.(Sat Dobato)-Thaiba-Godawari
D-110	R.R.(Sat Dobato)-Thecho-Chapagaun-Lele
D-111	R.R.(Jaulakhel) - Nakhu - Bungamati
D-112	Bhaktapur-Nagarkot
(4) City Road	
Kathmandu City Class A Roads	
KC-101	Ring Road
KC-102	Maitighar - Thapathali
	Thapathali (Bagmati Bridge) - Tripureswor Junction
	Tripureswor - Nagasthan
	Nagasthan- Ranipokhari
	Ranipokhari - Lainchour
	Lainchour - Maharajgunj-Ring Road Jn.
KC-103	Nagasthan - Shahid Gate - Bhadrakali
	Bhadrakali - Singh Durbar
KC-104	New Road Gate-Kasthamandap-Hanumandhoka
KC-105	Kalimati - Kuleswor
	Kuleswor - Ring Road
KC-106	Kalimati - Hotel Soalte Oberoi
KC-107	Bhadrakali - NEA-Trichandra Campus
	Trichandra Campus-Royal Palace
KC-108	Trichandra Campus - Kamaladi (RNA)
KC-109	Bus Stop - City Hall- Padmodaya HS
KC-110	Maitighar - Singh Durbar - Putalisadak
KC-111	Keshar Mahal - Nagpokhari
	Nagpokhari - Nanigunj-Lainchour
KC-112	Bhotahity - Former Zonal Commissioner's Office
KC-114	Ring Road - Tribhuvan Airport
KC-115	Ring Road - Museum - Swoyambhu
KC-116	Road around Swoyambhu
KC-117	Lainchaur - Amrit Campus
	Amrit Campus - Balaju
Lalitpur City Class A Roads	
LC-101	RR(Sat Dobato)-Lagankhel(Bus Stop)
	Lagankhel(Bus Stop)-Jawalakhel(Roundabout)
	Jawalakhel (Roundabout)- Pulchowk
	Pulchowk - Bagmati Bridge
LC-102	Jawalakhel(Roundabout)-Ekantakuna
	Ekantakuna-Ring Road
LC-103	Patan Gate- Kopundole

Link No.	Name of Road
Kathmandu city Class B Roads	
KC-202	Gaushala - Pashupati - Guheswori
KC-203	Kalimati - Tankeswori - Tahachal - Museum
KC-204	Shital Niwas - Baluwatar - Rastra Bank - Bhatbhateni
	Bhatbhateni- Tangal - Bhagwatibahal- Kamalpokhari
	Kamalpokhari - Dilli Bazar
KC-206	Keshar Mahal - Thamel(Nursing Campus)
	- Chhetrapati - Shova Bhagawati
KC-207	Nagasthan - Bhimsen Tower - Khichhapokhari
	- New Road (American Library)
KC-209	Jaya Nepal Cinema - Hattisar - Krishna Pauroti
	Krishna Pauroti - Kamaladi Ganesh
KC-210	Krishna Pauroti - Kamal Pokhari
	Kamal Pokhari - Gyaneswor - Rato Pul
	Rato Pool - Gaushala
KC-211	Nag Pokhari - Singh Dobato - Gairi Dhara -
	Rastra Bank - Baluwatar
KC-212	Singh Dobato - Bal Mandir
KC-213	Dilli Bazar - Maitidevi-Old Baneswor
	Old Baneswor -Gaushala
KC-215	Sano Gauchar - Gyaneswor
	Gyaneswor - Maitidevi - Ghattekulo
KC-216	Dilli Bazar - Kalikasthan - Putalisadak
KC-217	Nag Pokhari - Bhagawati Bahal - Sano Gauchar
	Sano Gauchar - Kalo Pool - Shifal - Chabahil
	Chabahil(Mitra Park) - Guheswori
KC-218	Old Baneswor - Mahadevsthan - New Baneswor
KC-219	Thapathali - Maternity Hospital - Babar Mahal
KC-220	National Archives - Back side of Babar Mahal
	- International Conference Centre
KC-224	Kathmandu Ganeshsthan - Nardevi - Chhetrapati-
	Sorhakhutte
KC-225	Kathmandu Ganeshsthan - Bhimsensthan -
	Tankeswori (Bishnumati Bridge)
KC-229	Dallu - Shodha Bhagawati
KC-230	Swoyambhu - Bijeswori - Shodha Bhagawati
KC-252	Adwait Marg
KC-253	Sinamangal -Old Baneswor
KC-254	Rastriya Nachghar-Tindhara Pathsala - Krisha
	Pauroti - Kamalpokhari
KC-255	Bhadrakali - Maitighar
KC-257	Former Zonal Commissioner's Office-Bagh Bazar
Lalitpur City Class B Roads	
LC-201	Kupandol-Sanepa-Pulchowk
LC-202	Pulchowk-Gabahal
	Gabahal-Durbar Square
	Durbar Square-Gwarko
LC-203	Durbar Square-Lagankhel
LC-204	Gabahal-Patan Gate
LC-205	Jhamsikhel- Ring Road
LC-206	Lagankhel-Army Banack-Ring Road
Bhaktapur City Class B Roads	
BC-201	Sallaghari Jn.- Bus Park
BC-202	Bus Park- Durbar Square
BC-203	Bus Park- Thimi Road Jn.-Nagarkot Road Jn.
BC-204	Nagarkot Road Jn.-Amiko Highway

SUMMARY OF ROAD INVENTORY IN KATHMANDU VALLEY

	DOR Road Statistics in 1990				JICA Study Team in 1990			
	Road Length (km)	Blacked Topped (Km)	Gravelled (km)	Earthen (km)	Road Length (km)	Blacked Topped (km)	Gravelled (km)	Earthen (km)
Road Network by District								
1. Kathmandu District								
Highway	18.0	18.0	0.0	0.0	18.0	18.0	0.0	0.0
Feeder Road	0.0	0.0	0.0	0.0	17.0	17.0	0.0	0.0
District Road	172.0	51.0	72.0	49.0	172.0	51.0	72.0	49.0
Urban Road	250.0	146.0	66.0	38.0	250.0	146.0	66.0	38.0
Total (1)	440.0	215.0	138.0	87.0	457.0	232.0	138.0	87.0
2. Lalitpur District								
Highway	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Feeder Road	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
District Road	91.0	32.0	15.0	44.0	91.0	32.0	15.0	44.0
Urban Road	73.0	41.0	22.0	10.0	73.0	41.0	22.0	10.0
Total (2)	164.0	73.0	37.0	54.0	164.0	73.0	37.0	54.0
3. Bhaktapur District								
Highway	16.0	16.0	0.0	0.0	16.0	16.0	0.0	0.0
Feeder Road	8.0	8.0	0.0	0.0	8.0	8.0	0.0	0.0
District Road	79.0	29.0	39.0	11.0	79.0	29.0	39.0	11.0
Urban Road	16.0	6.0	10.0	0.0	16.0	6.0	10.0	0.0
Total (3)	119.0	59.0	49.0	11.0	119.0	59.0	49.0	11.0
Total (1)+(2)+(3)	723.0	347.0	224.0	152.0	740.0	364.0	224.0	152.0
Road Network by Classification								
1. Highway								
Kathmandu District	18.0	18.0	0.0	0.0	18.0	18.0	0.0	0.0
Lalitpur District	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bhaktapur District	16.0	16.0	0.0	0.0	16.0	16.0	0.0	0.0
Total (1)	34.0	34.0	0.0	0.0	34.0	34.0	0.0	0.0
2. Feeder Road								
Kathmandu District	0.0	0.0	0.0	0.0	17.0	17.0	0.0	0.0
Lalitpur District	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bhaktapur District	8.0	8.0	0.0	0.0	8.0	8.0	0.0	0.0
Total (2)	8.0	8.0	0.0	0.0	25.0	25.0	0.0	0.0
3. District Road								
Kathmandu District	172.0	51.0	72.0	49.0	172.0	51.0	72.0	49.0
Lalitpur District	91.0	32.0	15.0	44.0	91.0	32.0	15.0	44.0
Bhaktapur District	79.0	29.0	39.0	11.0	79.0	29.0	39.0	11.0
Total (3)	342.0	112.0	126.0	104.0	342.0	112.0	126.0	104.0
4. Urban Road								
Kathmandu District	250.0	146.0	66.0	38.0	250.0	146.0	66.0	38.0
Lalitpur District	73.0	41.0	22.0	10.0	73.0	41.0	22.0	10.0
Bhaktapur District	16.0	6.0	10.0	0.0	16.0	6.0	10.0	0.0
Total (4)	339.0	193.0	98.0	48.0	339.0	193.0	98.0	48.0
Total (1) + (2) + (3) + (4)	723.0	347.0	224.0	152.0	740.0	364.0	224.0	152.0

**Kathmandu Valley Urban Road Development
Summary of Road Inventory - Rural Road**

SY: Sajha Yaayaa
MB: Mini-bus
TMP: Tempo Y: Yes, N: No

Link No.	Name of Road	Road Length (km)	Classification	Lane No.	Carriage-way Width (m)	Pavement Type			Pavement Condition		Bridge Nos. Length(m)		Bus Route	Side Walk	Remarks
						Black-topped (km)	Gravelled (km)	Earthen (km)	Good (km)	Fair (km)	Fair (km)	Poor (km)			
1. Highway															
H-001	Tribhuvan Highway(Tripureswar-Soaltee)	2.0	Highway	4.0	12.5	2.0	0.0	0.0	2.0	0.0	0.0	1.0	SY,MB,TMP	Y	
	Tribhuvan Highway (Soaltee - Ring Road)	1.0	"	2.0	7.0	1.0	0.0	0.0	1.5	0.0	0.0	0.0	SY,MB,TMP	N	
	Tribhuvan Highway (Ring Road - Nagdihunga)	9.0	"	2.0	7.0	9.0	0.0	0.0	0.0	9.0	0.0	1.0	SY,MB,TMP	N	
H-002	Arniko Rajmarg (Thapathali-Koteswar)	5.0	"	4.0	14.0	5.0	0.0	0.0	0.0	0.0	0.0	2.0	TB,MB,TMP	Y	Originally excluded
	Arniko Rajmarg (Koteswar - Bhaktapur)	9.0	"	2.0	6.5	9.0	0.0	0.0	8.0	0.0	0.0	2.0	TB,MB	N	Originally 52.0 km
	Arniko Rajmarg (Bhaktapur - Saraga)	8.0	"	2.0	6.0	8.0	0.0	0.0	7.0	0.0	0.0	1.0	MB	N	
	Total of Highway (1)	34.0				34.0	0.0	0.0							
2. Feeder Road															
2.1 Kathmandu District															
F-001	Trisuli Highway(R.R.-Balaju)	0.4	Feeder Rd	2.0	7.0	0.4	0.0	0.0	0.4	0.0	0.0	0.0	SY,MB	N	From Nuwakot Distr.
	Trisuli Highway(Balaju- Thulo Khola)	16.6	"	1.0	5.0	11.7	0.0	0.0	0.0	11.7	0.0	0.0		N	
2.2 Lalitpur District															
		0.0				0.0	0.0	0.0							
2.3 Bhaktapur District															
F-002	A.R.M (Koteswar)-Thimi-Bhaktapur	8.0	Feeder Rd	1.0	3.8	8.0	0.0	0.0	0.0	8.0	0.0	2.0	SY,MB	N	
	Total of Feeder Road (2)	25.0				20.1	0.0	0.0							
3. District Road															
3.1: Kathmandu District															
D-101	R.R.(Tribhuvan Univ.)-Pharping-Daksinkali		Distr. Rd												Primary District Road
	R.R.(Tribhuvan Univ.)-Chobhar	4.0	"	2.0	7.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	SY,MB	N	
	Chobhar- Daksinkali	14.0	"	1.0	4.0	14.0	0.0	0.0	14.0	0.0	0.0	0.0	SY,MB	N	
D-103	R.R.(Kirito)-Siapaila-Bhimdunga	7.0	"	1.0	3.0	1.0	6.0	0.0	1.0	0.0	6.0	0.0	No	N	Primary District Road
D-104	R.R.(Maharajganj)-Tokha	4.0	"	1.0	4.0	0.0	4.0	0.0	0.0	0.0	4.0	1.0	SY,MB,TMP	N	Primary District Road
D-105	R.R.(Bansbar)- Budhanilkantha	6.0	"	2.0	7.5	6.0	0.0	0.0	1.0	5.0	0.0	0.0	SY,MB,TMP	N	Primary District Road
D-106	R.R.(Chabahi)-Gokarna-Sankhu														Primary District Road
	R.R.(Chabahi)-Gokarna	4.0	"	2.0	10.0	4.0	0.0	0.0	4.0	0.0	0.0	1.0	SY,MB,TMP	Y	
	Gokarna-Sankhu	8.0	"	1.0	3.8	8.0	0.0	0.0	8.0	0.0	0.0	0.0	SY,MB	N	
D-107	Baragaun (Jomati)-Sundarijal	9.0	"	1.0	3.5	0.0	9.0	0.0	0.0	0.0	9.0	2.0	MB	N	Primary District Road
D-108	Belaju - Phunwar		"	1.0	3.5	0.0	4.0	3.0	0.0	0.0	7.0	1.0			
	Total of Kathmandu District Road (1)	63.0				97.0	23.0	3.0							
2.2: Lalitpur District															
D-109	R.R.(Gwarko)-Lubhu-Lamaar	9.0	Distr. Rd	1.0	3.5	5.0	3.0	1.0	5.0	4.0	0.0	2.0	MB	N	Primary District Road

**Kathmandu Valley Urban Road Development
Summary of Road Inventory - Rural Road**

SY: Sejha Yaraaya
MB: Mini-bus
TMP: Tempo

Y: Yes, N: No

Link No.	Name of Road	Road Length (km)	Classification	Lane No.	Carriage-way Width (m)	Pavement Type			Pavement Condition		Bridge Nos., Length(m)		Bus Route SY, MB, TMP	Side Walk Y, N	Remarks	
						Black-topped (km)	Gravelled (km)	Earthen (km)	Good (km)	Fair (km)	Poor (km)	Good				Bad
D-110	R.R.(Sat Doba) - Thaba-Godawari															
	R.R.(Sat Doba) - Harisiddhi	2.5	"	2.0	6.0	2.5	0.0	0.0	2.5	0.0	0.0	1.0	0.0	0.0	N	Primary District Road
	Harisiddhi-Thaba-Godawari	7.5	"	1.0	3.7	7.5	0.0	0.0	7.5	0.0	0.0	0.0	0.0	0.0	N	
D-111	R.R.(Sat Doba) - Trecho-Changgaun-Lele	13.0	"	1.0	3.0	7.0	0.0	0.0	7.0	0.0	6.0	0.0	0.0	0.0	N	Primary District Road
L-112	R.R.(Jaulakhel) - Nakhu - Bupgamati	8.0	"	2.0	5.5	7.0	1.0	0.0	7.0	1.0	0.0	0.0	1.0	0.0	N	Primary District Road
	Total of Lalitpur District Road (2)	40.0				29.0	4.0	7.0								
2.3: Bhaktapur District																
D-113	Bhaktapur-Nagarkot	20.0	Dist. Rd	1.0	3.5	20.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	N	Primary District Road
D-114	Bhaktapur- Changunarayan	6.0	"	1.0	3.0	6.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	N	
	Total of Bhaktapur District Roads (3)	26.0				26.0	0.0	0.0								
	Total of District Roads (1)+(2)+(3)	129.0				92.0	27.0	10.0								
Summary of Highway and Rural Roads in KTM Valley																
1.	Highway	54.0				34.0	0.0	0.0	0.0							
2.	Feeder Road	25.0				25.0	0.0	0.0	0.0							
3.	District Road	129.0				92.0	27.0	10.0								
	Total	188.0				151.0	27.0	10.0								

Kathmandu Valley Urban Road Development Summary of Road Inventory - Urban Road

SY: Sajha Yatayat C: Commercial area
MB: Mini-bus R: Residential area
TMP: Tempo A: Agricultural/other area

Note: Urban road subject to the Study consists of Highway inside Ring Road and City roads in each district.
City road subject to the Study are Class A and Class B roads only.

Link NO.	Name of Road	Road Length (km)	Lane No.	Carriageway width (m)	Pavement Type		Pavement Condition	Side-walk (m)	Roadside Clearance (m)	Roadside Condition	One-way System	Parking Space	Signal Controlled	Bus Route	Bridge		Remarks
					Black-topped	Gravelled Earthem									Type	Length (m)	
2. Urban Road																	
KC-101	Ring Road																
	Tribhuvan Highway Jn. - Trisuli Road Jn.	6.20	2	10.0	6.20	0.0	G	0.0	20.0	C,R,A	N	N	N	SY,MB	RC	10.0	2m sidewalk in each Bridge
	Trisuli Road Jn. - Chabahal	6.30	2	10.0	6.30	0.0	G	0.0	20.0	C,R,A	N	N	N	SY,MB	RC	10.0	
	Chabahal - Gausala	1.00	2	10.0	1.00	0.0	G	3.5	10.0	C	N	N	Y	SY,MB	RC	10.0	
	Gausala - Arniko Highway Jn.	4.50	2	10.0	4.50	0.0	G	0.0	10.0	C,R	N	N	N	SY,MB	RC	10.0	
	Arniko Highway Jn. - Tribhuvan Highway Jn.	10.00	2	10.0	10.00	0.0	F	0.0	20.0	C,R,A	N	N	N	MB	RC	10.0	
	Subtotal of Ring Road	28.00			28.00	0.00											
2.2. Kathmandu District City Road																	
2.2.1 Class A Road (Primary Road)																	
KC-102	Koteswar - Matighar - Thapathali **	0.50	4	14.0	0.50	0.0	G	2.5	0.0	C,R,A	N	Y	Y	SY,MB			Stem in HW
	Thapathali (Bagmati Bridge) - Tripureswar Jn.	0.50	4	14.0	0.50	0.0	G	2.5	0.0	C,R	N	Y	Y	SY,MB			
	Tripureswar - Ranipokhari	1.00	2	9.0	1.00	0.0	G	2.0	0.0	C,R	Y	N	Y	SY			Partly one way
	Ranipokhari - Lainchaur	0.50	4	13.0	0.50	0.0	G	2.5	0.0	C,R	N	Y	Y	SY,MB, TMP			
	Lainchaur - Maharajgunj-Ring Road Jn.	3.40	2	7.5	3.40	0.0	G	2.0	0.0	C,R	N	N	N	SY, TMP			
KC-103	Nagasthan - Sahid gate - Bhadrakali																
	- Singh Durbar	0.94	4	15.0	0.94	0.0	G	2.5	0.0	C	Y	N	Y	SY,MB, TMP			Partly one way
KC-104	New Road Gate - Kasthamandap - Hanuman Dhoka	0.80	4	12.0	0.80	0.0	G	2.4	0.0	C	N	N	Y				
KC-105	Tripureswar - Kalimati **	0.00	2	8.8	0.00	0.0	G	2.0	0.0	C	N	N	N	SY,MB, TMP	RC	8.8	Tribhuvan HW
	Kalimati - Ring Road	1.70	2	5.2	1.70	0.0	G	0.0	4.0	C,R	N	N	N	SY,MB, TMP			
KC-106	Kalimati - Hotel Soalte Oberoi **	0.00	2	8.8	0.00	0.0	G	2.0	0.0	C,R	N	N	N				Tribhuvan HW
KC-107	Bhadrakali - NEA-Trichandra Campus	1.26	2	8.5	1.26	0.0	G	2.5	0.0	C	Y	N	Y	SY,MB, TMP			
	Trichandra Campus Palace	0.48	4	18.0	0.48	0.0	G	2.3	0.0	C	N	N	Y				
KC-108	Trichandra Campus - Kamaladi(RNA)	0.53	2	7.5	0.53	0.0	G	2.0	0.0	C,R	N	N	N				
KC-109	Bus Stop - City Hall - Padmodaya HS	0.57	2	8.4	0.57	0.0	G	2.0	0.0	C	N	N	N	SY,MB	RC	8.4	
KC-110	Matighar - Singh Durbar - Putalisadak	0.57	4	13.3	0.57	0.0	G	2.0	0.0	C	N	Y	Y				
KC-111	Keshar Mahal - Nagpokhari	0.60	4	10.0	0.60	0.0	G	3.0	0.0	C	N	N	Y				
	Nagpokhari - Namigunj-Lainchaur	1.54	2	7.5	1.54	0.0	G	3.0	0.0	R	N	N	N				
KC-112	Bhotahity - Former Zonal Commissioner's Office	0.22	4	14.0	0.22	0.0	G	3.0	0.0	C	Y	Y	Y	SY,MB, TMP			
KC-113	Ring Road (Balaju Bypass)-Balaju	0.20	2	7.0	0.20	0.0	G	0.0	10.0	A	N	N	N	SY,MB			
	Balaju-Nagarjun	1.40	1	3.8	1.40	0.0	G	0.0	10.0	A	N	N	N	SY,MB			
KC-114	Ring Road - Tribhuvan Airport	0.90	2	7.5	0.90	0.0	G	2.5	10.0	A	N	N	Y	SY			
KC-115	Ring Road - Museum - Swayambhu	2.36	1	4.0	2.36	0.0	F			C,R	N	N	N				
KC-116	Road around Swayambhu	2.34	1	3.8	2.34	0.0	F	0.0	2.0	R,C	N	N	N				
KC-117	Lainchaur - Amrit Campus	0.30	2	8.5	0.30	0.0	F	2.8	0.0	C,R	N	Y	N	SY,MB, TMP			
	Arri Campus - Balaju	2.04	2	5.0	2.04	0.0	P	0.0	6.0	C,R	N	N	N	SY,MB, TMP			
	Subtotal of Class A roads	24.65			24.65	0.00											
2.1.2 Class B Road (Secondary Road)																	
KC-202	Gausala - Pasupati - Gubheswori	1.19	2	5.0	1.19	0.0	F	0.0	5.0	C,R	N	N	N				

Kathmandu Valley Urban Road Development Summary of Road Inventory - Urban Road

SY: Sajha Yatayat C: Commercial area
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Note: Urban road subject to the Study consists of Highway inside Ring Road and City roads in each district.
City road subject to the Study are Class A and Class B roads only.

Link NO.	Name of Road	Road Length (km)	Lane No.	Carriage-way width (m)	Pavement Type		Pavement Condition	Side-walk (m)	Roadside Clearance (m)	Roadside Condition	One-way System	Parking Space	Signal Controlled	Bus Route	Bridge Type	Bridge Width (m)	Bridge Length (m)	Remarks
					Black-topped (km)	Earthen (m)												
KC-203	Kalimati - Fankeswori - Tahachal - Museum	1.95	2	5.7	1.95	0.0	F	0.0	5.0	C.R	N	N	N	SY, MB, TMP				
KC-204	Sital Niwas - Baluwatar - Rastra Bank - Bhatbhateni	1.40	2	3.7	1.40	0.0	F	0.0	3.1	R.C	N	N	N	SY				
	Bhaathatani - Tanyal - Bhagwati Bahal - Kamalpokhari	1.30	2	3.7	1.30	0.0	F	0.0	3.1	C.R	N	N	N	SY, TMP				
	Kamalpokhari - Dilli Bazar	0.40	2	6.5	0.40	0.0	F	0.0	6.0	C.R	N	N	N					
	Dilli Bazar - Pualii Sadak	0.40	2	7.2	0.40	0.0	F	2.0	0.0	C.R	Y	N	N	SY, MB, TMP				
	Pualii Sadak - Padmodaya School	0.67	4	13.25	0.67	0.0	G	2.5	0.0	C.R	N	Y	Y	SY, MB, TMP				
KC-206	Keshar Mahal - Thiarne (Nursing Campus)																	
	- Chhetrapati - Shobha Bhagawati	1.82	1	2.0	1.82	0.0	P	0.0	3.7	C.R	N	N	N					
KC-207	Nagasthan - Bhimsen Tower - Khichhapokhari																	
	- New Road (American Library)	0.75	2	12.0	0.75	0.0	F	2.5	0.0	C.R	N	Y	N					
KC-209	Jay Nepal Cinema - Hattisar - Krishna Paurou	0.29	2	7.5	0.29	0.0	G	2.0	0.0	C.R	N	N	N					
	Krishna Paurou - Kamaladi Ganesh	0.89	2	7.6	0.89	0.0	G	2.0	0.0	C.R	N	N	N					
KC-210	Krishna Paurou - Kamal Pokhari	0.50	2	6.8	0.50	0.0	G	0.0	2.0	C.R	N	N	N	MB				
	Kamal Pokhari - Gyaneswor - Rato Pul	0.90	2	6.0	0.90	0.0	F	0.0	4.0	C.R	N	N	N					
	Rato Pul - Gaushtala	0.77	2	6.0	0.77	0.0	F	0.0	6.0	R.A	N	N	Y					
KC-211	Nag Pokhari - Singh Dobato - Gairi Dhara - Rastra Bank - Baluwatar	1.76	2	5.5	1.76	0.0	F	0.0	4.0	R.C	N	N	N					
KC-212	Singh Dobato - Bal Mandir	0.45	2	7.5	0.45	0.0	G	0.0	4.0	R.C	N	N	N	TMP				
KC-213	Dilli Bazar - Manidevi	0.38	2	7.0	0.38	0.0	F	2.0	0.0	C.R	Y	N	N	SY, MB, TMP				
	Manidevi - Old Banewor	0.97	2	8.0	0.97	0.0	F	2.0	0.0	C.R	N	N	N	SY, MB, TMP				
	Old Banewor - Gaushtala	0.80	2	8.7	0.80	0.0	F	0.0	12.5	C.R	N	Y	Y	SY, MB, TMP				
KC-215	Sano Gauchar - Gyaneswor	0.36	2	5.0	0.36	0.0	F	0.0	0.7	C.R	N	N	N					
	Gyaneswor - Manidevi - Chhatkulo	1.02	1	4.2	1.02	0.0	F	0.0	3.5	C.R	Y	N	N	SY, MB, TMP				
	Dilli Bazar - Kalikasthan - Putalisadak	0.85	2	6.5	0.85	0.0	G	0.0	2.0	C.R	N	N	N					
KC-217	Nag Pokhari - Bhagbati Bahal - Sano Gauchar	0.53	1	3.7	0.53	0.0	G	0.0	2.0	C.R	N	N	N					
	Sano Gauchar - Kalo Pool - Shifal - Chabahi	1.12	1	3.7	1.12	0.0	F	0.0	1.8	C.R	N	N	N					
	Chabahi (Mura Park) - Gheswori	0.70	1	3.5	0.70	0.0	F	0.0	2.0	R	N	N	N					
KC-218	Old Banewor - Mahadevsthan - New Banewor	1.60	1	3.2	1.60	0.0	P	0.0	2.5	R.C	N	N	N					
KC-219	Thapathali - Maternity Home - Babar Mahal	1.00	1	3.5	0.50	0.5	P	0.0	0.0	R.C	N	N	N					
KC-220	National Archives - Back side of Babar Mahal - International Conference Centre	1.60	1	4.2	0.80	0.8	P	0.0	7.8	R.C	N	N	N					
KC-224	Kaushandu Ganeshtan - Nardevi - Chhetrapati	1.69	2	5.0	1.69	0.0	P	0.0	1.5	C.R	N	N	N					
	Chhetrapati - Sorhakhute																	
KC-225	Kaushandu Ganeshtan - Bhimsenshan - Tankeswon (Bishnumai Bridge)	0.45	2	7.3	0.45	0.0	F	0.0	2.3	C.R	N	N	N					
KC-229	Dallu - Shobha Bhagawati	0.95	1	4.0	0.95	0.0	P	0.0	2.0	C.R	N	N	N					
KC-230	Syambhu - Bheswori - Shobha Bhagawati	1.05	1	4.5	1.05	0.0	F	0.0	2.7	C.R	N	N	N					
KC-252	Adwaii Marg	0.62	1	4.5	0.60	0.6	P	0.0	1.0	C.R	N	N	N					
KC-253	Sina Mangal - Banewor	1.90	2	7.5	1.90	0.0	F	2.0	2.0	C.R	N	N	N					RC 66
KC-254	Rastriya Nachghar - Tindhara Pathasala - Krishna																	

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Note: Urban road subject to the Study consists of Highway inside Ring Road and City roads in each district.
City road subject to the Study are Class A and Class B roads only.

Y: Yes N: No

Link NO.	Name of Road	Road Length (km)	Lane No.	Carriage-way width (m)	Pavement Type		Pavement Condition	Side-walk (m)	Roadside Clearance (m)	Roadside Condition	One-way System	Parking Space	Signal Controlled	Bus Route	Bridge		Remarks
					Black-topped (km)	Gravelled Earthen (m)									Type	Length (m)	
	Paurroti - Kamal Pokhari	1.31	2	7.5	1.31	0.0	G	2.0	0.0	C.R	Y	N	Y	SY,MB,TMP			
KC-255	Bhadrakali - Maitighar	0.70	2	6.3	0.70	0.0	F	2.5	0.0	R	N	N	N				
KC-257	Former Zonal Commissioner's Office-Bagh Bazar	0.67	2	8.6	0.67	0.0	F	2.9	0.0	C.R	Y	N	Y	SY,MB			
	Subtotal of Class B city roads	35.71			33.79	1.92	0.00										
	Total of Kathmandu city roads (Class A & B)	60.36															
	2. Lalitpur District City Roads																
2.1	Lalitpur District City Road (Class A)																
LC-101	RR(Sat Dobato)-Laganikhel	0.80	2	7.0	0.80	0.0	G	0.0	1.0	C	N	N	N	SY,MB,TMP			
	Laganikhel-Jawalakhel	1.30	2	7.5	1.30	0.0	G	0.0	6.5	C	N	N	N	SY,MB,TMP			
	Jawalakhel - Pulchowk	1.00	4	10.5	1.00	0.0	G	2.5	4.0	C	N	N	N	SY,MB,TMP			
	Pulchowk - Bagmati Bridge	0.90	4	14.5	0.90	0.0	G	2.5	4.0	C	N	N	N	SY,MB,TMP			
LC-102	Jawalakhel-Ekanakuna	0.40	2	7.5	0.40	0.0	G	2.0	0.0	C.R	N	N	N	MB			
	Ekanakuna-Ring Road	0.40	2	5.5	0.40	0.0	P	0.0	2.8	C.R	N	N	N	MB			
LC-103	Patan Gate- Kupanadol	0.30	2	6.5	0.30	0.0	G	0.0	2.5	R	N	N	N	MB,TMP			
	Subtotal of Class A City Roads	5.10			5.10	0.00	0.00										
2.2	Lalitpur District city roads (Class B)																
LC-201	Kupanadol-Sanepa-Pulchowk	3.30	1	4.00	3.30	0.0	F	0.0	4.0	R	N	N	N	N			
LC-202	Pulchowk-Gabahal	0.40	4	13.50	0.40	0.0	G	2.5	0.0	C	N	N	N	N			
	Gabahal-Durban Square	0.60	2	6.50	0.60	0.0	G	0.0	0.0	C	N	N	N	N			
	Durban Square-Owarko	1.20	1	4.40	1.20	0.0	P	0.0	0.0	C.R	N	N	N	N			
LC-203	Durban Square-Laganikhel	0.50	2	5.5	0.50	0.0	P	0.0	0.0	C	N	N	N	N			
LC-204	Gabahal-Patan Gate	0.35	1	4.0	0.35	0.0	P	0.0	2.5	C.R	N	N	N	N			
LC-205	Jhamsikhel - Ring Road	1.20	1	3.8	1.20	0.0	P	0.0	1.5	C.R	N	N	N	N			
LC-206	Laganikhel-Army Barrack-Ring Road	0.80	1	3.5	0.80	0.0	F	0.0	1.5	C.R	N	N	N	N			
	Subtotal of Class B Roads	8.95			8.95	0.00	0.00										
	Total of Lalitpur City Roads	13.45															
	3. Bhaktapur City Roads																
BC-101	Sallaghari Jn.-Bus Park	1.00	2	6.5	1.00	0.0	G	0.0	3.0	R	N	N	N	SY,MB			
BC-102	Bus Park- Durbar Square	0.70	1	3.2	0.70	0.0	F	0.0	0.0	C.R	N	N	N				
BC-103	Bus Park- Thimi Road Jn.- Nagarkot Road Jn.	4.40	1	3.8	4.40	0.0	P	0.0	2.5	C.A	N	N	N	MB			
BC-104	Nagarkot Road Jn.-Arniko Highway	1.70	2	5.5	0.00	0.0	P	0.0	3.0	C.A	N	N	N	MB			
	Total of Bhaktapur City Roads	7.80			6.10	0.00	1.70										
	Total of Primary City Road in KTM Valley	37.55			35.85	0.00	1.70										
	Total of Secondary City Road in KTM Valley	44.06			42.14	1.92	0.00										
	Total of City Road in KTM Valley	109.61			105.99	1.92	1.70										

Possible Traffic Capacity of Road Network in Kathmandu Valley

C2=2500xLxrcxNxr1 C4=2200xLxrcxNxr1xN
rN=100/(100-axPm+bxPb)

Link No.	Name of Road	Nos. of lane	Lane Width	Adjust. factor (fL)	Lateral Clearance	Adjust. factor (fC)	(% of M/cycle Pm	Conv. to P/car a	(% of bicycle Pb	Conv. to P/car b	Adjustment for Mixing rN	Roadside Condition r1	Possible Traffic Capacity			Remarks
													2 lanes	4 lanes	C4	
District: Kathmandu, Lalitpur and Bhaktapur																
(1) Highway																
H-001	Tribhuvan Highway	2	4.40	0.85	2.0	1.00	19	0.5	36	0.5	0.78	1.00	1670			
	Tripureswor - Soalteec	2	3.50	1.00	0.0	0.70	19	0.5	36	0.5	0.78	0.75	1030			
	Soalteec - Kalankishan	2	3.50	1.00	2.0	1.00	18	0.5	40	0.5	0.78	0.70	1360			
H-002																
	Kalankishan - Nagdhunga	2	3.50	1.00	2.0	1.00	18	0.5	40	0.5	0.78	0.70	1360			
	Amiko Highway	4	3.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.90	6210			
	Maniagar - Koteswor	2	3.25	0.94	2.0	1.00	18	0.5	40	0.5	0.78	0.75	1370			
	Koteswor - Bhaktapur	2	3.00	0.85	2.0	1.00	10	0.5	10	0.5	0.91	0.80	1550			
	Bhaktapur - Sanga	2	3.00	0.85	2.0	1.00	10	0.5	10	0.5	0.91	0.80	1550			
(2) Feeder Road																
F-001	Trisuli Road	2	3.50	1.00	2.0	1.00	18	0.5	40	0.5	0.78	0.75	1450			
	R.R. - Balaju	1	3.50										50			
	Balaju - Thulokhola	1	3.80										140			
	Thimi Road	1	3.80										140			
	ARM: Thimi- Bhaktapur															
(3) District Road (Primary Road only)																
Kathmandu District																
D-101	R.R.(Tribhuvan Univ.) - Pharping- Dakshinkali	2	3.50	1.00	2.0	1.00	18	0.5	40	0.5	0.78	0.80	1550			
	R.R.(Tribhuvan Univ.) - Chodhar	1	4.00										200			
	Chovar - Dakshinkali	1	3.00										50			
D-102	R.R.(Kimobi) - Sitapaila- Bhitmdhunga	1	4.00										200			
D-103	R.R.(Maharajuni) - Tocha	2	3.75	1.00	2.0	1.00	18	0.5	40	0.5	0.78	0.80	1550			
D-104	R.R.(Bansari)- Budhanilkanth	2	3.75	1.00	2.0	1.00	18	0.5	40	0.5	0.78	0.80	1550			
D-105	R.R.(Chabahil)-Gokarna-Sankhu	2	5.00	1.00	2.0	1.00	18	0.5	40	0.5	0.78	0.70	1360			
	R.R.(Chabahil)-Gokarna	1	3.80										140			
	Gokarna-Sankhu	1	3.50										50			
D-106	Baragaun (Jorpati)-Sundarijal	1	3.50										50			
D-107	Balaju - Phulung	1	3.50										50			
	Phulung	1	3.50										50			
	Patan District															
D-108	R.R.(Gwarko)-Lubhu-Lamitar	1	3.50										50			
D-109	R.R.(Sat Dobato)-Thimba-Godawari	2	3.00	0.85	2.0	1.00	18	0.5	40	0.5	0.78	0.80	1320			
	R.R.(Sat Dobato)-Harsiddhi	1	3.70										110			
	Harsiddhi-Thimba-Godawari	1	3.00										50			
D-110	R.R.(Sat Dobato)-Precho-Chapagaun-Lele	1	3.00										1120			
D-111	R.R.(Jawaliakhe)-Nakhu - Bungamali	2	2.75	0.77	2.0	1.00	18	0.5	40	0.5	0.78	0.75	1120			
	Bhaktapur District															
D-112	Bhaktapur-Nagarkot	1	3.50										50			
(4) City Road																
Kathmandu City Class A Roads																
KC-101	Ring Road	2	5.00	1.00	5.0	1.00	19	0.5	36	0.5	0.78	1.00	1960			
KC-102	Maniagar - Thapathali	4	3.50	1.00	2.5	1.00	19	0.5	36	0.5	0.78	0.70	4830			
	Thapathali (Bagmati bridge) - Tripureswor Junction	4	3.50	1.00	2.5	1.00	19	0.5	36	0.5	0.78	0.70	4830			
	Tripureswor - Nagasthan	2	4.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70	1370			
	Nagasthan - Ranipokhan	2	4.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.85	1670		Oneway, High pedestrian	
	Ranipokhan - Lainchaur	4	3.25	0.94	2.0	1.00	19	0.5	36	0.5	0.78	0.85	5510			
	Lainchaur - Mahाराजगंज-Ring Road Jn.	2	3.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70	1370			
KC-103	Nagasthan - Shahid Gate - Bhadrakali	4	3.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.85	1670		Oneway, High pedestrian	
	Bhadrakali - Singh Durbar	4	3.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	1.00	6900			

Possible Traffic Capacity of Road Network in Kathmandu Valley

C2=2500*rl*Cs*Cx*Nr1 C4=2200*rl*Cs*Cx*Nr1*RN
rN=(100/(100+axPm+bxPb))

District: Kathmandu, Lalitpur and Bhaktapur

Link No.	Name of Road	Nos. of lane	Lane Width	Adjust. factor (GL)	Lateral Clearance	Adjust. factor (rC)	(% of M/cycle Pm)	Conv. to P/car a	(% of bicycle Pb)	Conv. to P/car b	Adjustment for Mixing rN	Roadside Condition	Possible Traffic Capacity		Remarks
													2 lanes.	4 lanes	
KC-104	New Road Gate-Kasthamandap-Hanumandhoka	4	3.00	0.85	2.0	1.00	19	0.5	36	0.5	0.78	0.70	C2	4110	
KC-105	Kallimati - Kuleswor	2	3.00	0.85	10.0	1.00	19	0.5	36	0.5	0.78	0.70		1170	
KC-106	Kuleswor - Ring Road	2	2.75	0.77	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1060	
KC-107	Kallimati - Hotel Soalle Oberoi	2	3.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-108	Bhadrakali - NEA-Trichandra Campus	2	4.25	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.80		1570	Oneway, High Pedestrian
KC-109	Trichandra Campus-Royal Palace	4	4.50	1.00	2.5	1.00	19	0.5	36	0.5	0.78	0.70		4830	
KC-110	Trichandra Campus - Kamaladi (RNA)	2	3.75	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-111	Bus Stop - City Hall - Padmodaya HS	2	4.40	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-112	Maitighar - Singh Durbar - Punalisadak	4	3.25	0.94	2.0	1.00	19	0.5	36	0.5	0.78	0.70		4540	
KC-113	Keshar Mahal - Nagpokhari	2	5.00	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-114	Nagpokhari - Nanigunj - Lainchour	2	3.75	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-115	Bhokchhi - Former Zonal Commissioner's Office	4	3.50	1.00	3.0	1.00	19	0.5	36	0.5	0.78	0.70		4830	Oneway, High Pedestrian
KC-116	Ring Road - Tribhuvan Airport	2	3.75	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-117	Ring Road - Museum - Swyambhu	1	3.75											130	
KC-118	Road around Swyambhu	1	3.75											130	
KC-119	Lainchour - Amrit Campus	2	4.25	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-120	Amrit Campus - Balaju	2	2.75	0.77	5.0	1.00	19	0.5	36	0.5	0.78	0.70		1060	
Lalitpur City Class A Roads															
LC-101	RR(Sat Dobato)-Lagankhel(Bus Stop)	2	3.50	1.00	0.0	0.70	19	0.5	36	0.5	0.78	0.70		960	
LC-102	Lagankhel(Bus Stop)-Jawalakhel(Round About)	2	3.75	1.00	6.5	1.00	19	0.5	36	0.5	0.78	0.70		1370	
LC-103	Jawalakhel (Round About)- Pulchowk	2	5.25	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
LC-104	Pulchowk - Begmati Bridge	4	3.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		4830	
LC-105	Jawalakhel(Round about)-Ekantakuma	2	3.75	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
LC-106	Ekantakuma-Ring Road	2	2.75	0.77	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1060	
LC-107	Patan Gate- Kipandol	2	3.25	0.94	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1290	
Kathmandu city Class B Roads															
KC-202	Gaushala - Pashupati - Guleswori	1	5.00											500	
KC-203	Kallimati - Tankeswori - Thachal - Museum	2	2.75	0.77	0.0	0.70	19	0.5	36	0.5	0.78	0.70		740	
KC-204	Shital Niwas - Baluwatar - Rasira Bank - Bhatbhateni	1	3.70											110	
KC-205	Bhatbhateni - Jangal - Bhagwati-bahal - kamalpokhari	1	3.70											110	
KC-206	Kamalpokhari - Dilli Bazar	2	3.25	0.94	0.0	0.70	19	0.5	36	0.5	0.78	0.70		900	
KC-207	Keshar Mahal - Thamel(Nursing Campus)	1	4.50											350	
KC-208	Chhetrapati - Shodha Bhagawati	1	4.50											350	
KC-209	Nagasthan - Bhimsen Tower - Khichhapokhari	2	3.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-210	- New Road (American Library)	2	3.75	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-211	Jaya Nepal Cinema - Hatisar - Krishna Puroi	2	3.75	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-212	Krishna Puroi - Kamaladi Ganesh	2	3.40	0.95	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1300	
KC-213	Krishna Puroi - Kamal Pokhari	2	3.40	0.95	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1300	
KC-214	Kamal Pokhari - Gyaneswor - Rato Pul	2	3.00	0.85	3.0	1.00	19	0.5	36	0.5	0.78	0.70		1170	
KC-215	Rato Pul - Gaushala	2	3.00	0.85	3.0	1.00	19	0.5	36	0.5	0.78	0.70		1170	
KC-216	Nag Pokhari - Singh Dobato - Gairi Dhara	2	2.75	0.77	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1060	
KC-217	Rasira Bank - Baluwatar	2	2.75	0.77	0.0	0.70	19	0.5	36	0.5	0.78	0.70		740	
KC-218	Singh Dobato - Bal Mandir	2	2.75	0.77	0.0	0.70	19	0.5	36	0.5	0.78	0.70		740	
KC-219	Dilli Bazar - Maritdevi	2	3.50	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	Oneway, High Pedestrian
KC-220	Maitidevi - Old Banaswor	2	4.00	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-221	Old Banaswor - Gaushala	2	4.35	1.00	3.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
KC-222	Sano Gauchar - Gyaneswor	1	5.00											500	

Possible Traffic Capacity of Road Network in Kathmandu Valley

C2=2500xLxvCxCrNxrI C4=2200xLxvCxCrNxrI
 rN=100/(100+axPm+bxPb)

District: Kathmandu, Lalitpur and Bhaktapur	Link No.	Name of Road	Nos. of lane	Lane Width	Adjust. factor (rL)	Lateral Clearance	Adjust. factor (rC)	(% of M/cycle Pm)	Conv. to P/car a	(% of bicycle Pb)	Conv. to P/car b	Adjustment for Mixing rN	Roadside Condition rI	Possible Traffic Capacity		Remarks
														2 lanes	4 lanes	
		Gyateshor - Manidevi - Ghaitekulo	1	4.20					0.5	36	0.5	0.78		C2	260	Oneway, High Pedestrian
	KC-216	Dilli Bazar - Kalikasthan - Pualisadak	2	3.25	0.94	2.0	1.00	19	0.5				0.70		1290	
	KC-217	Nag Pokhari - Bhagwati Bahal - Sano Gauchar - Sano Gauchar - Kalo Pul - Sital - Chabahi	1	3.70											110	
		Chabahi(Mitra Park) - Guheswori	1	3.50											50	
	KC-218	Old Baneswor - Manadevsthan - New Baneswor	1	3.20											50	
	KC-219	Thapabali - Maternity Hospital - Babar Mahal	1	3.50											50	
	KC-220	National Archieves - Back side of Babar Mahal - International Conference Centre	1	4.20											260	
	KC-224	Kathmandu Ganeshsthan - Nardevi - Chhetrapati - Sorhakutte	1	5.00											500	
	KC-225	Kathmandu Ganeshsthan - Bhimsenssthan - Tankeswori (Bishnumati Bridge)	1	3.75											130	
	KC-229	Dala - Shodha Bhagawati	1	4.00											200	
	KC-230	Swoyambhu - Bijeswori - Shodha Bhagawati	1	4.50											350	
	KC-252	Adwait Marg	1	4.50											350	
	KC-253	Sina Mangal - Old Baneswor	2	3.75	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
	KC-254	Rastriya Nachghar - Tindhara Pathisala - Krishan	2	3.75	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	
	KC-255	Bhadrakali - Matighar	2	3.00	0.85	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1170	
	KC-257	Former Zonal Commissioner's Office-Bagh Bazar	2	4.30	1.00	2.0	1.00	19	0.5	36	0.5	0.78	0.70		1370	Oneway, High Pedestrian
		Lalitpur City Class B Roads														
	LC-201	Kupundol-Sanepa-Pulchowk	1	4.00											200	
	LC-202	Pulchowk-Gabahal	4	3.25	0.85	2.0	1.00	19	0.5	36	0.5	0.78	0.70		4110	
		Gabahal-Durbar Square	2	3.25	0.94	0.0	0.70	19	0.5	36	0.5	0.78	0.70		900	
		Durbar Square-Gwarko	1	4.40											320	
	LC-203	Durbar Square-Laganthele	2	2.75	0.77	0.0	0.70	19	0.5	36	0.5	0.78	0.70		740	
	LC-204	Gabahal-Patan Gate	1	4.00											200	
	LC-205	Bhamsikhel - Ring Road	1	3.80											140	
	LC-206	Laganthele-Army Barrack-Ring Road	1	3.50											50	
		Bhaktapur City Class B Roads														
	BC-201	Sallaghar Jn. - Bus Park	2	3.25	0.94	1.5	0.95	18	0.5	40	0.5	0.78	0.70		1210	
	BC-202	Bus Park - Durbar Square	1	3.20											50	
	BC-203	Bus Park - Thimi Road Jn. - Nagarkot Road Jn.	1	3.80											140	
	BC-204	Nagarkot Road Jn. - Arniko Highway	2	2.75	0.77	2.0	1.00	18	0.5	40	0.5	0.78	0.70		1040	

NEA: Nepal Electricity Authority HS: High School RNA: Royal Nepal Academy RR: Ring Road

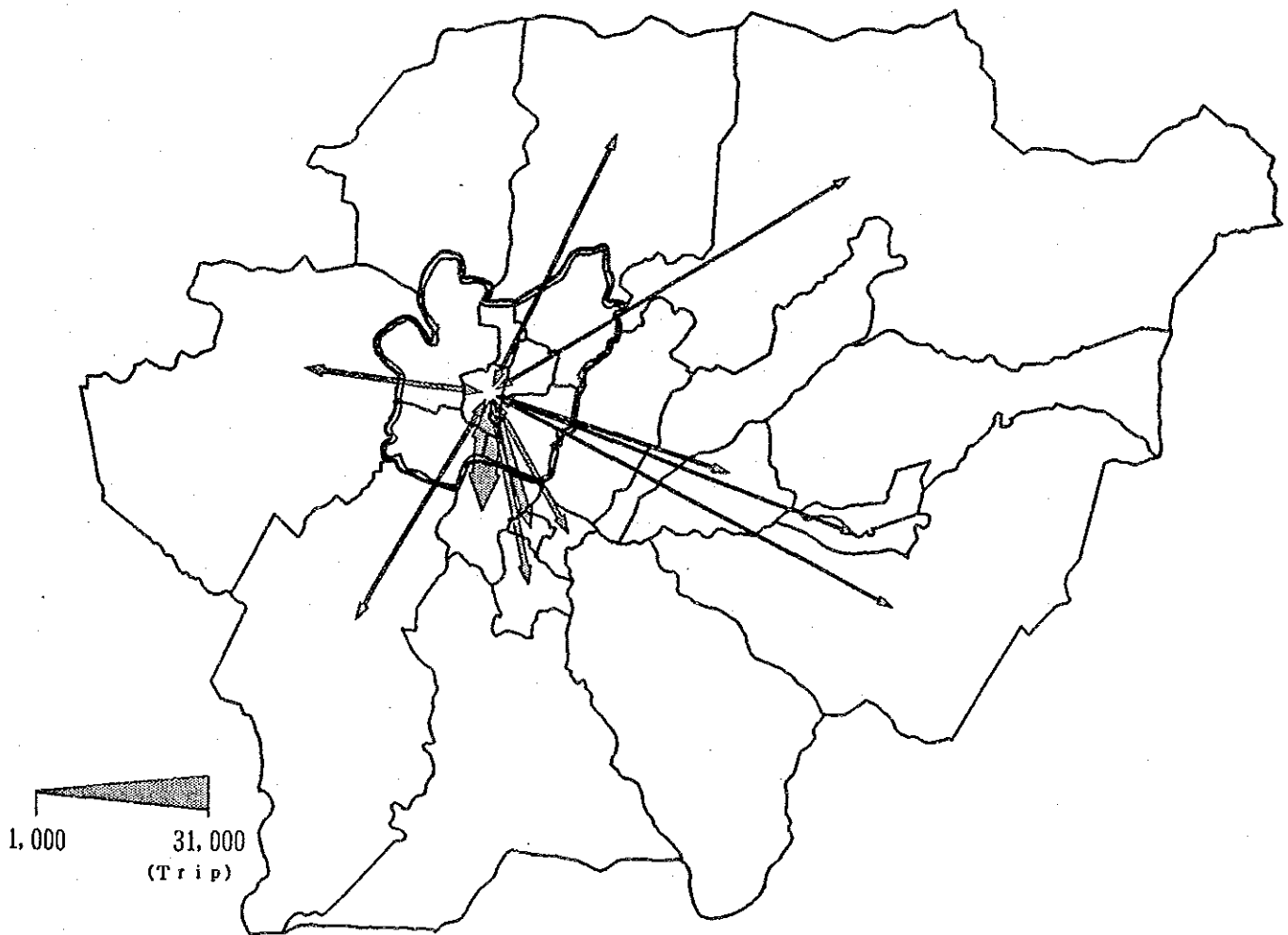
CHAPTER 4 PRESENT TRAFFIC SITUATION

Appendix 4-1 Present Traffic Desire Lines (Vehicle)

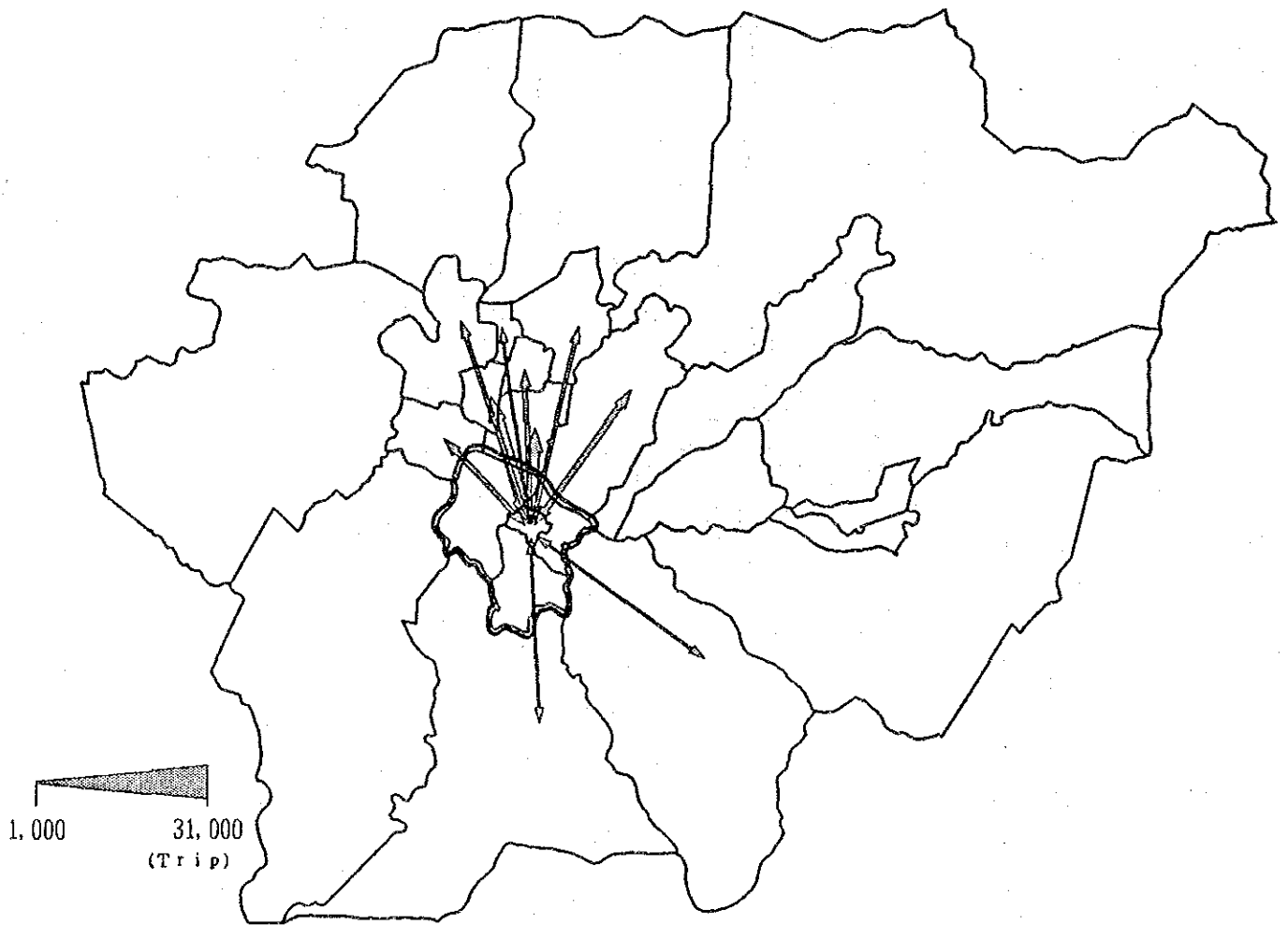
Appendix 4-2 Present Degree of Saturation at Intersection

APPENDIX 4-1 PRESENT TRAFFIC DESIRE LINES (VEHICLE)

(Vehicle) Excluding Bicycle (KATHMANDU CITY)

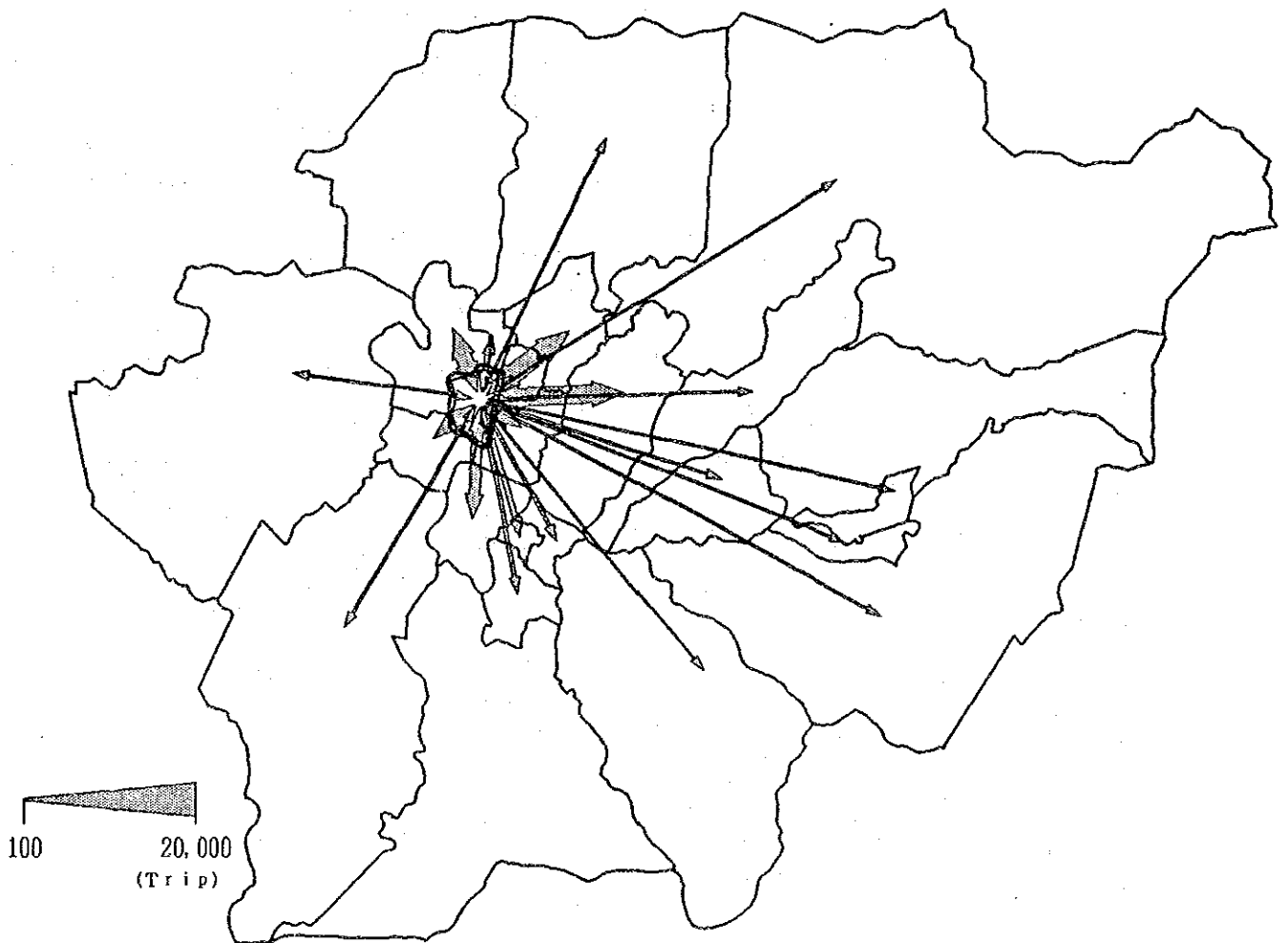


(Vehicle) Excluding Bicycle (PATAN CITY).

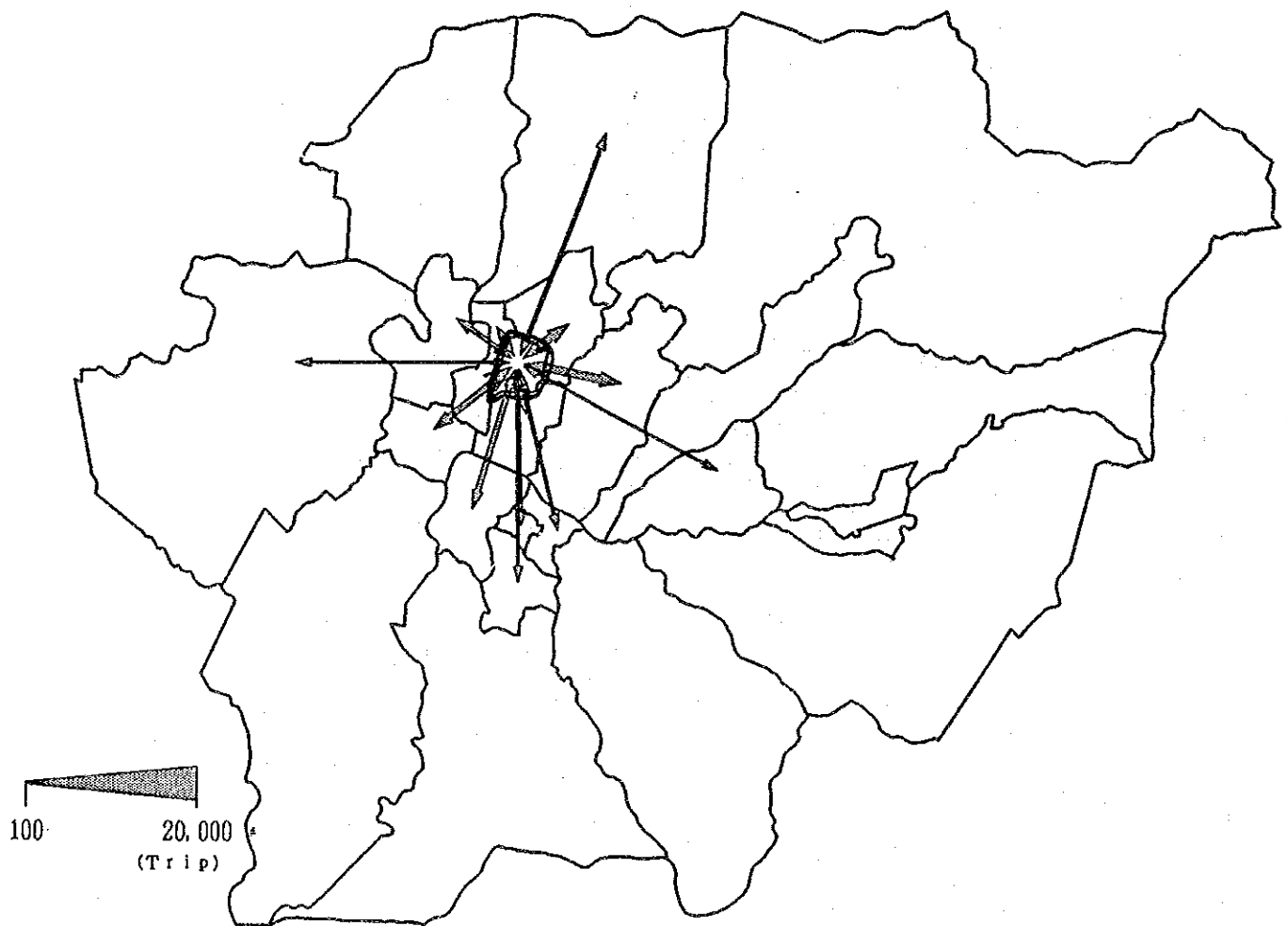


(Vehicle) Excluding Bicycle

(ZONE1)



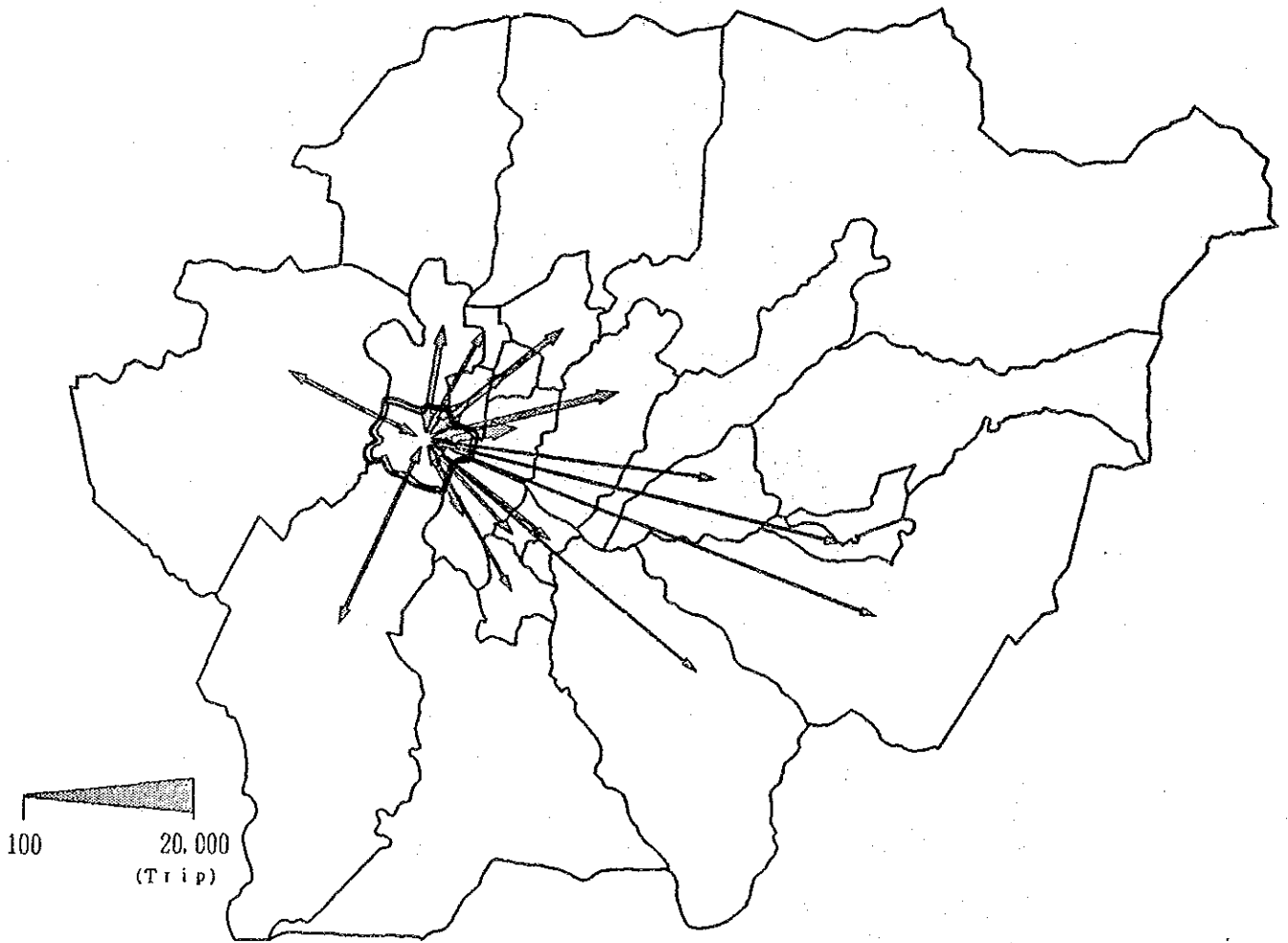
(Vehicle) Excluding Bicycle (ZONE3)



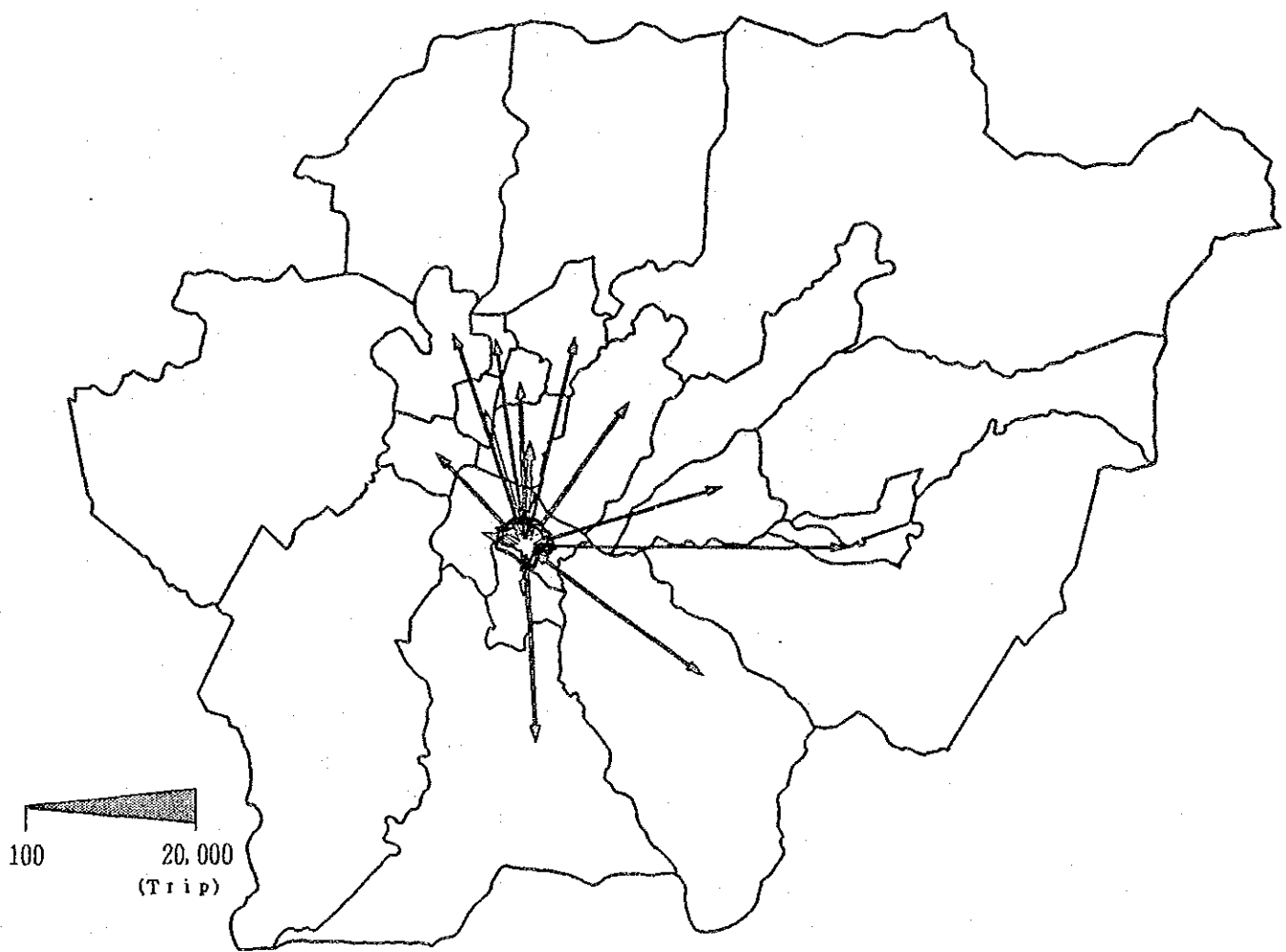
(Vehicle) Excluding Bicycle (ZONE 4)



(Vehicle) Excluding Bicycle (ZONE5)



(Vehicle) Excluding Bicycle (ZONES)



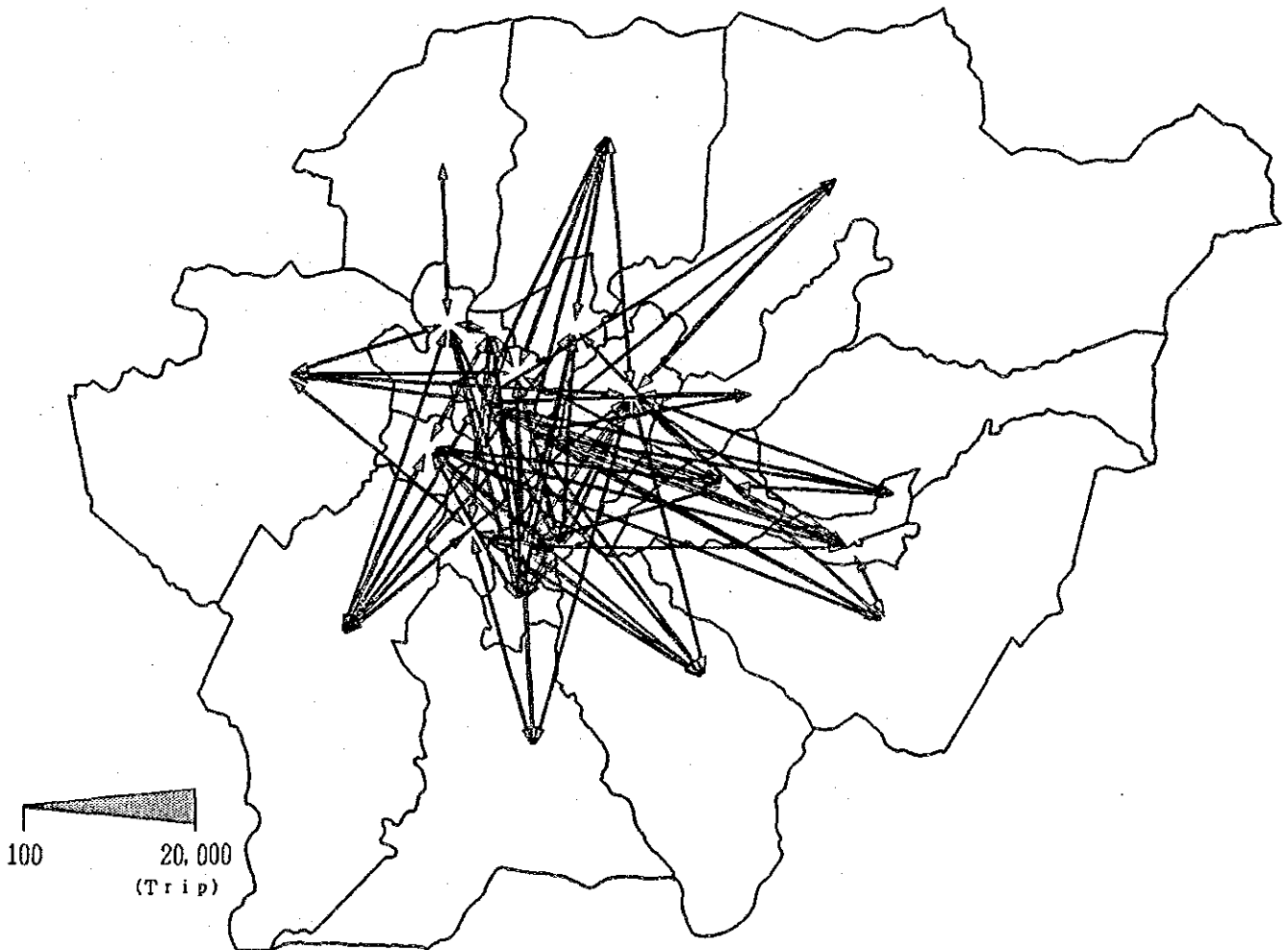
(Vehicle) Excluding Bicycle

(1000~20000)



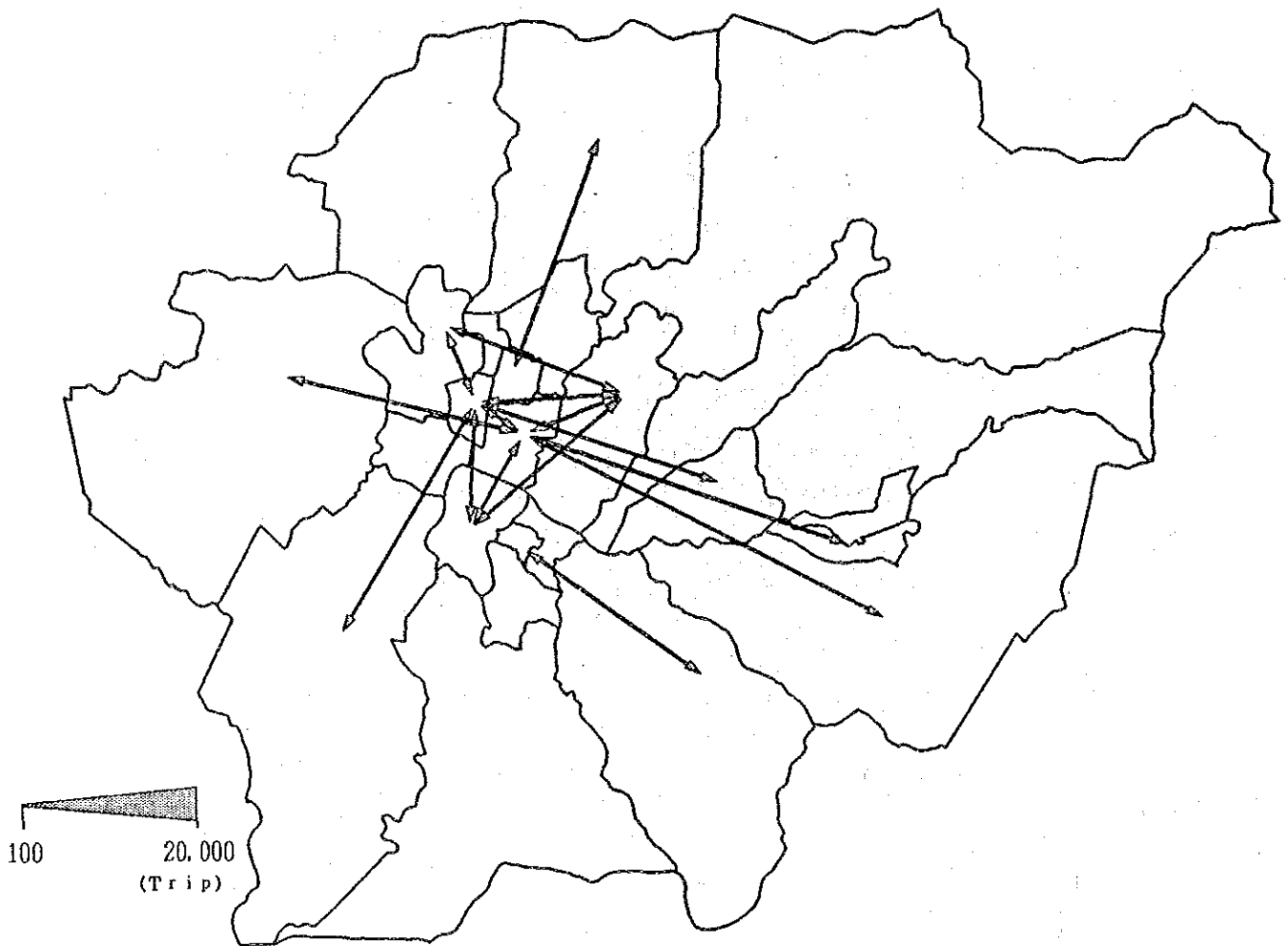
(Vehicle) Excluding Bicycle

(100~1000)



(Vehicle)

Bus+Minibus



APPENDIX 4-2 PRESENT DEGREE OF SATURATION AT INTERSECTION

Point C1 10:00 - 11:00

Direction		1 + 2	3	4	5	6
Lane		Through Left	Through	Left	Right	Left
Number of Lanes		1	1	1	1	1
Ideal Saturation Flow Rate (pcu/h(effective green time))		2,000	2,000	1,800	1,800	1,800
Adjustment Factor	Lane Width (m)	1.00 (4.0)	1.00 (3.5)	1.00 (3.5)	1.00 (3.5)	1.00 (3.5)
	Approach Grade (%)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)
	Heavy Vehicles (%)	0.99 (1.0)	1.00 (0.3)	0.98 (2.9)	0.97 (5.1)	1.00 (0.0)
	Right Turns (%)	1.00	1.00	1.00	1.00	1.00
	Left Turns (%)	0.68 (52.2)	1.00	0.56	1.00	0.56
Saturation Flow Rate (vehicle/h(effective green time))		1,351	1,996	988	1,738	1,008
Traffic Volume (vehicle/h)*		1,134	297	520	316	727
Normalized Volume		0.84	0.15	0.53	0.11	0.72
Degree of Saturation by Phase	Phase 1	0.84			0.11	0.72
	Phase 2		0.15	0.53		
	Phase 3					
Degree of Saturation		1.37				

* : Passenger Car Equivalent of Motorcycle = 0.5

Point C1 16:00 - 17:00

Direction		1 + 2	3	4	5	6
Lane		Through Left	Through	Left	Right	Left
Number of Lanes		1	1	1	1	1
Ideal Saturation Flow Rate (pcu/h(effective green time))		2,000	2,000	1,800	1,800	1,800
Adjustment Factor	Lane Width (m)	1.00 (4.0)	1.00 (3.5)	1.00 (3.5)	1.00 (3.5)	1.00 (3.5)
	Approach Grade (%)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)
	Heavy Vehicles (%)	0.99 (1.5)	1.00 (0.0)	0.98 (3.5)	0.92 (12.3)	1.00 (0.0)
	Right Turns (%)	1.00	1.00	1.00	1.00	1.00
	Left Turns (%)	0.70 (46.1)	1.00	0.56	1.00	0.56
Saturation Flow Rate (vehicle/h(effective green time))		1,385	2,000	984	1,657	1,008
Traffic Volume (vehicle/h)*		1,090	339	405	357	886
Normalized Volume		0.79	0.17	0.41	0.13	0.88
Degree of Saturation by Phase	Phase 1	0.79			0.13	0.88
	Phase 2		0.17	0.41		
	Phase 3					
Degree of Saturation		1.29				

* : Passenger Car Equivalent of Motorcycle = 0.5

Point C3 10:00 - 11:00

Direction		1 + 2+3
Lane		Through Left,Right
Number of Lanes		2
Ideal Saturation Flow Rate (pcu/h(effective green time))		4,000
Adjustment Factor	Lane Width (m)	1.00 (5.0)
	Approach Grade (%)	1.00 (0.0)
	Heavy Vehicles (%)	0.98 (3.1)
	Right Turns (%)	0.76 (30.4)
	Left Turns (%)	0.96 (4.3)
Saturation Flow Rate (vehicle/h(effective green time))		2,856
Traffic Volume (vehicle/h)*		2,140
Normalized Volume		0.75
Degree of Saturation by Phase	Phase 1	0.75
	Phase 2	
	Phase 3	
Degree of Saturation		0.75

* : Passenger Car Equivalent of Motorcycle = 0.5

Point C3 16:00 - 17:00

Direction		1 + 2+3
Lane		Through Left,Right
Number of Lanes		2
Ideal Saturation Flow Rate (pcu/h(effective green time))		4,000
Adjustment Factor	Lane Width (m)	1.00 (5.0)
	Approach Grade (%)	1.00 (0.0)
	Heavy Vehicles (%)	0.98 (2.6)
	Right Turns (%)	0.74 (33.3)
	Left Turns (%)	0.97 (3.5)
Saturation Flow Rate (vehicle/h(effective green time))		2,820
Traffic Volume (vehicle/h)*		2,348
Normalized Volume		0.83
Degree of Saturation by Phase	Phase 1	0.83
	Phase 2	
	Phase 3	
Degree of Saturation		0.83

* : Passenger Car Equivalent of Motorcycle = 0.5

Point C4 10:00 - 11:00

Direction	1 + 2	3	4+5+6	7+8	9	10+11+12	
Lane	Through Right	Left	Through Left,Right	Through Right	Left	Through Left,Right	
Number of Lanes	1	1	1	1	1	1	
Ideal Saturation Flow Rate (pcu/h(effective green time))	2,000	1,800	2,000	2,000	1,800	2,000	
Adjustment Factor	Lane Width (m)	1.00 (3.3)	1.00 (3.2)	1.00 (5.0)	1.00 (3.3)	1.00 (3.2)	1.00 (5.0)
	Approach Grade (%)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)
	Heavy Vehicles (%)	1.00 (0.7)	0.99 (0.8)	1.00 (0.4)	0.99 (0.9)	0.98 (2.3)	1.00 (0.6)
	Right Turns (%)	0.89 (10.1)	1.00	0.79 (17.8)	0.85 (12.5)	1.00	0.75 (43.1)
	Left Turns (%)	1.00	0.88	0.93 (23.5)	1.00	0.88	0.91 (31.4)
Saturation Flow Rate (vehicle/h(effective green time))	1,771	1,575	1,465	1,689	1,559	1,359	
Traffic Volume (vehicle/h)*	575	132	510	535	577	885	
Normalized Volume	0.32	0.08	0.35	0.32	0.37	0.65	
Degree of Saturation by Phase	Phase 1	0.32	0.08		0.32	0.37	
	Phase 2			0.35			0.65
	Phase 3						
Degree of Saturation	1.02						

* : Passenger Car Equivalent of Motorcycle = 0.5

Point C4 16:00 - 17:00

Direction	1 + 2	3	4+5+6	7+8	9	10+11+12	
Lane	Through Right	Left	Through Left,Right	Through Right	Left	Through Left,Right	
Number of Lanes	1	1	1	1	1	1	
Ideal Saturation Flow Rate (pcu/h(effective green time))	2,000	1,800	2,000	2,000	1,800	2,000	
Adjustment Factor	Lane Width (m)	1.00 (3.3)	1.00 (3.2)	1.00 (5.0)	1.00 (3.3)	1.00 (3.2)	1.00 (5.0)
	Approach Grade (%)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)
	Heavy Vehicles (%)	0.99 (1.0)	0.99 (0.9)	1.00 (0.2)	0.99 (0.9)	0.98 (2.2)	1.00 (0.5)
	Right Turns (%)	0.95 (5.9)	1.00	0.79 (17.7)	0.54 (12.0)	1.00	0.72 (48.5)
	Left Turns (%)	1.00	0.88	0.96 (15.8)	1.00	0.88	0.91 (30.6)
Saturation Flow Rate (vehicle/h(effective green time))	1,887	1,574	1,515	1,073	1,560	1,306	
Traffic Volume (vehicle/h)*	1,046	112	430	425	455	849	
Normalized Volume	0.55	0.07	0.28	0.40	0.29	0.65	
Degree of Saturation by Phase	Phase 1	0.55	0.07		0.40	0.29	
	Phase 2			0.28			0.65
	Phase 3						
Degree of Saturation	1.20						

* : Passenger Car Equivalent of Motorcycle = 0.5

Point C6 10:00 - 11:00

Direction	1	2	3	4	5+6	7	
Lane	Through	Left	Right	Through	Trough Right	Left	
Number of Lanes	1	1	1	1	1	1	
Ideal Saturation Flow Rate (pcu/h(effective green time))	2,000	1,800	1,800	2,000	2,000	1,800	
Adjustment Factor	Lane Width (m)	1.00 (3.3)	1.00 (3.3)	1.00 (3.3)	1.00 (3.3)	1.00 (3.5)	1.00 (3.5)
	Approach Grade (%)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)
	Heavy Vehicles (%)	1.00 (0.6)	0.98 (2.9)	1.00 (0.0)	1.00 (0.7)	1.00 (0.7)	0.99 (0.9)
	Right Turns (%)	1.00	1.00	1.00	1.00	0.76 (43.4)	1.00
	Left Turns (%)	1.00	0.60	1.00	1.00	1.00	0.60
Saturation Flow Rate (vehicle/h(effective green time))	1,992	1,059	1,800	1,990	1,513	1,073	
Traffic Volume (vehicle/h)*	535	102	123	549	304	331	
Normalized Volume	0.27	0.10	0.01	0.28	0.20	0.31	
Degree of Saturation by Phase	Phase 1	0.27	0.10	0.01	0.28		
	Phase 2					0.20	0.31
	Phase 3						
Degree of Saturation	0.59						

* : Passenger Car Equivalent of Motorcycle = 0.5

Point C6 16:00 - 17:00

Direction	1	2	3	4	5+6	7	
Lane	Through	Left	Right	Through	Trough Right	Left	
Number of Lanes	1	1	1	1	1	1	
Ideal Saturation Flow Rate (pcu/h(effective green time))	2,000	1,800	1,800	2,000	2,000	1,800	
Adjustment Factor	Lane Width (m)	1.00 (3.3)	1.00 (3.3)	1.00 (3.3)	1.00 (3.3)	1.00 (3.5)	1.00 (3.5)
	Approach Grade (%)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)
	Heavy Vehicles (%)	1.00 (0.6)	0.98 (2.8)	1.00 (0.0)	0.99 (1.2)	0.99 (0.8)	1.00 (0.7)
	Right Turns (%)	1.00	1.00	1.00	1.00	0.82 (28.9)	1.00
	Left Turns (%)	1.00	0.60	1.00	1.00	1.00	0.60
Saturation Flow Rate (vehicle/h(effective green time))	1,992	1,059	1,800	1,983	1,631	1,075	
Traffic Volume (vehicle/h)*	676	107	65	481	363	281	
Normalized Volume	0.34	0.10	0.00	0.24	0.22	0.26	
Degree of Saturation by Phase	Phase 1	0.34	0.10	0.00	0.24		
	Phase 2					0.22	0.26
	Phase 3						
Degree of Saturation	0.60						

* : Passenger Car Equivalent of Motorcycle = 0.5

Point C7 10:00 - 11:00

Direction		1+2	3	4+5	6	7+8	9	10+11+12
Lane		Through Right	Left	Through Right	Left	Through Right	Left	Through Left,Right
Number of Lanes		1	1	1	1	1	1	1
Ideal Saturation Flow Rate (pcu/h(effective green time))		2,000	1,800	2,000	1,800	2,000	1,800	2,000
Adjustment Factor	Lane Width (m)	1.00 (3.3)	1.00 (3.3)	1.00 (3.8)	1.00 (3.7)	1.00 (3.3)	1.00 (3.3)	1.00 (4.0)
	Approach Grade (%)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)
	Heavy Vehicles (%)	1.00 (0.4)	0.93 (11.4)	0.95 (7.8)	0.98 (2.2)	0.98 (2.4)	1.00 (0.0)	1.00 (0.0)
	Right Turns (%)	0.74 (10.9)	1.00	0.95 (93.3)	1.00	0.70 (16.2)	1.00	0.73 (32.5)
	Left Turns (%)	1.00	0.54	1.00	0.54	1.00	0.54	0.73 (35.1)
Saturation Flow Rate (vehicle/h(effective green time))		1,476	900	1,802	957	1,377	972	1,066
Traffic Volume (vehicle/h)*		751	429	524	46	820	125	114
Normalized Volume		0.51	0.48	0.29	0.05	0.60	0.13	0.11
Degree of Saturation by Phase	Phase 1	0.51	0.48			0.60	0.13	
	Phase 2			0.29	0.05			0.11
	Phase 3							
Degree of Saturation		0.89						

* : Passenger Car Equivalent of Motorcycle = 0.5

Point C7 16:00 - 17:00

Direction		1+2	3	4+5	6	7+8	9	10+11+12
Lane		Through Right	Left	Through Right	Left	Through Right	Left	Through Left,Right
Number of Lanes		1	1	1	1	1	1	1
Ideal Saturation Flow Rate (pcu/h(effective green time))		2,000	1,800	2,000	1,800	2,000	1,800	2,000
Adjustment Factor	Lane Width (m)	1.00 (3.3)	1.00 (3.3)	1.00 (3.8)	1.00 (3.7)	1.00 (3.3)	1.00 (3.3)	1.00 (4.0)
	Approach Grade (%)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)	1.00 (0.0)
	Heavy Vehicles (%)	0.99 (1.2)	0.93 (11.5)	0.94 (9.6)	1.00 (0.0)	0.97 (3.9)	1.00 (0.0)	0.99 (0.8)
	Right Turns (%)	0.95 (1.9)	1.00	0.90 (98.2)	1.00	0.93 (3.9)	1.00	0.72 (29.5)
	Left Turns (%)	1.00	0.54	1.00	0.54	1.00	0.54	0.72 (36.5)
Saturation Flow Rate (vehicle/h(effective green time))		1,884	900	1,687	972	1,811	972	1,031
Traffic Volume (vehicle/h)*		671	364	544	40	802	34	241
Normalized Volume		0.36	0.40	0.32	0.04	0.44	0.03	0.23
Degree of Saturation by Phase	Phase 1	0.36	0.40			0.44	0.03	
	Phase 2			0.32	0.04			0.23
	Phase 3							
Degree of Saturation		0.76						

* : Passenger Car Equivalent of Motorcycle = 0.5

CHAPTER 6 ROAD DEVELOPMENT PLAN

Appendix 6-1 Estimation of Present Vehicle OD Matrices

Appendix 6-2 OD Matrices

Appendix 6-3 Road Network for Traffic Assignment

Appendix 6-4 Results of Traffic Assignment

APPENDIX 6-1 ESTIMATION OF PRESENT VEHICLE OD MATRICES

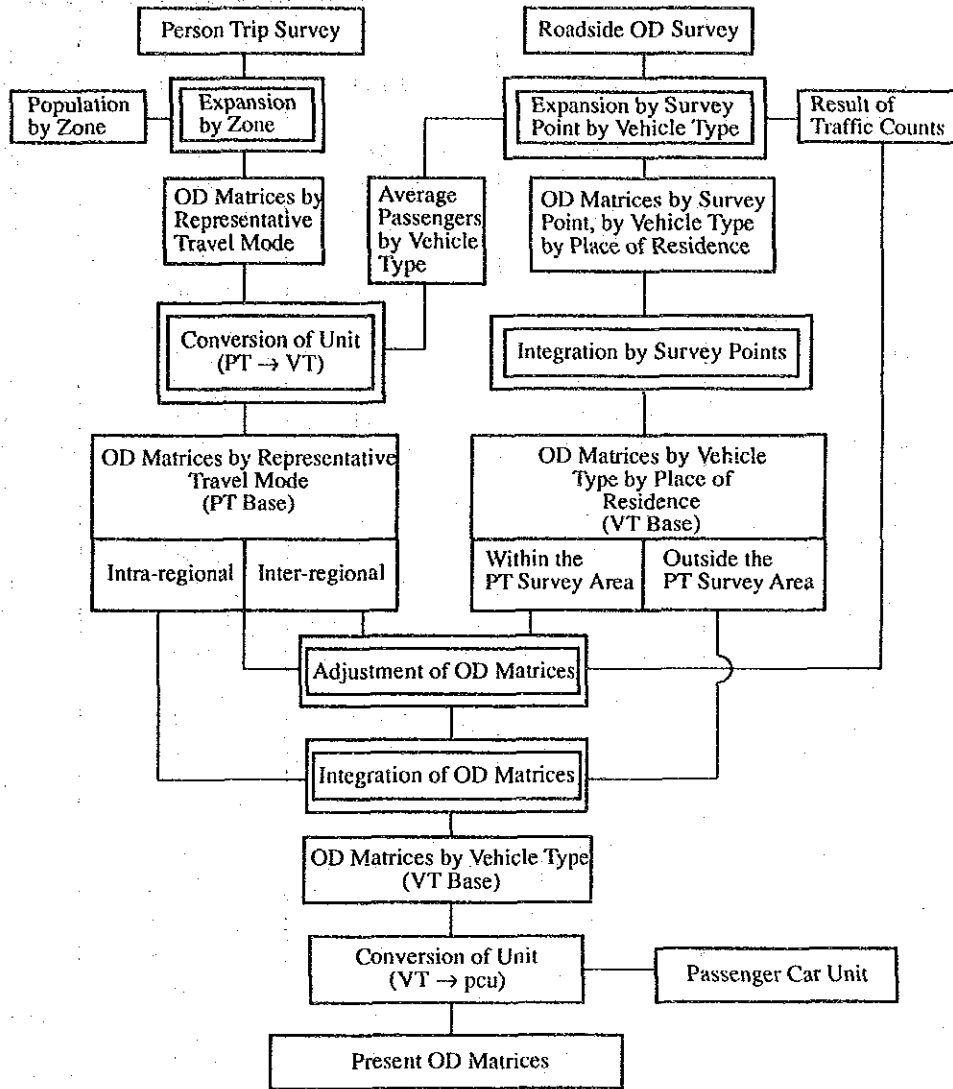


FIG. A-6-1 PROCESS OF ESTIMATION OF PRESENT VEHICLE OD MATRICES

Parameters applied in the above process are given in Table A-6-1 to A-6-5.

TABLE A-6-1 EXPANSION FACTOR (PERSON TRIP SURVEY)

Zone	Number of Sample	Population	Population of five and above	Expansion Factor
101	362	6,691	5,687	16
102	203	8,288	7,045	35
103	1,292	29,749	25,287	20
104	320	8,592	7,303	23
105	1,363	37,380	31,773	23
106	772	24,831	21,106	27
107	1,426	41,213	35,031	25
108	343	9,983	8,486	25
109	724	20,329	17,280	24
110	1,237	30,074	25,563	21
111	643	19,491	16,567	26
112	674	20,281	17,239	26
113	843	28,813	24,491	29
114	1,445	45,330	38,531	27
115	561	19,190	16,312	29
116	795	19,208	16,327	21
117	385	12,753	10,840	28
118	735	32,068	27,258	37
Kathmandu City	14,123	414,264	352,126	25
201	896	25,925	22,036	25
202	394	11,757	9,993	25
203	656	15,300	13,005	20
204	1,284	28,019	23,816	19
205	705	15,856	13,478	19
206	702	20,346	17,294	25
Lalitpur City	4,637	117,203	99,621	21
301	425	16,099	13,684	32
302	360	9,794	8,325	23
303	627	18,752	15,939	25
304	453	16,477	14,005	31
Bhaktapur City	1,865	61,122	51,953	28
Person Trip Survey Area Total	20,625	592,589	503,701	24

TABLE A-6-2 EXPANSION FACTOR (ROADSIDE OD SURVEY)

Point		Bicycle	Motor-cycle	Tempo	Taxi	Mini-Bus	Bus	Passenger Car	Light Truck	Heavy Truck	Others	Total
A1	TV ¹⁾	955	425	620	196	124	45	327	71	49	125	2,938
	VS ²⁾	271	129	219	59	42	13	110	27	27	26	923
	EF ³⁾	3.52	3.29	2.83	3.32	2.95	3.54	2.97	2.63	1.81	4.81	3.18
A2	TV	1,441	496	324	99	160	52	264	93	126	143	3,198
	VS	410	178	119	37	71	16	92	29	43	48	1,043
	EF	3.51	2.79	2.72	2.68	2.25	3.25	2.87	3.21	2.93	2.98	3.07
A3	TV	1,411	2,312	518	594	1,067	482	841	304	746	524	8,799
	VS	334	755	163	227	373	188	234	126	259	143	3,800
	EF	4.22	3.06	3.18	2.62	2.85	2.59	3.59	2.41	2.88	3.66	3.14
A4	TV	2,197	492	149	107	60	19	90	70	220	126	3,530
	VS	404	221	88	71	39	4	103	36	146	39	1,151
	EF	5.44	2.23	1.69	1.51	1.54	4.75	0.87	1.94	1.51	3.23	3.07
A5	TV	1,937	799	236	179	155	42	444	78	346	93	4,309
	VS	510	279	88	78	52	18	161	23	151	27	1,397
	EF	3.80	2.88	2.68	1.51	2.50	2.33	2.76	3.39	2.29	3.44	3.08
A6	TV	1,683	556	95	383	47	28	139	29	127	162	3,243
	VS	424	194	99	163	24	8	81	14	53	40	1,040
	EF	3.97	2.87	2.44	2.35	1.96	3.50	1.72	2.07	2.40	4.05	3.12
A7	TV	1,064	955	209	257	326	120	461	127	323	168	4,010
	VS	284	301	77	112	114	35	163	44	123	49	1,303
	EF	3.75	3.17	2.71	2.29	2.86	3.33	2.83	2.89	2.63	3.43	3.08
A8	TV	575	619	875	237	286	375	385	153	1,041	212	4,758
	VS	137	172	295	83	87	135	88	58	307	78	1,450
	EF	4.20	3.60	2.97	2.85	3.29	2.78	4.38	2.25	3.39	2.72	3.28
A9	TV	1,353	333	55	98	69	17	125	56	30	129	2,265
	VS	285	158	26	46	44	11	60	27	20	43	720
	EF	4.75	2.11	2.12	2.13	1.57	1.55	2.08	2.07	1.50	3.00	3.15
A10	TV	240	64	17	35	47	24	55	8	41	37	568
	VS	57	24	5	13	19	13	24	3	23	6	187
	EF	4.21	2.57	3.40	2.69	2.47	1.85	2.29	2.67	1.78	6.17	2.04
A11	TV	520	1,194	168	279	658	484	520	174	327	262	4,585
	VS	108	397	45	88	228	156	175	45	3.27	66	1,403
	EF	4.81	3.01	3.73	3.17	2.89	3.10	2.97	3.87		3.97	3.26
A12	TV	467	182	24	43	203	20	51	11	51	102	1,154
	VS	107	75	15	18	81	5	11	3	23	25	363
	EF	4.36	2.43	1.60	2.39	2.51	4.00	4.64	3.67	2.22	4.08	3.18
A13	TV	1,161	118	19	31	40	9	73	15	7	79	1,552
	VS	323	57	4	16	18	5	24	9	5	41	502
	EF	3.59	2.07	4.75	1.94	2.22	1.80	3.04	1.57	1.40	1.93	3.09
A14	TV	285	343	30	85	247	137	193	45	145	103	1,514
	VS	45	121	8	39	89	70	57	23	54	26	542
	EF	5.33	2.83	3.75	2.18	2.78	1.96	2.88	1.96	2.70	3.96	2.98
A15	TV	77	152	97	71	270	360	163	96	847	136	2,219
	VS	7	28	19	33	82	162	68	16	273	27	715
	EF	11.00	5.43	5.11	2.15	2.68	2.22	2.40	6.00	3.10	5.04	3.10

- 1) TV : Traffic Volume
 2) VS : Number of Valid Sample
 3) EF : Expansion factor

TABLE A-6-3 AVERAGE NUMBER OF PASSENGERS BY VEHICLE TYPE

Bicycle	1.096
Motorcycle	1.512
Taxi	4.416
Mini-Bus	27.183
Bus	46.788
Passenger Car	3.683
Truck	4.215

TABLE A-6-4 PASSENGER CAR UNIT IN NEPAL

Bicycle	0.5
Motorcycle	0.5
Taxi	1.0
Mini-Bus	3.0
Bus	4.0
Passenger Car	1.0
Light Truck	1.5
Heavy Truck	4.0

APPENDIX 6-2 OD MATRICES

TABLE OD MATRICES BY VEHICLE TYPE (1991)

1991

UNIT: VEHICLE

MOTORCYCLE

MODE	DESTINATION	KATHMANDU U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMAND U RURAL	PATAN RAL	PATAN RU R RURAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL
ORIGIN											
	KATHMANDU CITY	42543	5975	343	1182	303	519	155	0	0	51020
	PATAN CITY	5886	2858	60	151	345	77	22	0	0	9399
	BHAKTAPAR CITY	320	54	845	3	3	136	18	0	0	1379
	KATHMANDU RURAL	1156	154	6	131	10	9	0	0	0	1466
	PATAN RURAL	257	320	0	12	14	15	6	0	0	624
	BHAKTAPAR RURAL	468	63	110	3	13	17	14	0	0	688
	OUTSIDE OF SURVE	107	18	22	0	0	8	0	0	0	155
	OTHER	0	0	0	0	0	0	0	0	0	0
	TOTAL	50737	9442	1386	1482	688	781	215	0	0	64731

1991

UNIT: VEHICLE

TAXI

MODE	DESTINATION	KATHMAND U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMAND U RURAL	PATAN RAL	PATAN RU R RURAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL
ORIGIN											
	KATHMANDU CITY	71873	7084	177	1489	141	192	56	0	0	81012
	PATAN CITY	6332	2033	21	59	363	35	6	0	0	8849
	BHAKTAPAR CITY	170	28	136	6	0	21	7	0	0	368
	KATHMANDU RURAL	1337	39	3	57	2	3	0	0	0	1441
	PATAN RURAL	62	369	0	1	1	0	0	0	0	433
	BHAKTAPAR RURAL	221	21	32	3	4	1	2	0	0	284
	OUTSIDE OF SURVE	54	4	9	4	0	0	0	0	0	71
	OTHER	0	0	0	0	0	0	0	0	0	0
	TOTAL	80049	9578	378	1619	511	252	71	0	0	92458

TABLE OD MATRICES BY VEHICLE TYPE (1991)

1991		UNIT: VEHICLE										1
MODE		BUS										1
DESTINATION	ORIGIN	KATHMANDU CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RAL	PATAN RU	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
KATHMANDU CITY	KATHMANDU CITY	2604	685	329	547	24	245	414	0	4848		
PATAN CITY	PATAN CITY	704	221	36	39	116	36	12	0	1164		
BHAKTAPAR CITY	BHAKTAPAR CITY	343	26	93	0	0	62	6	0	530		
KATHMANDU RURAL	KATHMANDU RURAL	451	19	3	27	2	12	0	0	514		
PATAN RURAL	PATAN RURAL	27	118	0	3	2	2	2	0	154		
BHAKTAPAR RURAL	BHAKTAPAR RURAL	143	14	51	3	3	7	6	0	227		
OUTSIDE OF SURVE	OUTSIDE OF SURVE	364	8	0	3	0	2	0	0	377		
OTHER	OTHER	0	0	0	0	0	0	0	0	0		
TOTAL	TOTAL	4636	1091	512	622	147	366	440	0	7814		

1991		UNIT: VEHICLE										1
MODE		PASSENGER CAR										1
DESTINATION	ORIGIN	KATHMANDU CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RAL	PATAN RU	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
KATHMANDU CITY	KATHMANDU CITY	25187	3928	150	582	112	200	164	0	30323		
PATAN CITY	PATAN CITY	4024	2017	17	78	84	32	31	0	6283		
BHAKTAPAR CITY	BHAKTAPAR CITY	148	12	143	0	0	18	12	0	333		
KATHMANDU RURAL	KATHMANDU RURAL	548	63	0	44	6	8	3	0	672		
PATAN RURAL	PATAN RURAL	126	73	0	1	2	0	0	0	202		
BHAKTAPAR RURAL	BHAKTAPAR RURAL	117	18	35	8	0	6	6	0	190		
OUTSIDE OF SURVE	OUTSIDE OF SURVE	98	14	6	0	0	0	1	0	119		
OTHER	OTHER	0	0	0	0	0	0	0	0	0		
TOTAL	TOTAL	30248	6125	351	713	204	264	217	0	38122		

TABLE OD MATRICES BY VEHICLE TYPE (1991)

MODE	DESTINATION	UNIT: VEHICLE										TOTAL
		TRUCK					OTHER					
ORIGIN	KATHMANDU U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RU RAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL			
KATHMANDU CITY	6815	728	172	755	229	234	508	0	9441			
PATAN CITY	1016	303	20	92	259	31	52	0	1773			
BHAKTAPAR CITY	157	24	1588	22	0	137	31	0	1959			
KATHMANDU RURAL	761	88	37	163	19	28	34	0	1130			
PATAN RURAL	177	194	0	25	18	10	11	0	435			
BHAKTAPAR RURAL	253	37	106	17	41	16	18	0	488			
OUTSIDE OF SURVE	448	54	26	27	14	9	16	0	594			
OTHER	0	0	0	0	0	0	0	0	0			
TOTAL	9627	1428	1949	1101	580	465	670	0	15820			

MODE	DESTINATION	UNIT: VEHICLE										TOTAL
		TRUCK					OTHER					
ORIGIN	KATHMANDU U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RU RAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL			
KATHMANDU CITY	149022	18400	1171	4555	809	1390	1297	0	176644			
PATAN CITY	17962	7432	154	419	1167	211	123	0	27468			
BHAKTAPAR CITY	1138	144	2805	31	3	374	74	0	4569			
KATHMANDU RURAL	4253	363	49	422	39	60	37	0	5223			
PATAN RURAL	649	1074	0	42	37	27	19	0	1848			
BHAKTAPAR RURAL	1202	153	334	34	61	47	46	0	1877			
OUTSIDE OF SURVE	1071	98	63	34	14	19	17	0	1316			
OTHER	0	0	0	0	0	0	0	0	0			
TOTAL	175297	27664	4576	5537	2130	2128	1613	0	218945			

TABLE OD MARTICES BY VEHICLE TYPE(1997)

1997

UNIT: VEHICLE

MODE	DESTINATION	MOTORCYCLE										TOTAL
		KATHMANDU U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RURAL	PATAN RU RAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
	KATHMANDU CITY	62446	10038	623	1979	472	820	205	0	76583		
	PATAN CITY	9916	5463	109	268	521	125	25	0	16427		
	BHAKTAPAR CITY	612	116	2250	3	2	131	15	0	3129		
	KATHMANDU RURAL	2007	253	6	130	9	7	0	0	2412		
	PATAN RURAL	443	537	0	12	13	12	4	0	1021		
	BHAKTAPAR RURAL	844	109	123	4	10	16	10	0	1116		
	OUTSIDE OF SURVE	196	34	24	0	0	7	0	0	261		
	OTHER	0	0	0	0	0	0	0	0	0		
	TOTAL	76464	16550	3135	2396	1027	1118	259	0	100949		

1997

UNIT: VEHICLE

MODE	DESTINATION	TAXI										TOTAL
		KATHMANDU U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RURAL	PATAN RU RAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
	KATHMANDU CITY	73496	7114	243	1654	143	280	81	0	83011		
	PATAN CITY	6347	2033	26	61	381	51	4	0	8903		
	BHAKTAPAR CITY	241	34	136	0	0	9	2	0	422		
	KATHMANDU RURAL	1669	44	0	17	0	0	0	0	1730		
	PATAN RURAL	107	414	0	0	0	0	0	0	521		
	BHAKTAPAR RURAL	301	32	10	0	1	1	1	0	346		
	OUTSIDE OF SURVE	80	5	2	1	0	0	0	0	88		
	OTHER	0	0	0	0	0	0	0	0	0		
	TOTAL	82241	9676	417	1733	525	341	88	0	95021		

TABLE OD MARTICES BY VEHICLE TYPE(1997)

1997		UNIT: VEHICLE								1	
MODE	DESTINATION	KATHMANDU CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RU RAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
	ORIGIN										
	KATHMANDU CITY	6400	1514	476	570	39	222	465	0	9686	
	PATAN CITY	1537	530	38	36	147	27	0	0	2315	
	BHAKTAPAR CITY	488	41	62	0	0	11	0	0	602	
	KATHMANDU RURAL	573	24	1	8	0	2	0	0	608	
	PATAN RURAL	31	149	0	0	1	0	0	0	181	
	BHAKTAPAR RURAL	212	21	27	1	1	6	0	0	268	
	OUTSIDE OF SURVE	462	0	0	0	0	0	0	0	462	
	OTHER	0	0	0	0	0	0	0	0	0	
	TOTAL	9703	2279	604	615	188	268	465	0	14122	

1997		UNIT: VEHICLE								1	
MODE	DESTINATION	KATHMANDU CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RU RAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
	ORIGIN										
	KATHMANDU CITY	40983	6052	339	1266	252	330	206	0	49428	
	PATAN CITY	6380	5992	45	148	181	58	42	0	12846	
	BHAKTAPAR CITY	362	34	1184	0	0	6	2	0	1588	
	KATHMANDU RURAL	1236	167	0	10	0	1	0	0	1414	
	PATAN RURAL	256	171	0	0	0	0	0	0	427	
	BHAKTAPAR RURAL	305	68	18	2	0	2	0	0	395	
	OUTSIDE OF SURVE	222	34	1	0	0	0	0	0	257	
	OTHER	0	0	0	0	0	0	0	0	0	
	TOTAL	49744	12518	1587	1426	433	397	250	0	66355	

TABLE OD MARTICES BY VEHICLE TYPE(1997)

MODE	DESTINATION ORIGIN	UNIT: VEHICLE										TOTAL
		TRUCK					TOTAL					
		KATHMANDU U CITY	PATAN CITY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RURAL	PATAN RU	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER		
1997		8049	893	304	1226	268	417	736	0	11893		
	KATHMANDU CITY	1241	364	43	154	309	73	73	0	2257		
	PATAN CITY	305	46	1875	20	0	154	34	0	2434		
	BHAKTAPAR CITY	1233	130	47	194	15	29	32	0	1680		
	KATHMANDU RURAL	278	320	0	23	12	12	8	0	653		
	PATAN RURAL	439	66	132	17	30	18	19	0	721		
	BHAKTAPAR RURAL	736	85	28	33	11	12	14	0	919		
	OUTSIDE OF SURVE	0	0	0	0	0	0	0	0	0		
	OTHER	12281	1904	2429	1667	645	715	916	0	20557		
	TOTAL											

MODE	DESTINATION ORIGIN	UNIT: VEHICLE										TOTAL
		TRUCK					TOTAL					
		KATHMANDU U CITY	PATAN CITY	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RURAL	PATAN RU	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER		
1997		191374	25611	1985	6695	1174	2069	1693	0	230601		
	KATHMANDU CITY	25421	14382	261	667	1539	334	144	0	42748		
	PATAN CITY	2008	271	5507	23	2	311	53	0	8175		
	BHAKTAPAR CITY	6718	618	54	359	24	39	32	0	7844		
	KATHMANDU RURAL	1115	1591	0	35	26	24	12	0	2803		
	PATAN RURAL	2101	296	310	24	42	43	30	0	2846		
	BHAKTAPAR RURAL	1696	158	55	34	11	19	14	0	1987		
	OUTSIDE OF SURVE	0	0	0	0	0	0	0	0	0		
	OTHER	230433	42927	8172	7837	2818	2839	1978	0	297004		
	TOTAL											

TABLE OD MARTICES BY VEHICLE TYPE(2015)

MODE	DESTINATION	UNIT: VEHICLE										TOTAL
		MOTORCYCLE					VEHICLE					
	ORIGIN	KATHMANDU U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMAND U RURAL	PATAN RAL	PATAN RU	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
	KATHMANDU CITY	123754	18045	758	4491	1215	1432	348	0	150043		
	PATAN CITY	17836	10250	109	547	964	174	38	0	29918		
	BHAKTAPAR CITY	751	120	3702	11	11	402	51	0	5048		
	KATHMANDU RURAL	4569	494	24	728	67	42	0	0	5924		
	PATAN RURAL	1066	1032	0	115	128	78	29	0	2448		
	BHAKTAPAR RURAL	1515	144	375	13	65	61	47	0	2220		
	OUTSIDE OF SURVE	347	49	83	0	0	33	0	0	512		
	OTHER	0	0	0	0	0	0	0	0	0		
	TOTAL	149838	30134	5051	5905	2450	2222	513	0	196113		

MODE	DESTINATION	UNIT: VEHICLE										TOTAL
		TAXI					VEHICLE					
	ORIGIN	KATHMAND U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMAND U RURAL	PATAN RAL	PATAN RU	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
	KATHMANDU CITY	73230	6920	225	2880	406	416	102	0	84179		
	PATAN CITY	6135	1961	17	79	521	42	6	0	8761		
	BHAKTAPAR CITY	244	33	125	7	0	70	19	0	498		
	KATHMANDU RURAL	2913	67	5	303	5	12	0	0	3305		
	PATAN RURAL	379	536	0	44	36	0	0	0	995		
	BHAKTAPAR RURAL	412	31	81	7	20	7	9	0	567		
	OUTSIDE OF SURVE	110	6	14	10	0	0	0	0	140		
	OTHER	0	0	0	0	0	0	0	0	0		
	TOTAL	83423	9554	467	3330	988	547	136	0	98445		

TABLE OD MARTICES BY VEHICLE TYPE(2015)

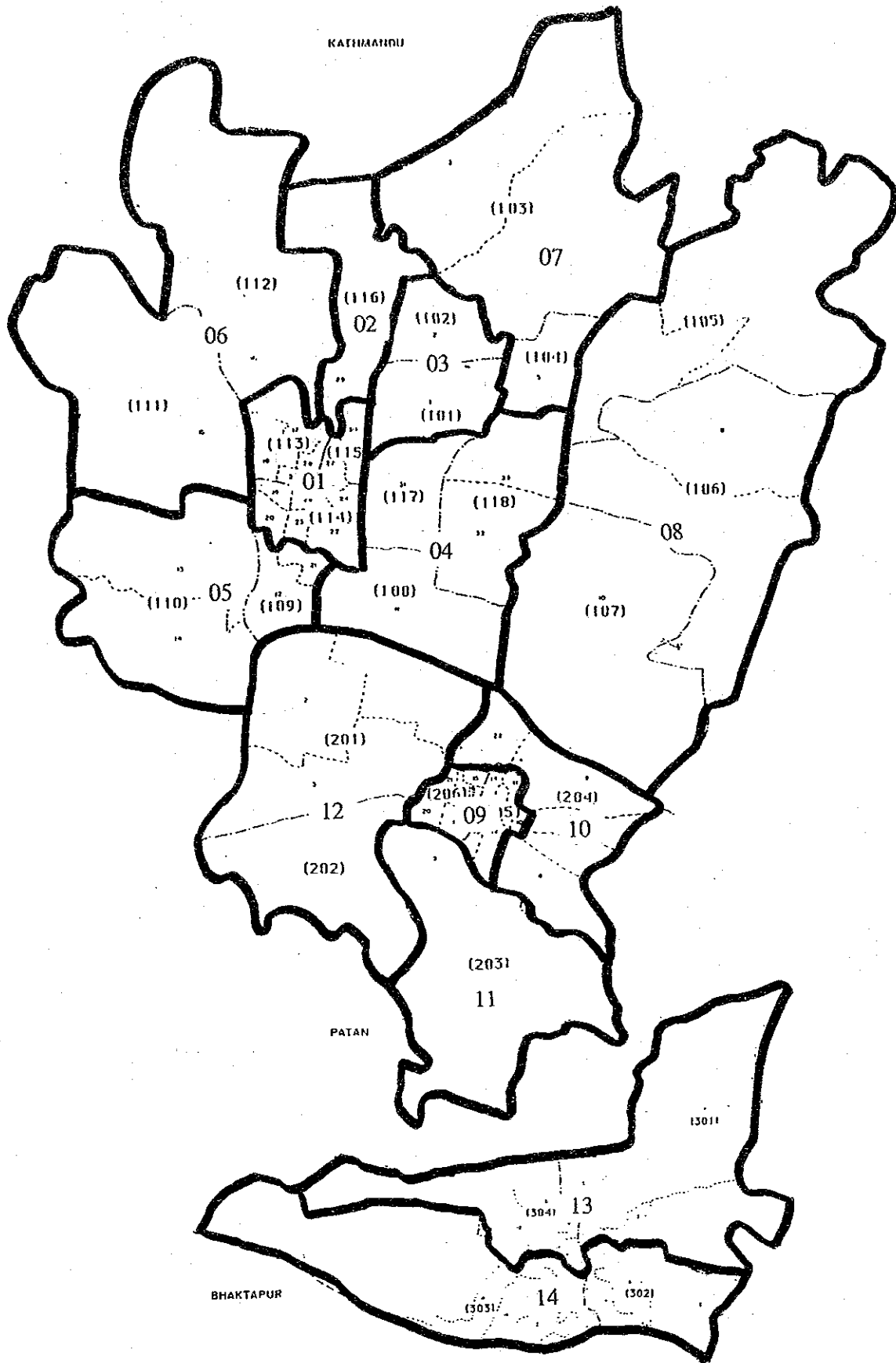
MODE	DESTINATION	UNIT: VEHICLE										TOTAL
		BUS					PASSENGER CAR					
2015		KATHMANDU U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMAND U RURAL	PATAN RU RAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL		
	ORIGIN											
	KATHMANDU CITY	10851	2295	541	918	110	261	683	0	15659		
	PATAN CITY	2321	787	18	58	197	19	0	0	3400		
	BHAKTAPAR CITY	541	20	78	0	0	81	0	0	720		
	KATHMANDU RURAL	927	29	8	120	4	28	0	0	1116		
	PATAN RURAL	98	202	0	7	17	5	0	0	329		
	BHAKTAPAR RURAL	263	13	85	14	10	10	0	0	395		
	OUTSIDE OF SURVE	687	0	0	0	0	0	0	0	687		
	OTHER	0	0	0	0	0	0	0	0	0		
	TOTAL	15688	3346	730	1117	338	404	683	0	22306		

MODE	DESTINATION	UNIT: VEHICLE										TOTAL
		PASSENGER CAR					PASSENGER CAR					
2015		KATHMAND U CITY	PATAN CI TY	BHAKTAPA R CITY	KATHMAND U RURAL	PATAN RU RAL	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL		
	ORIGIN											
	KATHMANDU CITY	121381	17626	585	4002	917	814	519	0	145844		
	PATAN CITY	18394	14581	86	464	474	162	101	0	34262		
	BHAKTAPAR CITY	696	61	3115	0	0	68	29	0	3969		
	KATHMANDU RURAL	3904	498	0	360	46	28	11	0	4847		
	PATAN RURAL	946	495	0	8	12	0	0	0	1461		
	BHAKTAPAR RURAL	722	165	144	39	0	17	15	0	1102		
	OUTSIDE OF SURVE	609	73	19	0	0	0	3	0	704		
	OTHER	0	0	0	0	0	0	0	0	0		
	TOTAL	146652	33499	3949	4873	1449	1089	678	0	192189		

TABLE OD MARTICES BY VEHICLE TYPE(2015)

MODE	DESTINATION	UNIT: VEHICLE										TOTAL
		TRUCK					VEHICLE					
ORIGIN	KATHMANDU U CITY	PATAN TY	PATAN CI	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RAL	PATAN RU	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
KATHMANDU CITY	25523	2715	687	4586	1230	1331	2331	0	38403			
PATAN CITY	3799	1096	64	460	856	169	162	0	6606			
BHAKTAPAR CITY	689	73	5985	95	0	510	104	0	7456			
KATHMANDU RURAL	4626	384	197	1104	112	154	166	0	6743			
PATAN RURAL	1214	925	0	189	105	78	59	0	2570			
BHAKTAPAR RURAL	1364	145	426	102	193	74	77	0	2381			
OUTSIDE OF SURVE	2370	177	84	180	63	56	61	0	2991			
OTHER	0	0	0	0	0	0	0	0	0			
TOTAL	39585	5515	7443	6716	2559	2372	2960	0	67150			

MODE	DESTINATION	UNIT: VEHICLE										TOTAL
		TRUCK					VEHICLE					
ORIGIN	KATHMANDU U CITY	PATAN TY	PATAN CI	BHAKTAPA R CITY	KATHMANDU U RURAL	PATAN RAL	PATAN RU	BHAKTAPA R RURAL	OUTSIDE OF SURVE	OTHER	TOTAL	
KATHMANDU CITY	354739	47601	2796	16877	3878	4254	3983	0	434128			
PATAN CITY	48485	28675	294	1608	3012	566	307	0	82947			
BHAKTAPAR CITY	2921	307	13005	113	11	1131	203	0	17691			
KATHMANDU RURAL	16939	1472	234	2615	234	264	177	0	21935			
PATAN RURAL	3703	3190	0	363	298	161	88	0	7803			
BHAKTAPAR RURAL	4276	498	1111	175	288	169	148	0	6665			
OUTSIDE OF SURVE	4123	305	200	190	63	89	64	0	5034			
OTHER	0	0	0	0	0	0	0	0	0			
TOTAL	435186	82048	17640	21941	7784	6634	4970	0	576203			



CONSOLIDATED TRAFFIC ZONE

CONSOLIDATED TRAFFIC ZONE CORRESPONDING TABLE

Consolidated Zone No.	Traffic Zone
01	113, 114, 115
02	116
03	101, 102
04	108, 117, 118
05	109, 110
06	111, 112
07	103, 104
08	105, 106, 107
09	205, 206
10	204
11	203
12	201, 202
13	301, 304
14	302, 303
15	601
16	401, 402
17	604
18	602, 603, 720
19	503, 504
20	501, 502
21	409, 410
22	407, 408, 740, 750
23	406, 730
24	405
25	403, 404

TABLE OD MATRICES OF ALL VEHICLE TYPE (CONSOLIDATED ZONE - 1991)

1991

UNIT: PCU

MODE	TOTAL									
	1	2	3	4	5	6	7	8	9	10
DESTINATION	1	2	3	4	5	6	7	8	9	10
ORIGIN	1	2	3	4	5	6	7	8	9	10
1	4106	1067	3658	4268	3713	4659	5847	5340	1401	470
2	1044	279	327	1116	336	490	1149	555	70	17
3	3697	283	1614	2020	1083	1043	2044	1819	192	128
4	4308	1032	1845	4406	2848	1761	3815	4340	761	435
5	3613	410	1193	2877	2538	1051	933	1329	357	156
6	4881	425	744	1732	1953	4462	899	1866	130	49
7	6049	1124	2169	4457	1191	761	3309	2704	385	302
8	4976	513	1719	4606	1321	1682	2403	5885	134	134
9	1798	70	118	736	289	212	370	464	389	392
10	380	44	142	407	174	86	302	85	392	145
11	819	106	85	615	250	190	107	297	147	137
12	2736	401	925	2877	1099	688	762	1825	397	125
13	108	50	55	196	60	35	4	120	18	14
14	210	18	46	918	95	51	32	224	118	18
15	352	37	59	305	150	64	106	617	136	27
16	122	2	44	83	29	51	14	309	42	20
17	8	12	14	4	8	5	0	34	7	0
18	138	16	39	596	119	33	41	171	23	12
19	126	16	65	114	75	132	64	184	714	75
20	62	10	6	54	13	6	9	97	485	79
21	616	35	44	224	687	140	152	131	35	39
22	318	57	149	1076	1190	238	122	261	120	13
23	25	17	34	0	14	211	23	17	8	0
24	59	46	515	56	53	71	184	144	0	11
25	191	15	49	35	47	47	20	631	0	24
OTHER	0	0	0	7	0	0	11	7	4	0
TOTAL	40742	6085	15658	33785	19335	18169	22722	29246	6726	2820

TABLE OD MATRICES OF ALL VEHICLE TYPE (CONSOLIDATED ZONE - 1991)

1991

UNIT: PCU

MODE	ORIGIN	TOTAL														I
		11	12	13	14	15	16	17	18	19	20					
1	690	3596	83	298	467	101	6	164	81	46						
2	60	428	40	29	81	20	7	18	24	3						
3	158	802	64	75	158	80	20	19	51	40						
4	539	2637	237	713	344	103	59	520	126	62						
5	166	927	38	104	153	55	52	100	156	104						
6	196	855	35	50	66	41	53	9	118	56						
7	114	708	11	45	57	16	18	10	47	16						
8	359	1501	139	251	517	463	15	202	241	111						
9	180	337	16	133	155	57	4	26	724	703						
10	103	130	18	30	70	9	0	9	117	62						
11	836	673	0	2	16	0	0	3	56	45						
12	661	2527	21	31	61	4	2	20	102	86						
13	2	23	2649	393	100	24	101	69	2	0						
14	0	43	743	2821	404	28	78	172	2	0						
15	0	64	120	314	22	0	13	42	118	33						
16	2	56	14	61	2	7	0	0	8	12						
17	0	4	77	101	23	0	10	23	11	0						
18	2	19	38	105	41	0	8	2	0	17						
19	66	101	0	0	48	21	0	2	17	42						
20	32	96	0	0	2	8	0	4	20	3						
21	21	160	2	3	9	35	11	31	31	4						
22	0	156	0	46	39	6	0	46	26	6						
23	0	4	0	0	0	0	0	0	0	0						
24	0	9	0	16	2	1	0	3	4	4						
25	0	29	0	24	53	74	11	24	18	2						
OTHER	0	0	0	0	0	0	0	0	7	0						
TOTAL	4177	15885	4345	5445	2890	1153	468	1531	2105	1457						

TABLE OD MATRICES OF ALL VEHICLE TYPE (CONSOLIDATED ZONE - 1991)

1991

UNIT: PCU

MODE	DESTINATION	ORIGIN										TOTAL
		21	22	23	24	25	OTHER	TOTAL				
1	614	422	7	136	137	0	41377					
2	68	69	0	62	16	0	6308					
3	31	157	11	560	81	0	16230					
4	287	1694	25	93	89	0	33079					
5	755	1332	17	48	87	0	18551					
6	112	222	153	36	49	0	18992					
7	54	86	14	259	41	0	23947					
8	103	325	13	149	453	7	28483					
9	120	111	0	4	14	67	7489					
10	30	4	0	25	1	0	2763					
11	20	1	0	0	0	0	4595					
12	209	149	5	43	17	7	15580					
13	0	3	0	0	0	0	4024					
14	3	2	0	24	0	0	5850					
15	32	59	0	0	30	0	2700					
16	26	0	0	0	57	0	961					
17	0	0	0	0	2	0	343					
18	32	21	0	9	2	0	1484					
19	9	22	0	7	27	11	1940					
20	15	6	0	1	13	0	1032					
21	0	33	0	10	10	0	2463					
22	45	103	5	11	39	0	4072					
23	0	0	0	0	0	0	353					
24	10	35	0	2	23	0	1248					
25	11	15	0	4	413	0	1727					
OTHER	0	0	0	0	0	0	36					
TOTAL	2586	4871	250	1483	1601	92	245427					

TABLE OD MATRICES OF ALL VEHICLE TYPE (CONSOLIDATED ZONE - 1997)

1997

UNIT: PCU

MODE	TOTAL											
	1	2	3	4	5	6	7	8	9	10		
ORIGIN												
1	5850	1539	4131	5879	5144	5811	6479	7266	1743	962		
2	1552	333	465	1409	477	589	1279	713	84	31		
3	4163	433	1345	3598	1185	1455	2132	2464	278	413		
4	5911	1303	3670	5378	3502	2826	4267	6590	1122	964		
5	5063	525	1240	3639	3256	1278	1120	1730	482	230		
6	5953	520	1232	2690	2348	5895	1204	2126	260	97		
7	6748	1237	2234	4931	1327	981	3346	3393	462	413		
8	6789	688	2499	6947	1799	2124	3141	7918	625	252		
9	2261	84	215	1083	379	339	442	734	2752	525		
10	790	54	418	938	245	134	413	192	525	593		
11	1396	140	143	1268	359	256	163	495	311	510		
12	3619	517	866	3668	1258	907	905	2523	687	326		
13	167	86	87	345	134	59	7	196	33	16		
14	315	41	104	1373	212	91	59	376	218	34		
15	514	73	111	558	332	111	167	995	249	49		
16	150	3	65	184	61	90	23	456	75	34		
17	15	34	26	7	43	7	0	67	10	0		
18	144	26	1173	150	432	97	79	252	83	23		
19	173	32	100	240	146	207	87	267	1057	120		
20	78	22	14	105	26	13	11	147	706	136		
21	722	61	62	403	1266	220	199	180	66	56		
22	343	59	557	947	1622	306	119	312	136	19		
23	26	5	192	0	24	199	28	14	3	0		
24	77	84	652	124	135	132	299	227	0	21		
25	306	39	89	92	120	96	43	1020	0	34		
OTHER	0	0	0	24	0	0	4	14	5	0		
TOTAL	53123	7938	21690	45980	25832	24223	26016	40667	11972	5858		

TABLE OD MATRICES OF ALL VEHICLE TYPE (CONSOLIDATED ZONE - 1997)

UNIT: PCU

1997		TOTAL														
MODE	ORIGIN	11	12	13	14	15	16	17	18	19	20					
DESTINATION																
1	1174	4328	127	406	514	126	8	170	113	45						
2	85	501	54	51	128	12	15	27	40	5						
3	203	801	100	119	240	42	42	1180	74	33						
4	1120	3313	385	1127	513	141	59	191	234	77						
5	278	1101	57	211	273	86	80	347	194	106						
6	267	1111	56	99	152	84	62	59	185	57						
7	173	893	22	98	104	14	25	25	77	18						
8	587	2093	239	466	837	608	13	354	313	131						
9	357	605	19	204	208	70	12	47	1012	747						
10	476	337	32	50	121	10	0	14	164	60						
11	1097	1137	0	6	36	0	0	4	102	48						
12	1124	2462	36	62	111	5	3	44	153	103						
13	3	56	3426	540	81	24	58	51	0	0						
14	0	70	935	4142	412	24	42	135	1	0						
15	0	130	125	279	26	0	9	39	88	19						
16	2	80	17	73	1	7	0	0	6	18						
17	0	8	79	88	26	0	10	21	7	0						
18	2	42	52	113	44	0	5	9	4	11						
19	116	145	0	0	48	18	0	6	13	24						
20	60	122	0	0	1	7	0	7	17	2						
21	45	215	2	0	0	28	4	31	21	0						
22	0	189	0	49	45	7	0	47	18	0						
23	0	7	0	0	0	0	0	0	0	0						
24	0	20	0	16	1	1	0	7	4	4						
25	0	80	0	28	39	87	7	14	18	0						
OTHER	0	0	0	0	0	0	0	0	7	0						
TOTAL	7169	19846	5763	8207	3941	1401	454	2829	2865	1498						

TABLE OD MATRICES OF ALL VEHICLE TYPE (CONSOLIDATED ZONE - 1997)

1997
UNIT: PCU

MODE #	DESTINATION	TOTAL										TOTAL
		21	22	23	24	25	OTHER	25	OTHER	25	TOTAL	
ORIGIN												
1	725	311	7	176	279	0	53313	0	0	0	0	53313
2	98	35	0	70	38	0	8091	0	0	0	0	8091
3	43	496	160	585	127	0	21711	0	0	0	0	21711
4	363	958	60	148	173	0	44395	0	0	0	0	44395
5	1232	1737	36	70	177	0	24548	0	0	0	0	24548
6	199	295	170	72	111	0	25284	0	0	0	0	25284
7	100	131	33	390	98	0	27273	0	0	0	0	27273
8	145	358	29	199	859	7	40000	0	0	0	0	40000
9	168	116	0	4	20	36	12439	0	0	0	0	12439
10	39	5	0	40	2	0	5652	0	0	0	0	5652
11	33	0	0	0	0	0	7504	0	0	0	0	7504
12	347	211	7	75	33	7	20059	0	0	0	0	20059
13	0	0	0	0	0	0	5369	0	0	0	0	5369
14	0	2	0	21	0	0	8607	0	0	0	0	8607
15	23	36	0	0	28	0	3963	0	0	0	0	3963
16	23	0	0	0	54	0	1412	0	0	0	0	1412
17	0	0	0	0	2	0	448	0	0	0	0	448
18	31	21	0	0	8	0	2801	0	0	0	0	2801
19	9	14	0	4	27	4	2857	0	0	0	0	2857
20	12	0	0	0	13	0	1499	0	0	0	0	1499
21	0	23	0	2	8	0	3614	0	0	0	0	3614
22	30	91	4	15	32	0	4947	0	0	0	0	4947
23	0	0	0	0	0	0	498	0	0	0	0	498
24	8	28	0	0	23	0	1863	0	0	0	0	1863
25	8	14	0	0	440	0	2574	0	0	0	0	2574
OTHER	0	0	0	0	0	0	54	0	0	0	0	54
TOTAL	3638	4882	506	1871	2552	54	330775	0	0	0	0	330775

TABLE OD MATRICES OF ALL VEHICLE TYPE (CONSOLIDATED ZONE - 2015)

2015 UNIT: PCU

MODE	DESTINATION	TOTAL																
		11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	OTHER	TOTAL
ORIGIN	1	2665	8580	1111	345	613	173	281	6	256	114							
	2	359	860	72	62	280	28	52	14	105	17							
	3	334	1437	117	144	453	69	67	29	204	87							
	4	2405	6129	484	1568	1230	394	481	98	665	294							
	5	597	1915	77	407	759	249	1166	133	735	426							
	6	502	2404	183	293	641	354	333	171	1080	368							
	7	358	1824	42	217	348	30	95	52	339	101							
	8	1339	4330	451	837	2131	2228	2745	28	1212	511							
	9	639	862	10	138	248	139	68	6	1707	1389							
	10	1053	593	38	70	248	24	19	0	421	168							
	11	3090	2434	0	15	100	0	4	0	321	162							
	12	2427	5066	57	117	294	9	130	4	513	389							
	13	3	108	10231	1340	313	126	150	193	0	0							
	14	0	131	2587	11561	1587	106	433	109	6	0							
	15	0	377	444	1123	141	0	173	32	6	0							
	16	3	343	79	342	5	34	0	0	575	133							
	17	0	7	202	219	93	0	0	14	57	54							
	18	4	134	119	373	185	0	67	14	38	0							
	19	359	520	0	0	315	0	51	16	31	62							
	20	208	471	0	0	8	134	43	0	102	234							
	21	133	660	6	5	14	66	48	0	174	20							
	22	0	480	0	154	228	198	147	21	170	14							
	23	0	16	0	0	0	17	189	0	102	14							
	24	0	64	0	69	7	0	0	0	0	0							
	25	0	198	0	106	284	5	63	24	24	17							
OTHER		0	0	0	0	0	0	97	0	112	16							
TOTAL		16278	39943	15310	19505	10325	4836	6902	950	8977	4590							

TABLE OD MATRICES OF ALL VEHICLE TYPE (CONSOLIDATED ZONE - 2015)

		UNIT: PCU											
		TOTAL											
MODE	DESTINATION	21	22	23	24	25	OTHER	TOTAL					
ORIGIN													
1	1152	539	4	370	363	0	95407						
2	226	77	0	197	77	0	12948						
3	55	395	252	774	282	0	34345						
4	943	1798	150	467	369	0	85163						
5	4393	5324	112	287	423	0	51200						
6	1014	1361	551	385	495	0	65114						
7	399	499	87	1704	282	0	56073						
8	426	1056	58	847	2425	24	89117						
9	297	149	0	6	17	64	22109						
10	90	8	0	110	3	0	11040						
11	103	0	0	0	0	0	16975						
12	1043	617	16	269	84	34	42018						
13	0	2	0	0	0	0	14063						
14	5	6	0	92	0	0	20801						
15	170	176	0	0	191	0	10564						
16	186	0	0	0	348	0	4848						
17	0	0	0	0	7	0	940						
18	164	116	4	0	52	0	6937						
19	62	85	0	41	191	41	9003						
20	119	7	0	44	116	0	4584						
21	0	133	0	85	49	0	11184						
22	172	418	17	89	172	0	13159						
23	0	0	0	0	0	0	1252						
24	54	174	0	16	182	0	5798						
25	68	68	0	38	2915	0	9030						
OTHER	0	0	0	0	0	0	161						
TOTAL	11141	13008	1251	5821	9043	163	693853						

APPENDIX 6-3 ROAD NETWORK FOR TRAFFIC ASSIGNMENT

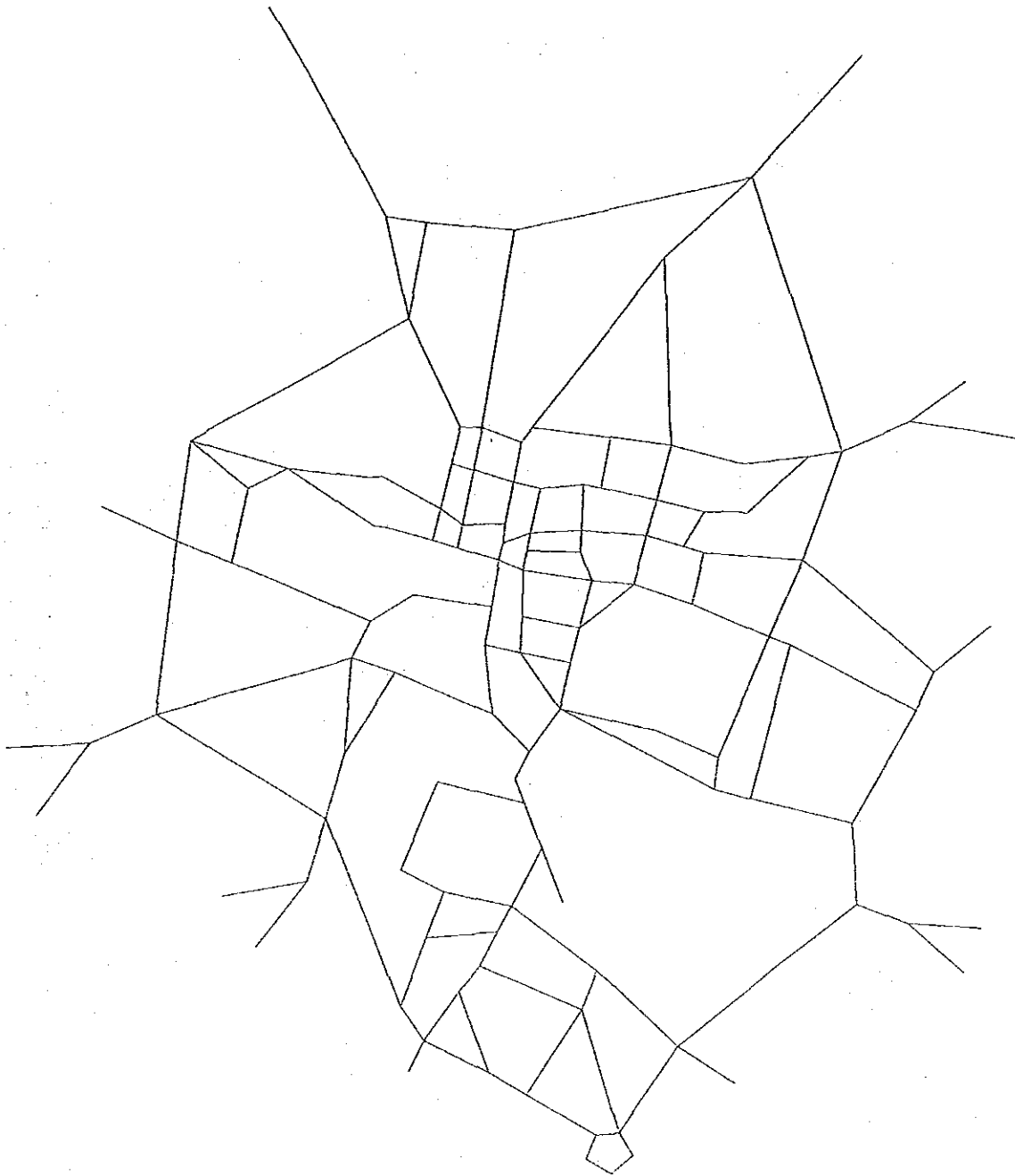


FIG. ROAD NETWORK FOR TRAFFIC ASSIGNMENT INSIDE THE RING ROAD (1991)

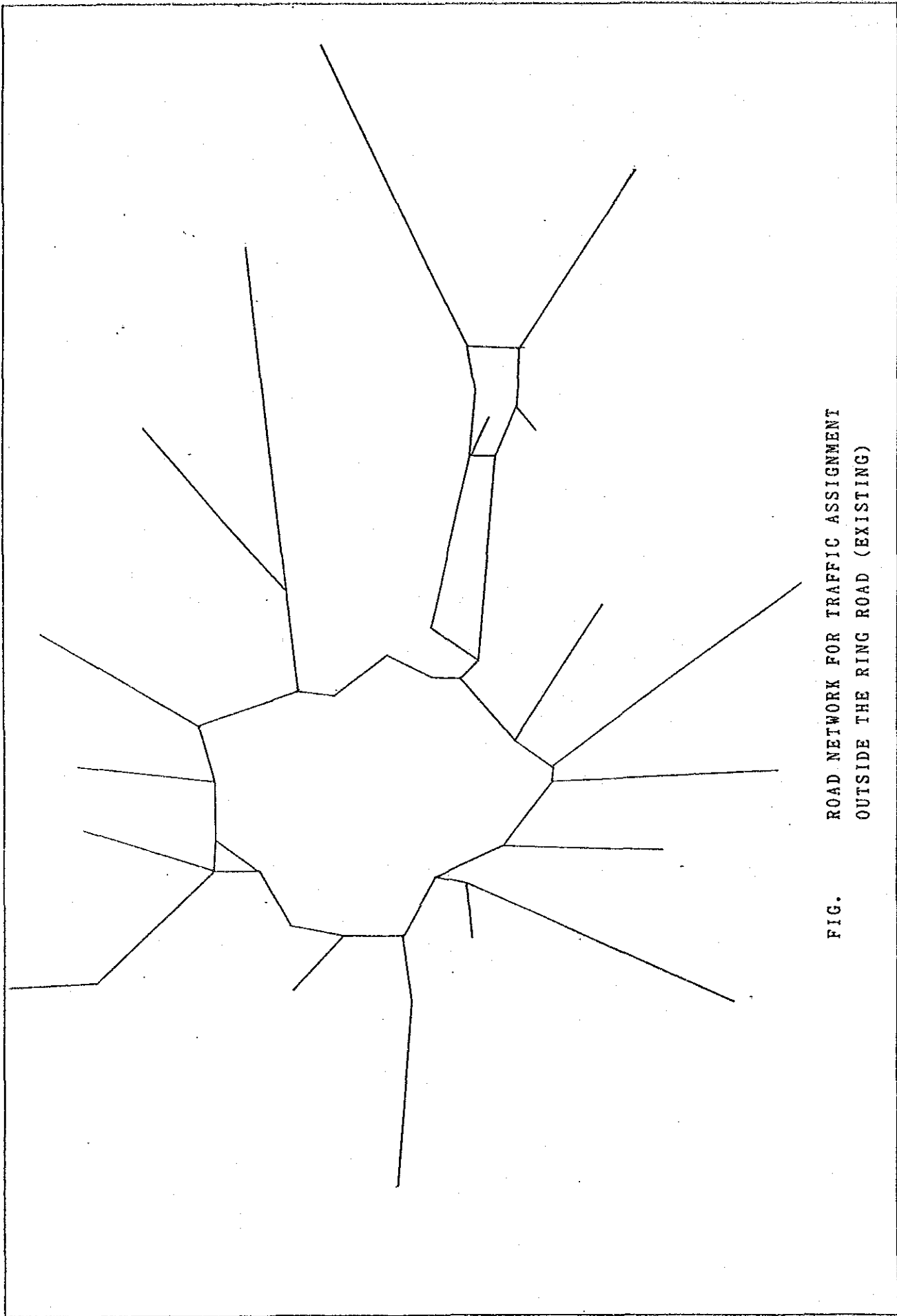


FIG. ROAD NETWORK FOR TRAFFIC ASSIGNMENT
OUTSIDE THE RING ROAD (EXISTING)

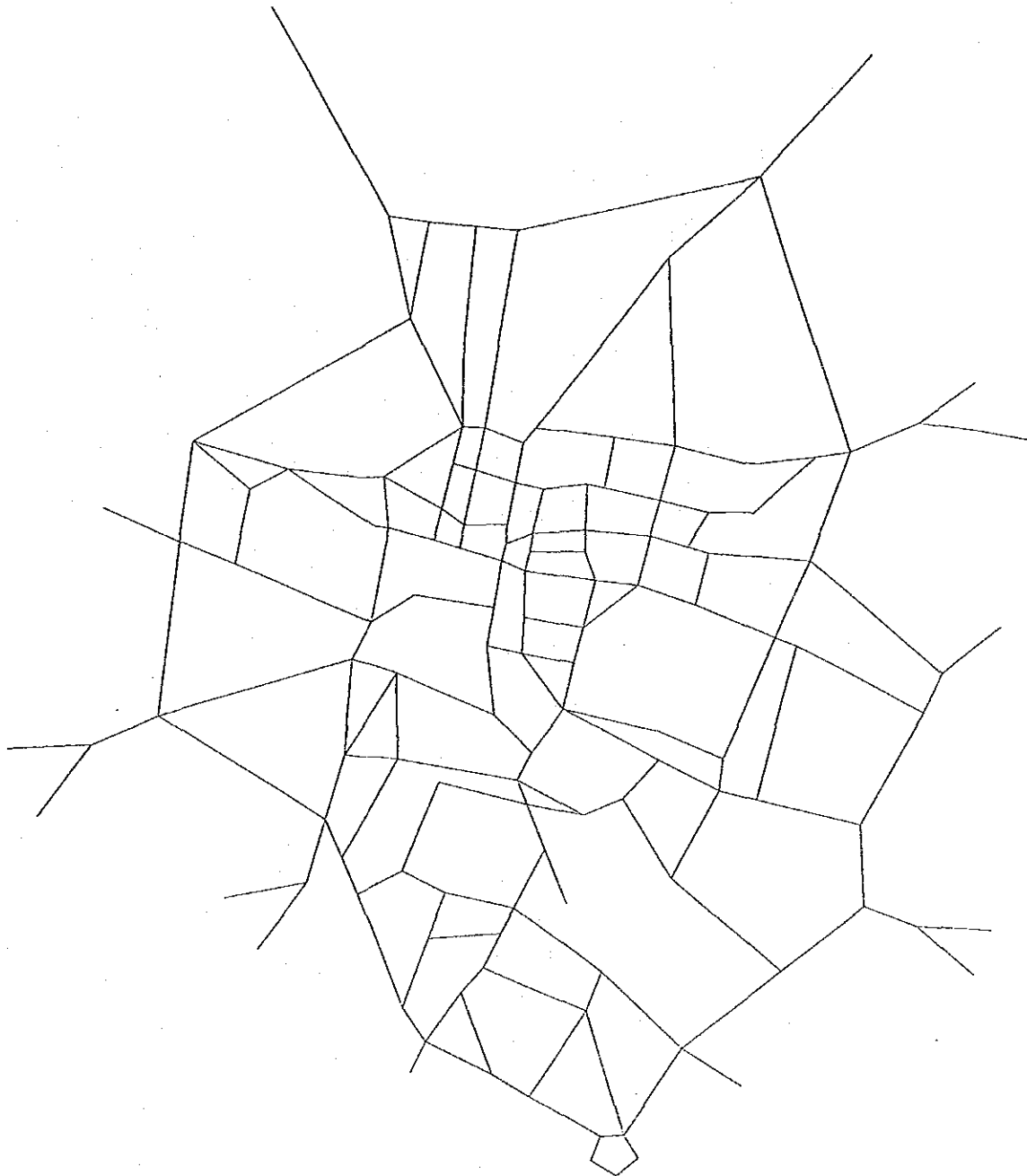


FIG. ROAD NETWORK FOR TRAFFIC ASSIGNMENT INSIDE THE RING ROAD (1997)

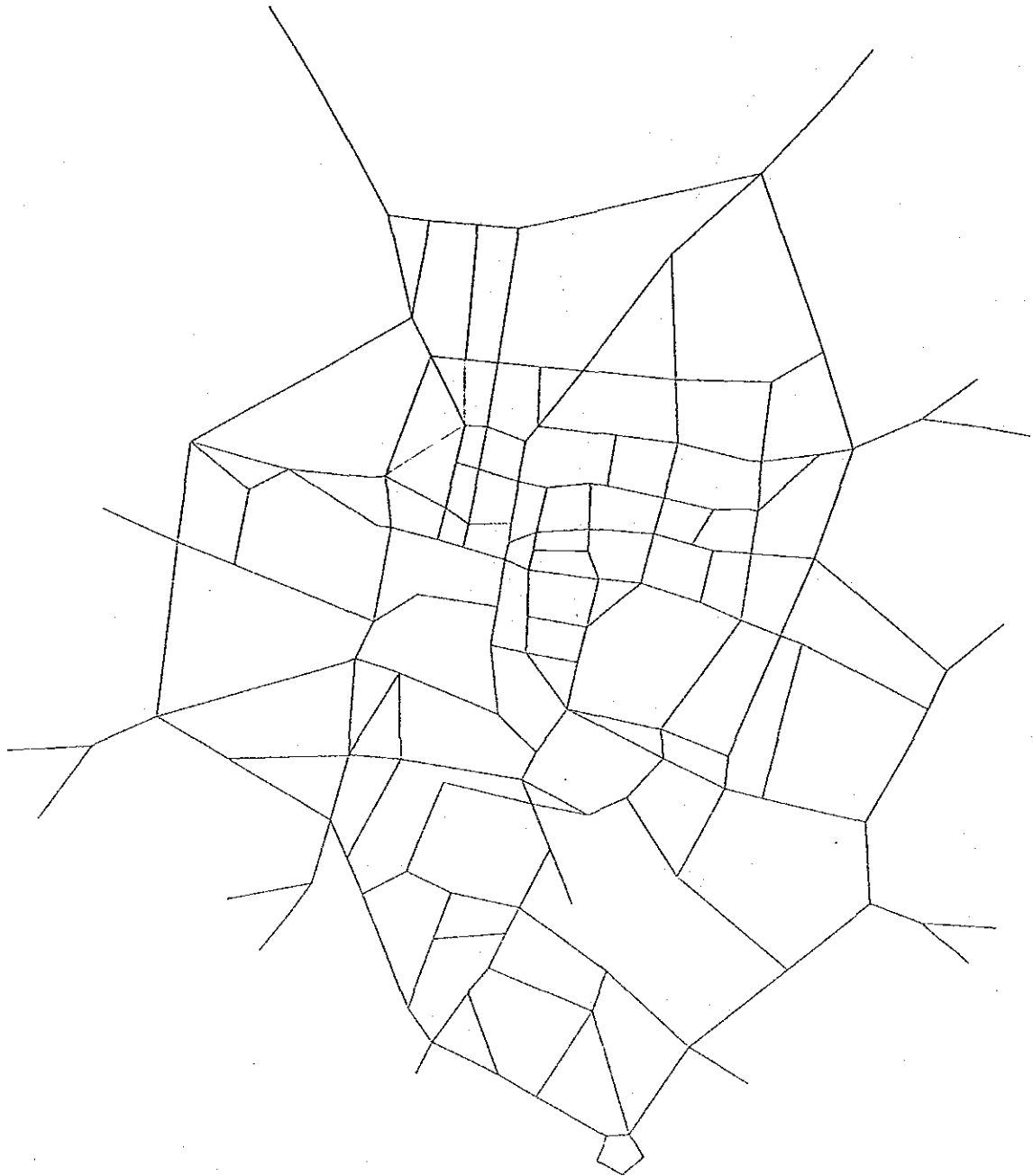


FIG. ROAD NETWORK FOR TRAFFIC ASSIGNMENT INSIDE THE RING ROAD (2015)

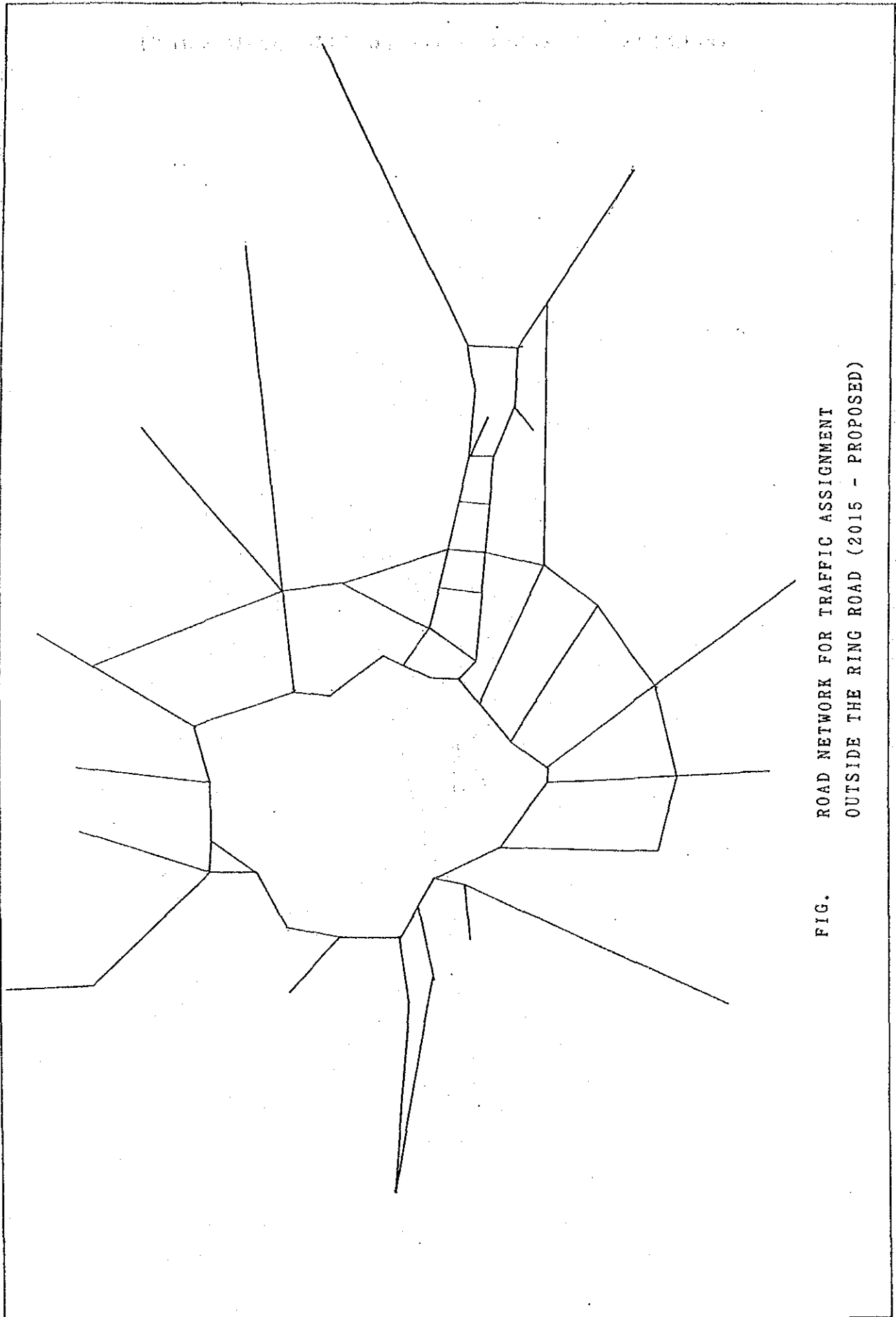
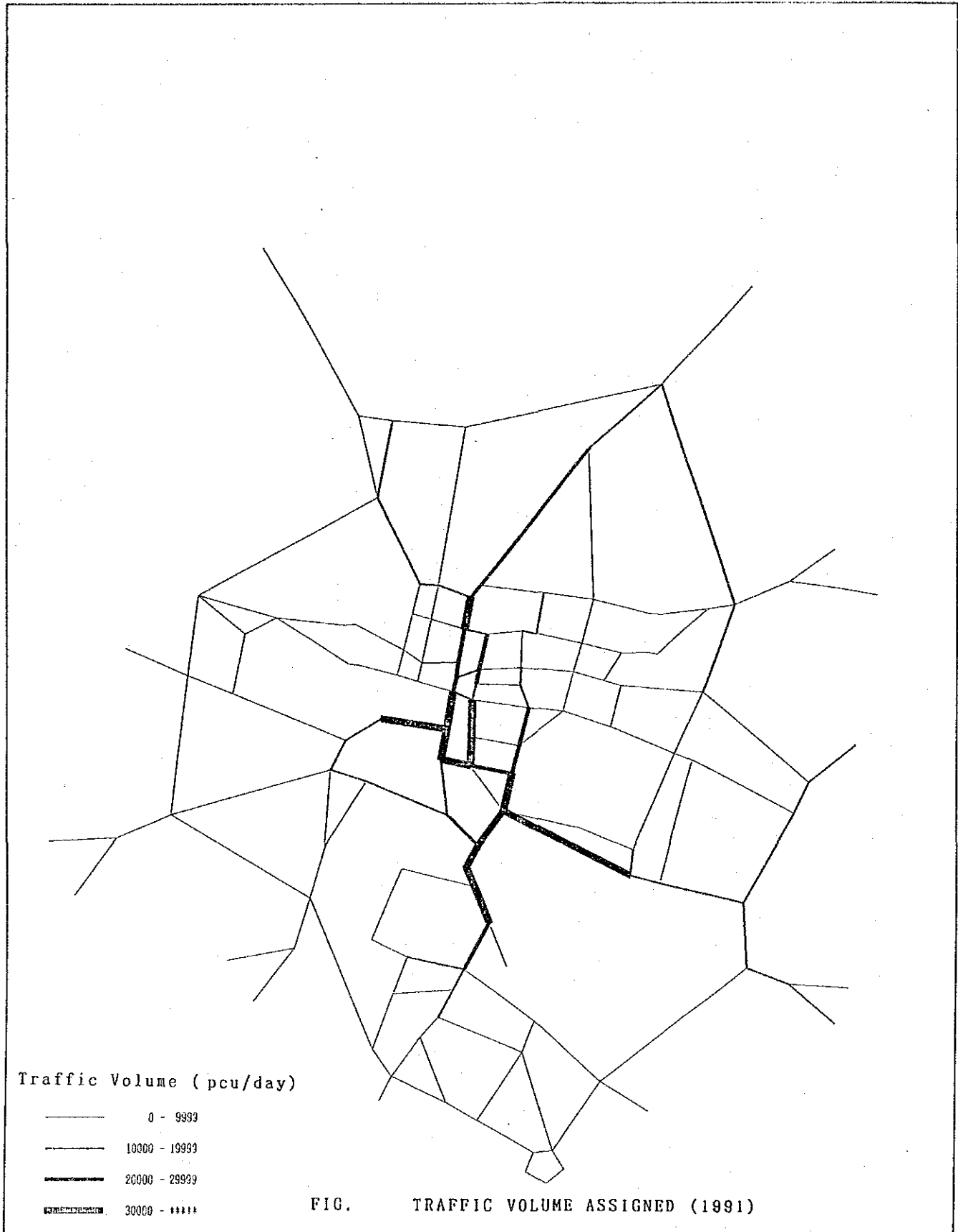
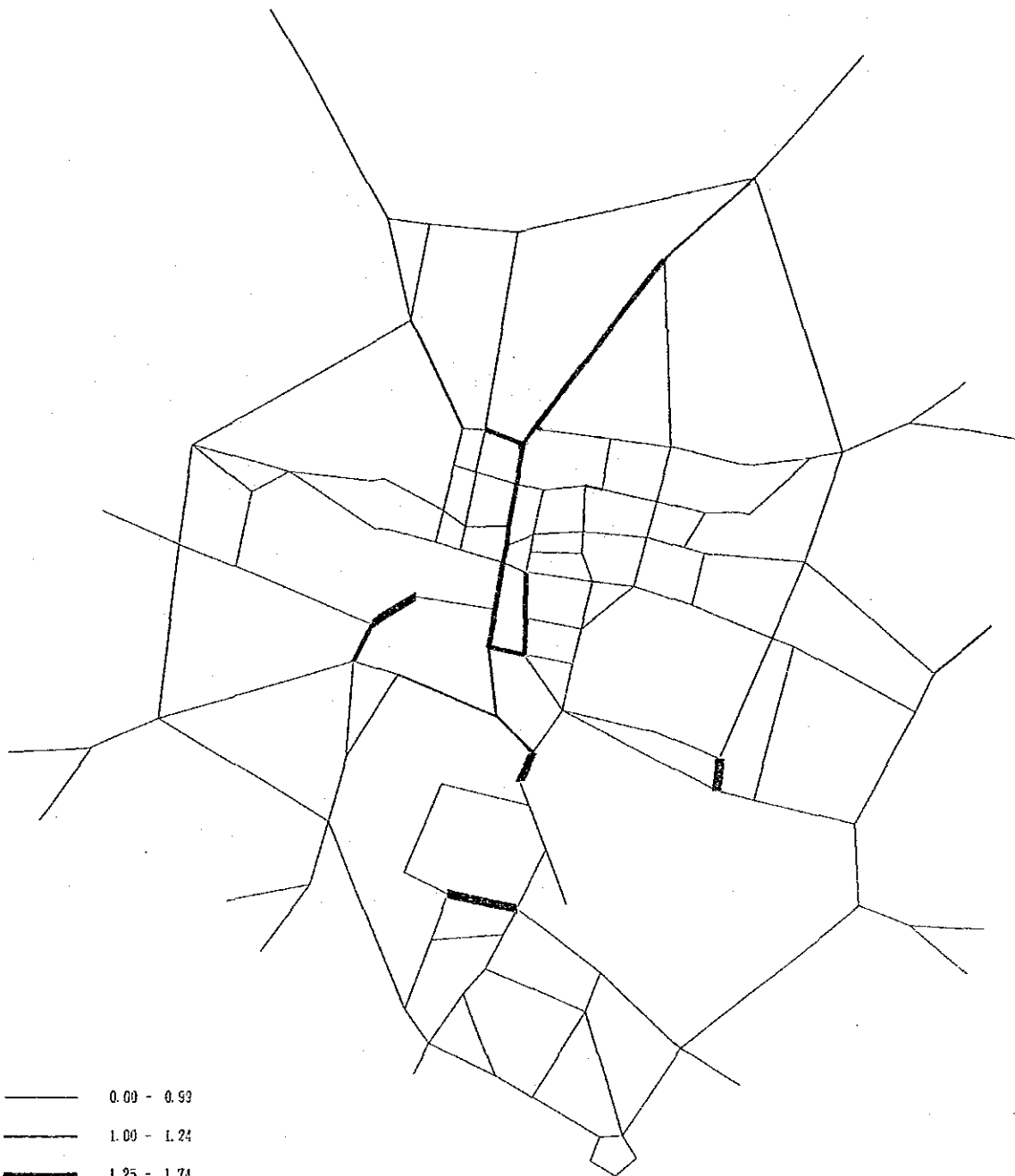


FIG. ROAD NETWORK FOR TRAFFIC ASSIGNMENT
OUTSIDE THE RING ROAD (2015 - PROPOSED)

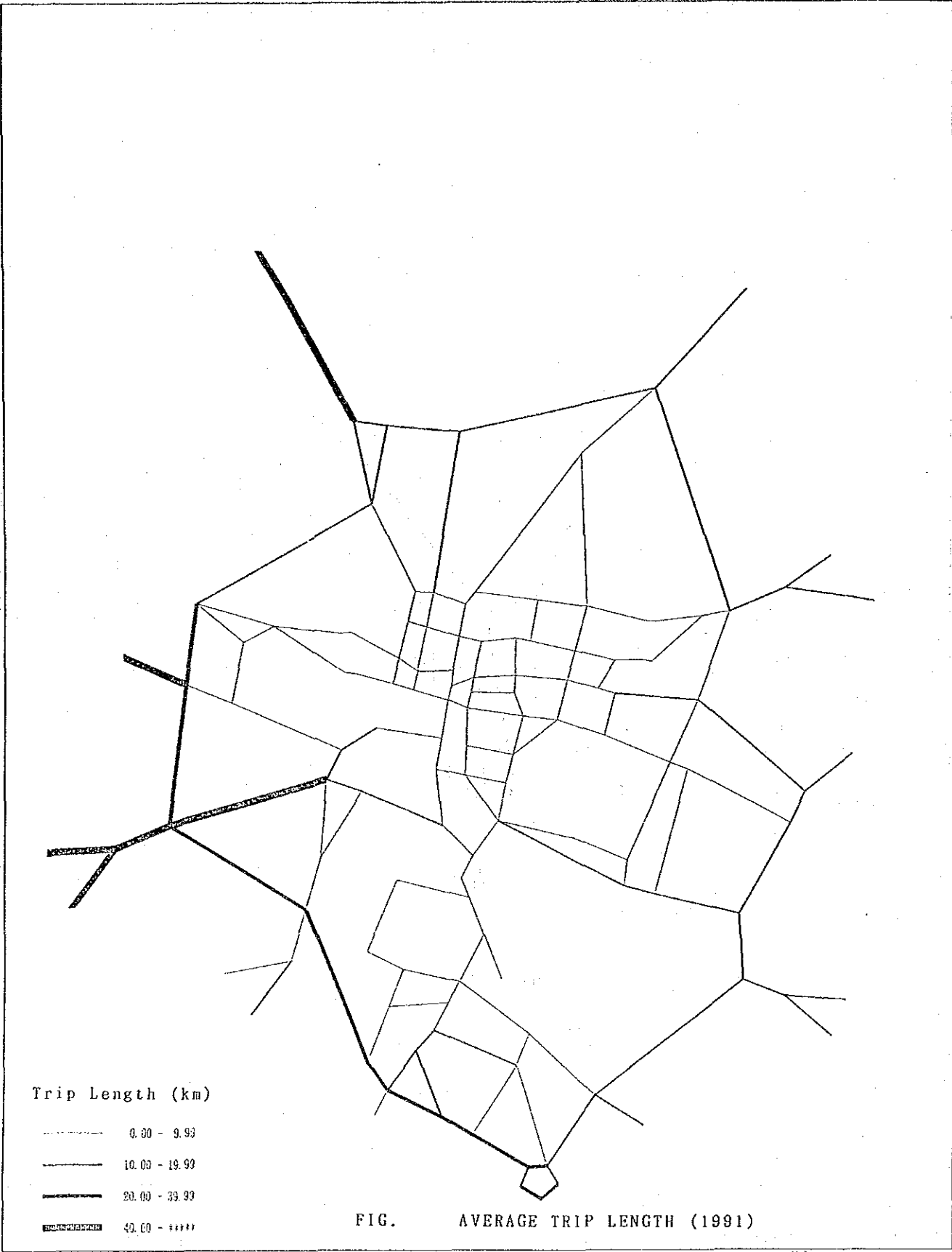
APPENDIX 6-4 RESULTS OF TRAFFIC ASSIGNMENT

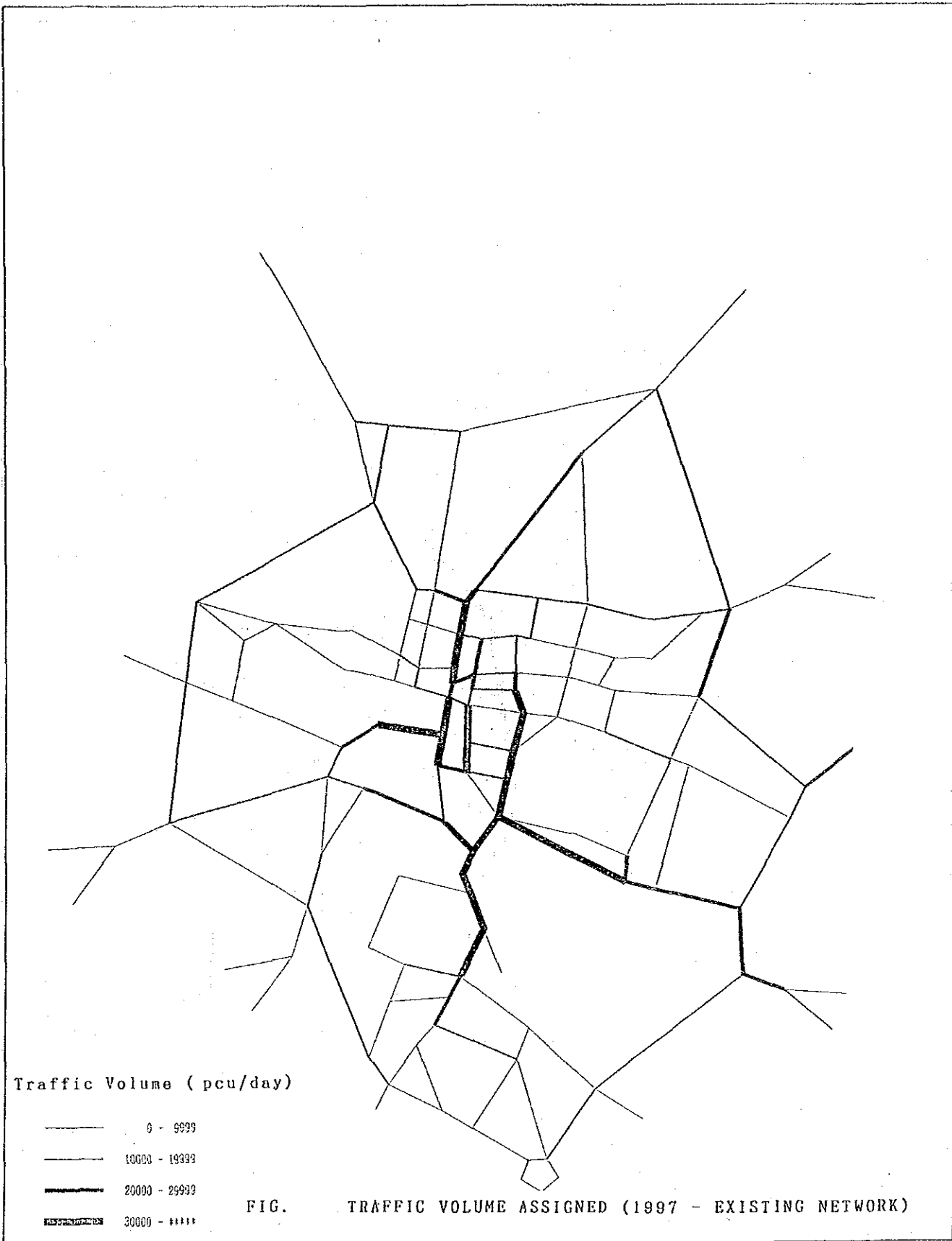


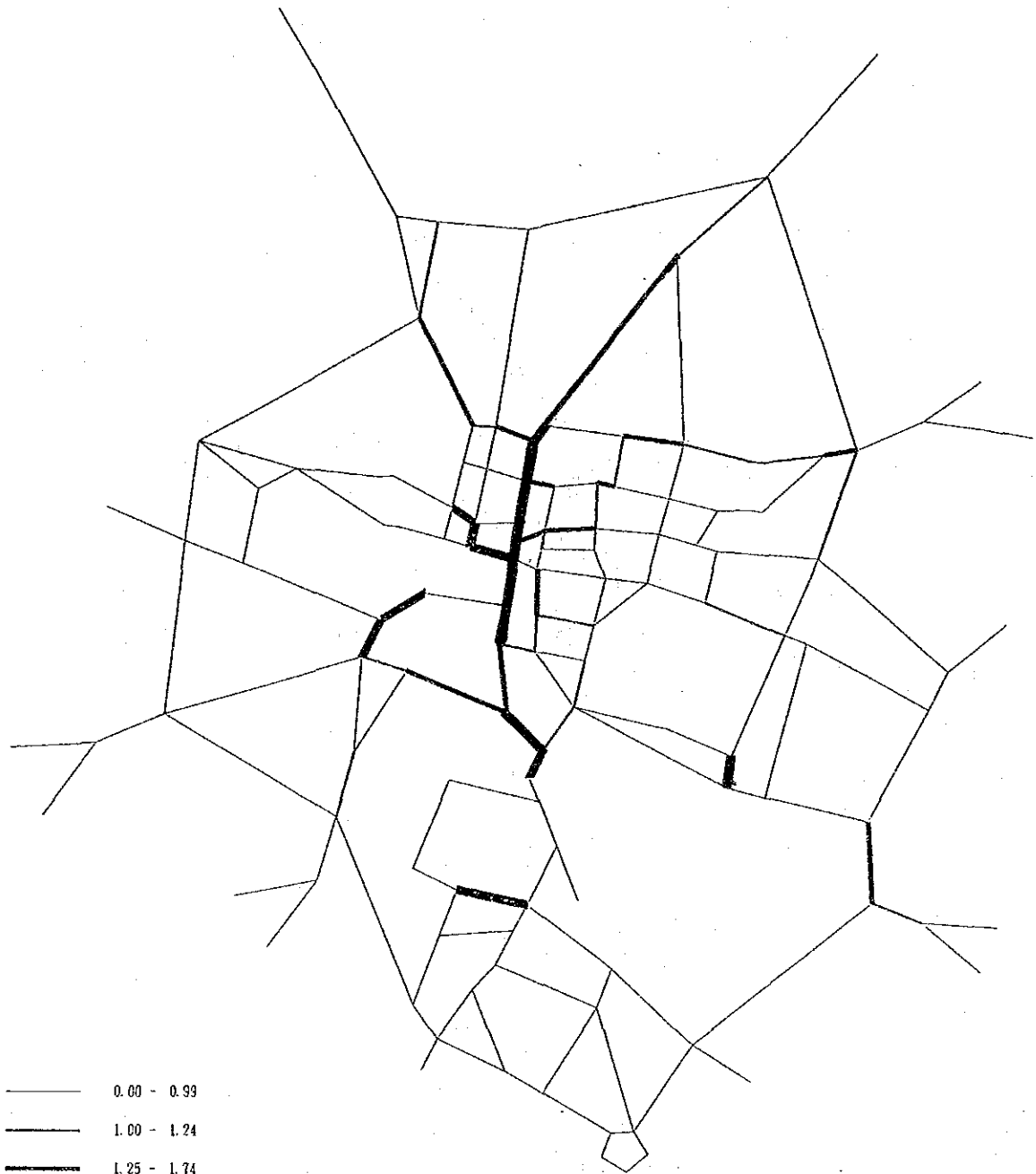


- 0.00 - 0.99
- 1.00 - 1.24
- 1.25 - 1.74
- - - - 1.75 - ****

FIG. CONGESTION DEGREE (1991)

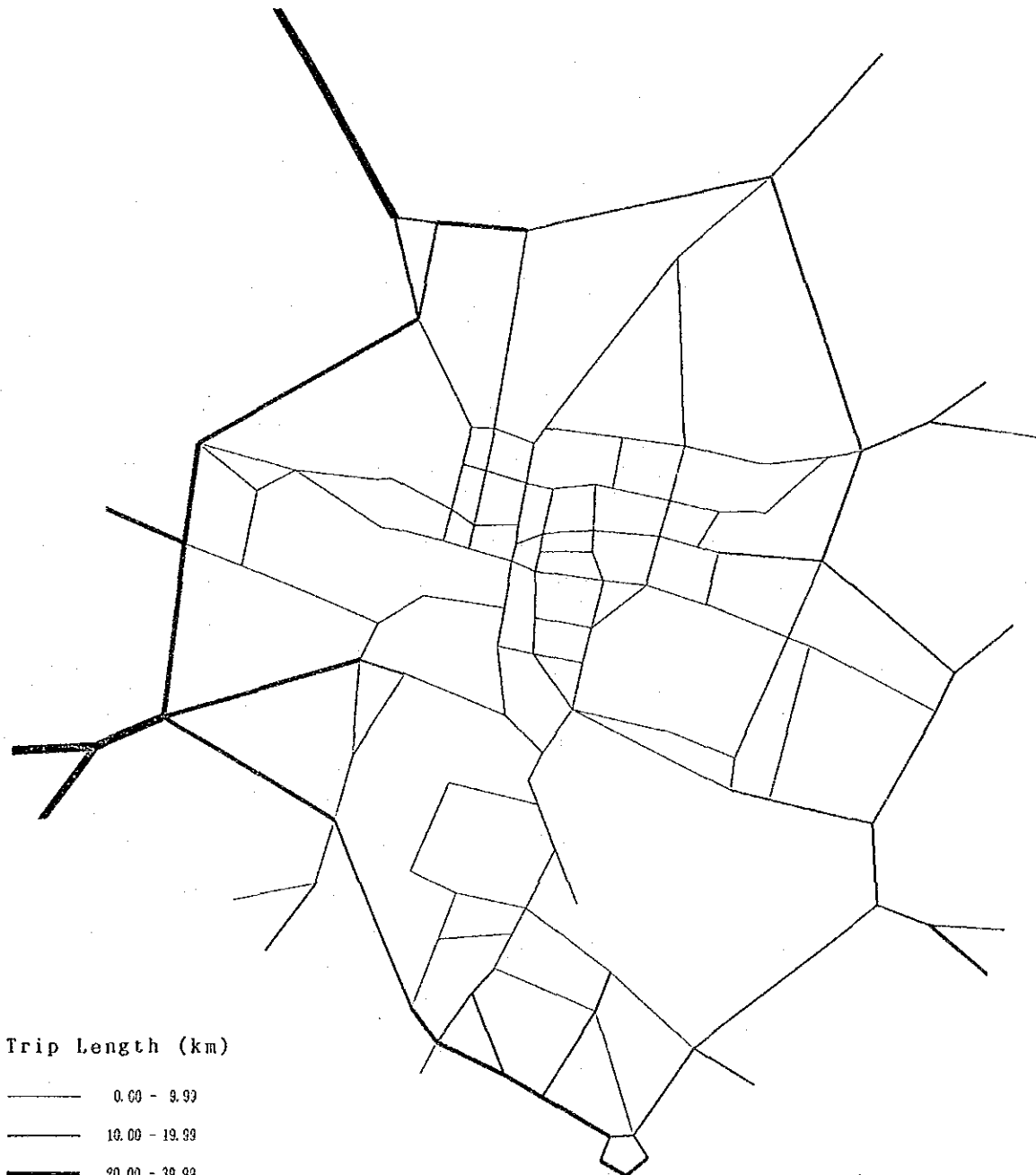






- 0.00 - 0.99
- 1.00 - 1.24
- 1.25 - 1.74
- - - - 1.75 - ****

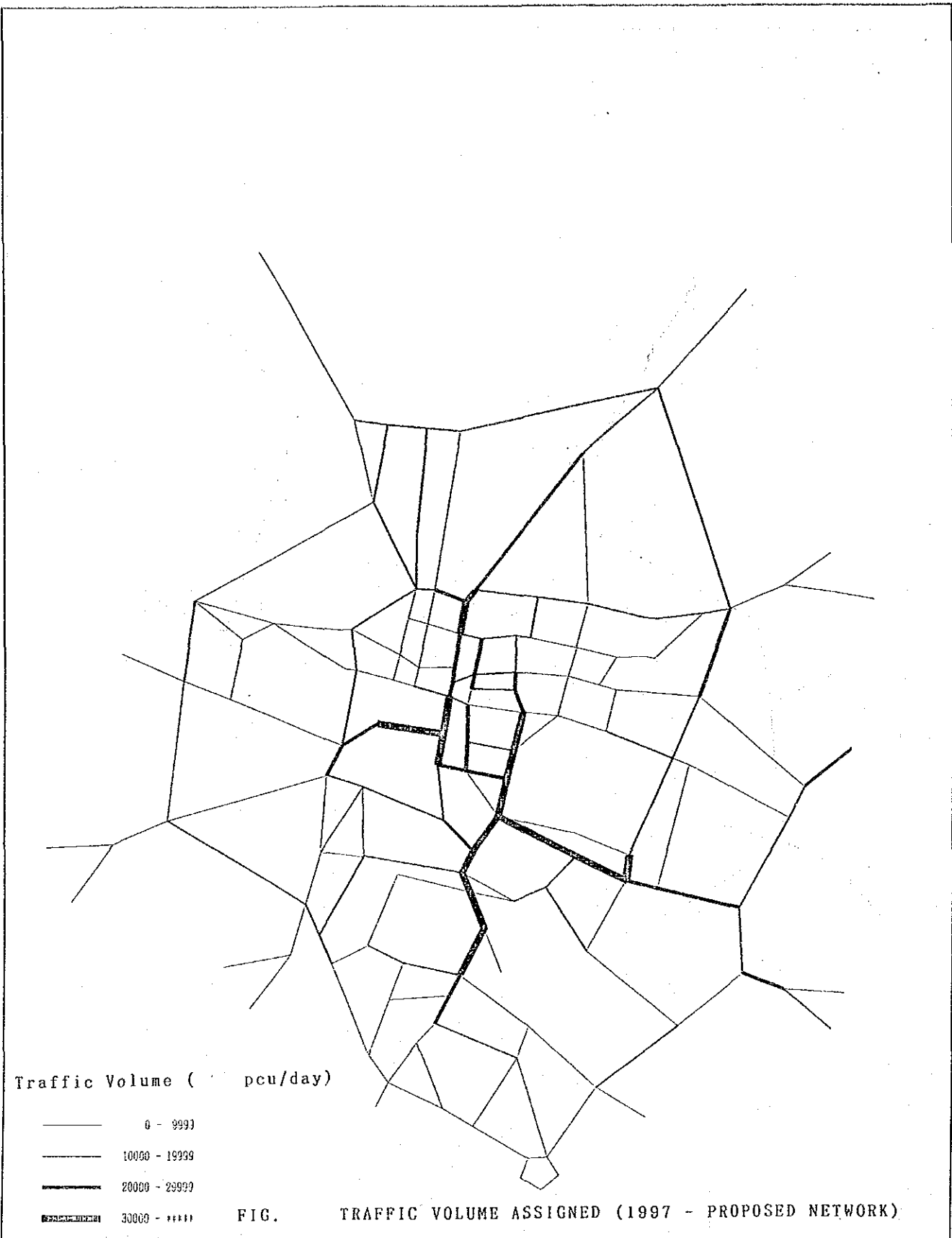
FIG. CONGESTION DEGREE (1997 - EXISTING NETWORK)

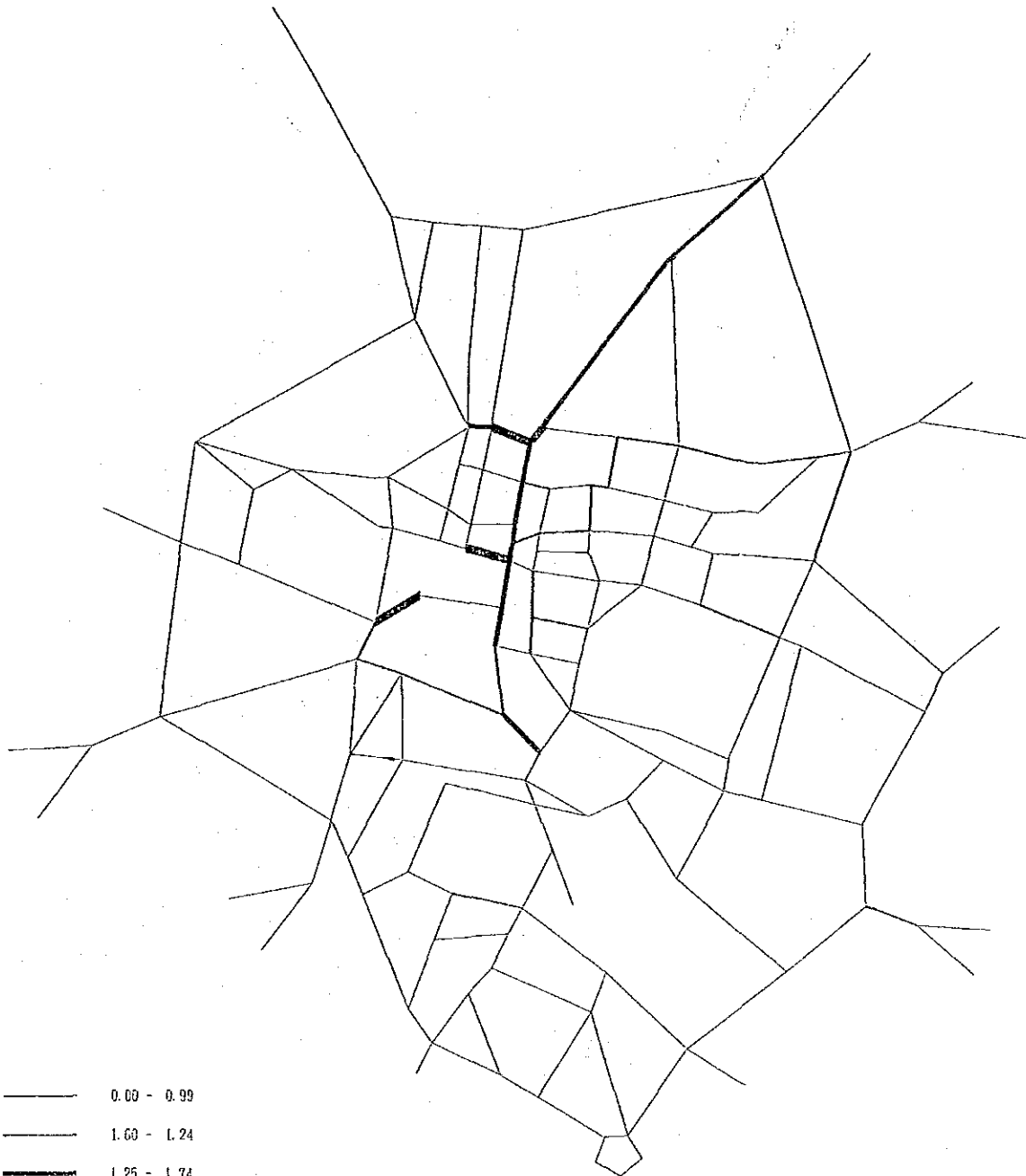


Trip Length (km)

- 0.00 - 9.99
- 10.00 - 19.99
- 20.00 - 39.99
- 40.00 - 49.99

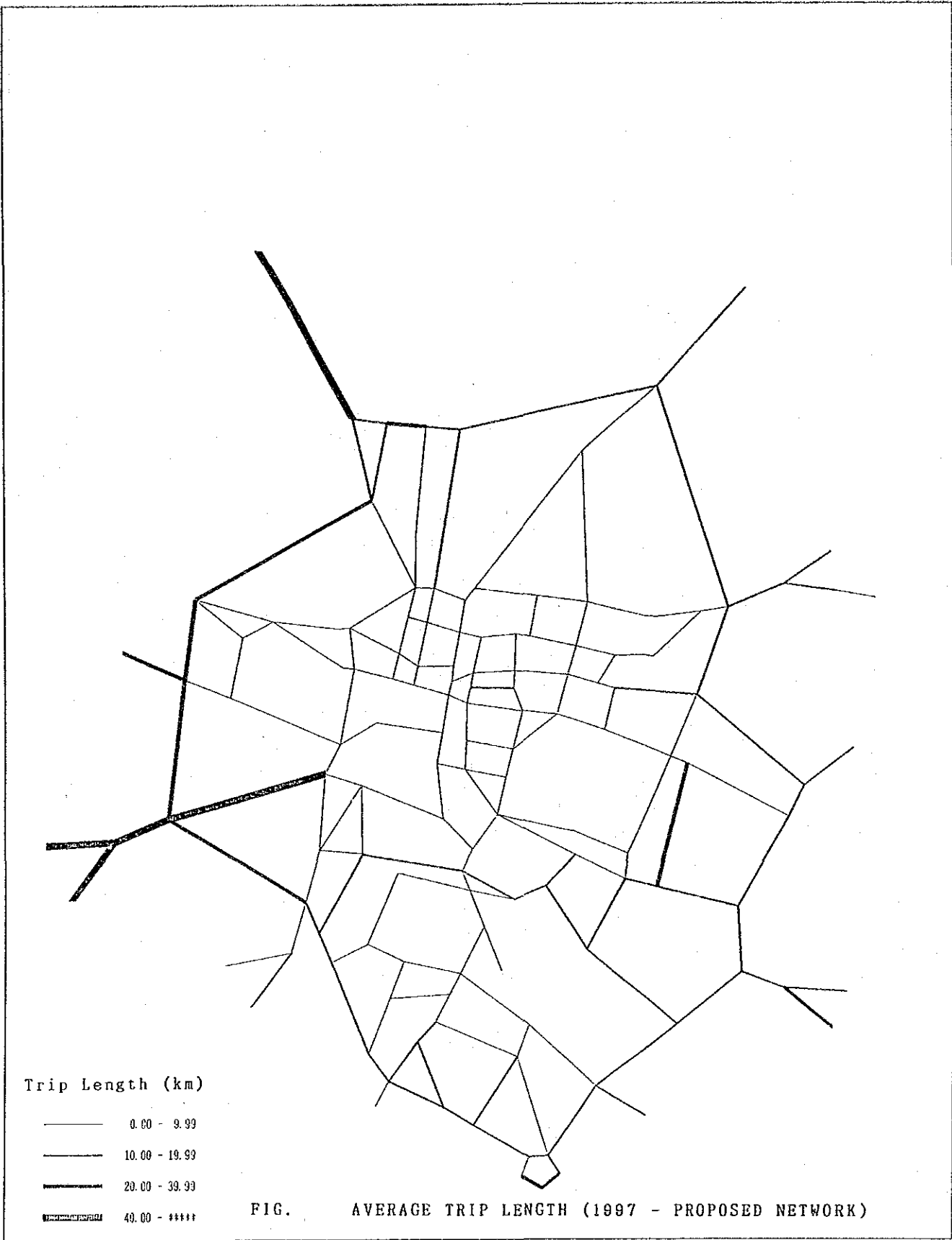
FIG. AVERAGE TRIP LENGTH (1997 - EXISTING NETWORK)

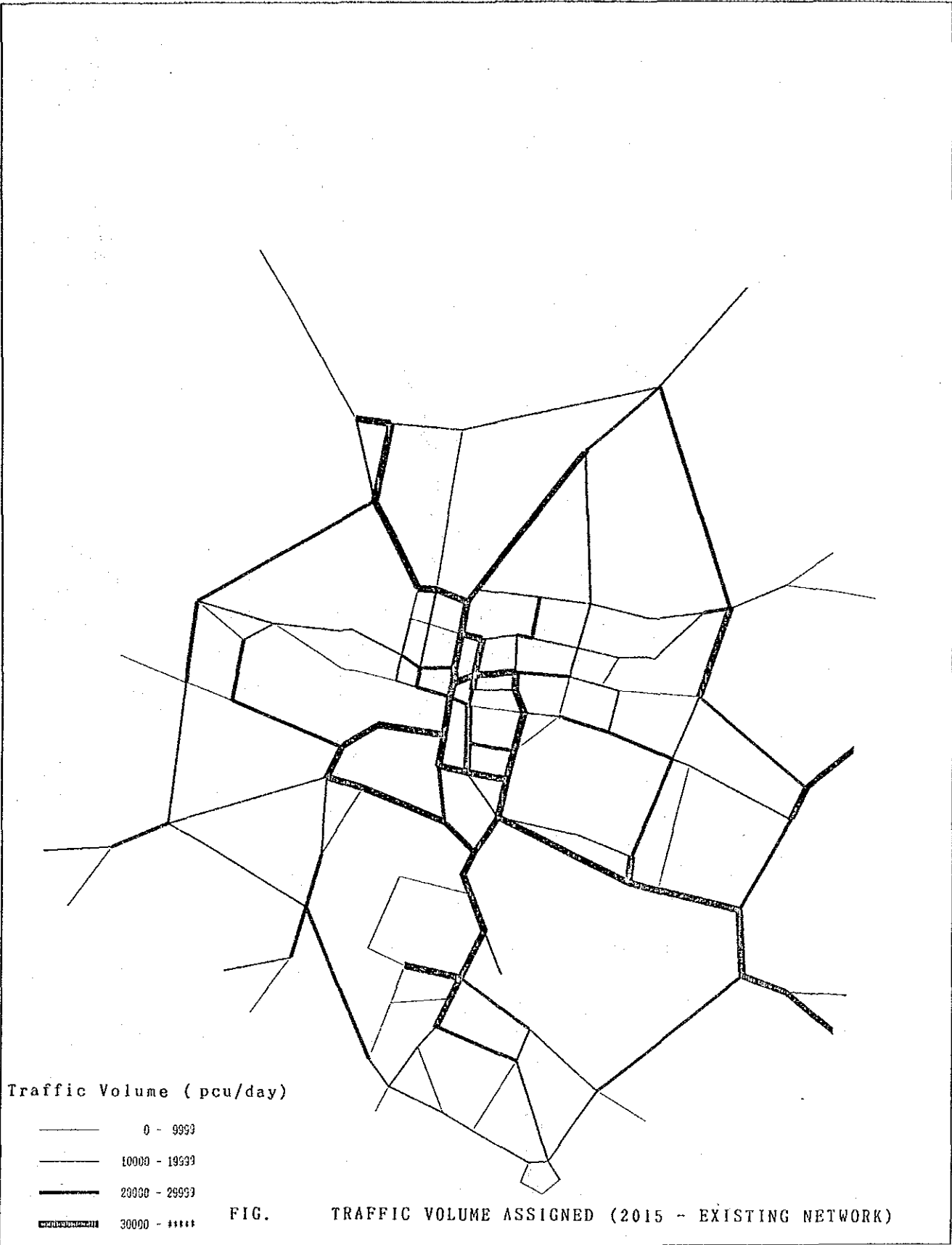


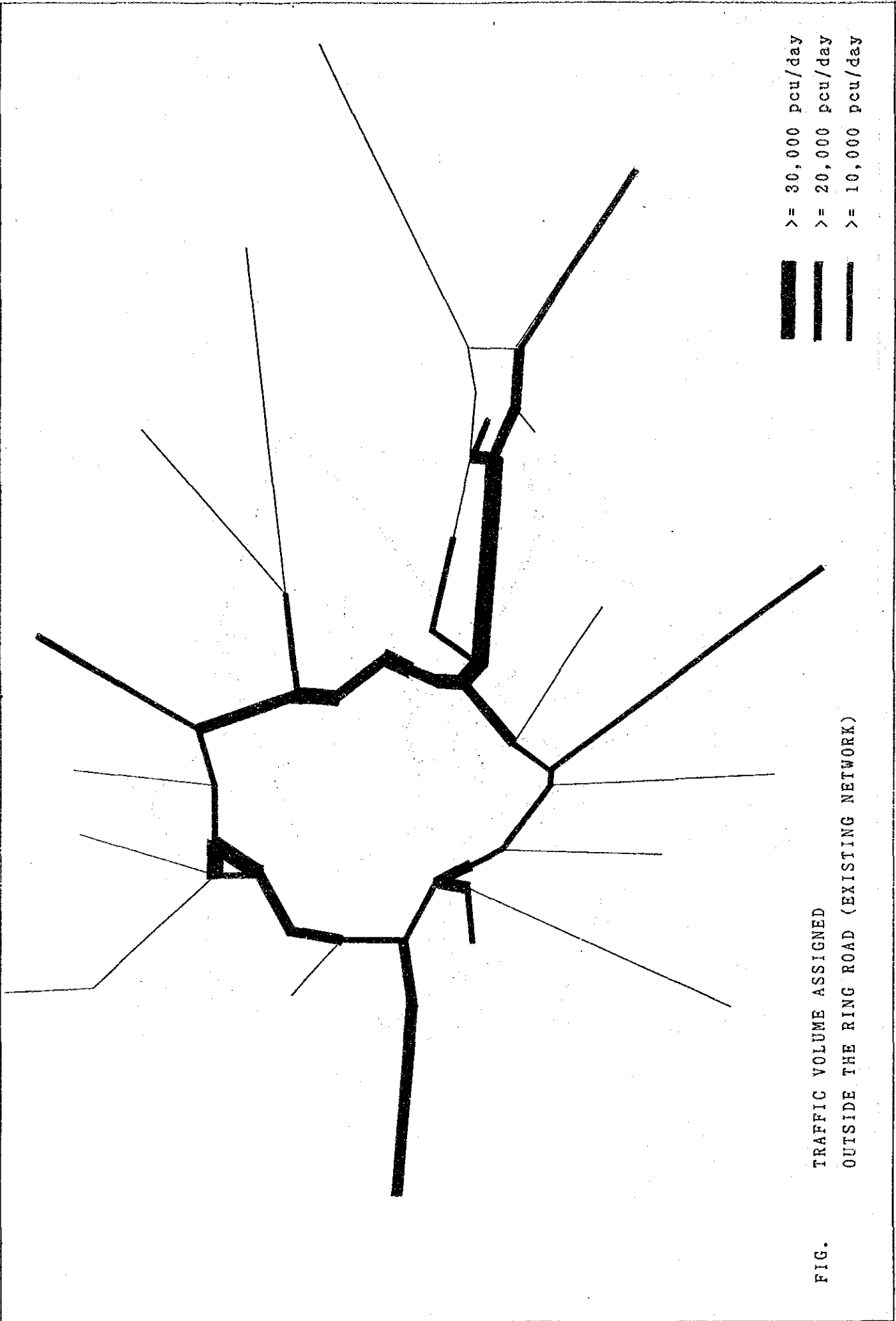


- 0.00 - 0.99
- 1.00 - 1.24
- 1.25 - 1.74
- - - - 1.75 - 4.44

FIG. CONGESTION DEGREE (1997 - PROPOSED NETWORK)

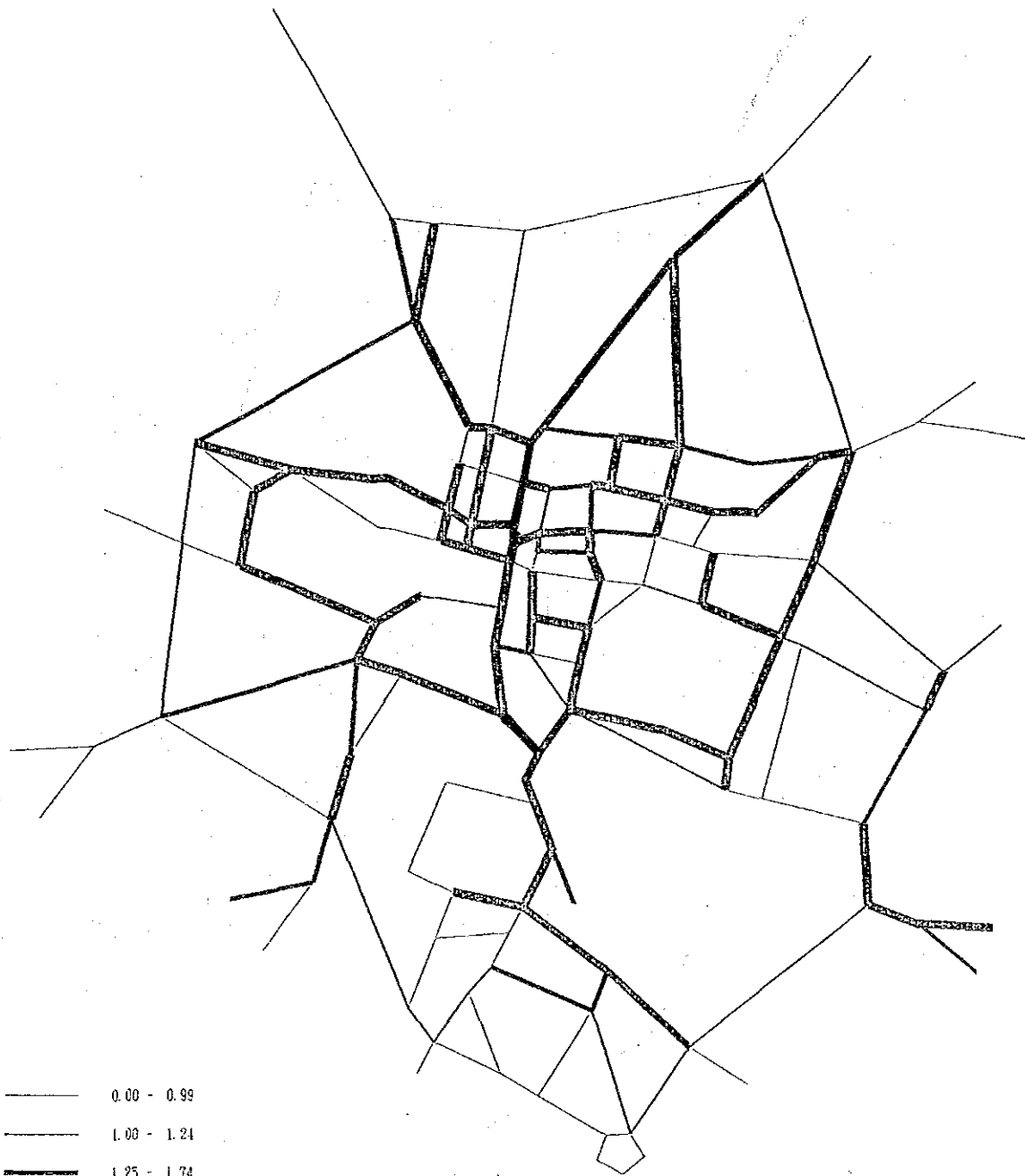






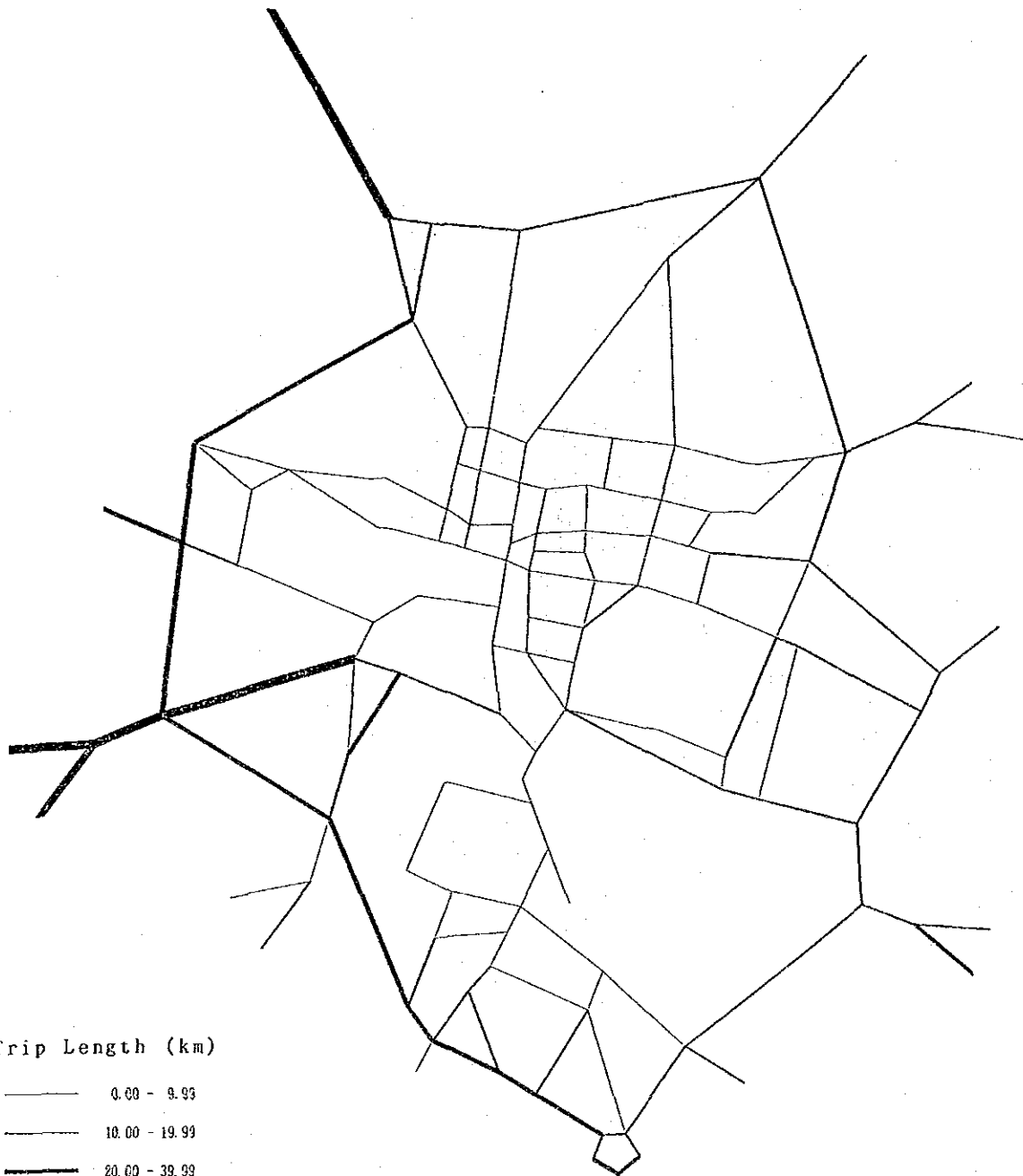
■ >= 30,000 pcu/day
 ■ >= 20,000 pcu/day
 ■ >= 10,000 pcu/day

FIG. TRAFFIC VOLUME ASSIGNED
 OUTSIDE THE RING ROAD (EXISTING NETWORK)



- 0.00 - 0.99
- 1.00 - 1.24
- 1.25 - 1.74
- 1.75 - 4.44

FIG. CONGESTION DEGREE (2015 - EXISTING NETWORK)



Trip Length (km)

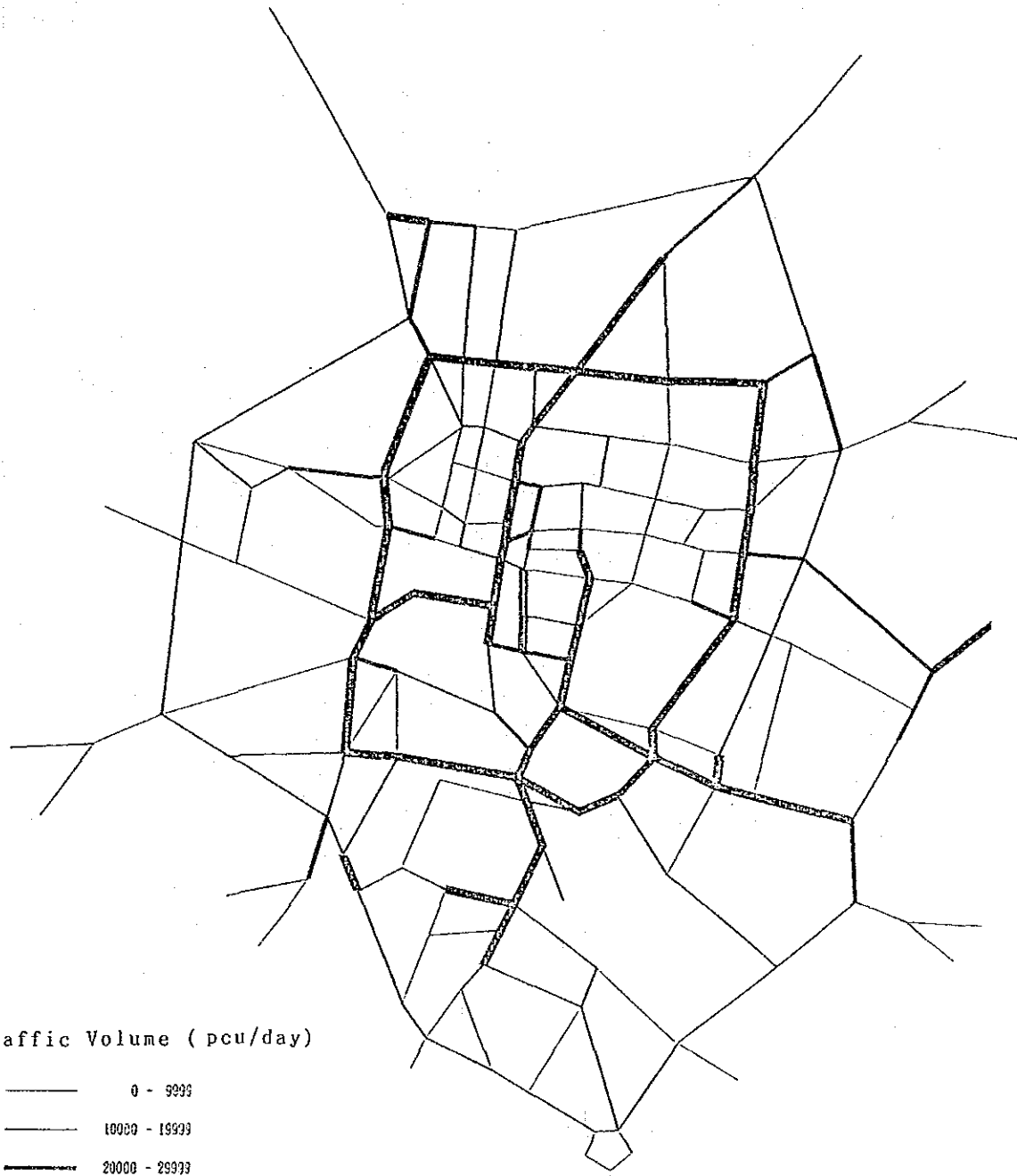
0.00 - 9.99

10.00 - 19.99

20.00 - 39.99

40.00 - 49.99

FIG. AVERAGE TRIP LENGTH (2015 - EXISTING NETWORK)



Traffic Volume (pcu/day)

- 0 - 9999
- 10000 - 19999
- 20000 - 29999
- 30000 - 39999

FIG.6.5 TRAFFIC VOLUME ASSIGNED (2015 - PROPOSED NETWORK)

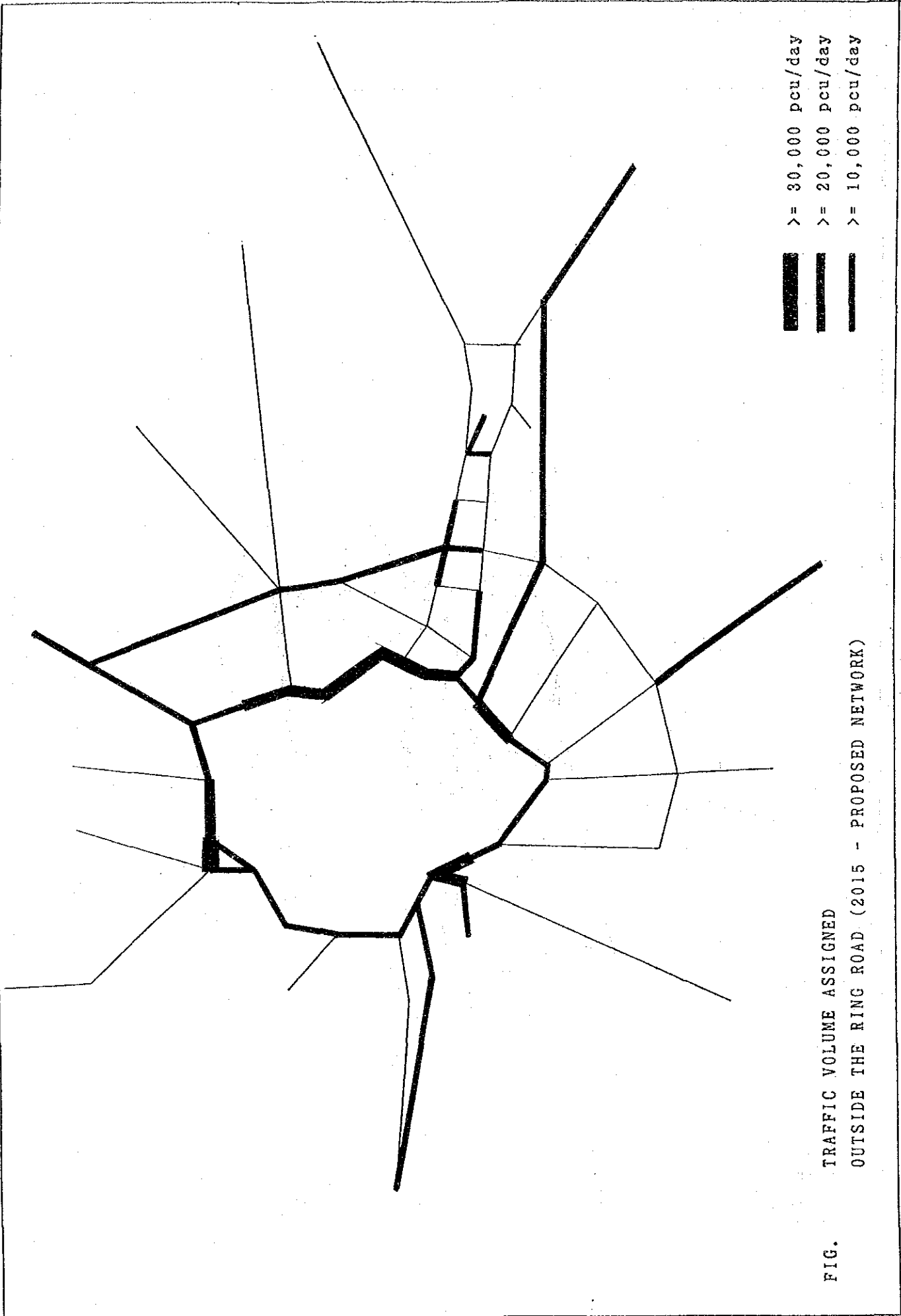
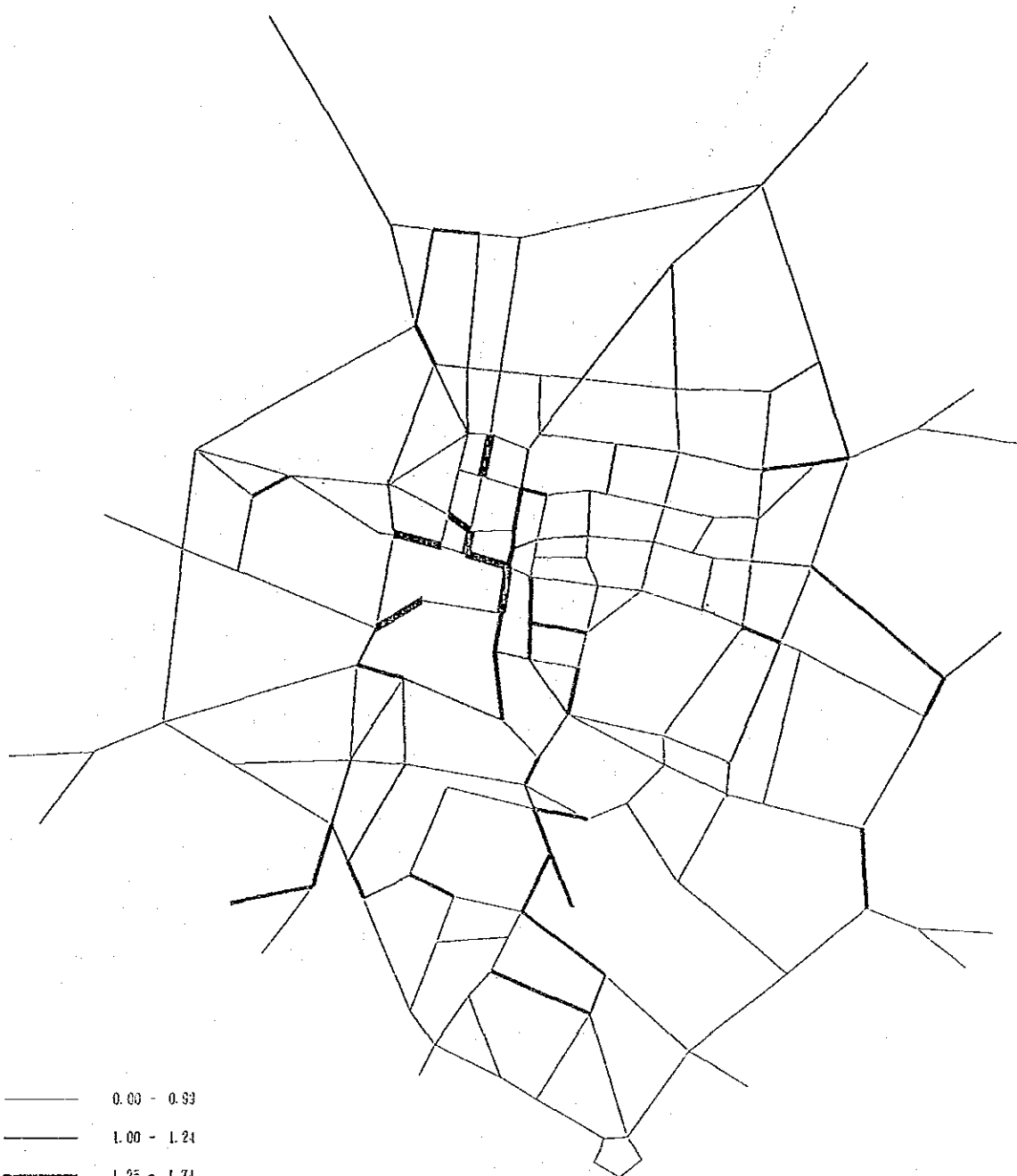
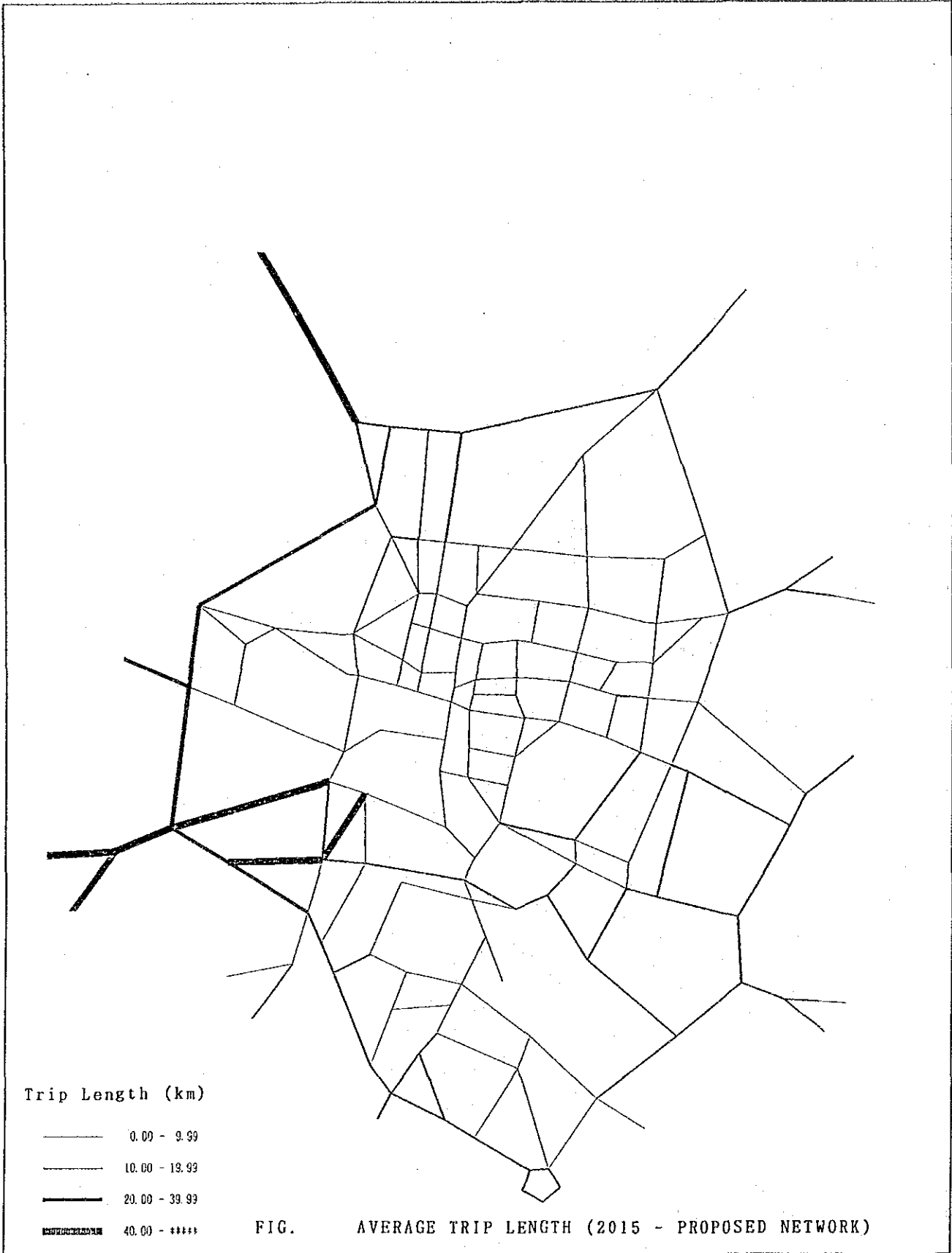


FIG. TRAFFIC VOLUME ASSIGNED
 OUTSIDE THE RING ROAD (2015 - PROPOSED NETWORK)



- 0.00 - 0.99
- 1.00 - 1.24
- 1.25 - 1.74
- 1.75 - 2.24

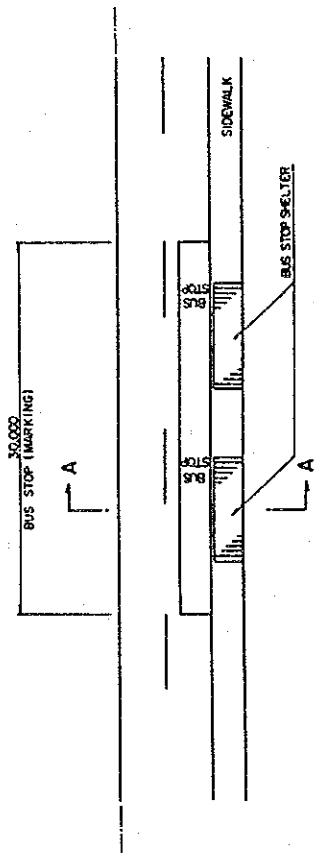
FIG.6.6 CONGESTION DEGREE (2015 - PROPOSED NETWORK)



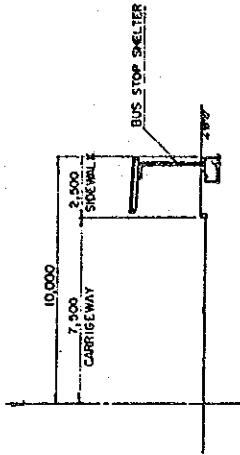
CHAPTER 7 PUBLIC TRANSPORT DEVELOPMENT PLAN

Appendix 7-1 GROUND PLAN OF BUS STOPS

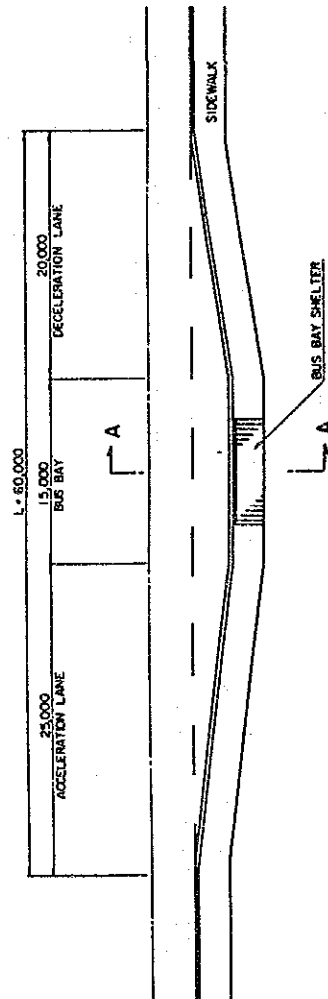
BUS STOP (TYPE-B) PLAN



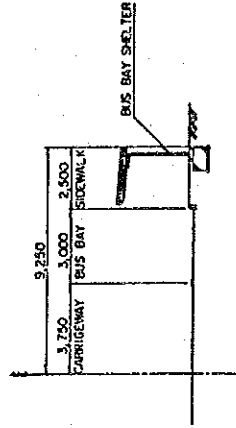
A-A SECTION



BUS BAY (TYPE-C) PLAN



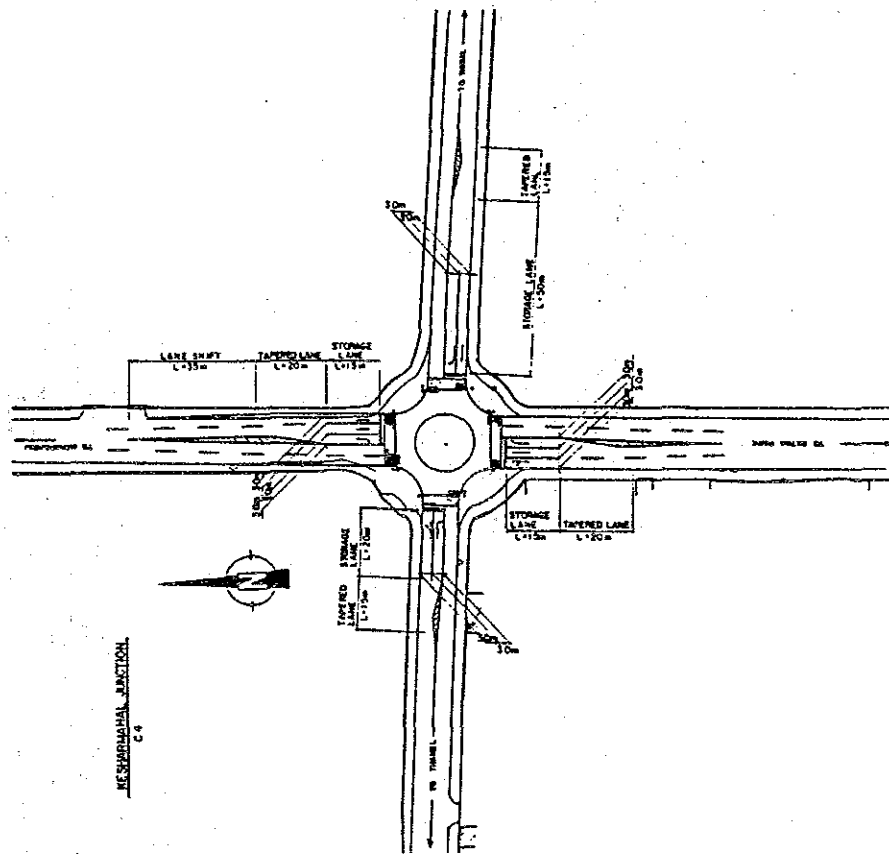
A-A SECTION



CHAPTER 8 TRAFFIC MANAGEMENT PLAN

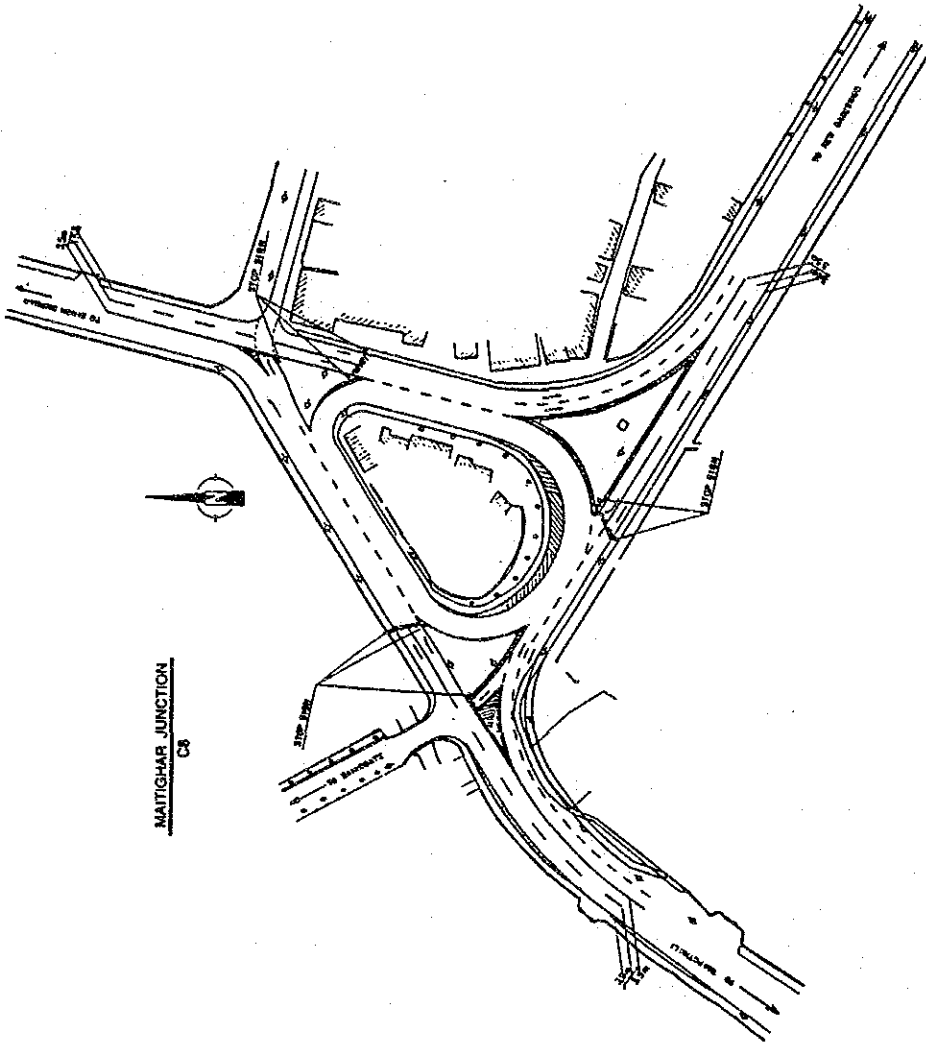
Appendix 8-1 Intersection Development Plan

Appendix 8-2 Traffic Volumes at Intersections

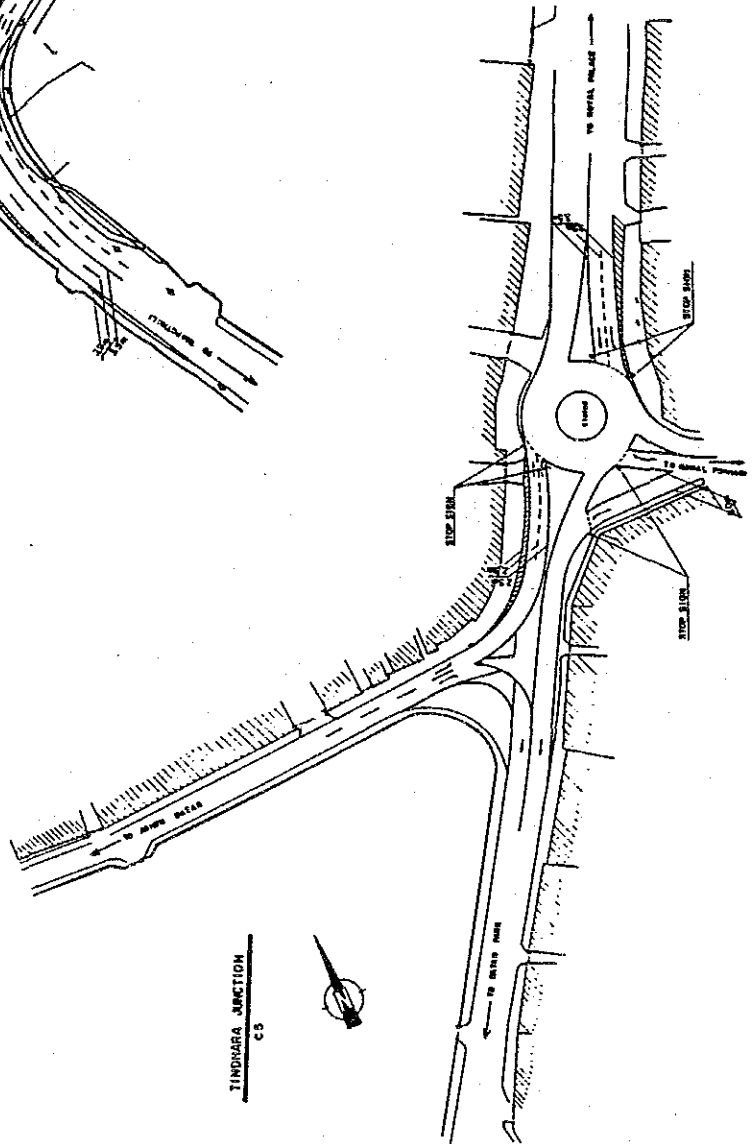


MESEQUITA JUNCTION
C 8

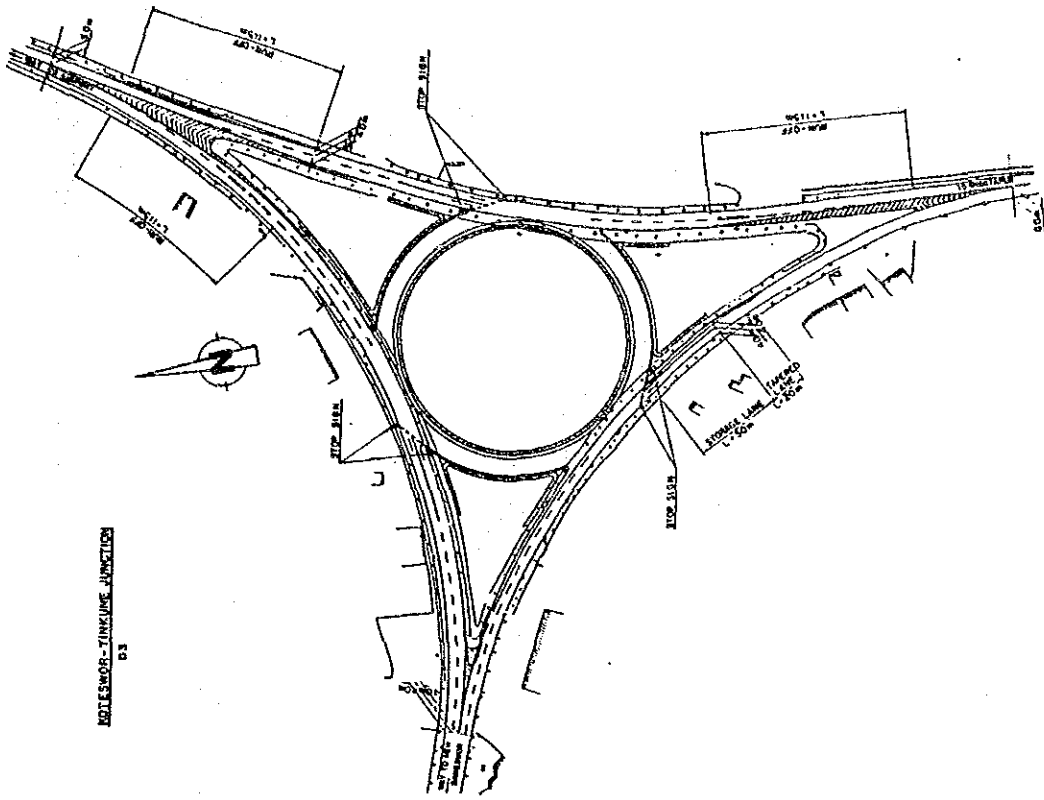
MAITIGHAR JUNCTION
CS



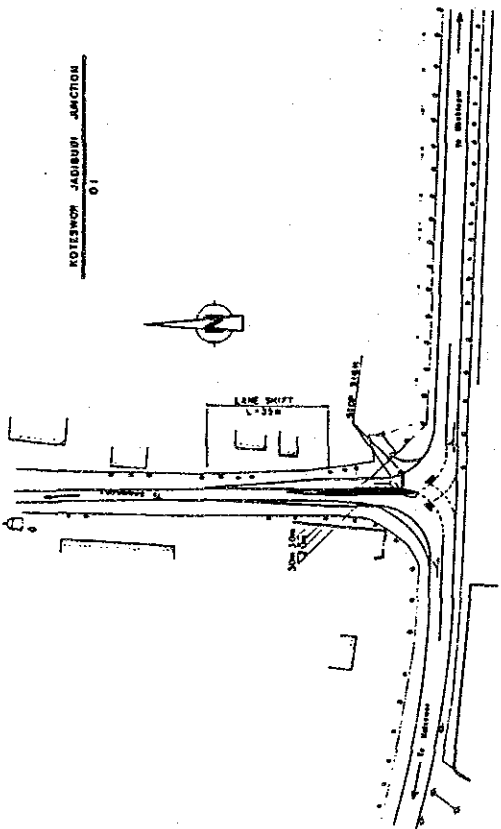
TINDHARA JUNCTION
CS



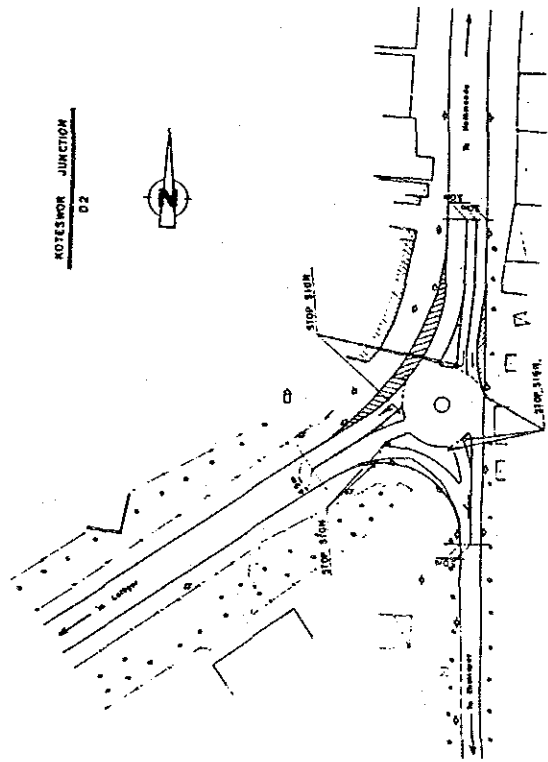
NOTESWOR-TINKLINE JUNCTION
03

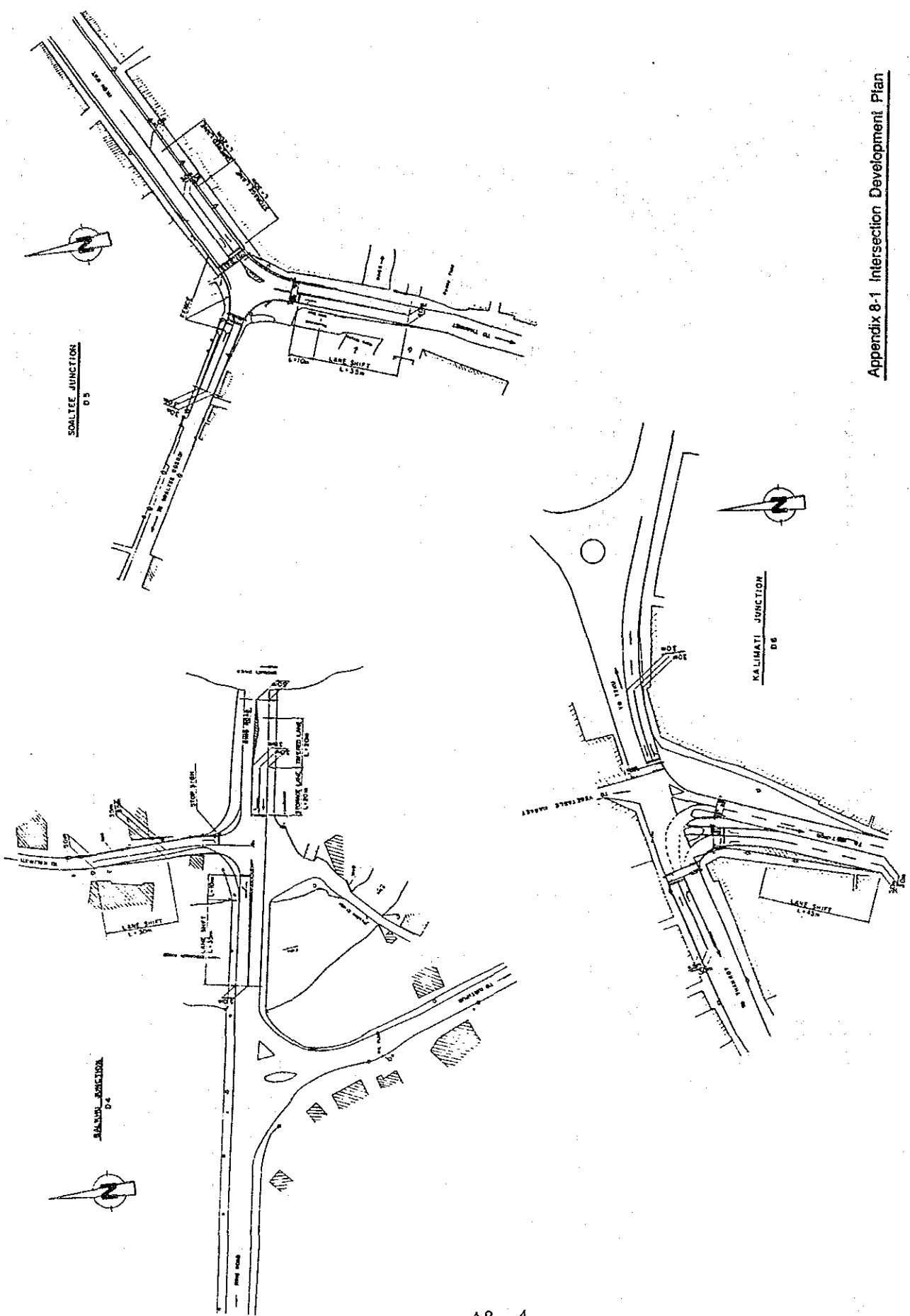


NOTESWOR JUNCTION
01

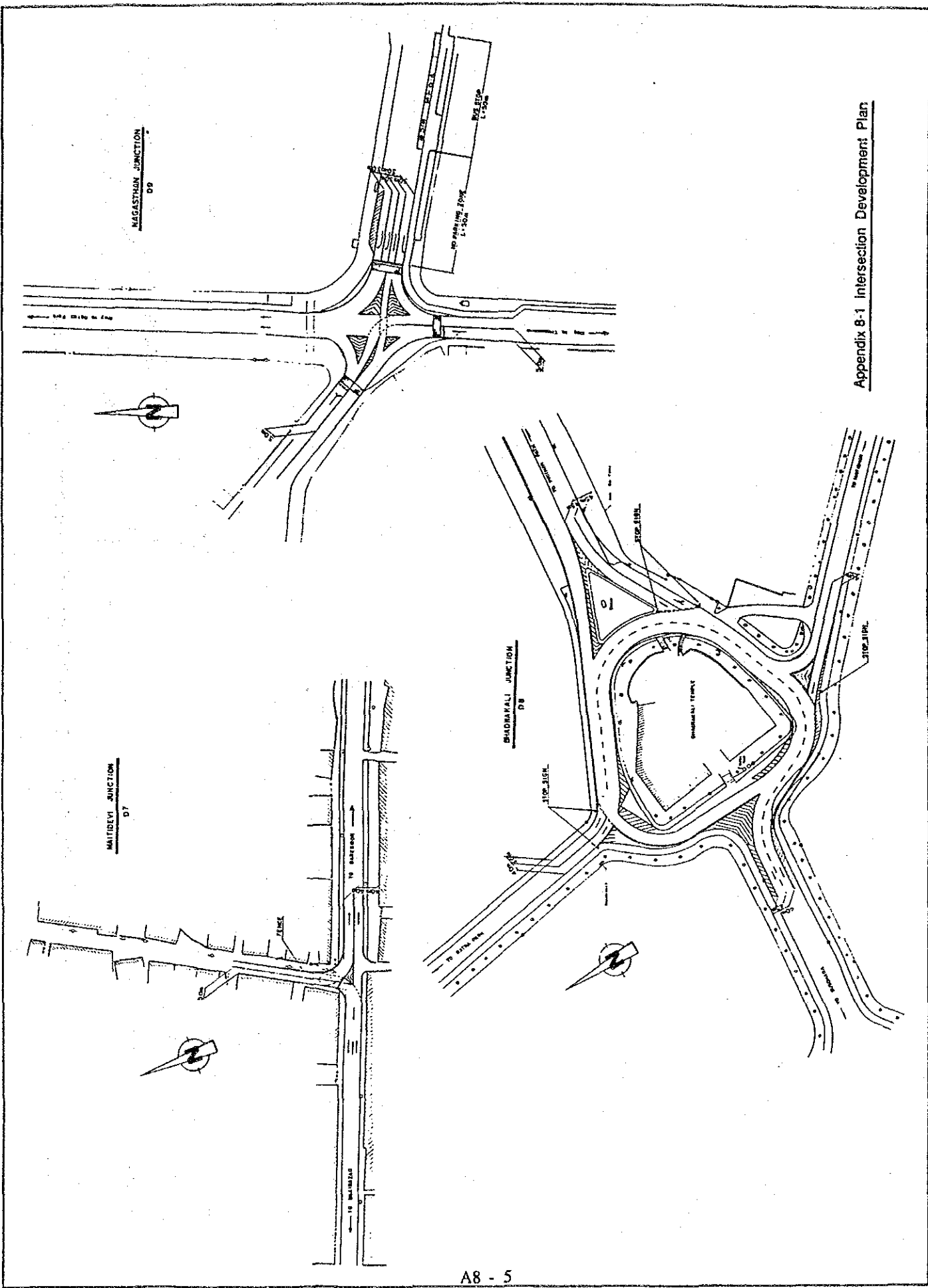


NOTESWOR JUNCTION
02

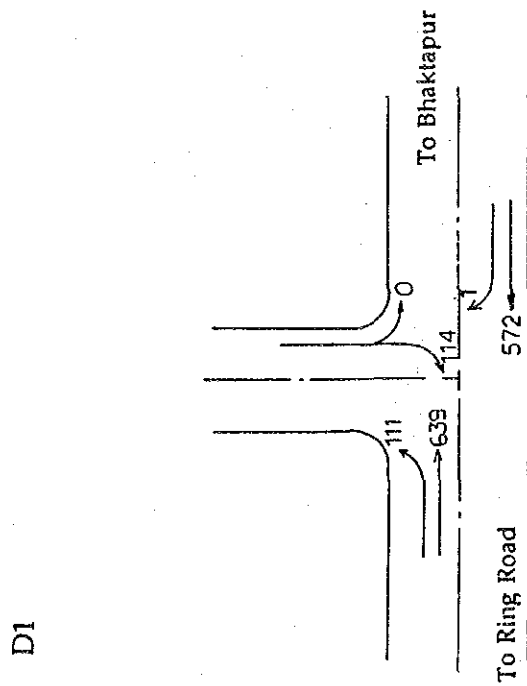
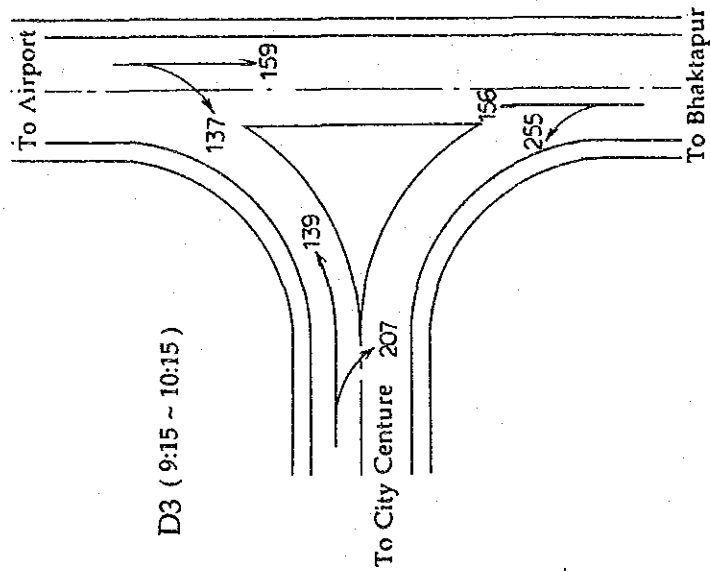
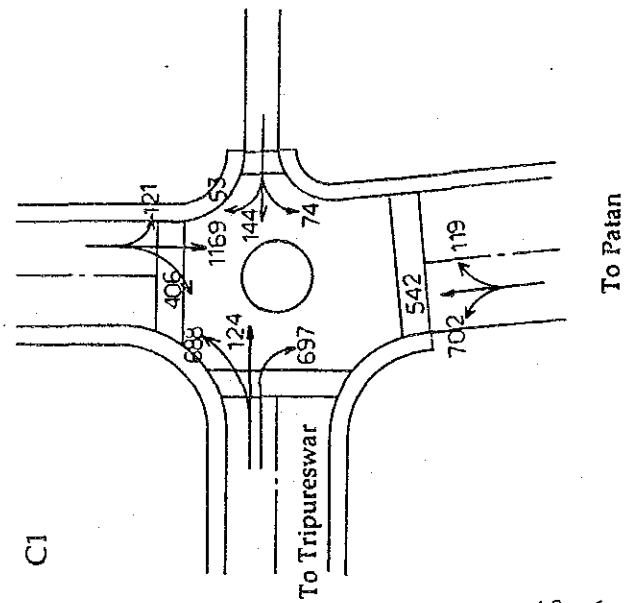
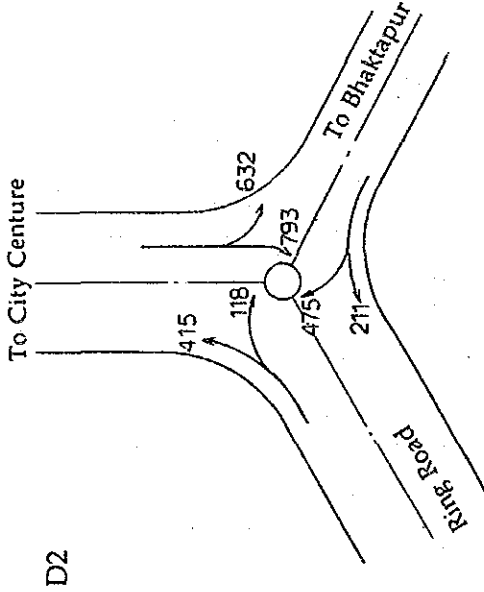
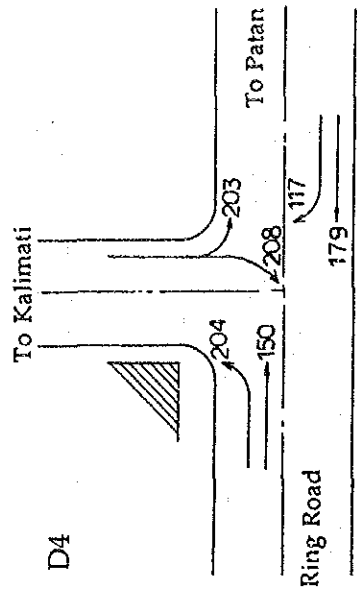




Appendix 8-1 Intersection Development Plan



APPENDIX 8-2 TRAFFIC VOLUMES AT INTERSECTIONS



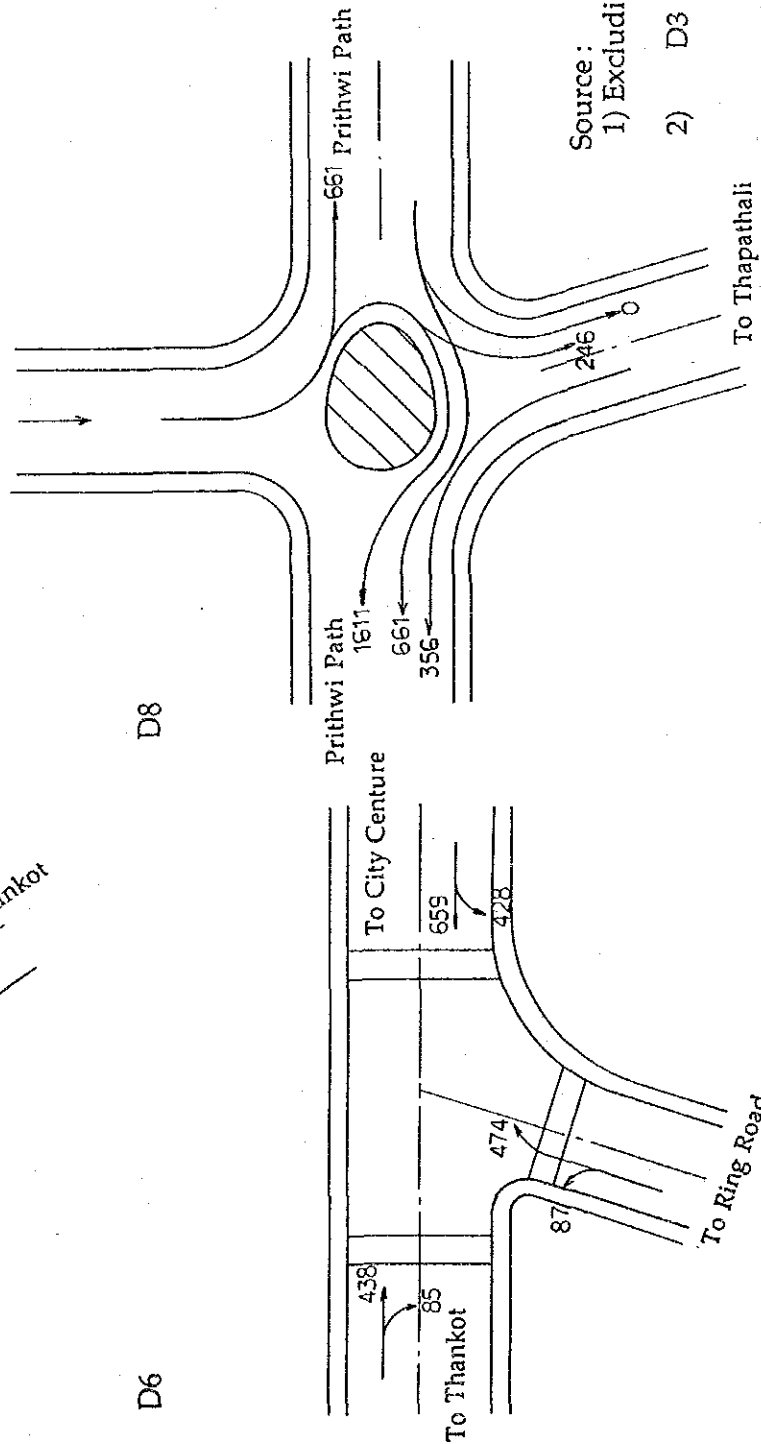
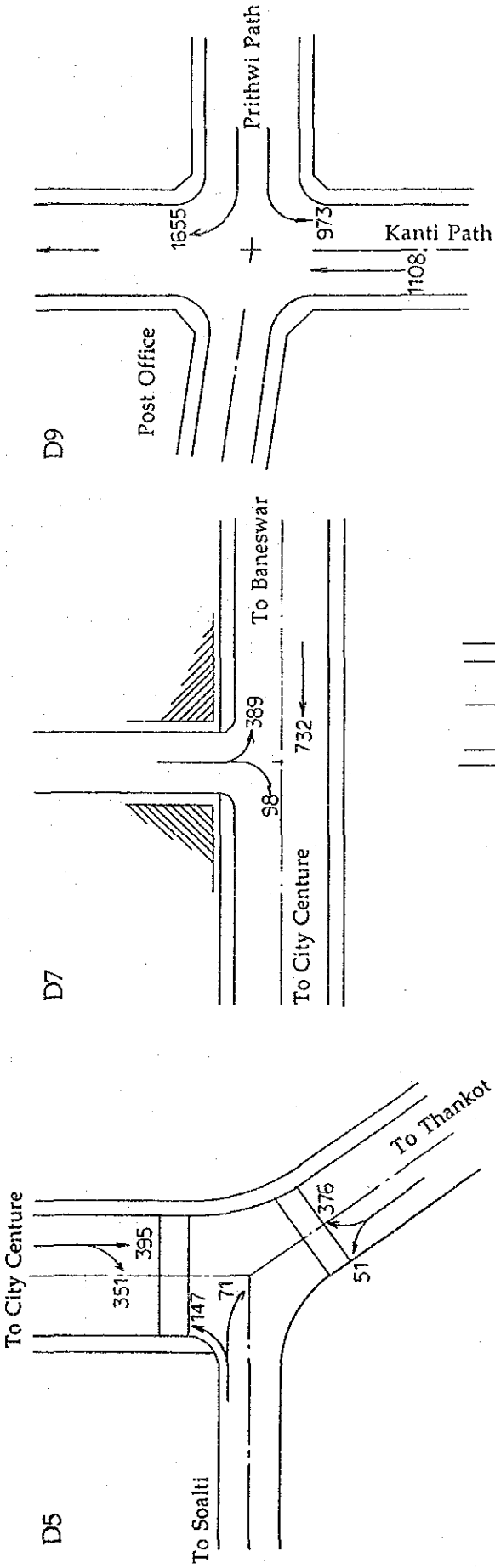
unit : vehicles / h

Source :

- 1) Excluding D3 : Additional Survey by Study Team , Sep. 1992.
- 2) D3 : DOR , May. 1991.

TRAFFIC VOLUMES BY DIRECTION (Excluding Bicycle) 10:00 ~ 11:00

APPENDIX 8-2 TRAFFIC VOLUMES AT INTERSECTIONS

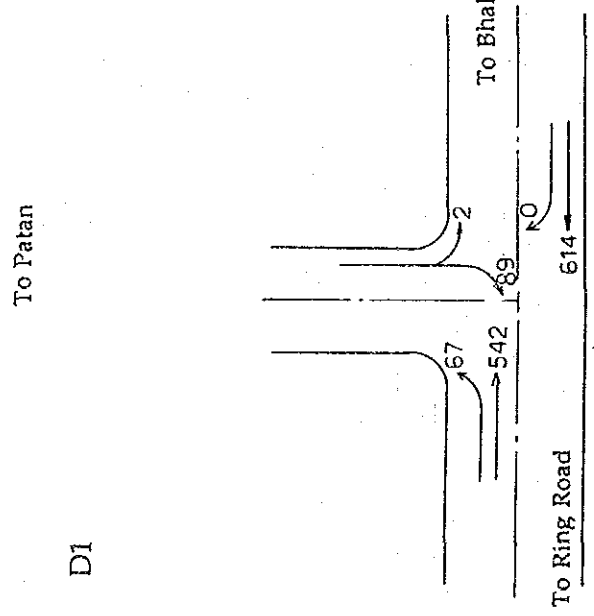
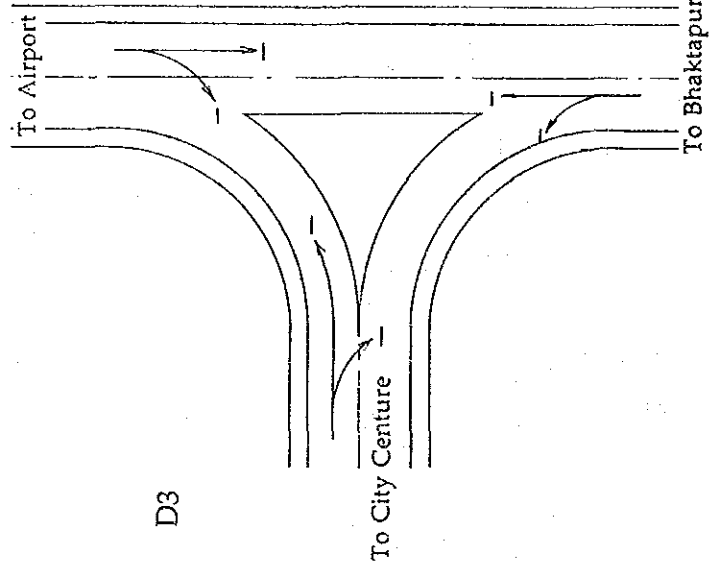
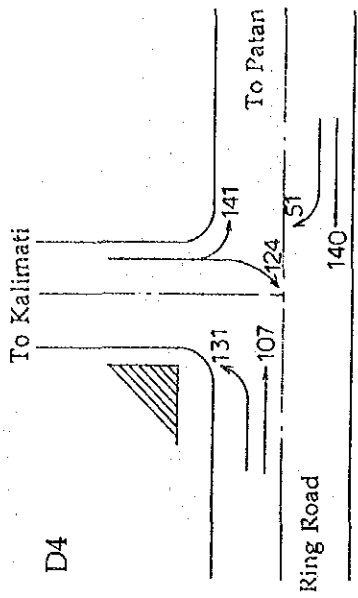
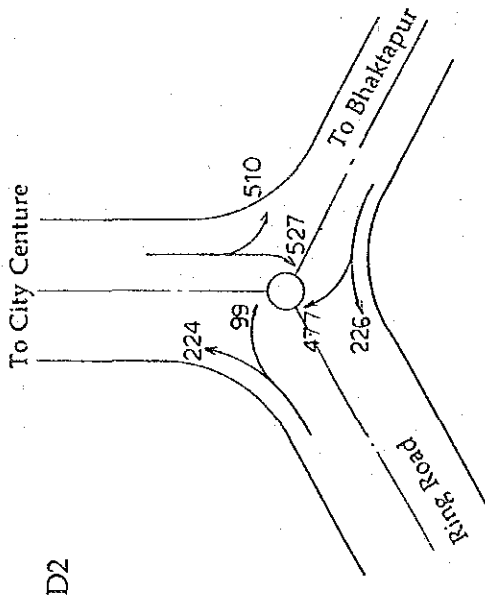
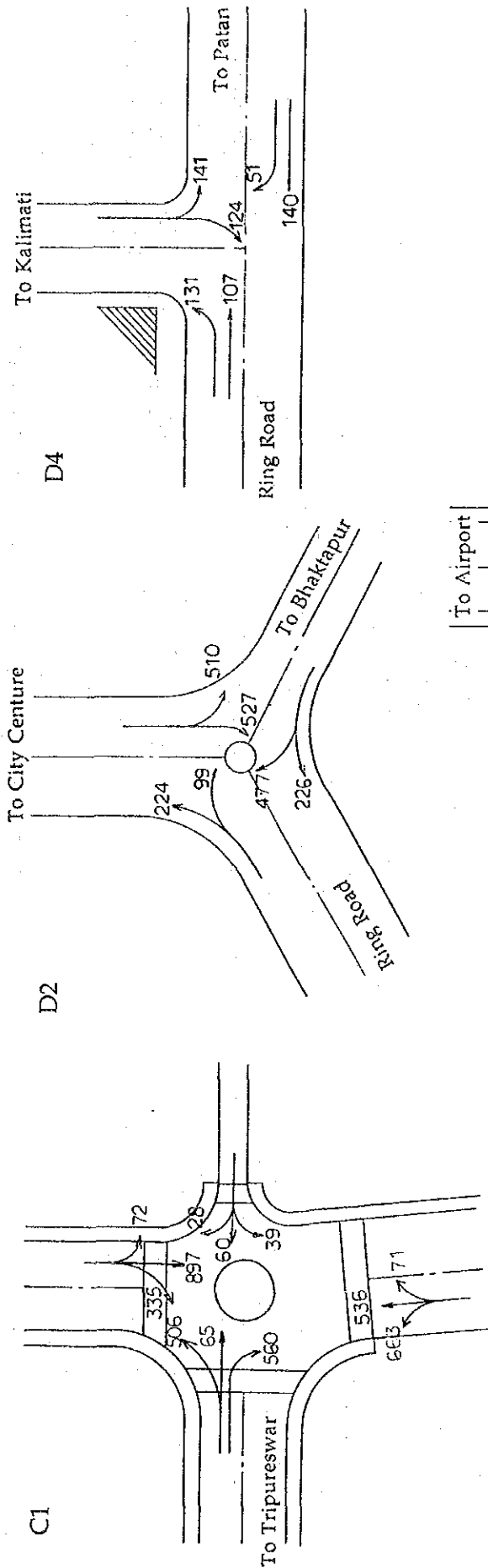


unit : vehicles / h

Source :
 1) Excluding D3 : Additional Survey by Study Team , Sep. 1992.
 2) D3 : DOR, May. 1991.

TRAFFIC VOLUMES BY DIRECTION (Excluding Bicycle) 10:00 ~ 11:00

APPENDIX 8-2 TRAFFIC VOLUMES AT INTERSECTIONS

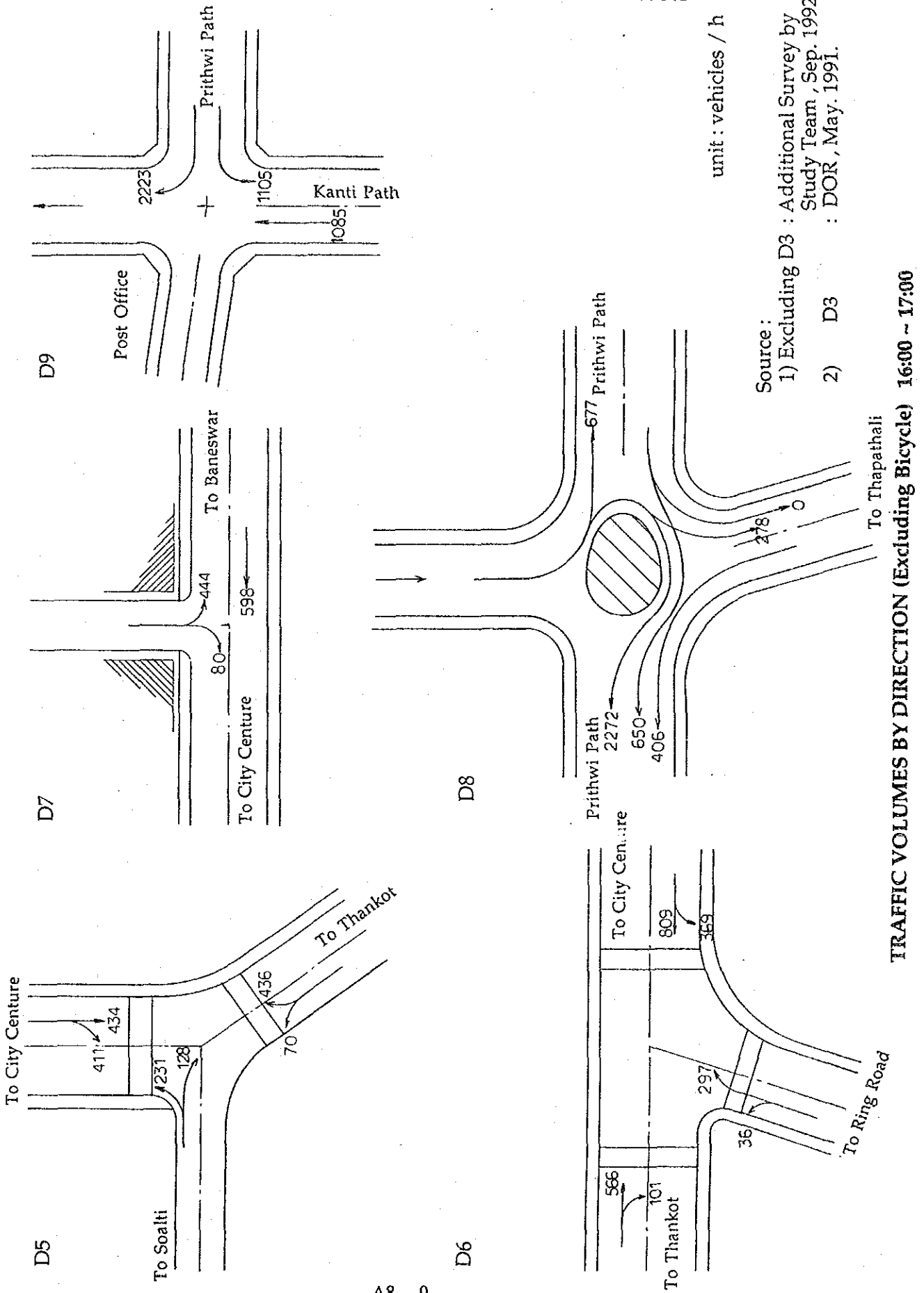


unit : vehicles / h

Source:
 1) Excluding D3 : Additional Survey by Study Team, Sep. 1992.
 2) D3 : DOR, May. 1991.

TRAFFIC VOLUMES BY DIRECTION (Excluding Bicycle) 16:00 ~ 17:00

APPENDIX 8-2 TRAFFIC VOLUMES AT INTERSECTIONS



**CHAPTER 9 DEVELOPMENT PLAN AND IMPLEMENTATION
SCHEDULE**

Appendix 9-1 Basic Information for Economic Evaluation

Appendix 9-2 Result of Economic Evaluation (Master Plan)

APPENDIX 9-1 BASIC INFORMATION FOR ECONOMIC EVALUATION

(1) Fuel Consumption Rates

Vehicle Type	Representative Vehicle	Fuel Consumption Rate (l/1000 km)	
		Gasoline	Diesel
Motorcycle	Hero Honda	33.33	-
Passenger Car	TOYOTA Corrola (Deluxe)	111.11	-
Truck	7 - 8 Ton TATA	-	222.22
Bus	63 Seater Long Chassis TATA	-	285.71

(2) Fuel Prices

Fuel Type	Retail Price	Duty and Tax	(Unit : NRs/litter)
			Economic Cost
Gasolin MS 87 Octan	25.0	9.0	16.0
Diesel HSD Diesel	10.0	3.6	6.4

Duty and Tax : 36%

* Source : TATA Company Kathmandu (Kalimati)
 TOYOTA House Kathmandu (Lazimpat)
 HERO Honda Company (Jyoti Bhawan)

(3) Oil Consumption Rate

Vehicle Type	Representative Vehicle	Oil Consumption	
		Type of Oil Used	Oil Consumption Rate (l/1,000 km)
Motorcycle	Hero Honda	Engine Oil 30 - 40	2.00
Passenger Car	TOYOTA Corrola (Deluxe)	Engine Oil 30 - 40	1.75
Truck	7 - 8 Ton TATA	Diesel Oil 30 - 40	3.50
Bus	63 Seater Hong Chassis TATA	Diesel Oil 30 - 40	3.75

(4) Oil Prices

Oil Type	Retail Price	Duty and Tax	(Unit : NRs/litter)
			Economic Cost
Engine Oil 30 - 40 (Gulf super duty)	150.0	54.0	96.0
Engine Oil 30 - 40 (Gulf super duty)	125.0	45.0	80.0

Duty and Tax : 36%

(5) Index for Fuel and Engine Oil Consumption Rate by Speed Level

Speed Level (km/h)	Index		
	Motorcycle/ Passenger Car	Truck	Bus
5	292	331	329
10	233	253	256
15	195	205	209
20	167	172	177
25	149	148	153
30	135	134	135
35	124	119	124
40	117	113	115
45	110	105	110
50	106	102	105
55	103	<u>100</u>	102
60	101	101	<u>100</u>
65	<u>100</u>	102	102
70	101	105	107
75	102	110	112
80	104	119	121
85	106	129	131

- Source :
- 1) Kanto Engineering Office, "Fuel Consumption the Vehicle Running on Roads - The Review on the Reports of Survey on Vehicle Fuel Consumption" 1979 Japan.
 - 2) M. Sano, "Fuel consumption on Roads" Traffic Engineering Vol. 14 No. 2, 1979 in Japan.

(6) Vehicle Prices

Vehicle Type	Representative Vehicle	Engine Capacity (cc)	Selling Price (NRs)	Price exclud. Taxes (NRs)	Remarks
Motorcycle	Hero Honda	100	63,000	37,170	Duty and Tax 41%
Passenger Car	TOYOTA Corrola (Deluxe)	1,300	1,850,000	646,850	186%
Truck	7 - 8 Ton TATA	4,788	880,000	519,200	41%
Bus	63 Seater Long Chassis TATA	4,788	1,080,000	637,200	41%

(7) Annual Travel Distance and Salvage Value

Vehicle Type	Representative Vehicle	Service Life (Years)	Annual Distance Travelled (Thousand km) (NRs)	Salvage Value of Vehicle (exclud. Taxes) (NRs)
Motorcycle	Hero Honda	7	29.2	19,700
Passenger Car	TOYOTA Corrola (Deluxe)	10	29.2	213,460
Truck	7 - 8 Ton TATA	8	36.5	244,020
Bus	63 Seater Long Chassis TATA	8	36.5	299,480

Salvage Value : 60% of initial value
(after 6 years' use)

(8) Depreciation, Capital and Interest Cost

Description	Motorcycle	Passenger Car	Truck	Bus
(A) Initial Vehicle Cost (Economic Cost W. O Tire)	37,170	646,850	519,200	637,200
(B) Vehicle Use in Year	7	10	8	8
(C) Salvage Value	19,700	213,460	244,020	299,480
(D) Depreciation Value (a) - (C)	17,470	433,390	275,180	337,720
(E) Capital Recovery Factor (r = 12%)	0.2191	0.1770	0.2013	0.2013
(F) Annual Cost (d) x (e)	3,828	76,710	55,394	67,983
(G) Life Operation (km)	204,400	292,000	292,000	292,000
(H) Annual Operation (km)	29,200	29,200	36,500	36,500
(I) Distance - Related Cost $\frac{(d)}{(B)} \times 1/2$ (H) (NRs/km)	0.0427	0.7421	0.4712	0.5783
(J) Annual Operation Hours (Hour)	2,880	2,880	2,880	2,880
(K) Time-Related Cost $\frac{(d)}{(B)} \times 1/2$ (J) (NRs/Hr)	0.4333	7.524	5.9719	7.3292
(L) Interest Charge $\frac{[(F) - (D)]}{(B)}$ (J) (NRs/Hr)	0.4625	11.5871	7.2903	8.9472
(M) Capital Cost (K) + (L) (NRs/Hr)	0.8958	19.1111	13.2622	16.2764

(9) Prices of Tire and Average Life Length of Tire

Vehicle Type	Representative Vehicle	Number of Tires	Average Life (km)	Unit Price of Tire & Tube		Share of Custom and Duty
				Retail Price (NRs)	Economic Cost (NRs)	
Motorcycle	Hero Honda	2	18,000	750	470	37%
Passenger Car	TOYOTA Corrola (Deluxe)	4	35,000	2,300	1,450	37%
Truck	7 - 8 Ton TATA	6	30,000	13,500	8,500	37%
Bus	63 Seater Long Chassis TATA	6	30,000	13,500	8,500	37%

Costom and Duty

= 37%

= (36% of Government Tax
+ 1% of Town Tax)

(10) Annual Repair and Maintenance Costs

Vehicle Type	Representative Vehicle	Annual expenditure on Parts (Excluding Tires)		Annual Expenditure on Labor		
		In Terms of % of Initial Vehicle Price (1)	In Terms of NRs. (2)	Labor Hours for Maintenance per Annum	Wage Rate * per Hours (NRs/h)	Labor Cost per Annum (NRs/Year)
Motorcycle	Hero Honda	5%	1,860	8 x 6 = 48	11	530
Passenger Car	TOYOTA Corrola (Deluxe)	5%	32,340	24 x 6 = 144	18	2,590
Truck	7 - 8 Ton TATA	10%	51,920	28 x 6 = 168	18	3,020
Bus	63 Seater Long Chassis TATA	10%	63,720	28 x 6 = 168	18	3,020

(11) Crew Cost

Vehicle Type	Representative Vehicle	Crew Type	* Monthly Income per Person (NRs)	Annual Income per Person (NRs)	Operation Hours per Day	Annual Operation Hours	Remarks (if any)
Motor cycle	Hero Honda	-	-	-	8	2,880	
Passenger Car	TOYOTA Corrola (Deluxe)	Driver	18,000	21,600	8	2,880	
Truck	7 - 8 Ton TATA	Driver	3,000	36,000	8	2,880	
		Assistant	1,250	15,000	8	2,880	
Bus	63 Seater Long Chassis TATA (L.P.O. 55)	Driver	3,000	36,000	8	2,880	
		Assistant	1,250	15,000	8	2,880	

* 1.8 times of 1985 value

(12) Estimation of Unit Vehicle Operating Costs
(Tire Cost, Maintenance Cost, Crew Cost and Overhead)

	Description	Motorcycle	Passenger Car	Truck	Bus
Tire (Set)	Price of a Set	NRs 470 x 2 = NRs 940	NRs 1,450 x 4 = NRs 5,800	NRs 8,500 x 6 = NRs 51,000	NRs 8,500 x 6 = NRs 51,000
	Tire Lift in km	18,000 km	35,000 km	30,000 km	30,000 km
	Tire Cost per km	NRs 0.0522	NRs 0.1657	NRs 1.7000	NRs 1.7000 km
Main- tenance	Part Cost (per year)	NRs 1,860	NRs 32,340	NRs 51,920	NRs 63,720
	Labor Cost (per year)	NRs 530	NRs 2,590	NRs 3,020	NRs 3,020
	Total Main- tenance Cost (per year)	NRs 2,390	NRs 34,930	NRs 54,940	NRs 66,740
	Annual Distance Travelled (km)	29,200 km	29,200 km	36,500 km	36,500 km
	Part Cost per 1,000 km	NRs 63.70	NRs 1,107.53	NRs 1,422.47	NRs 1,745.75
	Labor Cost per 1,000 km	NRs 18.15	NRs 88.70	NRs 82.74	NRs 82.74
	Total Mainte- nance Cost per 1,000 km	NRs 81.85	NRs 1,196.23	NRs 1,505.21	NRs 1,828.49
Crew Cost	Wage per Hour (driver)	-	NRs 7.500	NRs 12.500	NRs 12.500
	Wage per Hour (Assistant)	-	-	NRs 5.208	NRs 5.208
	Total Wage per Hour	-	NRs 7.500	NRs 17.708	NRs 17.708
	Overhead*	15% of total Vehicle Oper- ating Cost	15% of total Vehicle Oper- ating Cost	25% of total Vehicle Oper- ating Cost	25% of total Vehicle Oper- ating Cost

* Percentages in this table are assumed based upon the existing study about the second east-west highway, the World Bank, 1986.

(13) Cost Factor per km and per Hour

Vehicle Operating Cost

Description	Speed Level (km/h)	Vehicle Type				
		Motorcycle	Taxi	Bus	Passenger Car	Truck
Fuel (NRs/1000km)	5	1,557	5,191	6,016	5,191	4,708
	10	1,243	4,142	4,681	4,142	3,598
	15	1,040	3,467	3,822	3,467	2,916
	20	891	2,969	3,237	2,969	2,446
	25	795	2,649	2,798	2,649	2,105
	30	720	2,400	2,469	2,400	1,906
	35	661	2,204	2,267	2,204	1,692
	40	624	2,080	2,103	2,080	1,607
	45	587	1,956	2,011	1,956	1,493
	50	565	1,884	1,920	1,884	1,451
	55	549	1,831	1,865	1,831	1,422
	60	539	1,796	1,829	1,796	1,436
	65	533	1,778	1,865	1,778	1,451
	70	539	1,796	1,957	1,796	1,493
	75	544	1,813	2,048	1,813	1,564
	80	555	1,849	2,213	1,849	1,692
85	565	1,884	2,395	1,884	1,835	
Oil (NRs/1000km)	5	561	491	987	491	927
	10	447	391	768	391	708
	15	374	328	627	328	574
	20	321	281	531	281	482
	25	286	250	459	250	414
	30	259	227	405	227	375
	35	238	208	372	208	333
	40	225	197	345	197	316
	45	211	185	330	185	294
	50	204	178	315	178	286
	55	198	173	306	173	280
	60	194	170	300	170	283
	65	192	168	306	168	286
	70	194	170	321	170	294
	75	196	171	336	171	308
	80	200	175	363	175	333
85	204	178	393	178	361	
Tire (NRs/1000km)		52	166	1,700	166	1,700
Maintenance -Parts (NRs/1000km)		64	1,108	1,746	1,108	1,422
Maintenance -Labor (NRs/1000km)		18	89	83	89	83
Depreciation (NRs/1000km)		43	74	58	74	47
Crew (NRs/h)		0.00	7.50	17.71	7.50	17.71
Capital (NRs/h)		0.90	19.11	16.28	19.11	13.26

(NRs/1000km)

(14) Vehicle Operating Cost : Motorcycle

Speed Level (km/h)	Fuel	Oil	Tire	Maintenance		Depreciation	Crew	Capital	Subtotal	Overhead '(15%)	Total
				Parts	Labor						
5	1,557	561	52	64	18	43	0	179	2,474	371	2,845
10	1,243	447	52	64	18	43	0	90	1,956	293	2,250
15	1,040	374	52	64	18	43	0	60	1,651	248	1,898
20	891	321	52	64	18	43	0	45	1,433	215	1,648
25	795	286	52	64	18	43	0	36	1,293	194	1,487
30	720	259	52	64	18	43	0	30	1,186	178	1,363
35	661	238	52	64	18	43	0	26	1,102	165	1,267
40	624	225	52	64	18	43	0	22	1,048	157	1,205
45	587	211	52	64	18	43	0	20	994	149	1,144
50	565	204	52	64	18	43	0	18	963	145	1,108
55	549	198	52	64	18	43	0	16	940	141	1,081
60	539	194	52	64	18	43	0	15	924	139	1,063
65	533	192	52	64	18	43	0	14	916	137	1,053
70	539	194	52	64	18	43	0	13	922	138	1,060
75	544	196	52	64	18	43	0	12	928	139	1,068
80	555	200	52	64	18	43	0	11	942	141	1,083
85	565	204	52	64	18	43	0	11	956	143	1,099
							0.00	0.90			

(NRs/1000km)

(15) Vehicle Operating Cost : Taxi and Passenger Car

Speed Level (km/h)	Fuel	Oil	Tire	Maintenance		Depreciation	Crew	Capital	Subtotal	Overhead (15%)	Total
				Parts	Labor						
5	5,191	491	166	1,108	89	74	1,500	3,822	12,440	1,866	14,306
10	4,142	391	166	1,108	89	74	750	1,911	8,631	1,295	9,926
15	3,467	328	166	1,108	89	74	500	1,274	7,005	1,051	8,055
20	2,969	281	166	1,108	89	74	375	956	6,016	902	6,919
25	2,649	250	166	1,108	89	74	300	764	5,400	810	6,210
30	2,400	227	166	1,108	89	74	250	637	4,950	743	5,693
35	2,204	208	166	1,108	89	74	214	546	4,609	691	5,301
40	2,080	197	166	1,108	89	74	188	478	4,378	657	5,035
45	1,956	185	166	1,108	89	74	167	425	4,168	625	4,793
50	1,884	178	166	1,108	89	74	150	382	4,031	605	4,636
55	1,831	173	166	1,108	89	74	136	347	3,924	589	4,513
60	1,796	170	166	1,108	89	74	125	319	3,845	577	4,422
65	1,778	168	166	1,108	89	74	115	294	3,791	569	4,360
70	1,796	170	166	1,108	89	74	107	273	3,782	567	4,349
75	1,813	171	166	1,108	89	74	100	255	3,776	566	4,342
80	1,849	175	166	1,108	89	74	94	239	3,793	569	4,361
85	1,884	178	166	1,108	89	74	88	225	3,812	572	4,384
							7.50	19.11			

(NRs/1000km)

(16) Vehicle Operating Cost : Bus

Speed Level (km/h)	Fuel	Oil	Tire	Maintenance		Depreciation	Crew	Capital	Subtotal	Overhead (25%)	Total
				Parts	Labor						
5	6,016	987	1,700	1,746	83	58	3,542	3,255	17,386	4,347	21,733
10	4,681	768	1,700	1,746	83	58	1,771	1,628	12,434	3,108	15,542
15	3,822	627	1,700	1,746	83	58	1,181	1,085	10,301	2,575	12,876
20	3,237	531	1,700	1,746	83	58	885	814	9,053	2,263	11,316
25	2,798	459	1,700	1,746	83	58	708	651	8,202	2,051	10,253
30	2,469	405	1,700	1,746	83	58	590	543	7,593	1,898	9,491
35	2,267	372	1,700	1,746	83	58	506	465	7,197	1,799	8,996
40	2,103	345	1,700	1,746	83	58	443	407	6,884	1,721	8,605
45	2,011	330	1,700	1,746	83	58	394	362	6,683	1,671	8,354
50	1,920	315	1,700	1,746	83	58	354	326	6,501	1,625	8,126
55	1,865	306	1,700	1,746	83	58	322	296	6,375	1,594	7,969
60	1,829	300	1,700	1,746	83	58	295	271	6,281	1,570	7,852
65	1,865	306	1,700	1,746	83	58	272	250	6,280	1,570	7,850
70	1,957	321	1,700	1,746	83	58	253	233	6,349	1,587	7,937
75	2,048	336	1,700	1,746	83	58	236	217	6,424	1,606	8,029
80	2,213	363	1,700	1,746	83	58	221	203	6,587	1,647	8,233
85	2,395	393	1,700	1,746	83	58	208	191	6,775	1,694	8,468
							17.71	16.28			

(NRs/1000km)

(17) Vehicle Operating Cost : Truck

Speed Level (km/h)	Fuel	Oil	Tire	Maintenance		Depreciation	Crew	Capital	Subtotal	Overhead (25%)	Total	
				Parts	Labor							
5	4,708	927	1,700	1,422	83	47	3,542	2,652	15,081	3,770	18,851	
10	3,598	708	1,700	1,422	83	47	1,771	1,326	10,656	2,664	13,320	
15	2,916	574	1,700	1,422	83	47	1,181	884	8,807	2,202	11,008	
20	2,446	482	1,700	1,422	83	47	885	663	7,729	1,932	9,661	
25	2,105	414	1,700	1,422	83	47	708	530	7,011	1,753	8,763	
30	1,906	375	1,700	1,422	83	47	590	442	6,566	1,641	8,207	
35	1,692	333	1,700	1,422	83	47	506	379	6,163	1,541	7,704	
40	1,607	316	1,700	1,422	83	47	443	332	5,950	1,488	7,438	
45	1,493	294	1,700	1,422	83	47	394	295	5,728	1,432	7,160	
50	1,451	286	1,700	1,422	83	47	354	265	5,608	1,402	7,010	
55	1,422	280	1,700	1,422	83	47	322	241	5,518	1,379	6,897	
60	1,436	283	1,700	1,422	83	47	295	221	5,488	1,372	6,860	
65	1,451	286	1,700	1,422	83	47	272	204	5,465	1,366	6,831	
70	1,493	294	1,700	1,422	83	47	253	189	5,482	1,371	6,853	
75	1,564	308	1,700	1,422	83	47	236	177	5,538	1,384	6,922	
80	1,692	333	1,700	1,422	83	47	221	166	5,665	1,416	7,081	
85	1,835	361	1,700	1,422	83	47	208	156	5,813	1,453	7,266	
							17.71				13.26	

(18) Unit Time Cost by Type of Vehicles

Vehicle Type	Hourly Per capita Income (NRs.) (1)	Average Number of Passengers*1 (Person) (2)	Share of Business Trip*2 (3)	Probability of income-yielding activity*3 (4)	Unit Time Cost (NRs./hr.) (5) = (1) × (2) × (3) × (4)
Motorcycle	21.4	1.5	0.37	0.5	5.9
Passenger Car	21.4	2.7	0.27	0.5	7.8
Truck	21.4	3.2	0.37	0.5	12.7
Bus	21.4	45.8	0.20	0.5	98.0

*1, 2 : Result of traffic survey conducted by the Study Team.
(Ref. Table A-6-3 of Appendix 6 and Article 4.2.2)

*3 : One-half of opportunity for selecting productive activity was assumed.

APPENDIX 9-2 RESULT OF ECONOMIC EVALUATION (MASTER PLAN)

		(1) VOC Cost					
		Motorcycle	Taxi	Bus	Passenger Car	Truck	Total
VOC Cost (1,000NRs/year)	1997-without	262,466	1,016,572	407,625	747,787	808,013	3,242,463
	1997-with	243,939	938,922	389,249	693,882	789,033	3,055,025
	2015-without	624,611	1,325,552	849,501	2,700,810	2,936,141	8,436,615
	2015-with	488,573	1,000,821	574,662	2,107,705	2,533,856	6,705,617
	1997(without-with)	18,527	77,650	18,376	53,905	18,980	187,438
	2015(without-with)	136,038	324,731	274,839	593,105	402,285	1,730,998

		(2) Time Cost					
		Motorcycle	Taxi	Bus	Passenger Car	Truck	Total
Vehicle x Time (Vehicle*hr/day)	1997-without	18,276	17,367	3,610	12,136	7,698	59,087
	1997-with	15,977	15,117	3,257	10,511	7,300	52,162
	2015-without	57,077	28,962	8,042	56,884	36,191	187,156
	2015-with	33,307	16,288	5,270	33,926	24,688	113,479
Unit Time Cost (NRs/hr)		5.9	7.8	98.0	7.8	12.7	
Time Cost (1,000NRs/year)	1997-without	39,357	49,444	129,130	34,551	35,684	288,166
	1997-with	34,406	43,038	116,503	29,925	33,839	257,711
	2015-without	122,915	82,455	287,662	161,949	167,763	822,745
	2015-with	71,727	46,372	188,508	96,587	114,441	517,635
	1997(without-with)	4,951	6,406	12,627	4,626	1,845	30,455
	2015(without-with)	51,189	36,083	99,154	65,361	53,322	305,110

(3) IRR

Benefit	VOC Saving	1997	187	
		2015	1,731	
Cost	Construction Cost	1993	342	380
		1994	779	865
		1995	725	805
		1996	531	590
		1997	459	510
		1998-2005	3,501	3,890
		2006-2015	4,104	4,560
	Maintenance Cost			Construction Cost*0.05

Project Life 25 year

IRR= 13.6

(1,000,000NRs)

t	Year	Cost					Benefit					Benefit-Cost	
		Construction		Maintenance		Total	VOC Saving		Time Cost Saving		Bridge Maint. Cost Saving		Total
		Short	Long	Short	Long		Short	Long	Short	Long			
1	1992	0	0	0	0	0	0	0	0	0	0	0	0
2	1993	342	0	1	0	343	26	0	4	0	0	30	-313
3	1994	779	0	2	0	780	54	0	9	0	0	62	-718
4	1995	725	0	3	0	727	84	0	13	0	0	97	-630
5	1996	531	0	4	0	535	116	0	19	0	0	134	-401
6	1997	459	0	5	0	464	150	0	24	0	0	174	-290
7	1998	0	438	6	1	444	187	40	30	7	32	296	-148
8	1999	0	438	6	2	445	194	84	31	15	0	324	-121
9	2000	0	438	6	3	446	201	130	32	23	32	419	-27
10	2001	0	438	6	3	447	209	180	34	32	0	455	8
11	2002	0	438	6	4	448	217	234	35	42	32	560	-112
12	2003	0	438	6	5	448	225	291	36	52	0	605	156
13	2004	0	438	6	6	449	234	352	38	64	32	719	270
14	2005	0	438	6	7	450	243	418	39	75	0	775	325
15	2006	0	410	6	8	424	252	488	40	88	32	900	477
16	2007	0	410	6	8	425	262	563	42	102	0	968	543
17	2008	0	410	6	9	425	272	643	44	116	32	1,106	680
18	2009	0	410	6	10	426	282	728	45	131	0	1,186	760
19	2010	0	410	6	11	427	293	818	47	148	32	1,337	910
20	2011	0	410	6	12	428	304	915	49	165	0	1,432	1,004
21	2012	0	410	6	13	429	315	1,017	51	184	32	1,598	1,170
22	2013	0	410	6	14	430	327	1,126	52	203	0	1,709	1,279
23	2014	0	410	6	14	430	340	1,242	54	224	32	1,892	1,462
24	2015	0	410	6	15	431	353	1,365	57	246	0	2,020	1,589
25	2016	0	0	6	15	21	366	1,365	59	246	32	2,068	2,047
26	2017	0	0	6	15	21	380	1,417	61	256	0	2,113	2,092
27	2018	0	0	5	15	20	329	1,471	53	265	32	2,149	2,129
28	2019	0	0	4	15	19	273	1,527	44	275	0	2,119	2,100
29	2020	0	0	3	15	18	212	1,585	34	286	32	2,149	2,131
30	2021	0	0	2	15	17	147	1,645	24	297	0	2,112	2,095
31	2022	0	0	1	15	16	76	1,707	12	308	32	2,136	2,120
32	2023	0	0	0	14	14	0	1,674	0	302	0	1,976	1,961
33	2024	0	0	0	14	14	0	1,635	0	295	0	1,930	1,917
34	2025	0	0	0	13	13	0	1,591	0	287	0	1,878	1,866
35	2026	0	0	0	12	12	0	1,542	0	278	0	1,820	1,808
36	2027	0	0	0	11	11	0	1,486	0	268	0	1,754	1,743
37	2028	0	0	0	10	10	0	1,424	0	257	0	1,681	1,670
38	2029	0	0	0	9	9	0	1,355	0	244	0	1,599	1,590
39	2030	0	0	0	8	8	0	1,278	0	231	0	1,509	1,501
40	2031	0	0	0	8	8	0	1,194	0	215	0	1,410	1,402
41	2032	0	0	0	7	7	0	1,102	0	199	0	1,301	1,294
42	2033	0	0	0	6	6	0	1,001	0	181	0	1,181	1,175
43	2034	0	0	0	5	5	0	890	0	161	0	1,051	1,046
44	2035	0	0	0	4	4	0	770	0	139	0	909	905
45	2036	0	0	0	3	3	0	640	0	115	0	755	752
46	2037	0	0	0	3	3	0	498	0	90	0	588	585
47	2038	0	0	0	2	2	0	345	0	62	0	407	405
48	2039	0	0	0	1	1	0	179	0	32	0	211	210
49	2040	0	0	0	0	0	0	0	0	0	0	0	0

JICA