3.6 Recommendations

3.6.1 Physical Targets

There are capacity and structural deficiencies in about 8,400 Kms of the study roads which will have to be improved within the 7th Plan period. The physical target of major road improvement plan prepared for the Seventh Five Year Plan period is summarized and listed in Table 3.6.1.

Table 3.6.1 Physical Target and Selected Projects for the 7th Plan

(Kms)

Project Category		National Highway	Provincial Highway	Total
New Schemes	A (Dual Carriageway)	760	-	760
	B (Widening/Rehabili.)	1,170	1,210	2,380
	C (Overlay/Rehabili.)	1,510	2,510	4,020
On-going Road Improvement Schemes		830	380	1,210
Total:		4,270	4,100	8,370

The class of existing roads on the primary highway (1985/86) is shown in Fig. 3.6.1, and the expected class of road after the completion of the selected road improvement projects in the year of 1992/93 is shown in Fig. 3.6.2.

3.6.2 Investment Targets

The investment cost of the selected projects for the 7th Plan was estimated based on the physical target described above using unit construction cost shown in Table 3.4.4 and the estimated cost shown in the ADP 87/88 for ongoing projects. The result is presented in Table 3.6.2

As described in Chapter 2, Section 2.4, the Study Team estimated that the investment for the roads outside of this study requires a fund equivalent to 40% of the total investment cost of the Master Plan.

The investment cost allocation for this outside roads should be made with some appropriate balance among the individual Five Year Plans during the Master Plan period from 7th to 10th Plan.

In the 7th Plan, the Study Team recommended to apply comparative low investment allocation to the roads outside of this study as shown in App. Fig. 3-1 so that higher economic return should be expected from the priority projects on the primary highways in the study road network.

Fig. 3.6.1 Class of Road Existing on the Primary Highway Network

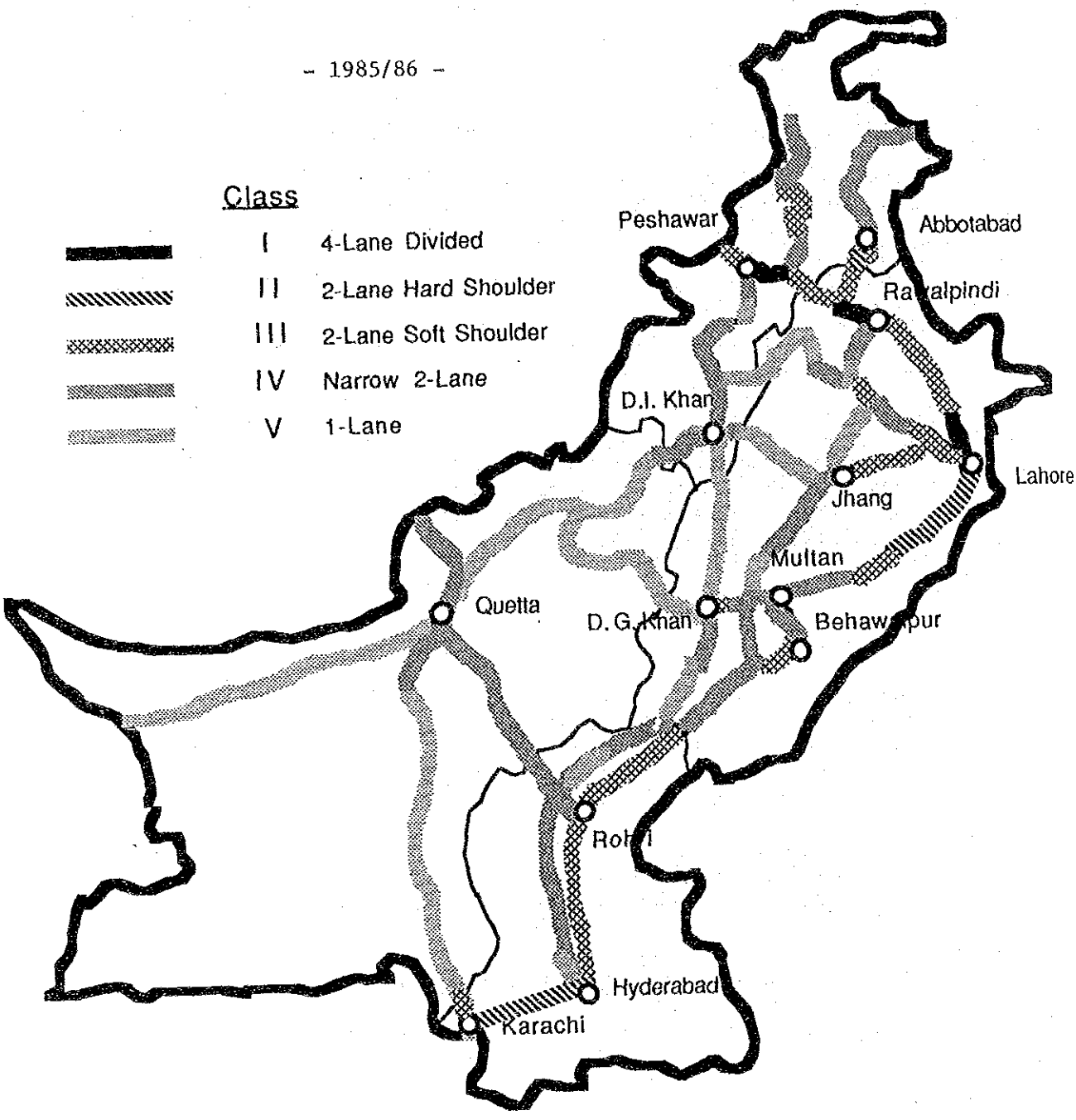


Fig. 3.6.2 Desirable Class of Road on the Primary Highway Network
- 1992/93 -

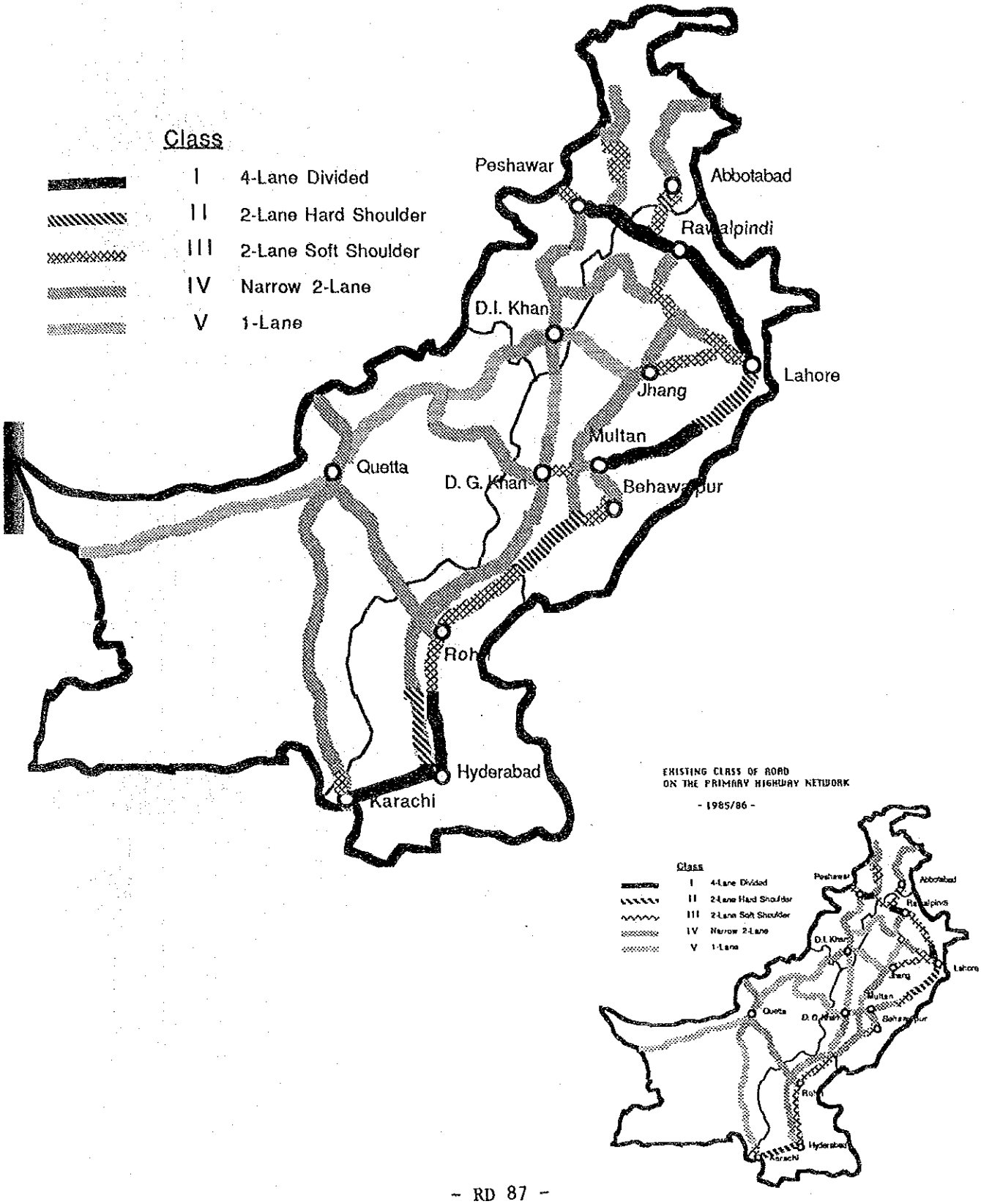


Table 3.6.2 Summary of Investment Cost (7th F.Y.P.)

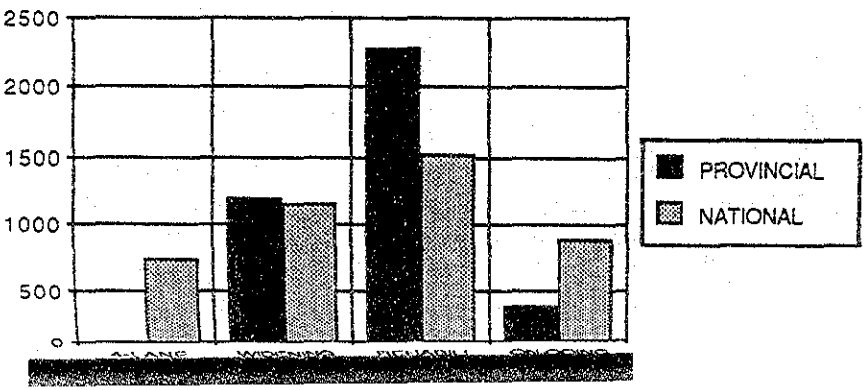
GROUPE		CATEGORY	HIGHWAY EXIS.CLASS	CLASS PROP.CLASS	PROVINCIAL-HIGHWAY LENGTH(KM)	PROVINCIAL-HIGHWAY COST	NATIONAL-HIGHWAY LENGTH(KM)	NATIONAL-HIGHWAY COST	TOTAL LENGTH(KM)	TOTAL COST
CONSTRUCTION DUE TO CAPACITY DEFICIENCIES	A	DUAL CARRIAGEWAY (4-LANE HIGHWAY)	II	I	0	0	150	812	150	812
			III	I	0	0	487	4036	487	4036
			IV	I	0	0	123	738	123	738
			SUB TOTAL		0	0	760	5586	760	5586
	B	WIDENING AND REHABILITATION	IV	II	0	0	314	1258	314	1258
			V	II	60	300	30	126	90	426
			V	II	46	193	0	0	46	193
			V	IV	1104	3543	826	2499	1930	6042
			SUB TOTAL		1210	4036	1170	3883	2380	7919
REHABILITATION DUE TO STRUCTURAL DEFICIENCIES	C	OVERLAY AND REHABILITATION	III	III	772	2144	462	1361	1234	3505
			IV	IV	907	2177	636	1526	1543	3703
			V	V	596	929	416	635	1012	1564
			SUB TOTAL		2275	5250	1514	3522	3789	8772
			TOTAL NEW	SCHEME	3485	9286	3444	12991	6929	22277
OTHERS		ON-GOING SCHEME	SUB TOTAL		378	534	913	1457	1291	1991
		TOTAL	(STUDY	NETWORK)	3863	9820	4357	14448	8220	24268

OUTSIDE THE STUDY 4282

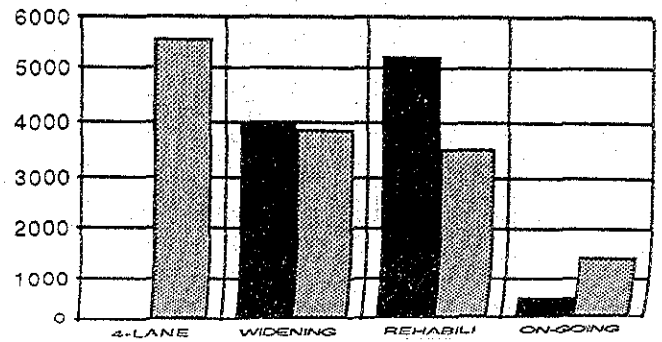
GRAND TOTAL RS.MILLION 28550

RD 88

ROAD LENGTH (KM)



INVESTMENT COST (RS.MILLION)



3.6.3 Proposed Study

The Study Team recommend that the following subjects be studied in detail in the 7th FYP period.

1) Additional Carriageway Project (N-5)

Nowshera - Cablat Section
Rawalpindi - Kharian Section

The National Highway Board intends construction of approximately 200 Kms of additional carriageway along N-5, including 2 river bridges between Karian and Nowshera. The project will be executed entirely through private sector of finance-cum-construct basis.

The project of private sector financing has been planned from the Sixth Plan or before, but the project could not be started because the government could not take the decision on levy of toll and guarantee for investment. Since these sections are the priority section in the National Highway, a detail study for verification of this project will be required in order to implement the project successfully and to construct good quality road.

2) Review of the Previous Engineering Studies (N-55)

Following the policies of highway improvement for North-South traffic in Pakistan defined by the Study Team as described in 3.7.1, the highway improvement programmes for N-55 (Indus Highway) should be implemented timely and smoothly. The several engineering studies have been conducted by local consultants to date, however a systematized development programmes have not been made yet.

It is, therefore, proposed that the review of the previous engineering studies conducted by the Government should be conducted by the following objectives.

- Review of the feasibility studies and preliminary designs including Kohat tunnel schemes conducted in Pakistan Government to date
- Overall evaluation and verification for Indus Highway Schemes from Kotri to Peshawar
- Recommendations for modern highway design and construction methods including the most effective programmes of technology transfer
- Prepare Long Term implementation schedule

2) Sukkar - Rohri Bridge Construction Project

The existing bridge crossing on the Indus River at Sukkar is actually the deck of Sukker barrage which is being used as a

bridge and it belongs to the provincial Irrigation Department. Moreover the access roads passes through the congested area in Sukkur City.

The new highway bridge is therefore planned to be constructed approximately 5 Kms away from the existing bridge and the access road shall bypass Sukkur City.

Its construction cost, if it is implemented for a new bridge project, would be high due to long span bridge over 800 m or more, but its benefits would also be high, its effect on NHB, however, would be significant. The bridge project should be carefully assessed.

4) Lahore Bypass Project

In order to operate the trunk highway functionally, provision of bypass, frontage road along the trunk highway in high populated city zone should be given priority.

National Highway N5 is the most heaviest trafficked trunk highway linking major populated cities such as Karachi, Hyderabad, Multan, Lahore, Gujranwala, Rawalpindi and Peshawar. In these cities, Lahore is the second biggest city in the country, and the N5 however no major alternative route for through traffic bypassing the city has not been built yet. N5 Passes the congested city area. The Government therefore has a preliminary plan of Lahore Bypass (26 kms) and expects that it would enable through traffic to bypass Lahore city and north bound traffic generated from newly developed area of Lahore to have alternate crossing of Ravi River thus reducing congestion on the circular road, Shahdara intersection and the city environment would be less polluted.

It is, therefore, recommended that a detail plan of this bypass project should be executed in the 7th FYP.

5) Construction of Road Transport Data Base

Several kinds of surveys regarding the road traffic, inventories and vehicles have been conducted and analyzed by line agencies. However, no complete bridges and drainage structures data on a national basis are available today.

In order to make suitable road improvement plan, to designs make proper and to control traffic for safety. It is necessary to understand the existing situation and its condition.

The National Transport Research Centre is faced at present with a number of difficulties in collecting, compiling and processing road transport data due to the following reasons:

- Poor and inconsistent reporting systems from the local government to the central government.
- Lack of uniform methodology and survey forms.

- Inappropriate location of traffic count stations.
- Inefficient management in data collection, compilation and processing.
- Lack of skillful manpower.
- Insufficient data processing facility.

The difficulties stated above have incurred from inappropriate and inconsistent planning results while the necessary cost became high due to the adhoc data collection and compilation wherever they became necessary.

Study on the construction of road transport data base is proposed aiming at the following points:

- Determine methodology of data collection, compilation and processing suitable for Pakistan.
- Collect traffic and road/bridge inventory data which can be the basis of the data base
- Recommended data processing facilities and software applicable.
- Training of the NTRC staff as well as transfer of technology.

6) Urban Transport Study in Lahore

During the course of this National Transport Plan Study, several subjects were identified as important but left largely unexamined due to their being out of the scope of the study. An urban transport study is one of them.

The city of Lahore, with the second largest population in Pakistan, has been suffering from a variety of urban transport problems including traffic congestion, improper utilization of road space, inefficient traffic management and poor management of public transport.

In view of the above fact, the Pakistan government as well as the local government has been trying to rationalize the urban transport system of Lahore. Due, however, to the lack of data, fund and technical skills, the efforts made are not satisfactory so far.

For the following purpose, the Urban Transport Study in Lahore is proposed;

- Collect urban transport data which can be the basis of transport planning in Lahore and its environs.
- Projection of future transport demand based on a carefully determined future socio-economic framework.
- Planning of road and railway infrastructure based on some possible alternative scenarios on landuse.
- Planning of public transport, including route structure, role of bus and other para-transit modes and the rationalization of public transport industry.

3.7 Policy Option

3.7.1 Road Development Plan for North-South Traffic

The benefit/cost analysis presented in Section 3.5.1 was for the entire project package proposed for the entire road network. The proposed projects were found economically feasible as a whole.

In order, however, to obtain the basic direction of road improvement projects for North-South traffic the following two scenarios have been tested:

Scenario-A: Concentrate on road projects of Route N5 and its environs (Do-Nothing for Route N55)

Scenario-B: Concentrate on road projects of Route N55 and its environs (Do-Nothing for Route N5)

North-South traffic in the country is expected to grow faster than others.

Since N5 is the most important highway connecting Karachi and the up-country while N55 is considered to be its alternative route, the comparison of the above listed two scenarios will be meaningful.

To test these scenarios, the same methodology was applied to the entire project package was adopted. As a result of preliminary economic evaluation, it was found that both scenarios have shown a sound economic feasibility. In relation to the "N5 Priority" and "N55 Priority" scenarios, both were found essential for the development of this country.

The following policy of the highway development programmes for the North-South traffic are considered;

- Highway Development projects for N5 and N55 should be implemented in parallel

- Development programmes for N5 should be made as a 4-lane Super Highway Construction project.

- In case of N55, the programmes should be defined as 2-lane Local Highway Improvement Project, having a function of collector and distributor roads, on the basis of widening or rehabilitation schemes.

The basic objectives of the improvement of Indus Highway are:

- Promote National Integration,
- Provide speedier transportation of agriculture products,
- Provide basic infrastructure for establishing industrial nuits,
- Avoid threat of disruption by floods, and
- Promote traffic safety and reduce vehicle operation costs.

Table 3.7.1 shows the prospective development plan both N5 and N55, and the priority of each section as shown in Fig. 3.7.1 and 3.7.2.

As far as N5 is concerned, the several major projects represented by the 4th Highway Project are going on now. However, highway improvement schemes for N55 so called Indus Highway had been delayed due to financial and other constraints. It is therefore, recommended that the road improvement programme of the priority sections represented by the following Northern Sections of Indus Highway be implemented within the coming 7th FYP.

(a) Peshawar-Kohat Section) ; Providing of Class III Highway including partial re-alignment including tunnel scheme, widening and rehabilitation for future Class (4-lane) Highway

(b) Kohat-Jatta Section ; Due to capacity deficiencies in the future widening of existing road from Class V (one-lane, one-way) to two-lane highway

(c) Jatta-Naurang Section ; Provision of New two-lane highway bypassing Bannue town.

3.7.2 Road Maintenance Performance Monitoring System

As described in Section 1.7.2, the Government and National Highways Board make use of a "Yardstick" system, which contains a set of formulae for estimating quantities for costs of a number of key items of maintenance work. However, this system is based upon a very few variable parameters, mainly pavement width and terrain, it distributes the allocated annual funds equally to all roads within the same category irrespective of the variable pavement conditions and other actual maintenance needs of the roads.

It is expected that the maintenance system will be modernized, and the maintenance budget will be rationalized by providing maintenance funds on the basis of actual field measurements and monitoring field parameters, instead of the yardstick basis.

In this Section, a performance evaluation formula so called "MCI" (Maintenance Control Index formula) established in Japan[1/] is introduced, and the data bank used for planning the maintenance and repair of the national highways in Japan based on the investigation is also introduced briefly.

1/ Source: Evaluation of the Serviceability of Pavement and Forecast of the Surface Performance by MCI, Public Works Research Institute, Ministry of Construction.

Table 3.7.1 Prospective Development Plan for N5 and N55

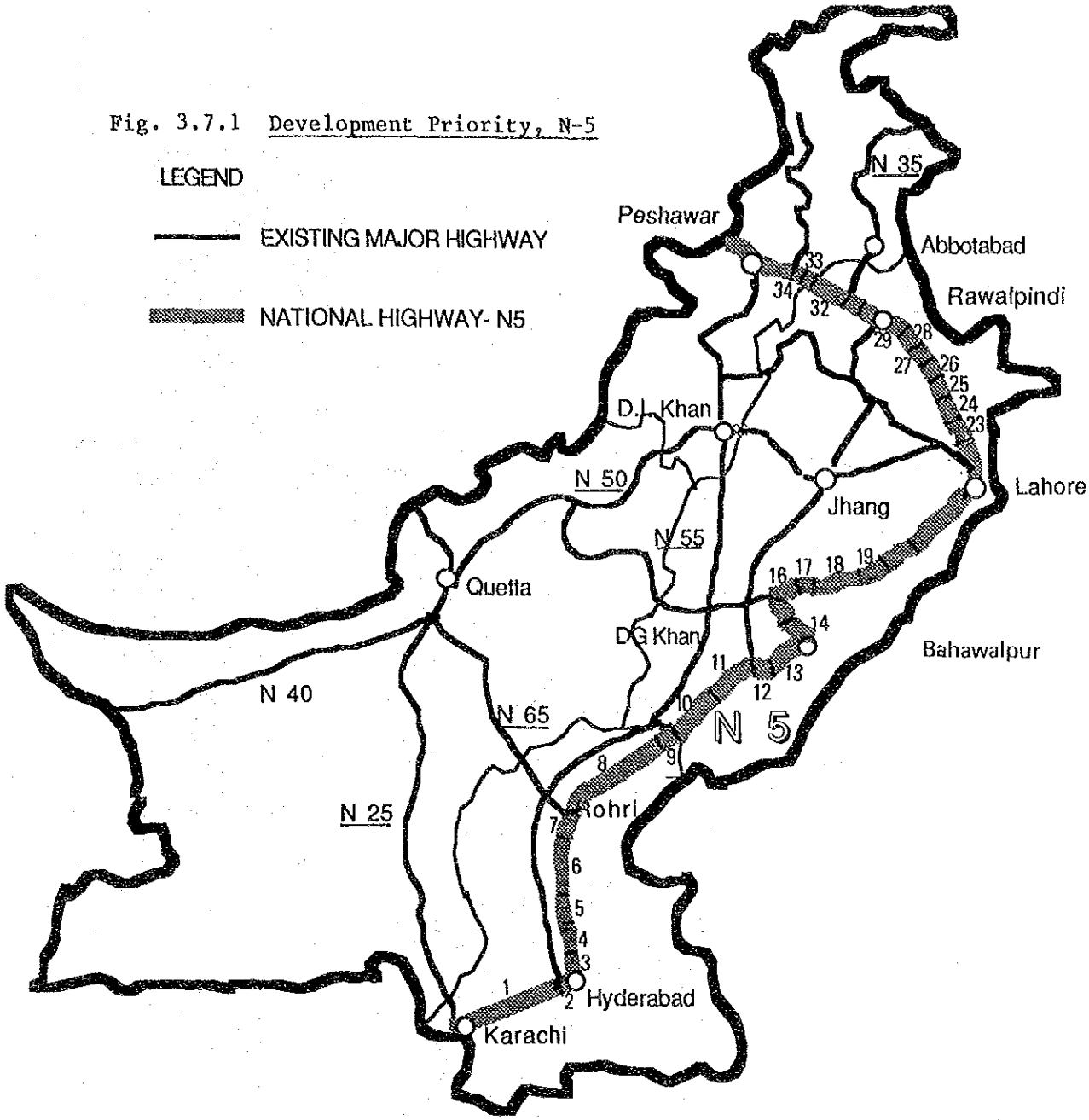
N-5

NODE NO.			SECTION			LENGTH	EXIS.CLASS	PROPOSED CLASS		EXIS.VOL	ASSIGNED VOLUME		V/C RATIO	DESIRED CLASS OF HIGHWAY				REMARKS
						(KM)		(1992/93)	(2005/06)	(VEH/DAY)	(1992/93)	(2005/06)	(1992/93)	(7TH FYP)	(8TH FYP)	(9TH FYP)	(10TH FYP)	
39	-	118	Karachi	-	Kotri	150	II	I	I	9255	11544	14419	1.30	A-I				4th Highway
118	-	33	Kotri	-	Hyderabad	15	II	I	I	---	13379	19189	1.52	A-I				
33	-	87	Hyderabad	-	Hala	46	III	I	I	5415	10682	14141	1.18	A-I				4th Highway
87	-	86	Hala	-	Sakrand	39	III	I	I	5471	9420	12824	1.08	A-I				4th Highway
86	-	102	Sakrand	-	Moro	70	III	I	I	5646	10776	12105	1.25	A-I				4th Highway
102	-	32	Moro	-	Khairpur	137	III	III	I	4857	7911	8796	0.94	C-III		A-I		
32	-	29	Khairpur	-	Rohri	25	III	III	I	7802	11779	13719	1.39	C-III	A-I			
29	-	82	Rohri	-	Ubauro	112	III	III	I	6803	9511	11230	1.05	C-III	A-I			
82	-	150	Ubauro	-	Boundary	13	III	III	III	---	6003	6134	0.74	C-III				
150	-	27	Boundary	-	Rahimyar Khan	48	IV	II	I	5510	9703	9963	1.43	B-II	A-I			
27	-	79	Rahimyar Khan	-	Trind M. Pana	101	IV	II	II	---	7249	7536	1.07	B-II				
79	-	80	Trind M. Pana	-	Chani Goth	12	IV	IV	IV	---	5058	5240	0.75	C-IV				
80	-	25	Chani Goth	-	Bahawalpur	71	III	III	I	5965	11051	11679	1.32	C-III	A-I			
25	-	121	Bahawalpur	-	Lodhran	20	III	III	III	5144	7120	7584	0.85	C-III				
121	-	23	Lodhran	-	Multan	75	IV	IV	IV	3478	3821	4935	0.44		V-IV			
23	-	75	Multan	-	Kabirwala	29	IV	I	I	3183	7525	9308	0.95	A-I				4th Highway
75	-	119	Kabirwala	-	Khanewal	14	IV	I	I	2417	3736	4568	0.52	A-I				4th Highway
119	-	72	Khanewal	-	Chichawatni	80	IV	I	I	3595	5673	6737	0.74	A-I				4th Highway
72	-	24	Chichawatni	-	Sahiwal	42	III	I	I	3160	5694	6594	0.64	A-I				4th Highway
24	-	71	Sahiwal	-	Okara	34	II	II	II	3924	7629	10007	0.80		C-II			
71	-	17	Okara	-	Lahore	111	II	II	I	5120	8433	11507	0.83			A-I		
17	-	19	Lahore	-	Gujranwala	73	I	I	I	15295	20712	33060	0.38		C-I			
19	-	61	Gujranwala	-	Wazirabad	39	III	I	I	10963	15197	21059	1.20	A-I				4th Highway
61	-	12	Wazirabad	-	Gujrat	11	III	I	I	10020	12413	16295	1.06	A-I				4th Highway
12	-	204	Gujrat	-	Kharian	38	III	I	I	7668	9382	11615	0.88	A-I				4th Highway
204	-	11	Kharian	-	Jhelum	24	III	I	I	7568	9483	13341	0.94	A-I				
11	-	93	Jhelum	-	Sohawa	40	III	I	I	7481	9732	13913	1.15	A-I				
93	-	57	Sohawa	-	Mandra	33	III	I	I	6949	9598	13650	1.15	A-I				
57	-	10	Mandra	-	Rawalpindi	31	III	I	I	7873	12539	18693	1.12	A-I				
10	-	117	Rawalpindi	-	Tarnual	12	I	I	I	14507	20138	32251	0.45		C-I			
117	-	55	Tarnual	-	Hassanabdal	37	I	I	I	10856	14194	20020	0.32		C-I			
55	-	9	Hassanabdal	-	Attock	44	III	I	I	8827	10866	15474	1.14	A-I				
9	-	116	Attock	-	Jehangira	9	III	I	I	4736	7553	11353	0.72	A-I				
116	-	53	Jehangira	-	Nowshera	22	III	I	I	4507	7376	10821	0.67	A-I				
53	-	2	Nowshera	-	Peshawar	35	I	I	I	8447	12240	21548	0.24			C-I		
2	-	201	Peshawar	-	Torkham	53	III	III	III	1145	2016	3738	0.18			C-III		

N-55

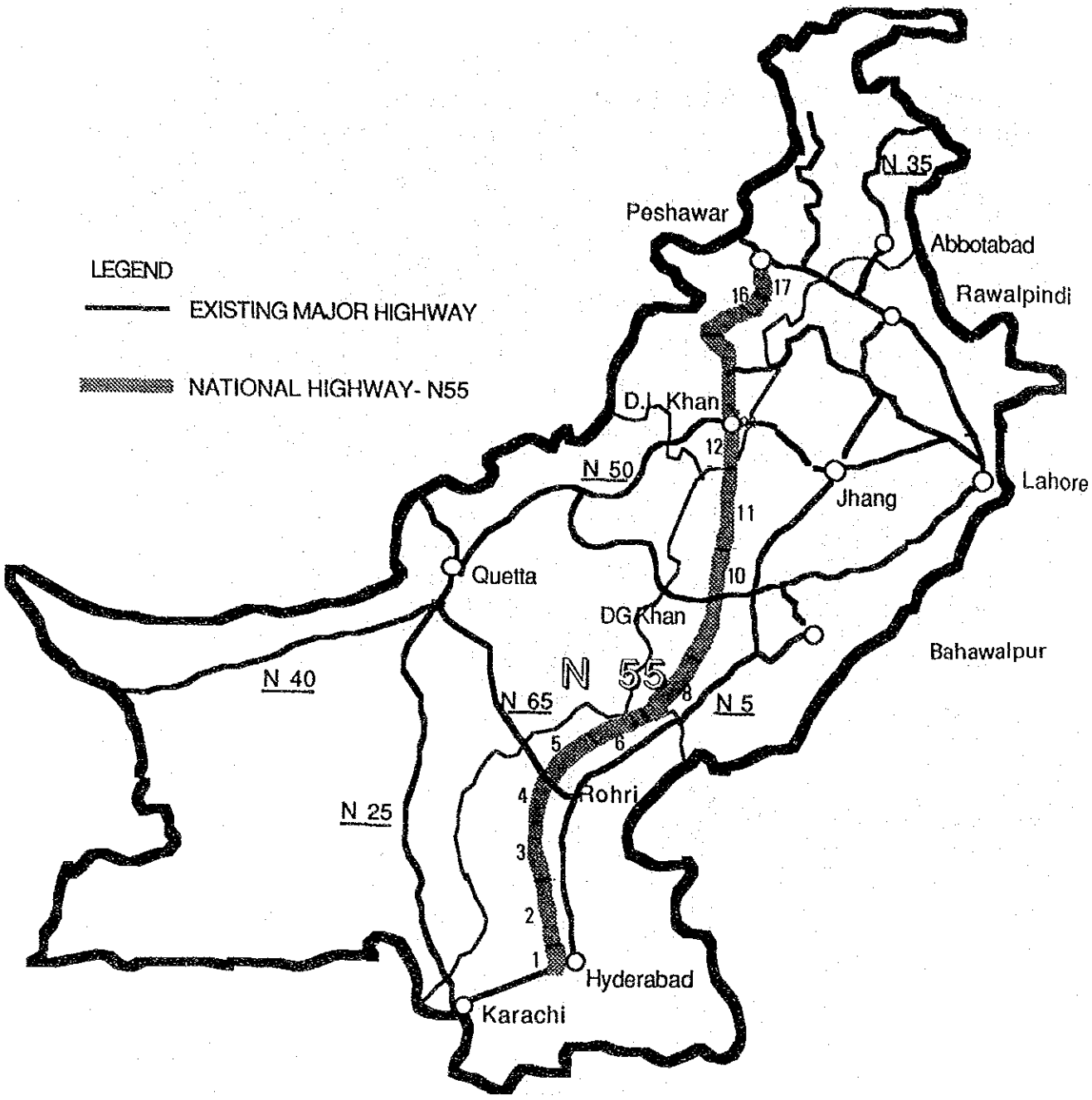
NODE NO.			SECTION			LENGTH	EXIS.CLASS	PROPOSED CLASS		EXIS.VOL	ASSIGNED VOLUME		V/C RATIO	DESIRED CLASS OF HIGHWAY				REMARKS
						(KM)		(1992/93)	(2005/06)	(VEH/DAY)	(1992/93)	(2005/06)	(1992/93)	(7TH FYP)	(8TH FYP)	(9TH FYP)	(10TH FYP)	
118	-	232	Kotri	-	Gopang	30	V	II	I	1785	10337	12337	0.32	B-II	A-I			
232	-	34	Gopang	-	Dadu	165	IV	II	I	1785	10333	12337	1.44	B-II	A-I			
34	-	30	Dadu	-	Larkana	119	IV	IV	IV	---	5420	6717	0.69	C-IV				
30	-	28	Larkana	-	Shikarpur	62	IV	IV	IV	---	3333	4255	0.44	C-IV				
28	-	84	Shikarpur	-	Kundkot	64	V	IV	IV	3156	6923	11333	5.19	B-IV				
84	-	81	Kundkot	-	Kashmor	47	IV	IV	IV	1444	5101	5648	0.71	C-IV				
81	-	159	Kashmor	-	Boundary	2	IV	IV	IV	---	1513	1560	0.23				C-IV	
159	-	231	Boundary	-	Rajanpur	109	V	IV	IV	829	2482	2870	1.99	B-IV				
231	-	21	Rajanpur	-	D. G. Khan	109	IV	IV	IV	829	2482	2870	0.35		C-IV			
21	-	74	D. G. Khan	-	Shadan Lund	51	V	IV	IV	991	1127	1936	0.51	B-IV				
74	-	160	Shadan Lund	-	Boundary	106	V	V	IV	561	983	1372	0.70	C-V			B-IV	
160	-	5	Boundary	-	D. I. Khan	51	V	IV	IV	952	1711	2896	1.17	B-IV				
5	-	59	D. I. Khan	-	Talazai	94	IV	IV	IV	1606	2751	4640	0.32		C-IV			
59	-	6	Talazai	-	Bannu	47	IV	IV	IV	1960	3226	5150	0.35		C-IV			
6	-	94	Bannu	-	Jatta	96	IV	IV	IV	---	1081	1401	0.18				C-IV	
94	-	3	Jatta	-	Kohat	29	V	IV	IV	---	1510	1843	1.24	B-IV				
3	-	9	Kohat	-	Peshawar	64	IV	IV	I	4883	6876	11662	1.42	B-III			A-I	

Fig. 3.7.1 Development Priority, N-5



NO.	NODE NO.		SECTION			SCHEME (7TH FYP)	RANKING	REMARKS
1	39 -	118	Karachi	-	Kotri	A-I	S	4th Highway
2	118 -	33	*Kotri*	-	*Hyderabad*	A-I	S	
3	33 -	87	Hyderabad	-	Hala	A-I	S	4th Highway
4	87 -	86	Hala	-	Sakrand	A-I	S	4th Highway
5	86 -	102	Sakrand	-	Moro	A-I	S	4th Highway
6	102 -	32	Moro	-	Khaipur	C-III	S	
7	32 -	29	*Khairpur*	-	*Rohri*	C-III	S	
8	29 -	82	Rohri	-	Ubauro	C-III	A	
9	82 -	150	Ubauro	-	Boundary	C-III	A	
10	150 -	27	Boundary	-	Rahimyar Khan	B-II	A	
11	27 -	79	Rahimyar Khan	-	Trnd M. Pana	B-II	A	
12	79 -	80	*Trnd M. Pana*	-	*Chani Goth*	C-IV	A	
13	80 -	25	Chani Goth	-	Bahawalpur	C-III	A	
14	25 -	121	Bahawalpur	-	Lodhran	C-III	A	
15	121 -	23	Lodhran	-	Multan			
16	23 -	75	Multan	-	Kabirwala	A-I	S	4th Highway
17	75 -	119	*Kabirwala*	-	*Khanewal*	A-I	B	4th Highway
18	119 -	72	Khanewal	-	Chichawatni	A-I	A	4th Highway
19	72 -	24	Chichawatni	-	Sahiwal	A-I	B	4th Highway
20	24 -	71	Sahiwal	-	Okara			
21	71 -	17	Okara	-	Lahore			
22	17 -	19	Lahore	-	Gujranwala			
23	19 -	61	Gujranwala	-	Wazirabad	A-I	A	4th Highway
24	61 -	12	Wazirabad	-	Gujrat	A-I	S	4th Highway
25	12 -	204	Gujrat	-	Kharian	A-I	A	4th Highway
26	204 -	11	Kharian	-	Jhelum	A-I	S	
27	11 -	93	Jhelum	-	Sohawa	A-I	A	
28	93 -	57	Sohawa	-	Mandra	A-I	A	
29	57 -	10	Mandra	-	Rawalpindi	A-I	S	
30	10 -	117	Rawalpindi	-	Tarnual			
31	117 -	55	Tarnual	-	Hassanabdal			
32	55 -	9	Hassanabdal	-	Attock	A-I	A	
33	9 -	116	Attock	-	Jehangira	A-I	A	
34	116 -	53	Jehangira	-	Nowshera	A-I	B	
35	53 -	2	Nowshera	-	Peshawar			
36	2 -	201	Peshawar	-	Torkham			

Fig. 3.7.2 Development Priority, N-55



NO.	NODE NO.		SECTION			SCHEME (7TH FYP)	RANKING	REMARKS
1	118	232	Kotri	-	Gopang	B-II	S	
2	232	34	Gopang	-	Dadu	B-II	A	
3	34	30	Dadu	-	Larkana	C-IV	A	
4	30	28	Larkana	-	Shikarpur	C-IV	B	
5	28	84	Shikarpur	-	Kundkot	B-IV	B	
6	84	81	Kundkot	-	Kashmor	C-IV	A	
7	81	159	Kashmor	-	Boundary			
8	159	231	Boundary	-	Rajanpur	B-IV	B	
9	231	21	Rajanpur	-	D.G. Khan			
10	21	74	D.G. Khan	-	Shadan Lund	B-IV	A	
11	74	160	Shadan Lund	-	Boundary	C-V	C	
12	160	5	Boundary	-	D. I. Khan	B-IV	A	
13	5	59	D. I. Khan	-	Tajazai			
14	59	6	Tajazai	-	Bannu	*		
15	6	94	Bannu	-	Jatta	*		
16	94	3	Jatta	-	Kohat	B-IV	A	
17	3	2	Kohat	-	Peshawar	C-IV	S	

Remarks: * Survey work for F/S and design is in progress on Jatta-Karak-Sarai-Naurang Section (93 km) under the Indus Highway project.

(1) Formulation of Serviceability Evaluation

1) Method of Investigation

The surface maintenance survey is the one carried out throughout the country from 1972 as part of the survey of the administration of national highways under the direct jurisdiction of the government and is comprised of the basic survey and general survey.

The basic survey is intended to obtain the basic data for providing reasonable criteria for maintenance and repair. Under the survey, a section of about 300 m of asphalt pavement of known pavement composition, etc. is chosen to measure the cracking ratio, rutting, evenness, coefficient of skid resistance, and traffic volume once a year, along with an overall evaluation of the surface by visual observation.

2) Surface Characteristic Values Representing the Surface Performance

The surface performance is expressed by such characteristic values as cracking ratio, rutting, evenness, and coefficient of skid resistance as well as the surface roughness and uniformity. These are characteristics greatly related to the performance of pavement, and when these characteristics or characteristic values are used for evaluation of the performance of pavement, it is convenient practically that they be as few as possible and be quantifiable with relative ease.

Also, they must be such that the measurement is made relatively easily, with reproducibility. When the performance of pavement degrades, maintenance repair must be made. Therefore, it is necessary to consider the characteristics which are used for determination if the repair is required or not under the present condition. In consideration of the foregoing, three characteristic values of cracking ratio, rutting and evenness were taken as representing the surface characteristics expressing the performance of pavements. These characteristic values are outlined below:

Cracking Ratio (%)

The cracking ratio represents the proportion of the cracked area to the whole area of investigation. To calculate the cracking area, two methods are available; one is a measurement method according to which a total of the area of cracks in the form of a net and the length of linear cracks multiplied by 0.3 m is taken as the cracking area; and the other is a mesh method according to which the total of the value obtainable by multiplying the number of meshes in which cracks are produced in the form of a net by 0.25 m^2 and the value obtainable by multiplying the number of meshes in which linear cracks are produced by 0.15 m^2. In general, the mesh method gives greater values of cracking ratio than the measurement method.

The surface maintenance survey was made generally by the measurement method, with the mesh method applied only to a very small part. Recently, however, the mesh method has been employed increasingly for the sake of labor economy.

Rutting (mm)

The rutting amount is given by measuring the cross-sectional form of the surface by a traverse profilometer and by taking the difference between the highest and lowest parts as the rutting of the cross-section. This measurement is made at an interval of 20 m, the mean value is taken as the rutting of the section. As a value for the road administrator to use in determining if maintenance repair is necessary or not, it is often maintained that the largest of the values calculated for the respective cross-sections should be used. But, the maximum value is apt to be governed by an abnormal value. This involves a problem that it is hardly forecast. Then, it is sometimes maintained that a value of combination of the mean value and a statistic value $\sqrt{V}$ expressing the extent of variation should be taken as the rutting of the section concerned. In this report, the rutting is represented by the mean value.

Evenness (mm)

The evenness is provided by measuring the longitudinal form of the track of running to the left wheel on the traveling lane with a 3 m profilometer, reading the values at a 1.5 m interval of the form thus obtained and calculating the standard deviation of them to take it as the vertical profile. When measured with a 8 m profilometer or any other measuring instrument, the value is converted with a conversion formula used.

3) Surface Characteristic Values and Pavement Performance

From the results of the surface maintenance survey containing the values of measurement of the foregoing three characteristics, as well as, the overall evaluation by visual observation, there were 1,808 sets of data obtained. The overall evaluation by visual observation is the rating of the performance of pavement through visual observation by the road administrator of the surface condition with respect to the items shown in Table 3.7.2, as below.

(Overall Evaluation)

A - No defect observed (good).
B - Some defects noted, but generally good.
C - Defects noted, but no repair required.
D - Minor repair required (patching, partial seal coat, etc.).
E - Major repair required (overlay, construction, etc.).

Table 3.7.2 Items of Observation

Items		Contents
Texture of the surface		Very Coarse
		Coarse
		Aggregates Appear
		Smooth
Uniformity of the Surface		Good
		Medium
		Bad
Asphalt Content		Much Flush
		Some Flush
		Possible to Flush
		Black Surface & No Flush
		Brown and Dry Surface
Skidness		Not Slippery
		Medium
		Slippery
Deformation and Rutting		Much
		Some
		No
Stripping and Pot Holes		Much
		Some
		No
Wearing		Much
		Some
		No
Cracking	Line type	Much
		Some
		No
	Net type	0%
		0 - 5%
		10 - 20%
		20 - 50%
		50 -100%

4) Performance Evaluation Formula

Using the said 1808 sets of data, formulation of the performance evaluation was examined. Here, the performance is more practically expressed in numerals than in categories, but for such purpose, it is necessary to express the results of overall evaluation in numerals. Then, the foregoing overall evaluation ratings were expressed in numerals as A=10, B=8 ---- E=2 as the performance would express, in a broad sense, the service level of roads so that it would be convenient and readily understandable to decrease the value showing the performance with decreasing surface performance and that the indication in 10 steps would be adequate for expressing the size of such values.

The evaluation of serviceability is apt to vary from the standpoint to standpoint of the evaluator, and such standpoints are classified largely into those of the road administrator, road

users such as drivers and passengers, and roadside inhabitants and pedestrians, and a summary of the results of evaluation of the evaluators of the respective standpoints is considered to be the final performance evaluation. As the overall evaluation by the surface maintenance survey would be considered as an evaluation seen from the standpoint of the road administrator for determination whether the maintenance repair of the pavement would be required or not, it was named, in order to distinguish from the final evaluation, as a Maintenance Control Index. The regression formula of MCI is given as

$$MCI = 10 - 1.48C^{0.3} - 0.29D^{0.7} - 0.47\ ^{0.2}$$

where, MCI = Maintenance Control Index; and
C : Cracking ratio (%);
D : Rutting (mm);
: Evenness (mm);

The survey was made of various road surfaces throughout the country, while no pre-training of the evaluators was made. Nevertheless, the multiple correlation coefficient of the formula was about 0.75. Thus, it was considered that the foregoing three characteristics were appropriately chosen to express the performance, that the method of numerical representation of the overall evaluation was adequate and that the MCI formula would be practically applicable.

To quantitatively express the performance of the pavement by the surface characteristic values of cracking ratio, rutting, etc., the PSI formula derived from the AASTHO Road Test results, is widely known.

Fig. 3.7.3 shows the change of the evaluation value with change of the surface characteristic values in MCI and PSI formulas. MCI is of a 10-step indication, while PSI is of 5-step indication, so that the scales are adjusted.

As seen from Fig. 3.7.3, the cracking ratio is the largest of the effect on MCI, and the evenness is not so much. The scope of application of the MCI formula is considered to be generally 40 percent or less for the cracking ratio, 35 mm or less for the rutting or 5.0 mm or less for the evenness.

The curves of MCI and PSI for the varying values of cracking ratio and rutting are shown in Fig. 3.7.4.

(2) Pavement Data Bank

1) Basic Concept

Photographing and other automatic methods have enabled the measurement of surface performance over a wide range recently. Also, through development of computers, it is now possible to process the data much more thoroughly.

Fig. 3.7.3 The Change of MCI and PCI by Road Surface Characteristics

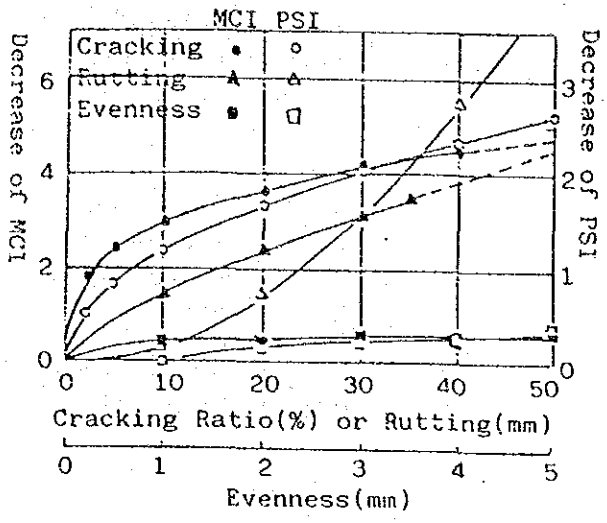
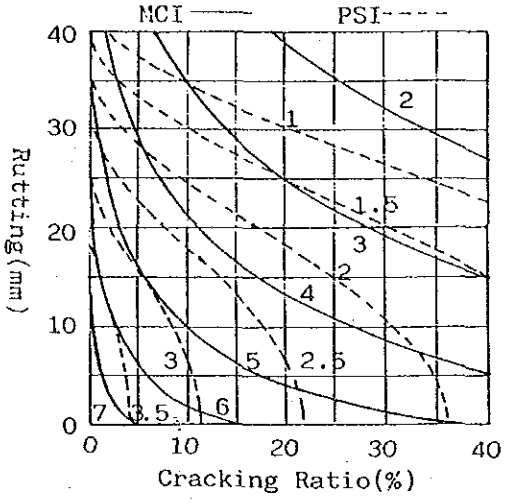


Fig. 3.7.4 Relation between MCI, PSI and Road Surface Characteristics



2) Object and Positioning

The pavement data bank is intended to maintain the basic data on pavement in an adequate form by computer processing to obtain statistic data on pavements and provide data for formulation of maintenance plans, as required. For the roads in general, not only the data bank on pavement but many other data banks are conceivable, as shown in Table 3.7.3, and some of them are already in operation. In the national highways under the Government's direct control, it is the simplest and most practical way to associate these data with one another by means of route name and kilometer marker. Thus, in the pavement data bank, the method of associating the data with one another by means of route name and kilometer marker is employed.

3) Input Information

As the operation is still in the early stage, only those data which are necessary presently are taken. Such data are shown in Table 3.7.4.

4) Output Formats and Applications

The output is tentatively provided in the following five formats.

Format 1 Surface performance data list.
Format 2 Performance level diagram.
Format 3 Frequency distribution table.
Format 4 Histogram.
Format 5 Maintenance repair sections list.

Table 3.7.3 Classification of Data Bank

No.	Category	Input Information	Usage
1	Road Administration	Road Classification, Origin & Destination, Actual Length, Length of Each Structure, Length of Sidewalk, Data of Commencement of Service, Street Trees	Road Planning Road Statistics
2	Road Traffic	Geometric Design, Width, Traffic Volume	Partial Reconstruction, By-pass Highway Planning, Calculation of Road Improvement Level
3	Pavement	Pavement Structure, Traffic Volume, Road Surface Characteristics	Planning of Pavement Maintenance
4	Road Environment	Traffic Volume, Roadside Condition Noise, Vibration, Air Pollution	Countermeasures to Road Public Hazard
5	Traffic Safety	Geometric Condition, Intersection (Structure of Intersection), Rate of Accident, Safety Equipment, Traffic Sign	Planning for Road Safety Improvement

Formats 1 and 2 are adapted for output by work office, detachment and route, and Formats 3 and 4 are adapted for output by surface type and item of investigation (cracking, mean rutting, evenness and MCI) in addition to the foregoing. Format 5 is enabled to set the guide line as desired. The outputs in these formats are usable as data for grasping the conditions preparing data for budgetary appropriations at the regional construction bureaus, work offices and detachments.

It is also expected that the unique methods of application to the respective regional construction bureaus will be developed and further that all data are managed at the Road Bureau, etc. for use on a countrywide level. As the data are accumulated increasingly, they will permit a long-range analysis to be used effectively for examination of the pavement structure. At the same time, it will be enabled to obtain all sorts of data easily through connection with the other data banks.

5) Outline of the System

The system is represented in flow charts shown in Fig. 3.7.5.

Table 3.7.4 List of Input Information

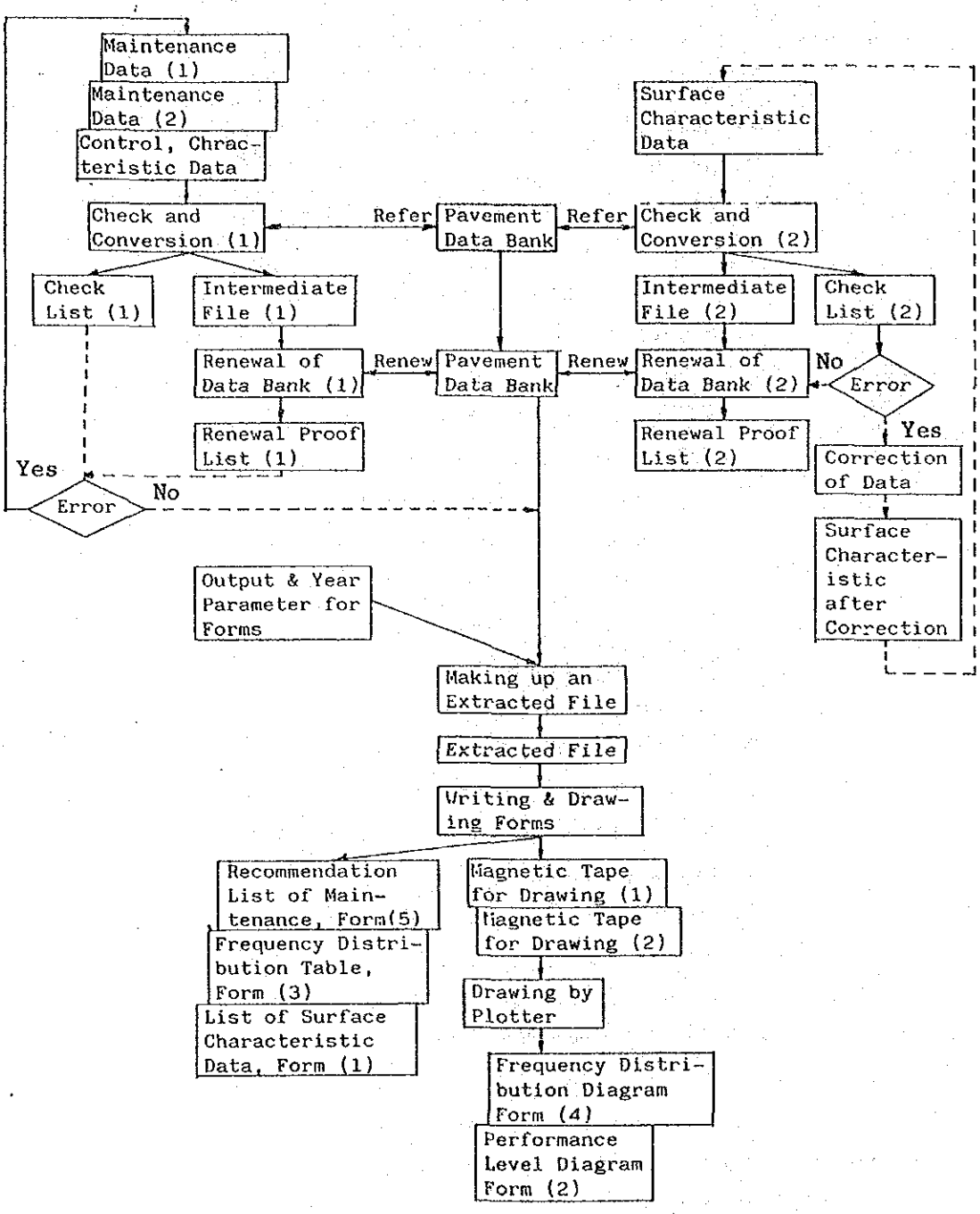
I Data for Road Administration
1. Route No.
2. Name of Construction Branch Office
3. Address
4. Distance between Kilometer Marker

II Peculiar Data of Each Highway
1. Number of Lines
2. Road Classification by Traffic Volume of Heavy Vehicles
3. CBR of Subgrade
4. TA (Equivalent Thickness to As. Layers)
5. Distinction of Areas (1)
6. Distinction of Areas (2)
7. Road Equipments
8. Data of Construction
9. Existence of Intersection

III Data of Road Surface Characteristics
1. Cracking Ratio
2. Rutting
3. Evenness
4. Asphalt/Concrete

IV Construction and Maintenance Data
1. Construction Techniques
2. Thickness of Pavement
3. Materials
4. Pavement Structure
5. Treatment on Subgrade
6. Measured CBR of Subgrade
7. Measured TA

Fig. 3.7.5 Main Flow of the System



3.7.3 Financial Resources for Road Construction and Privatization

(1) Taxes on Road Users

As one of major factor, it is pointed out that the insufficient funds for road maintenance, rehabilitation and reconstruction accounting for the poor and deteriorating quality of Pakistan's roads. The public expenditure of Pakistan belongs to the low level group in the international comparison as shown in Table 3.7.5.

However, road users in Pakistan pay nearly twice the amount spent by the Government on roads through import and excise duties on vehicle, parts, tyres, batteries, fuel, oil registration and licencing fees and tolls on roads and bridges. Taxes are levied in accordance with general taxation policy without reference to expenditure on roads. The expenditure on road is only 57% of tax revenues as shown in Table 3.7.6. Great efforts should be made to increase the expenditure of construction and maintenance of roads from within the taxes paid by road users.

While, the Government of Pakistan intends to broaden the mode of financing for highway development programmes by introduction of the private sector.

Regarding toll financing, in the true sense of the term would be left to the private enterprise subject to fulfilment of all necessary and sufficient conditions.

(2) Privatization

The privatization boom has come, many of the third world countries are asking the private sector to take over some traditionally public operations.

In this section, as an example of privatization for transport system development, the Build-Operate-Transfer (BOT) formula and some ongoing schemes using B.O.T. in Indonesia and Greece are introduced.

Basically, privatization shifts the ownership and/or operation of a traditionally public asset - a highway, a power plant, an oil company-to the private sector. Of the many forms it can take, the following three are of particular formula;

- Divestiture - the sale of state-owned enterprises or assets to private interests. This is the "popular" privatization formula.

- Contracting out - an arrangement under which the government contracts with private interests to produce and deliver services, often in the utilities and urban transport sector. A few examples: Contracts for road construction and maintenance are common in such countries as Brazil, Colombia, India and Kenya; and the Ivory Coast, the Dominican Republic.

Table 3.7.5 International Comparison of Public Expenditure

COUNTRY	YEAR	TRANSPORT & COMMUNICATION VIS-A-VIS		ROAD VIS-A-VIS		
		GDP (%)	POPULATION ($/person)	GDP (%)	POPULATION ($/person)	LENGTH ($/km)
[EUROPE]						
Germany	1981	1.64	671	0.48	196	6744
Italy	1981	2.17	1281	0.43	25	4835
[AFRICA]						
Ghana	1980	0.65	9	0.43	6	---
Morocco	1981	3.89	27	0.63	5	1577
Tanzania	1981	2.94	4	1.76	3	---
[AMERICA]						
Argentina	1981	1.67	73	0.64	28	3882
Brazil	1981	0.90	20	0.33	8	640
Canada	1981	1.23	149	0.03	3	81
Chile	1981	0.83	24	0.59	17	2473
Mexico	1981	1.51	49	0.37	12	3920
U.S.A.	1982	1.67	13	1.34	11	6851
Venezuela	1982	2.71	127	0.78	37	---
[ASIA]						
Burma	1981	1.03	2	0.71	1	---
India	1981	0.44	1	---	---	---
Indonesia	1981	2.30	13	0.70	4	---
Iran	1981	1.89	52	1.04	29	---
Malaysia	1981	3.35	60	1.89	34	19110
Nepal	1981	2.50	3	2.04	3	9158
Pakistan	1981	1.58	6	0.31	1	1077
Philippines	1981	2.00	15	1.67	13	---
Sri Lanka	1981	2.44	7	---	---	---
Thailand	1982	1.67	13	1.34	11	6851
Australia	1982	0.80	89	0.43	48	882

Table 3.7.6 Overall Revenues & Expenditure on Roads (1984 - 85)

Tax Revenues from Road Users			Allocation of Tax Revenues to Motor Vehicles			Roads Expenditures (Included construction maintenance administration)		
Federal	7,556.5	(74.4%)	Federal	6,615	(86.8%)	Federal	1,010	(24.0%)
• Import Duties & Sales Tax	3,868.7		• Vehicles & Parts	3,868				
• Excise/Customs Duties & Development Surcharge on P.O.L.	3,687.8		• Petrol & Diesel	1,866				
			• Crude & Mobile	881				
Provincial	903.6	(8.9%)	Provincial	904	(11.9%)	Provincial	2,189	(52.0%)
• Registration & Licensing Fees & Others	823.8		• Registrations	824				
• Tolls	79.8		• Tolls	80				
Local	1,696.7	(16.7%)	Local	102	(1.3%)	Local	1,014	(24.0%)
• Octroi	1,594.7							
• Tolls Tax	69.9							
• Others	32.1							
Total	10,156.8	(100.0%)	Total	7,621	(100.0%)	Total	4,214	(100.0%)

Source: Road User Charges in Pakistan, NTRC, 1987

- Contractor equity - an arrangement under which contractors and consultants own and operate the project they design and build.

BOT Formula

BOT, also known as the "Ozal formula," is gathering steam. Despite hesitancy on the part of some developed countries to take part in such an arrangement, it is one of the up-and-coming privatization schemes devised by cash- and credit-short industrializing countries to get their large infrastructure projects off the ground. The BOT formula is used on the Turkish power plants and also is considering it for hydro-electric works, highways, ports, housing and airports. And several other countries - Indonesia and Greece, to name two -have proposed BOT financing for highway and mass-transit works.

Conceived as a form of investment offset, the BOT approach calls for the successful bidder to finance the project, operate it for a specified period to earn back its investment and then transfer ownership to a public authority. In practice, it requires a foreign contractor to supply long-term financing - generally for 15 years - and to take a majority share in the joint venture established with a public authority to operate the facility. As an investor, the contractor is permitted to repatriate earnings from its equity investment at a guaranteed rate of exchange. Those earnings are equivalent to the cost of the contractor's engineering and construction services, plus the equipment supplied to the project.

Perhaps inspired by the Turkish government's initiative, other countries are now contemplating build-operate-transfer (BOT) financing for major infrastructure projects in the transport sector. Foremost among them are Greece and Indonesia.

BOT in Indonesian Highway

The Indonesian Highway Corporation is currently seeking partners to build and manage individual toll roads based on Turkey's BOT model. The foreign contractor selected for the job would take an equity stake in the project, managing it for an agreed number of years and repatriating profits earned from the operation. As is customary in Indonesia's public sector, the government has not laid down specific rules concerning the form that foreign investment will take in the program.

Highway Corporation believes the BOT formula presents a minimum of risk for foreign contractors, mainly because Indonesia enjoys a steady 6.5 percent annual growth in road traffic, regardless of fluctuations in the economy's performance. During the next five years the authority plans to build 1,025 kilometers of new toll roads and several flyovers and interchanges.

Despite the high priority assigned to highway construction in its development plan, Jakarta will not invest foreign exchange in the projects, because it believes the good return on investment the

ventures offer make it easy to find outside partners with financing. But the Highway Corporation is authorized to issue public bonds to finance its share of each project. These bonds are limited, however, to five-year maturities and must be redeemed by new bonds, not cash - a constraint that undermines the corporation's search for foreign partners to provide large-scale BOT financing.

Foreign companies participating in BOT toll road ventures must enter into a joint venture with the Highway Corporation. The government will guarantee that private investors' equity will not be nationalized, but all other contractual conditions - including the rate of return, repatriation of profits and capital transfer - are subject to negotiation with the Highway Corporation.

Although Indonesia would prefer a BOT arrangement, the authority will consider other formulas for cooperation, including turnkey construction and joint management. The key element in any foreign partner's proposal is "a readiness to transfer know-how and technology."

BOT in Greek

Meanwhile, the Greek government reportedly is considering the BOT formula for its proposed expansion of the Athens "metro" commuter rapid transit system. An alternative approach would involve paying foreign contractors with a 50-50 mix of convertible currency and Greek products, which the contractors must dispose of abroad on their own or through a Greek trading company.

APPENDIX FOR

ROAD PLANNING

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Appendix to Chapter 3 (Section 3.4.2)

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App. Table 1-1 List of Node Number and Place

NODE NUMBER	THE NAME OF PLACE
1	Mardan
2	Peshawar
3	Kohat
4	Abbotabad
5	Dera Ismail Khan
6	Bannu
7	Chitral
8	Batgram Saidu
9	Attock
10	Rawalpindi
11	Jhelum
12	Gujrat
13	Sargodha
14	Mianwali
15	Faislabad
16	Jhang
17	Lahore
18	Sheikhupura
19	Gujranwala
20	Sialkot
21	Dera Ghazi Khan
22	Muzaffargarh
23	Multan
24	Sahiwal
25	Bahawalpur
26	Bahawalnagar
27	Rahimyar Khan
28	Shikarpur
29	Rohri
30	Larkana
31	Nawabshah
32	Khairpur
33	Hyderabad
34	Dadu
35	Umarkot
36	Sanghar
37	Thatta
38	Badin
39	Karachi
40	Quetta
41	Loralai
42	Dalbandin
43	Kalat
44	Bera
45	Sibi
46	---
47	Gilgit
48	Boundary between N. W. F. P. and Jammu & Kashmir
49	Kabul
50	Boundary between Panjab and INDIA
51	Taftan
52	Chakdarra Fort
53	Nowshera
54	Mansehra
55	Hassanabdal
56	Fatehjang
57	Mandra
58	Talagang
59	Tajazai
60	Pail
61	Wazirabad
62	Khushab
63	Pindi Bhattian
64	Chiniot
65	Sarai Krisha
66	Atharan Hazari
67	Sumundri
68	Basal
69	Dipalpur
70	Rajana
71	Okara
72	Chichawalni
73	Bunga Hayat
74	Shadan Lund
75	Kabirwala
76	Arifwala
77	Vihari
78	Hassalpur
79	Tarinda Muhammad Panah
80	Chani Goth
81	Kashmor
82	Ubauro
83	Jacobabad
84	Kandhkot
85	Karamdad Qurashi
86	Sakrand
87	Hala
88	Tando Ghulam Ali
89	Bisham
90	Haripur
91	Charsada
92	Chakwal
93	Sohawa
94	Jatta
95	Kalabagh
96	Qila Saifullah
97	Bewata
98	Burewala
99	Kot Addu
100	Chowk Munda

App. Table 1-1 Continued

NODE NUMBER	THE NAME OF PLACE
101	Rangpur
102	Moro
103	Gopchali
104	Shahdadpur
105	Tando Allahyar
106	Mirpur Khas
107	Tando Muhammad Khan
108	Matli
109	Sujawal
110	Surab
111	Pidarak
112	Hoshab
113	Pasani
114	Wingai
115	Swabi
116	Jehangira
117	Tarnual
118	Kotri
119	Khanewal
120	Jahanian
121	Lodhran
122	Digri
150	Boundary between Panjab and Sind
151	Boundary between Sind and Baluchistan
152	Boundary between Panjab and N. W. F. P.
153	Boundary between N. W. F. P. and Baluchistan
154	Boundary between Sind and Baluchistan
155	Murree
156	Isakhel
157	Boundary between Panjab and N. W. F. P.
158	Boundary between Panjab and N. W. F. P.
159	Boundary between Panjab and N. W. F. P.
160	Boundary between Panjab and N. W. F. P.
161	Boundary between Panjab and N. W. F. P.

NODE NUMBER	THE NAME OF PLACE
201	Torkham
202	Boundary between N. W. F. P. and AFGANISTAN
203	Jandola
204	Kharian
205	Jalalpur
206	Chak Mano
207	Phalia
208	Khutiata
209	Lalian
210	Qaidabad
211	Dullewala
212	Darya Khan
213	Bhakkar
214	Dera Din Panah
215	Jaranwala
216	Pakpattan
217	Tando Adam
218	Smallan
219	Zhob
220	Boundary between N. W. F. P. and Baluchistan
221	Chaman
222	---
223	Ahmadwal
224	Drug
225	Basima
226	---
227	Khuzdar
228	Awaran
229	Boundary between N. W. F. P. and Gilgit Agency
230	Dir
231	Rajanpur
232	Gopang

App. Table 1-2 Updated Road Inventory

LINK NUMBER			NODE NO.	DISTANCE (km)	TERRAIN	TYPE OF SURFACE	WIDTH (m)	PAVEMENT CONDITION	CLASS
ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.							
5	1	1	150-27	48	F	T	6.5	4	IV
5	1	2	27-79	101	F	T	6.5	4	IV
5	1	3	79-80	13	F	T	6.0	4	IV
5	1	4	80-25	71	F	B	7.0	4	III
5	1	5	25-121	20	F	T	7.3	3	IV
5	1	6	121-23	75	F	T	6.0	3	IV
5	1	7	23-75	29	F	T	6.5	4	IV
5	1	8	75-119	14	F	T	6.0	4	IV
5	1	9	119-72	80	F	T	6.5	4	IV
5	1	10	72-24	42	F	T	7.3	5	III
5	1	11	24-71	34	F	B	7.3	2	II
5	1	12	71-17	111	F	B	7.3	2	II
5	1	13	17-19	73	F	T	14.6	3	I
5	1	14	19-61	39	F	T	7.3	4	III
5	1	15	61-12	11	F	T	7.3	4	III
5	1	16	11-204	24	F	T	7.3	4	III
5	1	111	204-12	38	F	T	7.3	4	III
5	1	17	11-93	40	H	T	7.3	4	III
5	1	18	93-57	33	H	T	7.3	4	III
5	1	19	57-10	31	F	T	7.3	3	III
5	1	20	10-117	12	F	T	14.6	3	I
5	1	21	117-55	37	F	T	14.6	4	I
5	1	22	55-9	44	H	T	7.3	3	III
35	1	23	55-152	14	F	T	7.0	4	III
0	1	24	10-155	72	M	T	6.0	5	IV
0	1	26	156-95	54	F	T	4.5	3	V
0	1	27	95-14	48	F	T	4.5	4	V
0	1	28	157-95	27	M	B	3.8	5	V
0	1	29	158-68	38	F	T	3.8	4	V
0	1	30	68-56	40	F	T	6.0	4	IV
0	1	31	56-117	30	F	T	6.0	4	IV
55	1	32	159-231	109	F	T	3.8	4	V
55	1	134	231-21	109	F	T	6.0	3	IV
55	1	33	21-74	51	F	T	4.5	5	V
55	1	34	74-160	106	F	T	4.5	4	V
0	1	35	17-18	38	F	B	7.3	4	III
0	1	36	18-15	97	F	T	7.3	4	III
0	1	37	15-16	82	F	T	7.3	4	III
0	1	38	16-66	32	F	T	6.0	4	IV
0	1	39	66-65	94	F	T	3.8	4	V
0	1	40	65-213	20	F	T	4.5	4	V
0	1	134	212-213	16	F	T	4.5	4	V
0	1	122	161-212	12	F	T	4.5	4	V
0	1	42	97-21	92	M	T	4.5	4	V
0	1	43	79-22	129	F	T	6.0	3	IV
0	1	44	22-101	63	F	T	4.5	4	V
0	1	45	101-66	92	F	T	6.0	4	IV
0	1	46	66-62	138	F	T	5.0	3	V

App. Table 1-2 Continued

LINK NUMBER			NODE NO.	DISTANCE (km)	TERRAIN	TYPE OF SURFACE	WIDTH (m)	PAVEMENT CONDITION	CLASS
ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.							
0	1	47	62-60	46	M	T	5.0	5	V
0	1	48	60-92	58	H	T	3.8	5	V
0	1	49	92-57	62	F	T	6.0	4	IV
0	1	50	17-50	68	F	T	7.3	4	III
0	1	51	21-85	34	F	T	7.3	4	III
0	1	52	85-22	23	F	T	6.5	4	IV
0	1	53	22-23	34	F	T	6.0	4	IV
0	1	54	75-16	113	F	T	6.0	4	IV
0	1	55	16-13	117	F	T	5.0	5	V
0	1	56	13-208	95	F	T	6.5	4	IV
0	1	112	208-207	18	F	T	6.5	4	IV
0	1	113	207-206	21	F	T	6.5	4	IV
0	1	114	206-12	37	F	T	6.5	4	IV
0	1	57	18-63	70	F	T	7.3	4	III
0	1	58	13-209	43	F	T	6.5	4	IV
0	1	118	209-63	20	F	T	6.5	4	IV
0	1	59	13-62	47	F	T	7.3	4	III
0	1	60	14-210	41	F	T	5.5	4	IV
0	1	119	210-62	48	F	T	5.5	4	IV
0	1	61	18-19	53	F	T	6.5	4	IV
0	1	62	19-20	48	F	T	5.0	4	V
0	1	63	20-61	42	F	T	6.5	4	IV
0	1	64	15-215	38	F	T	6.0	4	IV
0	1	127	215-17	100	F	T	6.0	4	IV
0	1	65	25-78	91	F	T	4.5	5	V
0	1	66	78-26	78	F	T	6.0	4	IV
0	1	67	26-76	40	F	T	6.0	4	IV
0	1	68	76-24	46	F	T	5.5	4	IV
0	1	69	67-15	40	F	T	6.5	4	IV
0	1	70	15-64	37	F	T	7.3	4	III
0	1	71	64-13	52	F	T	6.5	4	IV
0	1	72	27-80	107	F	T	4.5	3	V
0	1	73	26-73	130	F	T	5.5	4	IV
0	1	74	69-71	25	F	T	6.0	4	IV
0	1	75	77-78	50	F	T	6.0	4	IV
0	1	76	119-120	31	F	T	6.5	4	IV
0	1	77	120-121	57	F	T	6.0	4	IV
0	1	78	23-120	40	F	T	6.0	4	IV
0	1	79	120-77	57	F	T	6.0	4	IV
0	1	80	77-98	35	F	T	6.0	4	IV
0	1	81	98-76	40	F	T	6.0	4	IV
0	1	82	76-216	32	F	T	6.0	4	IV
0	1	131	216-73	22	F	T	6.0	4	IV
0	1	83	73-69	24	F	T	6.0	4	IV
0	1	84	69-17	138	F	T	6.0	4	IV
0	1	85	67-70	48	F	T	6.0	4	IV
0	1	86	98-72	48	F	T	6.0	4	IV
0	1	87	72-70	40	F	T	6.0	4	IV

App. Table 1-2 Continued

LINK NUMBER			NODE NO.	DISTANCE (km)	TERRAIN	TYPE OF SURFACE	WIDTH (m)	PAVEMENT CONDITION	CLASS
ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.							
0	1	88	70-16	51	F	T	6.0	4	IV
0	1	89	16-64	82	F	T	6.0	4	IV
0	1	90	64-63	33	F	T	6.5	4	IV
0	1	91	63-19	99	F	T	5.5	5	IV
0	1	92	22-100	60	F	T	5.5	4	IV
0	1	93	100-65	104	F	T	5.5	4	IV
0	1	94	65-211	40	F	T	6.0	5	IV
0	1	121	211-14	87	F	T	6.0	5	IV
0	1	95	14-58	99	F	T	5.0	5	V
0	1	96	60-58	47	F	T	5.5	4	IV
0	1	97	58-68	82	F	T	5.5	4	IV
0	1	98	68-9	81	H	T	3.8	4	V
0	1	99	58-56	87	F	T	6.0	5	IV
0	1	100	93-92	68	F	T	4.5	5	V
0	1	101	92-58	46	F	T	4.0	5	V
0	1	102	16-67	64	F	T	4.0	5	V
0	1	103	67-71	57	F	T	6.0	4	IV
0	1	104	74-99	29	F	T	6.0	5	IV
0	1	105	99-214	8	F	T	3.8	5	V
0	1	126	214-100	9	F	T	3.8	5	V
0	1	106	100-101	31	F	T	3.8	4	V
0	1	107	85-99	50	F	T	5.5	3	IV
5	2	1	39-118	150	F	B	7.3	2	II
5	2	2	118-33	15	F	T	7.3	2	II
5	2	3	33-87	46	F	T	7.3	4	III
5	2	4	87-86	39	F	T	7.3	2	III
5	2	5	86-102	70	F	B	7.3	4	III
5	2	6	102-32	137	F	T	7.3	5	III
5	2	7	32-29	25	F	T	7.3	5	III
5	2	8	29-82	112	F	T	7.3	3	III
5	2	9	82-150	13	F	T	7.3	4	III
25	2	10	39-151	23	F	B	7.3	4	III
65	2	11	29-28	31	F	T	6.0	4	IV
65	2	12	28-83	42	F	T	6.0	4	IV
65	2	13	83-154	11	F	T	6.0	4	IV
55	2	14	118-232	30	F	T	3.8	5	V
55	2	49	232-34	165	F	T	6.0	4	IV
55	2	15	34-30	119	F	T	6.0	3	IV
55	2	16	30-28	62	F	T	6.0	4	IV
55	2	17	28-84	64	F	T	5.0	4	V
55	2	18	84-81	47	F	T	5.5	4	IV
55	2	19	81-159	2	F	T	5.5	4	IV
0	2	20	33-105	34	F	B	7.3	4	III
0	2	21	105-106	32	F	B	6.5	4	IV
0	2	22	106-35	74	F	B	5.0	4	V
0	2	23	39-37	102	F	B	7.3	4	III
0	2	24	37-33	100	F	B	7.3	4	III
0	2	25	34-102	24	F	B	5.5	5	IV

App. Table 1-2 Continued

LINK NUMBER			NODE NO.	DISTANCE (km)	TERRAIN	TYPE OF SURFACE	WIDTH (m)	PAVEMENT CONDITION	CLASS
ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.							
0	2	26	86-31	21	F	B	7.3	5	III
0	2	27	31-103	16	F	B	3.8	4	V
0	2	28	103-36	48	F	B	5.5	4	IV
0	2	29	36-106	68	F	B	5.5	4	IV
0	2	30	106-122	40	F	B	5.5	5	IV
0	2	31	122-38	45	F	B	5.5	5	IV
0	2	32	38-109	81	F	B	5.0	5	V
0	2	33	109-37	24	F	B	5.5	5	IV
0	2	34	33-107	34	F	B	6.0	5	IV
0	2	35	107-88	16	F	B	6.0	4	IV
0	2	36	88-38	52	F	B	5.5	5	IV
0	2	37	103-104	30	F	B	3.8	3	V
0	2	38	104-217	41	F	B	5.5	4	IV
0	2	49	217-105	14	F	B	5.5	4	IV
0	2	39	105-108	45	F	B	5.0	5	V
0	2	40	108-88	26	F	B	5.5	5	IV
0	2	41	107-109	77	F	B	5.0	5	V
0	2	42	81-82	31	F	B	5.5	5	IV
0	2	43	87-104	26	F	B	5.5	5	IV
0	2	44	104-36	40	F	B	5.5	4	IV
0	2	45	30-83	135	F	B	5.0	4	V
0	2	46	83-84	76	F	B	5.5	3	IV
0	2	47	108-122	13	F	B	5.5	5	IV
5	3	1	9-116	9	F	B	7.3	2	III
5	3	2	116-53	22	F	B	7.3	2	III
5	3	3	53-2	35	F	B	14.6	2	I
5	3	4	2-201	53	M	B	7.3	4	III
35	3	5	152-90	19	H	T	6.0	4	IV
35	3	6	90-4	47	M	T	7.3	4	III
35	3	7	4-54	24	M	T	6.0	4	IV
35	3	8	54-89	122	M	T	6.0	4	IV
35	3	9	89-229	157	M	B	6.5	4	IV
50	3	10	5-153	90	H	B	5.5	4	IV
0	3	11	155-4	55	M	T	5.5	3	IV
0	3	12	59-156	39	H	D	5.0	4	V
0	3	13	94-157	37	M	T	3.8	3	V
0	3	14	3-202	186	M	T	6.0	4	V
0	3	15	3-158	50	F	D	6.0	2	IV
55	3	16	160-5	51	F	T	4.0	5	V
55	3	17	5-59	94	F	T	6.0	3	IV
55	3	18	59-6	47	F	T	6.0	4	IV
55	3	19	6-94	96	H	T	6.0	5	IV
55	3	20	94-3	29	F	T	5.5	5	V
55	3	21	3-2	64	M	T	6.0	4	IV
0	3	22	161-5	8	F	T	5.5	3	IV
0	3	23	53-1	23	F	T	6.5	3	IV
0	3	24	1-52	66	H	T	7.0	3	III
0	3	25	52-230	132	M	D	5.5	3	IV

App. Table 1-2 Continued

LINK NUMBER			NODE NO.	DISTANCE (km)	TERRAIN	TYPE OF SURFACE	WIDTH (m)	PAVEMENT CONDITION	CLASS
ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.							
0	3	26	2-91	29	F	D	7.3	4	III
0	3	27	91-1	28	F	D	7.3	3	III
0	3	28	1-115	46	F	D	7.3	3	III
0	3	29	115-90	88	M	D	7.0	4	III
0	3	30	52-8	35	F	T	6.0	3	IV
0	3	31	8-89	82	M	T	3.8	4	V
0	3	32	116-115	33	F	D	6.0	4	IV
0	3	33	2-1	80	F	D	7.3	4	III
25	4	1	151-114	77	F	B	4.0	4	V
25	4	2	114-44	76	F	B	4.0	4	V
25	4	3	44-227	196	M	B	3.8	5	V
25	4	34	227-110	104	M	B	3.8	5	V
25	4	4	110-43	69	F	B	3.8	5	V
25	4	5	43-40	145	H	B	6.0	4	IV
25	4	6	40-221	130	H	B	6.0	4	IV
50	4	7	96-219	139	F	B	4.5	4	V
50	4	26	219-153	70	F	B	4.5	4	V
50	4	8	96-40	175	F	B	3.8	4	V
65	4	9	154-45	147	F	D	6.0	5	IV
65	4	10	45-40	148	M	T	6.0	4	IV
0	4	11	40-218	182	M	G	3.8	5	V
0	4	27	218-41	35	M	G	3.8	5	V
0	4	12	41-47	189	F	B	3.8	3	V
40	4	13	42-223	181	H	D	3.8	3	V
40	4	24	223-40	129	H	D	3.8	3	V
40	4	14	42-51	365	F	G	3.8	5	V
0	4	15	112-228	155	F	G	3.8	4	V
0	4	29	228-44	173	F	G	3.8	4	V
0	4	16	112-111	118	F	G	3.8	4	V
0	4	17	111-46	230	F	G	3.8	4	V
0	4	18	112-225	405	H	G	3.8	4	V
0	4	32	225-224	47	H	G	3.8	4	V
0	4	33	224-110	78	H	G	3.8	4	V
0	4	19	114-113	372	F	G	3.8	4	V
0	4	20	113-46	169	F	G	3.8	4	V
0	4	21	111-113	115	F	B	3.8	4	V
0	4	22	41-96	72	M	B	3.8	4	V
0	4	23	45-222	17	H	G	3.8	4	V
0	4	28	222-97	255	H	G	3.8	4	V
0	1	108	205-92	91	F	B	3.8	3	V
0	1	109	11-205	32	F	B	3.8	4	V
0	1	110	205-208	31	F	T	6.0	3	IV
0	1	115	206-19	69	F	T	6.0	4	IV
0	1	116	207-209	70	F	G	3.8	4	V
0	1	117	204-207	51	F	T	6.0	4	IV
0	1	120	14-212	100	F	G	3.8	4	V
0	1	123	212-211	50	F	B	5.5	4	IV

App. Table 1-2 Continued

LINK NUMBER			NODE NO.	DISTANCE (km)	TERRAIN	TYPE OF SURFACE	WIDTH (m)	PAVEMENT CONDITION	CLASS
ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.							
0	1	124	211-210	125	F	B	5.5	4	IV
0	1	125	213-214	118	F	G	3.8	4	V
0	1	128	215-71	62	F	B	3.8	3	V
0	1	129	67-24	80	F	T	6.0	4	IV
0	1	130	24-216	42	F	B	6.0	3	IV
0	1	132	77-121	99	F	B	5.0	3	V
0	1	133	25-26	242	F	B	3.8	4	V
0	2	48	217-33	60	F	B	3.8	4	V
0	3	34	203-220	80	M	T	3.8	3	V
0	3	35	5-203	105	F	T	6.0	3	IV
0	3	36	6-203	150	H	T	6.0	3	IV
0	3	37	230-7	73	M	D	5.5	4	IV
0	3	38	54-48	18	M	B	5.5	4	IV
0	4	25	220-219	97	M	G	3.8	4	V
0	4	30	226-228	166	M	G	3.8	4	V
0	4	31	223-224	178	M	B	3.8	4	V
0	4	35	225-226	26	M	G	3.8	4	V
0	4	36	226-227	61	M	G	3.8	4	V
0	4	37	218-222	180	M	G	3.8	4	V
99	0	1	49-201	192	M	T	7.3	4	III
99	0	2	49-202	146	M	T	3.8	4	V
99	0	3	49-221	565	H	B	6.0	4	IV
99	0	4	47-229	430	M	B	6.5	4	IV

App. Table 1-3 Bridge Inventory Surveyed

LINK NUMBER			NODE NO.	LOCATION	Number of Brige					NUMBER OF RAILWAY CROSSING	NUMBER OF FLYOVER BRIDGE
ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.			Narrow	Long S.	Poor	Others	Total		
5	2	1	39-118	Karachi - Kotri	0	5	0	6	11	1	0
5	2	2	118-33	Kotri - Hyderabad	0	1	0	1	2	0	0
5	2	3	33-87	Hyderabad - Hala	0	0	0	4	4	0	0
5	2	4	87-86	Hala - Sakrand	0	0	0	1	1	0	0
5	2	5	86-102	Sakrand - Moro	0	0	0	3	3	0	0
5	2	6	102-32	Moro - Khairpur	1	0	0	7	8	4	0
5	2	7	32-29	Khairpur - Rohri	0	3	0	2	5	1	0
5	2	8	29-82	Rohri - Ubauro	0	0	1	3	4	0	0
5	2	9	82-150	Ubauro - Boundary	0	0	0	2	2	0	0
5	1	1	150-27	Boundary - Rahimyar Khan	0	0	0	1	1	0	0
5	1	2	27-79	Rahimyar Khan - T. M. Pana	1	0	1	0	2	0	0
5	1	3	79-80	T. M. Pana - Chani Goth	0	0	0	1	1	0	0
5	1	4	80-25	Chani Goth - Bahawalpur	0	0	0	4	4	1	1
5	1	5	25-121	Bahawalpur - Lodhran	0	1	0	1	2	3	1
5	1	6	121-23	Lodhran - Multan	0	1	0	5	6	0	1
5	1	7	23-75	Multan - Kabirwala	0	0	0	1	1	0	0
5	1	8	75-119	Kabirwara - Khanewal	0	0	0	0	0	0	0
5	1	9	119-72	Khanewal - Chichawatni	1	1	1	2	5	3	0
5	1	10	72-24	Chichawatni - Sahiwal	0	0	0	2	2	0	0
5	1	11	24-71	Sahiwal - Okara	0	0	0	3	3	1	0
5	1	12	71-17	Okara - Lahore	0	2	0	4	6	0	1
5	1	13	17-19	Lahore - Gujranwala	0	3	0	21	24	1	0
5	1	14	19-61	Gujranwala - Wazirabad	0	1	0	2	3	0	0
5	1	15	61-12	Wazirabad - Gujrat	0	3	0	0	3	0	1
5	1	111	12-204	Gujrat - Kharian	0	0	0	0	0	0	0
5	1	16	204-11	Kharian - Jhelum	0	1	0	2	3	1	1
5	1	17	11-93	Jhelum - Sohawa	0	3	0	6	9	0	2
5	1	18	93-57	Sohawa - Mandra	0	0	0	3	3	0	1
5	1	19	57-10	Mandra - Rawalpindi	0	2	0	1	3	0	0
5	1	20	10-117	Rawalpindi - Tarnual	0	0	0	2	2	0	0
5	1	21	117-55	Tarnual - Hasan Abdal	1	0	0	3	4	1	0
5	1	22	55-9	Hasan Abdal - Attock	0	0	0	7	8	1	0
5	3	1	9-116	Attock - Jehangira	0	1	0	7	8	0	0
5	3	2	116-53	Jehangira - Nowshera	0	0	0	9	9	1	0
5	3	3	53-2	Nowshera - Peshawar	0	0	1	15	16	0	0
5	3	4	2-201	Peshawar - Boundary	---	---	---	---	12	---	---
25	2	10	39-151	Karachi - Boundary	0	0	0	0	0	1	0
25	4	1	151-114	Boundary - Wingai	0	1	0	5	6	0	0
25	4	2	114-44	Wingai - Bela	0	0	0	11	11	0	0
25	4	3	44-227	Bela - Khuzdar	0	1	2	38	41	0	0
25	4	34	227-110	Khuzdar - Surab	0	0	0	3	3	0	0
25	4	4	110-43	Surab - Kalat	0	0	0	1	1	0	0
25	4	5	43-40	Kalat - Quetta	0	0	0	5	5	1	0
25	4	6	40-221	Quetta - Chaman	0	1	1	5	7	3	1
35	1	23	55-152	Hasan Abdal - Boundary	0	1	0	4	5	1	0
35	3	5	152-90	Boundary - Hairpur	0	0	0	4	4	0	0
35	3	6	90-4	Hairpur - Abbottabad	0	2	0	4	6	0	0
35	3	7	4-54	Abbottabad - Mansehra	0	0	0	4	4	0	0
35	3	8	54-89	Mansehra - Bisham	0	3	0	10	13	0	0
35	3	9	89-229	Bisham - Boundary	1	1	0	17	19	0	0
40	4	24	40-223	Quetta - Ahmadwal	---	---	---	---	---	---	---
40	4	13	223-42	Ahmadwal - Dalbandin	---	---	---	---	---	---	---
40	4	14	42-51	Dalbandin - Taftan	---	---	---	---	---	---	---
50	3	10	5-153	D. I. Khan - Boundary	---	---	---	---	4	---	---
50	4	26	153-219	Boundary - Zhob	---	---	---	---	---	---	---
50	4	7	219-96	Zhob - Qila Saifullah	---	---	---	---	---	---	---
50	4	8	96-40	Qila Saifullah - Quetta	---	---	---	---	5	---	---
55	2	14	118-232	Kotri - Gopang	0	1	0	4	5	1	0
55	2	49	232-34	Gopang - Dadu	1	0	1	17	19	4	0
55	2	15	34-30	Dadu - Larkana	0	0	0	11	11	2	0
55	2	16	30-28	Larkana - Shikarpur	0	0	2	6	8	0	0
55	2	17	28-84	Shikarpur - Kund Kot	1	0	0	7	8	0	0
55	2	18	84-81	Kund Kot - Kashmor	0	0	0	1	1	1	0
55	2	19	81-159	Kashmor - Boundary	0	0	0	2	2	1	0
55	1	32	159-231	Boundary - Rajanpur	0	1	0	9	10	1	0

App. Table 1-3 Continued.

LINK NUMBER			NODE NO.	LOCATION	Number of Brige					NUMBER OF RAILWAY CROSSING	NUMBER OF FLYOVER BRIDGE
ROAD NO.	PROVINCIAL NO.	SERIAL NO.			Narrow	Long S.	Poor	Others	Total		
55	1	134	231-21	Rajanpur - D.G.Khan	1	0	0	7	8	1	0
55	1	33	21-74	D.G.Khan - Shadan Lund	0	2	0	6	8	0	0
55	1	34	74-160	Shadan Lund - Boundary	0	0	0	1	1	1	0
55	3	16	160-5	Boundary - D.I.Khan	0	4	0	5	9	0	0
55	3	17	5-59	D.I.Khan - Tajazai	0	0	0	6	6	1	0
55	3	18	59-6	Tajazai - Bannu	0	1	0	1	2	1	0
55	3	19	6-94	Bannu - Jatta	5	4	2	6	13	0	0
55	3	20	94-3	Jatta - Kohat	4	1	0	0	4	1	0
55	3	21	3-2	Kohat - Peshawar	2	0	0	9	11	0	1
65	2	11	29-28	Rohri - Shikarpur	0	3	1	4	8	0	0
65	2	12	28-83	Shikarpur - Jacobabad	0	0	1	3	4	2	0
65	2	13	83-154	Jacobabad - Boundary	0	0	0	0	0	0	0
65	4	9	154-45	Boundary - Sibi	0	0	0	33	33	3	0
65	4	10	45-40	Sibi - Quetta	2	3	3	8	15	4	0

App. Table 1-4 List of Narrow Bridges

LOCATION				LENGTH (m)	LINK NUMBER			NODE NO.	REMARKS
					ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.		
93	Km	from	Moro	20	5	2	6	102-32	
87	Km	from	Rahimyar Khan	20	5	1	2	27-79	
15	Km	from	Khanewal	20	5	1	9	119-72	
20	Km	from	Tarnual	40	5	1	21	117-55	
98	Km	from	Bisham	20	35	3	9	89-229	
87	Km	from	Gopang	20	55	2	49	232-34	
70	Km	from	Larkana	10	55	2	16	30-28	Poor
45	Km	from	Shikarpur	20	55	2	17	28-84	
35	Km	from	Rajanpur	10	55	1	134	231-21	
4	Km	from	Bannu	250	55	3	19	6-94	Long Span, Poor
32	Km	from	Bannu	100	55	3	19	6-94	Long Span, Poor
49	Km	from	Bannu	70	55	3	19	6-94	
72	Km	from	Bannu	90	55	3	19	6-94	Long Span
81	Km	from	Bannu	70	55	3	19	6-94	
4	Km	from	Jatta	40	55	3	20	94-3	
9	Km	from	Jatta	20	55	3	20	94-3	
15	Km	from	Jatta	10	55	3	20	94-3	
21	Km	from	Jatta	100	55	3	20	94-3	Long Span
25	Km	from	Kohat	10	55	3	21	3-2	
53	Km	from	Kohat	10	55	3	21	3-2	
25	Km	from	Shikarpur	4.5	65	2	12	28-83	Poor
5	Km	from	Sibi	100	65	4	10	45-40	Long Span
50	Km	from	Sibi	50	65	4	10	45-40	

App. Table 1-5 List of Poor Bridges

LOCATION	WIDTH (m)	LENGTH (m)	LINK NUMBER			NODE NO.	REMARKS
			ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.		
73 Km from Rohri	6	20	5	2	8	29-82	
64 Km from Rahimyar Khan	6	20	5	1	2	27-79	
20 Km from Khanewal	6	15	5	1	9	119-72	
19 Km from Nowshera	6	20	5	3	3	53-2	
20 Km from Bela	7	20	25	4	3	44-227	
165 Km from Bela	8	25	25	4	3	44-227	
5 Km from Quetta	6	20	25	4	6	40-221	
26 Km from Larkana	8	20	55	2	16	30-28	
70 Km from Larkana	5	10	55	2	16	30-28	Narrow
5 Km from Bannu	5	250	55	3	19	6-94	Narrow, Long S
42 Km from Bannu	5	100	55	3	19	6-94	Narrow, Long S
30 Km from Rohri	6	20	65	2	11	29-28	
25 Km from Shikarpur	4.5	20	65	2	12	28-83	Narrow
106 Km from Sibi	6	30	65	4	10	45-40	
116 Km from Sibi	6	30	65	4	10	45-40	
126 Km from Sibi	6	30	65	4	10	45-40	

App. Table 1-6 List of Railway Crossings

LOCATION	LINK NUMBER			NODE NO.	LEVEL CROSSING	BRIDGE	REMARKS
	ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.				
138 Km from Karachi	5	2	1	39-118	O		
2 Km from Moro	5	2	6	102-32	O		
19 Km from Moro	5	2	6	102-32	O		
52 Km from Moro	5	2	6	102-32	O		
93 Km from Moro	5	2	6	102-32	O		
4 Km from Khairpur	5	2	7	32-29	O		
12 Km from T. M. Pana	5	1	3	79-80		0	4-Lane
67 Km from Chani Goth	5	1	4	80-25	O		
1 Km from Bahawalpur	5	1	5	25-121	O		
15 Km from Bahawalpur	5	1	5	25-121		O	4-Lane
21 Km from Bahawalpur	5	1	5	25-121	O		
21 Km from Bahawalpur	5	1	5	25-121	O		
75 Km from Lodhran	5	1	6	121-23		O	Long Span
1 Km from Khanewal	5	1	9	119-72	O		
27 Km from Khanewal	5	1	9	119-72	O		
60 Km from Khanewal	5	1	9	119-72	O		
22 Km from Sahiwal	5	1	11	24-71	O		
32 Km from Okara	5	1	12	71-17		0	4-Lane, Long Span
7 Km from Lahore	5	1	13	17-19	O		
10 Km from Wazirabad	5	1	15	61-12		0	Long Span
5 Km from Kharian	5	1	16	204-11		0	New
24 Km from Kharian	5	1	16	204-11	O		
5 Km from Jhelum	5	1	17	11-93		0	
6 Km from Jhelum	5	1	17	11-93		0	
19 Km from Sohawa	5	1	18	93-57		0	
2 Km from Tarnual	5	1	21	117-55	O		
8 Km from Hasan Abdal	5	1	22	55-9	O		
25 Km from Jehangira	5	3	2	116-53	O		
7 Km from Karachi	25	2	10	39-151	O		
102 Km from Kalat	25	4	5	43-40	O		
37 Km from Quetta	25	4	6	40-221	O		
38 Km from Quetta	25	4	6	40-221	O		
44 Km from Quetta	25	4	6	40-221	O		
92 Km from Quetta	25	4	6	40-221		0	Under Railway
40 Km from Hasan Abdal	35	1	23	55-152	O		
12 Km from Kotri	55	2	14	118-232	O		
21 Km from Gopang	55	2	49	232-34	O		
63 Km from Gopang	55	2	49	232-34	O		
82 Km from Gopang	55	2	49	232-34	O		
114 Km from Gopang	55	2	49	232-34	O		
5 Km from Dadu	55	2	15	34-30	O		
194 Km from Dadu	55	2	15	34-30	O		
46 Km from Kund Kot	55	2	18	84-81	O		
4 Km from Kashmor	55	2	19	81-159	O		
28 Km from Boundary	55	1	32	159-231	O		
2 Km from Rajanpur	55	1	134	231-21	O		
2 Km from Shadan Lund	55	1	34	74-160	O		
63 Km from D. I. Khan	55	3	17	5-59	O		

App. Table 1-6 Continued

LOCATION	LINK NUMBER			NODE NO.	LEVEL CROSSING	BRIDGE	REMARKS
	ROAD NO.	PROVIN-CIAL NO.	SERIAL NO.				
3 Km from Tajazai	55	3	18	59-6	O		
25 Km from Jatta	55	3	20	94-3	O		
65 Km from Kohat	55	3	21	3-2		0	
36 Km from Shikarpur	65	2	12	28-83	O		
39 Km from Shikarpur	65	2	12	28-83	O		
12 Km from Boundary	65	4	9	154-45	O		
109 Km from Boundary	65	4	9	154-45	O		
118 Km from Boundary	65	4	9	154-45	O		
1 Km from Sibi	65	4	10	45-40	O		
5 Km from Sibi	65	4	10	45-40	O		
132 Km from Sibi	65	4	10	45-40	O		
153 Km from Sibi	65	4	10	45-40	O		

App. Table 1-7 1985/86 Counted Volume/Capacity Ratio

ROAD	NODE		Km	Ter.	Width	Class	M.C	CAR	BUS	TRUCK	TOTAL	PCU(V)	PCU(C)	V/C*	87V/C**
5	150	27	48	F	6.5	4	118	223	235	4,934	5,510	15,789	20,000	0.79	0.96
5	80	25	71	F	7.0	3	352	583	400	4,630	5,965	15,849	24,000	0.66	0.81
5	25	121	20	F	7.3	3	230	500	407	4,007	5,144	13,857	24,000	0.58	0.70
5	121	23	75	F	6.0	4	820	927	575	1,156	3,478	6,530	20,000	0.33	0.40
5	23	75	29	F	6.5	4	213	1,359	668	943	3,183	6,299	20,000	0.31	0.38
5	75	119	14	F	6.0	4	498	339	275	1,305	2,417	5,328	20,000	0.27	0.33
5	119	72	80	F	6.5	4	436	949	578	1,632	3,595	7,797	20,000	0.39	0.48
5	72	24	42	F	7.3	3	301	829	608	1,422	3,160	7,070	24,000	0.29	0.36
5	24	71	34	F	7.3	2	342	1,404	631	1,547	3,924	8,109	24,000	0.34	0.41
5	71	17	111	F	7.3	2	413	1,899	734	2,074	5,120	10,530	24,000	0.44	0.54
5	17	19	73	F	14.6	1	1,333	9,569	2,145	2,248	15,295	23,415	90,000	0.26	0.32
5	19	61	39	F	7.3	3	2,051	5,820	1,230	1,862	10,963	16,122	24,000	0.67	0.82
5	61	12	11	F	7.3	3	355	4,385	1,515	3,765	10,020	20,403	24,000	0.85	1.04
5	11	204	24	F	7.3	3	424	2,658	1,400	3,086	7,568	16,328	24,000	0.68	0.83
5	204	12	38	F	7.3	3	353	2,980	1,152	3,183	7,668	16,162	24,000	0.67	0.82
5	11	93	40	H	7.3	3	137	3,082	956	3,306	7,481	20,199	24,000	0.84	1.03
5	93	57	33	H	7.3	3	85	2,999	837	3,028	6,949	18,502	24,000	0.77	0.94
5	57	10	31	F	7.3	3	40	3,844	1,083	2,906	7,873	15,831	24,000	0.66	0.81
5	10	117	12	F	14.6	1	496	7,067	1,576	5,368	14,507	28,147	90,000	0.31	0.38
5	117	55	37	F	14.6	1	479	5,012	1,134	4,231	10,856	21,347	90,000	0.24	0.29
5	55	9	44	H	7.3	3	729	3,888	1,077	3,133	8,827	21,093	24,000	0.88	1.07
35	55	152	14	F	7.0	3	79	2,825	483	1,071	4,458	7,527	24,000	0.31	0.38
0	10	155	72	M	6.0	4	91	2,035	240	319	2,685	5,435	20,000	0.27	0.33
0	156	95	54	F	4.5	5	85	354	88	391	918	1,834	8,664	0.21	0.26
0	95	14	48	F	4.5	5	470	664	163	472	1,769	2,804	8,664	0.32	0.40
0	158	68	38	F	3.8	5	29	207	130	205	571	1,227	4,529	0.27	0.33
0	68	56	40	F	6.0	4	82	549	160	253	1,044	1,829	20,000	0.09	0.11
0	56	117	30	F	6.0	4	104	981	359	658	2,102	4,084	20,000	0.20	0.25
55	159	231	109	F	3.8	5	280	149	123	277	829	1,489	4,529	0.33	0.40
55	231	21	109	F	6.0	4	280	149	123	277	829	1,489	20,000	0.07	0.09
55	21	74	51	F	4.5	5	417	185	157	232	991	1,561	8,664	0.18	0.22
55	74	160	106	F	4.5	5	157	149	102	153	561	993	8,664	0.11	0.14
0	17	18	38	F	7.3	3	567	2,108	728	846	4,249	7,114	24,000	0.30	0.36
0	18	15	97	F	7.3	3	434	1,390	1,324	865	4,013	8,174	24,000	0.34	0.42
0	15	16	82	F	7.3	3	618	870	826	1,257	3,571	7,428	24,000	0.31	0.38
0	16	66	32	F	6.0	4	78	417	445	773	1,713	4,110	20,000	0.21	0.25
0	66	65	94	F	3.8	5	28	93	98	171	390	914	4,529	0.20	0.25
0	65	213	20	F	4.5	5	32	150	182	162	526	1,198	8,664	0.14	0.17
0	212	213	16	F	4.5	5	399	468	195	462	1,524	2,639	8,664	0.30	0.37
0	97	21	92	M	4.5	5	88	70	25	645	828	4,134	8,664	0.48	0.58

Remarks; * Congestion Ratio - 1985/86

** Estimated congestion ratio - 1987/88
(85/86 Counted traffic volume x Annual growth rate/Design capacity,
Annual growth rate; Punjab 10.5 %, Sind 5.3%, N.W.F.P. 7.7%,
Baluchistan 7.0%)

1985/86 COUNTED VOLUME/CAPACITY RATIO ##### (2/5)

ROAD	NODE		Km	Ter.	Width	Class	M.C	CAR	BUS	TRUCK	TOTAL	PCU(V)	PCU(C)	V/C*	87V/C**
0	79	22	129	F	6.0	4	412	520	276	760	1,968	3,834	20,000	0.19	0.23
0	22	101	63	F	4.5	5	101	117	97	375	690	1,584	8,664	0.18	0.22
0	101	66	92	F	6.0	4	59	78	53	319	509	1,224	20,000	0.06	0.07
0	66	62	138	F	5.0	5	198	249	143	223	813	1,446	11,618	0.12	0.15
0	62	60	46	M	5.0	5	245	388	282	798	1,713	6,991	11,618	0.60	0.73
0	60	92	58	F	3.8	5	399	717	177	341	1,634	2,471	4,529	0.55	0.67
0	92	57	62	F	6.0	4	136	1,250	291	380	2,057	3,331	20,000	0.17	0.20
0	17	50	68	F	7.3	3	4,284	4,254	563	1,054	10,155	11,247	24,000	0.47	0.57
0	21	85	34	F	7.3	3	121	493	148	674	1,436	3,020	24,000	0.13	0.15
0	85	22	23	F	6.5	4	157	580	267	750	1,754	3,710	20,000	0.19	0.23
0	22	23	34	F	6.0	4	369	1,351	667	1,142	3,529	6,963	20,000	0.35	0.43
0	75	16	113	F	6.0	4	171	432	272	1,597	2,472	6,125	20,000	0.31	0.37
0	16	13	117	F	5.0	5	761	775	390	395	2,321	3,511	11,618	0.30	0.37
0	13	208	95	F	6.5	4	162	402	226	611	1,401	2,994	20,000	0.15	0.18
0	206	12	37	F	6.5	4	701	671	567	800	2,739	5,123	20,000	0.26	0.31
0	18	63	70	F	7.3	3	945	1,588	675	1,479	4,687	8,523	24,000	0.36	0.43
0	13	209	43	F	6.5	4	750	582	222	379	1,933	2,760	20,000	0.14	0.17
0	209	63	20	F	6.5	4	107	106	9	69	291	394	20,000	0.02	0.02
0	13	62	47	F	7.3	3	319	924	737	1,276	3,256	7,123	24,000	0.30	0.36
0	14	210	41	F	5.5	4	142	397	193	316	1,048	1,995	20,000	0.10	0.12
0	210	62	48	F	5.5	4	612	1,256	552	809	3,229	5,645	20,000	0.28	0.34
0	18	19	53	F	6.5	4	390	745	606	1,440	3,181	7,078	20,000	0.35	0.43
0	19	20	48	F	5.0	5	702	1,541	930	636	3,809	6,590	11,618	0.57	0.69
0	20	61	42	F	6.5	4	925	573	165	149	1,812	1,978	20,000	0.10	0.12
0	15	215	38	F	6.0	4	1,199	1,036	563	570	3,368	5,035	20,000	0.25	0.31
0	215	17	100	F	6.0	4	247	701	307	506	1,761	3,264	20,000	0.16	0.20
0	25	78	91	F	4.5	5	347	289	186	194	1,016	1,603	8,664	0.18	0.23
0	78	26	78	F	6.0	4	316	328	318	270	1,232	2,250	20,000	0.11	0.14
0	26	76	40	F	6.0	4	88	105	63	52	308	494	20,000	0.02	0.03
0	76	24	46	F	5.5	4	1,134	670	306	610	2,720	3,985	20,000	0.20	0.24
0	67	15	40	F	6.5	4	1,642	1,177	1,047	1,452	5,318	9,495	20,000	0.47	0.58
0	15	64	37	F	7.3	3	2,131	1,979	718	2,002	6,830	11,205	24,000	0.47	0.57
0	64	13	52	F	6.5	4	545	1,221	803	3,056	5,625	13,071	20,000	0.65	0.80
0	27	80	107	F	4.5	5	838	645	221	595	2,299	3,512	8,664	0.41	0.49
0	26	73	130	F	5.5	4	218	209	226	235	888	1,701	20,000	0.09	0.10
0	69	71	25	F	6.0	4	1,175	653	431	743	3,002	4,763	20,000	0.24	0.29
0	77	78	50	F	6.0	4	89	193	265	253	800	1,792	20,000	0.09	0.11
0	119	120	31	F	6.5	4	333	253	209	2,377	3,172	8,178	20,000	0.41	0.50
0	120	121	57	F	6.0	4	198	258	253	2,143	2,852	7,545	20,000	0.38	0.46
0	23	120	40	F	6.0	4	1,105	859	573	568	3,105	4,835	20,000	0.24	0.30

1985/86 COUNTED VOLUME/CAPACITY RATIO ##### (3/5)

ROAD	NODE		Km	Ter.	Width	Class	M.C	CAR	BUS	TRUCK	TOTAL	PCU(V)	PCU(C)	V/C*	87V/C**
0	120	77	57	F	6.0	4	213	407	280	462	1,362	2,740	20,000	0.14	0.17
0	77	98	35	F	6.0	4	315	457	435	458	1,665	3,294	20,000	0.16	0.20
0	98	76	40	F	6.0	4	863	430	388	471	2,152	3,439	20,000	0.17	0.21
0	76	216	32	F	6.0	4	179	162	202	231	774	1,551	20,000	0.08	0.09
0	216	73	22	F	6.0	4	301	222	192	299	1,014	1,846	20,000	0.09	0.11
0	73	69	24	F	6.0	4	346	356	336	474	1,512	2,959	20,000	0.15	0.18
0	69	17	138	F	6.0	4	341	235	173	403	1,152	2,134	20,000	0.11	0.13
0	67	70	48	F	6.0	4	440	289	507	464	1,700	3,422	20,000	0.17	0.21
0	98	72	48	F	6.0	4	683	295	280	414	1,672	2,719	20,000	0.14	0.17
0	72	70	40	F	6.0	4	378	329	551	504	1,762	3,683	20,000	0.18	0.22
0	70	16	51	F	6.0	4	546	390	173	529	1,638	2,769	20,000	0.14	0.17
0	16	64	82	F	6.0	4	202	281	187	1,301	1,971	4,846	20,000	0.24	0.30
0	64	63	33	F	6.5	4	363	641	392	1,501	2,897	6,502	20,000	0.33	0.40
0	63	19	99	F	5.5	4	364	157	137	293	951	1,629	20,000	0.08	0.10
0	22	100	60	F	5.5	4	75	107	130	491	803	2,008	20,000	0.10	0.12
0	100	65	104	F	5.5	4	185	249	196	662	1,292	2,916	20,000	0.15	0.18
0	65	211	40	F	6.0	4	39	123	156	560	878	2,291	20,000	0.11	0.14
0	211	14	87	F	6.0	4	203	452	238	627	1,520	3,149	20,000	0.16	0.19
0	14	58	99	F	5.0	5	661	635	140	670	2,106	3,396	11,618	0.29	0.36
0	60	58	47	F	5.5	4	167	424	98	290	979	1,672	20,000	0.08	0.10
0	58	68	82	F	5.5	4	47	273	38	177	535	942	20,000	0.05	0.06
0	68	9	81	H	3.8	5	225	798	27	235	1,285	1,959	4,529	0.43	0.53
0	58	56	87	F	6.0	4	136	1,249	230	872	2,487	4,623	20,000	0.23	0.28
0	93	92	68	F	4.5	5	148	426	117	182	873	1,397	8,664	0.16	0.20
0	92	58	46	F	4.0	5	499	908	155	328	1,890	2,607	5,710	0.46	0.56
0	16	67	64	F	4.0	5	468	216	138	266	1,088	1,662	5,710	0.29	0.36
0	67	71	57	F	6.0	4	99	265	224	312	900	1,923	20,000	0.10	0.12
0	74	99	29	F	6.0	4	55	107	129	290	581	1,392	20,000	0.07	0.08
0	214	100	9	F	3.8	5	95	67	109	122	393	808	4,529	0.18	0.22
0	100	101	31	F	3.8	5	152	84	32	147	415	697	4,529	0.15	0.19
0	85	99	50	F	5.5	4	99	191	165	727	1,182	2,917	20,000	0.15	0.18
5	39	118	150	F	7.3	2	77	2,410	619	6,149	9,255	22,753	24,000	0.95	1.05
5	33	87	46	F	7.3	3	188	1,153	383	3,691	5,415	13,469	24,000	0.56	0.62
5	87	86	39	F	7.3	3	175	1,248	387	3,661	5,471	13,480	24,000	0.56	0.62
5	86	102	70	F	7.3	3	605	858	307	3,876	5,646	13,710	24,000	0.57	0.63
5	102	32	137	F	7.3	3	336	706	205	3,610	4,857	12,319	24,000	0.51	0.57
5	32	29	25	F	7.3	3	510	1,031	310	5,951	7,802	20,069	24,000	0.84	0.93
5	29	82	112	F	7.3	3	839	1,124	313	4,527	6,803	16,064	24,000	0.67	0.74
25	39	151	23	F	7.3	3	376	3,068	354	1,854	5,652	9,880	24,000	0.41	0.46
65	29	28	31	F	6.0	4	262	1,754	394	1,300	3,710	6,967	20,000	0.35	0.39

1985/86 COUNTED VOLUME/CAPACITY RATIO ##### (4/5)

ROAD	NODE		Km	Ter.	Width	Class	M.C	CAR	BUS	TRUCK	TOTAL	PCU(V)	PCU(C)	V/C*	87V/C**
65	28	83	42	F	6.0	4	68	643	153	654	1,518	3,098	20,000	0.15	0.17
65	83	154	11	F	6.0	4	247	710	262	839	2,058	4,137	20,000	0.21	0.23
55	118	232	30	F	3.8	5	27	320	126	1,312	1,785	4,648	4,529	1.03	1.14
55	232	34	165	F	6.0	4	27	320	126	1,312	1,785	4,648	20,000	0.23	0.26
55	28	84	64	F	5.0	5	406	799	164	1,789	3,158	6,861	11,618	0.59	0.65
55	84	81	47	F	5.5	4	187	320	123	814	1,444	3,225	20,000	0.16	0.18
0	39	37	102	F	7.3	3	856	785	338	682	2,661	4,273	24,000	0.18	0.20
0	37	33	100	F	7.3	3	81	443	369	1,394	2,287	5,773	24,000	0.24	0.27
0	109	37	24	F	5.5	4	103	185	175	428	891	2,046	20,000	0.10	0.11
0	107	109	77	F	5.0	5	93	183	106	295	677	1,433	11,618	0.12	0.14
5	9	116	9	F	7.3	3	13	1,979	607	2,137	4,736	10,218	24,000	0.43	0.49
5	116	53	22	F	7.3	3	187	2,151	726	1,443	4,507	8,752	24,000	0.36	0.42
5	53	2	35	F	14.6	1	468	5,004	1,204	1,771	8,447	14,163	90,000	0.16	0.18
5	2	201	53	M	7.3	3	0	961	5	180	1,146	2,071	24,000	0.09	0.10
35	152	90	19	H	6.0	4	79	2,825	483	1,071	4,458	9,081	20,000	0.45	0.52
35	90	4	47	M	7.3	3	166	3,138	462	806	4,572	10,829	24,000	0.45	0.52
35	4	54	24	M	6.0	4	116	2,990	306	573	3,985	8,322	20,000	0.42	0.48
35	54	89	122	M	6.0	4	23	557	32	122	734	1,493	20,000	0.07	0.09
35	89	229	157	M	6.5	4	0	115	16	143	274	1,069	20,000	0.05	0.06
0	155	4	55	M	5.5	4	20	219	33	53	325	745	20,000	0.04	0.04
0	59	156	39	H	5.0	5	65	441	30	318	854	1,866	11,618	0.16	0.19
0	3	202	186	M	4.0	5	12	1,008	113	184	1,317	2,796	5,710	0.49	0.57
0	3	158	50	F	6.0	4	56	1,283	245	519	2,103	3,603	20,000	0.18	0.21
55	160	5	51	F	4.0	5	114	327	151	360	952	1,917	5,710	0.34	0.39
55	5	59	94	F	6.0	4	92	644	153	717	1,606	3,300	20,000	0.17	0.19
55	59	6	47	F	6.0	4	136	862	268	694	1,960	3,816	20,000	0.19	0.22
55	3	2	64	M	6.0	4	768	1,558	1,212	1,345	4,883	17,284	20,000	0.86	1.00
0	161	5	8	F	5.5	4	84	190	29	61	364	502	20,000	0.03	0.03
0	53	1	23	F	6.5	4	261	1,612	845	1,156	3,874	7,746	20,000	0.39	0.45
0	1	52	66	H	7.0	3	182	1,656	768	889	3,495	8,375	24,000	0.35	0.40
0	2	91	29	F	7.3	3	877	5,589	1,033	864	8,363	11,719	24,000	0.49	0.56
0	1	115	46	F	7.3	3	948	2,223	512	782	4,465	6,579	24,000	0.27	0.32
0	115	90	88	M	7.3	3	100	648	54	405	1,207	3,452	24,000	0.14	0.17
0	116	115	33	F	6.0	4	111	879	222	436	1,648	2,909	20,000	0.15	0.17
25	151	114	77	F	4.0	5	26	370	56	343	795	1,580	5,710	0.28	0.32
25	114	44	76	F	4.0	5	75	258	51	325	709	1,424	5,710	0.25	0.29
25	44	227	196	M	3.8	5	39	102	29	234	404	1,700	4,529	0.38	0.43
25	227	110	104	M	3.8	5	99	175	34	242	550	1,881	4,529	0.42	0.48
25	110	43	69	F	3.8	5	39	167	23	202	431	862	4,529	0.19	0.22
25	43	40	145	H	6.0	4	166	384	597	1,622	2,769	9,343	20,000	0.47	0.53

1985/86 COUNTED VOLUME/CAPACITY RATIO ##### (5/5)

ROAD	NODE		Km	Ter.	Width	Class	M.C	CAR	BUS	TRUCK	TOTAL	PCU(V)	PCU(C)	V/C*	87V/C**
25	40	221	130	H	6.0	4	85	850	328	690	1,953	4,965	20,000	0.25	0.28
50	96	219	139	F	4.5	5	64	80	85	500	729	1,867	8,664	0.22	0.25
50	96	40	175	F	3.8	5	45	27	9	43	124	206	4,529	0.05	0.05
65	154	45	147	F	6.0	4	158	320	145	712	1,335	2,970	20,000	0.15	0.17
65	45	40	148	M	6.0	4	200	393	51	720	1,364	5,119	20,000	0.26	0.29
0	40	218	182	M	3.8	5	58	46	12	75	191	597	4,529	0.13	0.15
0	41	97	189	F	3.8	5	85	43	29	313	470	1,112	4,529	0.25	0.28
40	42	223	181	H	3.8	5	155	65	40	105	365	723	4,529	0.16	0.18
40	42	51	365	F	3.8	5	135	48	25	75	283	416	4,529	0.09	0.11
0	228	44	173	F	3.8	5	43	60	30	280	413	1,012	4,529	0.22	0.26
0	111	46	230	F	3.8	5	63	60	8	30	161	206	4,529	0.05	0.05
0	112	225	405	H	3.8	5	125	80	36	86	327	631	4,529	0.14	0.16
0	224	110	78	H	3.8	5	203	500	278	840	1,821	5,074	4,529	1.12	1.28
0	111	113	115	F	3.8	5	144	85	30	80	339	487	4,529	0.11	0.12
0	222	97	255	H	3.8	5	55	41	15	70	181	409	4,529	0.09	0.10
0	205	92	91	F	3.8	5	78	71	40	149	338	677	4,529	0.15	0.18
0	11	205	32	F	3.8	5	68	214	60	586	928	2,186	4,529	0.48	0.59
0	206	19	69	F	6.0	4	701	671	567	800	2,739	5,123	20,000	0.26	0.31
0	212	211	50	F	5.5	4	270	188	128	200	786	1,307	20,000	0.07	0.08
0	213	214	118	F	3.8	5	103	189	122	218	632	1,261	4,529	0.28	0.34
0	215	71	62	F	3.8	5	367	163	128	177	835	1,262	4,529	0.28	0.34
0	24	216	42	F	6.0	4	350	253	211	263	1,077	1,850	20,000	0.09	0.11
0	77	121	99	F	5.0	5	383	260	107	153	903	1,232	11,618	0.11	0.13
0	25	26	242	F	3.8	5	257	92	159	82	590	944	4,529	0.21	0.25
0	203	220	80	M	3.8	5	33	200	89	279	601	2,425	4,529	0.54	0.62
0	5	203	105	F	6.0	4	66	466	169	426	1,127	2,284	20,000	0.11	0.13
0	6	203	150	H	6.0	4	21	208	67	76	372	791	20,000	0.04	0.05
0	223	224	178	M	3.8	5	100	56	8	125	289	904	4,529	0.20	0.23
0	218	222	180	M	3.8	5	27	15	6	28	76	233	4,529	0.05	0.06

App. Table 1.8 World Road and Road Traffic Statistics (1984)

COUNTORY	AREA (km^2)	LENGTH (km)	ROAD DENSITY (km/km^2)
[EUROPE]			
Austria	83850	107404	1.28
Belgium	30519	127688	4.2
Denmark	43076	70170	1.63
Finland	338145	75848	0.22
France	551000	804500	1.46
Germany	248692	487263	1.96
Great Britain	229988	347376	1.49
Greece	131990	34492	0.83
Italy	301262	397738	0.98
Netherlands	41160	- - -	- - -
Norway	323886	84562	0.26
Portugal	88944	- - -	- - -
Spain	504750	318548	0.63
Sweeden	411114	136418	0.3
Switerland	41288	70820	1.7
Turkey	799453	302777	0.39
[AFRICA]			
Algeria	- - -	72091	- - -
Ethiopia	1220000	37506	0.03
Kenya	582646	64584	0.11
Madagascar	592000	49638	- - -
Morocco	710850	57651	- - -
Nigeria	913073	107990	0.12
South Africa	1123226	184330	0.16
Tanzania	934400	81895	- - -
[AMERICA]			
Bolivia	1098581	40969	0.037
Brazil	8511965	1437574	0.17
Canada	9922330	391792	- - -
Chile	756945	79010	0.1
Colombia	1138914	74988	0.065
Mexico	- - -	214073	- - -
Panama	77082	8612	0.11
USA	9363400	6365590	0.68
[ASIA]			
India	3287263	1545891	0.47
Iraq	- - -	25265	- - -
Islael	20235	4631	0.22
Japan	377748	1125217	2.98
Korea	99106	51003	0.51
Malaysia	131588	28928	0.22
Pakistan	796095	100300	0.125
Philippines	300000	157139	0.52
Saudi Arabia	2253300	69434	0.03
Sri Lanka	65609	86218	- - -

App. Table 2-1 Desirable Implementation Schedule by Link
-Projects for W:Dening/Rehabilitation-

LINK R#	NO. P#	SER	NODE NO. FROM		TO	T	C	Growth in Congestion Ratio by Section																		
								1985	86	87	7th FYP 88	89	1990	91	92	8th FYP 93	94	1995	96	97	9th FYP 98	99	2000	01	02	10th FYP 03	04	2005
0	3	24	1	-	52	H	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1
								0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.1
0	3	23	1	-	53	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2	2	2	2	1	1
								0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.3
55	3	21	2	-	3	M	4	4	4	4	3	3	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
								0.8	0.9	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9	1.9	2.0	2.1	2.2	2.3	2.4	2.5
0	3	26	2	-	91	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1
								0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.1
55	3	20	3	-	94	F	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.6	0.7	0.8	0.8	0.9	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4
0	3	14	3	-	202	M	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.8	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0	2.2	2.3	2.4	2.5	2.7	2.8
35	3	6	4	-	90	M	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1
								0.6	0.6	0.7	0.7	0.8	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3
55	3	16	5	-	160	F	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	2.0
5	1	22	9	-	55	H	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
								0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5
0	1	98	9	-	88	H	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.5	0.6	0.6	0.7	0.8	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.0	2.1	2.3	2.5	2.6
5	3	1	9	-	116	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1
								0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0
5	1	19	10	-	57	F	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
								0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.5
0	1	24	10	-	155	M	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3
								0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.1
5	1	17	11	-	93	H	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
								1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5
5	1	16	11	-	204	F	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1
								0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3
0	1	108	11	-	205	F	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.8	0.9	0.9	1.0	1.1	1.2	1.4	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2
5	1	15	12	-	61	F	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
								0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3
5	1	111	12	-	204	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1
								0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Widening : Upper Figures : Highway Class
Rehabilitation Lower Figures : Congestion (V/C)

App. Table 2-1 Continued

LINK R#	LINK P#	LINK SER NO.	NODE NO. FROM	NODE NO. TO	T	C	1985	86	87	Growth in Congestion Ratio by Section: 7th FYP 88	89	1990	91	92	8th FYP 93	94	1995	96	97	9th FYP 98	99	2000	01	02	10th FYP 03	04	2005
0	1	55	13	16	F	5	5 0.9	5 1.0	4 1.0	4 1.1	4 1.2	4 1.3	4 1.4	4 1.6	4 1.7	4 1.7	4 1.8	4 1.9	4 2.0	4 2.2	4 2.3	4 2.4	4 2.5	4 2.7	4 2.8	4 3.0	4 3.1
0	1	59	13	82	F	3	3 0.3	3 0.3	3 0.4	3 0.4	3 0.4	3 0.5	3 0.5	3 0.6	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.8	3 0.9	3 0.9	3 1.0	1 1.0	1 1.1
0	1	71	13	64	F	4	4 0.6	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.8	4 0.8	4 0.8	4 0.9	4 0.9	4 0.9	4 1.0	2 1.0	2 1.1	2 1.1	2 1.2	1 1.2	1 1.3	1 1.4
0	1	95	14	58	F	5	5 0.9	4 1.0	4 1.2	4 1.3	4 1.5	4 1.8	4 2.0	4 2.3	4 2.4	4 2.5	4 2.6	4 2.7	4 2.8	4 2.9	4 3.1	4 3.2	4 3.3	4 3.4	4 3.6	4 3.7	4 3.9
0	1	27	14	95	F	5	5 0.7	5 0.8	5 0.9	4 1.0	4 1.2	4 1.3	4 1.5	4 1.7	4 1.7	4 1.8	4 1.9	4 1.9	4 2.0	4 2.0	4 2.1	4 2.2	4 2.3	4 2.3	4 2.4	4 2.5	4 2.6
0	1	36	15	18	F	3	3 0.4	3 0.4	3 0.4	3 0.5	3 0.5	3 0.6	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.8	3 0.8	3 0.9	3 0.9	3 0.9	3 0.9	3 1.0	3 1.0	1 1.0	1 1.0
0	1	70	15	64	F	3	3 0.4	3 0.4	3 0.5	3 0.5	3 0.5	3 0.5	3 0.6	3 0.6	3 0.6	3 0.6	3 0.7	3 0.7	3 0.8	3 0.8	3 0.8	3 0.9	3 0.9	3 1.0	1 1.0	1 1.1	1 1.2
0	1	69	15	67	F	4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.8	4 0.8	4 0.8	4 0.9	4 0.9	4 1.0	2 1.0	2 1.1	2 1.2	1 1.2	1 1.3	1 1.4
0	1	102	16	67	F	5	5 0.4	5 0.4	5 0.5	5 0.5	5 0.6	5 0.6	5 0.7	5 0.7	5 0.8	5 0.8	5 0.9	5 0.9	5 1.0	4 1.0	4 1.1	4 1.2	4 1.2	4 1.3	4 1.4	4 1.4	4 1.5
0	1	50	17	50	F	3	3 0.4	3 0.4	3 0.4	3 0.5	3 0.5	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.9	3 0.9	3 1.0	1 1.0	1 1.1	1 1.1	1 1.2	1 1.2	1 1.3
5	1	12	17	71	F	2	2 0.6	2 0.6	2 0.6	2 0.7	2 0.7	2 0.8	2 0.8	2 0.8	2 0.8	2 0.9	2 0.9	2 0.9	2 0.9	2 0.9	2 0.9	2 1.0	2 1.0	2 1.0	1 1.0	1 1.0	1 1.0
0	1	57	18	63	F	3	3 0.3	3 0.4	3 0.4	3 0.5	3 0.5	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.9	3 0.9	3 0.9	3 1.0	1 1.0	1 1.1	1 1.2	1 1.2	1 1.3
0	1	62	19	20	F	5	4 1.8	4 1.8	4 1.9	4 1.9	4 2.0	4 2.0	4 2.1	4 2.1	4 2.2	4 2.3	4 2.4	4 2.5	4 2.6	4 2.7	4 2.8	4 2.9	4 3.1	4 3.2	4 3.3	4 3.5	4 3.6
5	1	14	19	81	F	3	3 0.9	3 0.9	3 1.0	1 1.0	1 1.1	1 1.1	1 1.2	1 1.2	1 1.2	1 1.2	1 1.3	1 1.3	1 1.3	1 1.3	1 1.4	1 1.4	1 1.4	1 1.4	1 1.5	1 1.5	1 1.5
0	1	115	19	206	F	4	4 0.2	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.8	4 0.8	4 0.9	4 0.9	4 1.0	2 1.0	2 1.1	2 1.2
55	1	33	21	74	F	5	5 0.4	5 0.4	5 0.5	5 0.5	5 0.6	5 0.7	5 0.7	5 0.8	5 0.8	5 0.9	5 0.9	5 1.0	5 1.0	4 1.0	4 1.1	4 1.1	4 1.2	4 1.2	4 1.3	4 1.3	4 1.4
0	1	42	21	97	M	5	4 1.2	4 1.3	4 1.5	4 1.7	4 1.9	4 2.2	4 2.4	4 2.8	4 2.9	4 3.0	4 3.2	4 3.3	4 3.5	4 3.7	4 3.8	4 4.0	4 4.2	4 4.4	4 4.6	4 4.8	4 5.1
0	1	44	22	101	F	5	5 0.4	5 0.5	5 0.6	5 0.7	5 0.9	4 1.1	4 1.3	4 1.5	4 1.6	4 1.6	4 1.7	4 1.7	4 1.8	4 1.9	4 1.9	4 2.0	4 2.1	4 2.2	4 2.3	4 2.3	4 2.4

App. Table 2-1 Continued

LINK NO. R#	P#	SER	NODE NO. FROM	TO	T	C	1985	86	87	Growth in Congestion Ratio by Section: 7th FYP 88	89	1990	91	92	8th FYP 93	94	1995	96	97	9th FYP 98	99	2000	01	02	10th FYP 03	04	2005
5	1	7	23	75	F	4	4 0.5	4 0.6	4 0.6	4 0.7	4 0.7	4 0.8	4 0.9	4 0.9	4 1.0	4 1.0	4 1.0	4 1.0	4 1.0	2 1.0	2 1.0	2 1.0	2 1.0	2 1.1	2 1.1	2 1.1	2 1.1
0	1	65	25	78	F	5	5 0.4	5 0.5	5 0.5	5 0.6	5 0.7	5 0.8	5 0.9	4 1.0	4 1.1	4 1.1	4 1.1	4 1.1	4 1.1	4 1.2	4 1.2	4 1.2	4 1.2	4 1.2	4 1.3	4 1.3	4 1.3
5	1	4	25	80	F	3	3 0.7	3 0.7	3 0.8	3 0.8	3 1.0	1 1.1	1 1.2	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.4
5	1	2	27	79	F	4	4 0.7	4 0.7	4 0.8	4 0.8	4 0.9	4 0.9	2 1.0	2 1.1	2 1.1	2 1.1	2 1.1	2 1.1	2 1.1	2 1.1	2 1.1	2 1.1	2 1.1	2 1.1	2 1.1	2 1.1
0	1	72	27	80	F	5	5 0.9	4 1.1	4 1.4	4 1.7	4 2.1	4 2.7	4 3.3	4 4.2	4 4.2	4 4.2	4 4.3	4 4.3	4 4.3	4 4.4	4 4.4	4 4.4	4 4.5	4 4.5	4 4.5	4 4.6	4 4.6
5	1	1	27	150	F	4	4 0.8	4 0.9	4 0.9	2 1.0	1 1.1	1 1.2	1 1.3	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5
55	2	17	28	84	F	5	4 1.9	4 2.2	4 2.5	4 2.9	4 3.4	4 3.9	4 4.5	4 5.2	4 5.4	4 5.6	2 5.8	2 6.0	2 6.2	2 6.5	2 6.7	1 6.9	1 7.2	1 7.5	1 7.7	1 8.0	1 8.3
5	2	7	29	32	F	3	3 0.9	3 0.9	3 1.0	1 1.1	1 1.1	1 1.2	1 1.3	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.6	1 1.6
5	2	8	29	82	F	3	3 0.7	3 0.7	3 0.7	3 0.8	3 0.9	3 0.9	3 1.0	1 1.0	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1
0	2	27	31	103	F	5	5 0.3	5 0.4	5 0.5	5 0.7	5 1.0	4 1.3	4 1.7	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2	4 2.2
5	2	6	32	102	F	3	3 0.7	3 0.7	3 0.8	3 0.8	3 0.8	3 0.9	3 0.9	3 0.9	3 0.9	3 1.0	3 1.0	3 1.0	3 1.0	3 1.0	3 1.0	3 1.0	3 1.0	3 1.0	1 1.0	1 1.0	1 1.0
0	2	24	33	37	F	3	3 0.3	3 0.3	3 0.4	3 0.5	3 0.6	3 0.7	3 0.8	3 0.9	3 1.0	3 1.0	3 1.0	3 1.0	1 1.0	1 1.0	1 1.0	1 1.0	1 1.1	1 1.1	1 1.1	1 1.1	1 1.1
5	2	3	33	87	F	3	1 1.2	1 1.2	1 1.2	1 1.2	1 1.2	1 1.2	1 1.2	1 1.2	1 1.2	1 1.2	1 1.2	1 1.3	1 1.3	1 1.3	1 1.3	1 1.4	1 1.4	1 1.4	1 1.4	1 1.5	1 1.5
5	2	2	33	118	F	2	2 1.0	1 1.1	1 1.1	1 1.2	1 1.3	1 1.3	1 1.4	1 1.5	1 1.6	1 1.6	1 1.6	1 1.7	1 1.7	1 1.7	1 1.8	1 1.8	1 1.8	1 1.9	1 1.9	1 2.0	1 2.0
0	2	48	33	217	F	5	4 4.8	4 5.3	2 5.8	2 6.4	1 7.0	1 7.7	1 8.4	1 9.2	1 9.8	1 10.4	1 11.0	1 11.7	1 12.4	1 13.1	1 13.9	1 14.7	1 15.6	1 16.8	1 17.8	1 18.8	1 19.8
55	2	201	34	232	F	4	4 0.2	4 0.3	4 0.4	4 0.5	4 0.7	4 0.9	2 1.1	1 1.4	1 1.4	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.5	1 1.6	1 1.6	1 1.6
0	2	22	35	106	F	5	4 2.6	4 2.5	4 2.5	4 2.5	4 2.5	4 2.4	4 2.4	4 2.4	4 2.4	4 2.5	4 2.5	4 2.6	4 2.6	4 2.7	4 2.7	4 2.8	4 2.8	4 2.9	4 3.0	4 3.0	4 3.1
0	2	23	37	39	F	3	3 0.5	3 0.5	3 0.6	3 0.7	3 0.8	3 1.0	1 1.1	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.3	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4

App. Table 2-1 Continued

LINK NO. R#	P#	SER	NODE NO. FROM		TO	T	C	1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
											Growth in Congestion Ratio by Section																	
											7th FYP					8th FYP					9th FYP					10th FYP		
5	2	1	39	-	118	F	2	2 1.0	1 1.0	1 1.1	1 1.1	1 1.2	1 1.2	1 1.2	1 1.3	1 1.3	1 1.3	1 1.3	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.4	1 1.5	1 1.5	1 1.5
25	4	5	40	-	43	H	4	4 0.5	4 0.5	4 0.6	4 0.6	4 0.7	4 0.8	4 0.8	4 0.9	4 1.0	3 1.0	3 1.1	3 1.1	1 1.2	1 1.3	1 1.4	1 1.4	1 1.5	1 1.6	1 1.7	1 1.8	1 1.9
0	4	22	41	-	96	M	5	5 0.5	5 0.5	5 0.6	5 0.6	5 0.6	5 0.7	5 0.7	5 0.7	5 0.7	5 0.8	5 0.8	5 0.8	5 0.8	5 0.8	5 0.9	5 0.9	5 0.9	5 1.0	5 1.0	4 1.0	4 1.1	4 1.1
0	4	12	41	-	97	F	5	5 0.3	5 0.4	5 0.4	5 0.5	5 0.5	5 0.6	5 0.7	5 0.8	5 0.8	5 0.9	5 0.9	5 1.0	4 1.0	4 1.1	4 1.1	4 1.1	4 1.1	4 1.2	4 1.2	4 1.3	4 1.3
40	4	13	42	-	223	H	5	5 0.2	5 0.3	5 0.3	5 0.4	5 0.4	5 0.5	5 0.5	5 0.6	5 0.7	5 0.7	5 0.7	5 0.8	5 0.8	5 0.8	5 0.8	5 0.9	5 0.9	5 0.9	5 1.0	4 1.0	4 1.1	4 1.1
25	4	4	43	-	110	F	5	5 0.2	5 0.3	5 0.3	5 0.4	5 0.5	5 0.6	5 0.7	5 0.8	5 0.8	5 0.9	5 1.0	4 1.0	4 1.1	4 1.2	4 1.2	4 1.3	4 1.4	4 1.4	4 1.5	4 1.7	4 1.8	4 1.9
25	4	2	44	-	114	F	5	4 2.0	4 1.9	4 1.8	4 1.7	4 1.6	4 1.5	4 1.4	4 1.3	4 1.4	4 1.4	4 1.5	4 1.5	4 1.6	4 1.6	4 1.7	4 1.8	4 1.8	4 1.9	4 1.9	4 2.0	4 2.1
25	4	3	44	-	227	M	5	5 0.5	5 0.5	5 0.6	5 0.7	5 0.8	5 0.9	4 1.1	4 1.2	4 1.3	4 1.4	4 1.5	4 1.6	4 1.7	4 1.8	4 1.8	4 2.0	4 2.1	4 2.3	4 2.4	4 2.6	4 2.8	4 3.0
0	4	29	44	-	228	F	5	5 0.3	5 0.3	5 0.3	5 0.4	5 0.4	5 0.4	5 0.5	5 0.5	5 0.6	5 0.6	5 0.7	5 0.7	5 0.7	5 0.8	5 0.8	5 0.9	5 1.0	4 1.0	4 1.1	4 1.2	4 1.2
5	1	18	57	-	93	H	3	3 0.9	3 1.0	1 1.0	1 1.0	1 1.1	1 1.1	1 1.1	1 1.1	1 1.2	1 1.2	1 1.2	1 1.3	1 1.3	1 1.3	1 1.3	1 1.4	1 1.4	1 1.4	1 1.5	1 1.5	1 1.5
0	1	101	58	-	92	F	5	5 0.7	5 0.7	5 0.8	5 0.9	5 1.0	4 1.1	4 1.2	4 1.3	4 1.3	4 1.4	4 1.5	4 1.5	4 1.6	4 1.7	4 1.8	4 1.9	4 2.0	4 2.1	4 2.2	4 2.3	4 2.4
0	3	12	59	-	156	H	5	5 0.5	5 0.6	5 0.7	5 0.7	5 0.8	5 0.9	4 1.0	4 1.1	4 1.2	4 1.2	4 1.3	4 1.3	4 1.4	4 1.4	4 1.4	4 1.5	4 1.6	4 1.6	4 1.7	4 1.8	4 1.9	4 1.9
0	1	47	60	-	62	M	5	4 2.0	4 2.2	4 2.5	4 2.8	4 3.2	4 3.6	4 4.0	4 4.6	4 4.8	4 5.1	4 5.5	3 5.8	3 6.2	3 6.6	1 7.0	1 7.4	1 7.9	1 8.4	1 8.9	1 9.5	1 10.1
0	1	48	60	-	92	F	5	5 0.6	5 0.7	5 0.8	5 0.9	4 1.1	4 1.2	4 1.3	4 1.5	4 1.6	4 1.7	4 1.7	4 1.8	4 1.9	4 2.0	4 2.1	4 2.1	4 2.2	4 2.3	4 2.5	4 2.6	4 2.7
0	1	46	62	-	66	F	5	5 0.4	5 0.4	5 0.5	5 0.5	5 0.5	5 0.6	5 0.6	5 0.7	5 0.7	5 0.8	5 0.8	5 0.9	5 0.9	5 1.0	4 1.0	4 1.1	4 1.1	4 1.2	4 1.3	4 1.3	4 1.4
0	1	90	63	-	64	F	4	4 0.3	4 0.3	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.7	4 0.7	4 0.8	4 0.8	4 0.8	4 0.9	4 1.0	2 1.0	2 1.1	2 1.1	1 1.2	1 1.3
0	1	40	65	-	213	F	5	5 0.5	5 0.5	5 0.6	5 0.7	5 0.7	5 0.8	5 0.9	5 1.0	5 1.0	5 1.0	4 1.0	4 1.0	4 1.1	4 1.1	4 1.1	4 1.1	4 1.1	4 1.1	4 1.1	4 1.1	4 1.2
0	1	29	68	-	158	F	5	5 0.3	5 0.4	5 0.5	5 0.5	5 0.6	5 0.7	5 0.9	4 1.0	4 1.0	4 1.1	4 1.1	4 1.1	4 1.1	4 1.2	4 1.2	4 1.2	4 1.3	4 1.3	4 1.3	4 1.3	4 1.4

App. Table 2-1 Continued

LINK R#	LINK P#	NO. SER	NODE NO. FROM	NODE NO. TO	T	C	1985	86	87	Growth in Congestion Ratio by Section																		
										7th FYP					8th FYP					9th FYP					10th FYP		
										88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
0	1	128	71	215	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4
							0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.1
0	1	132	77	121	F	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.3	0.4	0.4	0.5	0.6	0.8	0.9	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3
5	2	4	86	87	F	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
							1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4
5	2	5	86	102	F	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
							0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
35	3	5	90	152	H	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3
							0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.1	1.0	1.0	1.1
0	1	100	92	93	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4
							0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.3	1.4
0	1	108	92	205	F	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.2	0.2	0.3	0.4	0.5	0.7	0.9	1.2	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0	2.0	2.1
0	1	26	95	156	F	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.8	1.9
50	4	7	96	219	F	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.5	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5
0	1	126	100	214	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4
							0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2
0	2	37	103	104	F	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.0	0.0	0.0	0.1	0.2	0.4	0.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
0	2	41	107	109	F	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.4	0.5	0.6	0.7	0.9	1.1	1.3	1.6	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.3	2.3
0	4	33	110	224	H	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3
							1.4	1.6	1.7	1.9	2.1	2.4	2.6	2.9	3.1	3.2	3.4	3.6	3.8	4.0	4.2	4.5	4.7	5.0	5.3	5.6	5.9
25	4	34	110	227	M	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.4	2.6	2.7	2.9	3.2
25	4	1	114	151	F	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							2.1	2.0	1.9	1.9	1.8	1.8	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.1	2.2	2.2	2.3	2.4	2.5	2.5	2.6
55	2	14	118	232	F	5	4	4	4	4	4	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
							1.3	1.7	2.2	2.9	3.8	4.9	6.3	8.2	8.3	8.3	8.4	8.5	8.5	8.6	8.6	8.7	8.8	8.8	8.9	9.0	9.0
55	1	32	159	231	F	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.4	0.5	0.6	0.8	1.0	1.2	1.6	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2
0	1	122	181	212	F	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.5	0.6	0.6	0.7	0.9	1.0	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4

App. Table 2-1 Continued

LINK R#	LINK P#	LINK SER NO.	NODE NO. FROM	NODE NO. TO	T	C	Growth in Congestion Ratio by Section																		
							1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
							7th FYP								8th FYP					9th FYP					10th FYP		
0	3	34	203	220	M	5	5 0.7	5 0.8	5 0.8	5 0.9	5 1.0	4 1.1	4 1.2	4 1.3	4 1.4	4 1.4	4 1.5	4 1.6	4 1.7	4 1.8	4 1.9	4 2.0	4 2.1	4 2.3	4 2.4	4 2.5	4 2.7
0	1	134	212	213	F	5	5 0.7	5 0.8	5 0.9	5 1.0	4 1.1	4 1.2	4 1.3	4 1.4	4 1.5	4 1.5	4 1.5	4 1.6	4 1.6	4 1.6	4 1.7	4 1.7	4 1.7	4 1.8	4 1.8	4 1.8	4 1.9
0	1	125	213	214	F	5	5 0.3	5 0.4	5 0.4	5 0.4	5 0.5	5 0.5	5 0.6	5 0.6	5 0.7	5 0.7	5 0.7	5 0.8	5 0.8	5 0.9	5 0.9	5 1.0	4 1.0	4 1.1	4 1.1	4 1.2	4 1.3
0	4	31	223	224	M	5	5 0.2	5 0.3	5 0.3	5 0.3	5 0.4	5 0.4	5 0.4	5 0.5	5 0.5	5 0.5	5 0.6	5 0.6	5 0.6	5 0.7	5 0.7	5 0.8	5 0.8	5 0.9	5 0.9	5 1.0	4 1.0
5	1	10	24	72	F	3	3 0.5	3 0.5	3 0.6	3 0.6	3 0.6	3 0.6	3 0.6	3 0.6	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7
5	3	2	53	116	F	3	3 0.4	3 0.4	3 0.5	3 0.5	3 0.5	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.8	3 0.8	3 0.8	3 0.8	3 0.9	3 0.9	3 0.9
5	1	9	72	119	F	4	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8
55	1	34	74	160	F	5	5 0.3	5 0.3	5 0.4	5 0.4	5 0.5	5 0.5	5 0.6	5 0.7	5 0.7	5 0.7	5 0.8	5 0.8	5 0.8	5 0.8	5 0.8	5 0.9	5 0.9	5 0.9	5 0.9	5 0.9	5 1.0
5	1	8	75	119	F	4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6

App. Table 2-2 Desirable Implementation Shedule by Link
-Project for Rehabilitation-

LINK NO. R#	P#	SER	NODE NO. FROM	TO	T	C	1985	86	87	7th FYP 88	89	1990	91	92	8th FYP 93	94	1995	96	97	9th FYP 98	99	2000	01	02	10th FYP 03	04	2005
0	3	33	1 -	2	F	3	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0
0	3	27	1 -	91	F	3	3 0.3	3 0.3	3 0.3	3 0.3	3 0.3	3 0.3	3 0.3	3 0.3	3 0.4	3 0.4	3 0.4	3 0.4	3 0.4	3 0.4	3 0.4	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5
0	3	28	1 -	115	F	3	3 0.3	3 0.3	3 0.3	3 0.3	3 0.4	3 0.4	3 0.4	3 0.4	3 0.5	3 0.5	3 0.5	3 0.6	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.9	3 0.9
5	3	3	2 -	53	F	1	1 0.2	1 0.2	1 0.2	1 0.2	1 0.2	1 0.2	1 0.2	1 0.2	1 0.2	1 0.3	1 0.3	1 0.3	1 0.3	1 0.3	1 0.3	1 0.3	1 0.3	1 0.4	1 0.4	1 0.4	1 0.4
5	3	4	2 -	201	M	3	3 0.1	3 0.1	3 0.1	3 0.1	3 0.1	3 0.1	3 0.2	3 0.2	3 0.2	3 0.2	3 0.2	3 0.2	3 0.2	3 0.2	3 0.2	3 0.3	3 0.3	3 0.3	3 0.3	3 0.3	3 0.3
0	3	15	3 -	158	F	4	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.7
35	3	7	4 -	54	M	4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.7	4 0.8	4 0.8	4 0.9	4 0.9	4 1.0
0	3	11	4 -	155	M	4	4 0.0	4 0.0	4 0.0	4 0.0	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3
55	3	17	5 -	59	F	4	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5
50	3	10	5 -	153	H	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1
0	3	22	5 -	161	F	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3
0	3	35	5 -	203	F	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4
55	3	18	6 -	59	F	4	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5
55	3	19	6 -	94	H	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2
0	3	36	6 -	203	H	4	4 0.0	4 0.0	4 0.0	4 0.0	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1
0	3	37	7 -	230	M	4	4 0.0	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3
0	3	30	8 -	52	F	4	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4
0	3	31	8 -	89	M	5	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0

(Column heading over 88–2005: Growth in Congestion Ratio by Section)

———— Rehabilitation

Upper Figures : Highway Class
Lower Figures : Congestion Ration (V/C)

App. Table 2-2 Continued

LINK NO. R#	P#	SER	NODE NO. FROM		TO	T	C	Growth in Congestion Ratio by Section																	
								7th FYP						8th FYP					9th FYP					10th FYP		
								1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
5	1	20	10	-	117	F	1	1 0.3	1 0.3	1 0.3	1 0.4	1 0.4	1 0.4	1 0.4	1 0.4	1 0.5	1 0.5	1 0.5	1 0.5	1 0.5	1 0.6	1 0.6	1 0.6	1 0.6	1 0.6	1 0.7	1 0.7	1 0.7
0	1	114	12	-	206	F	4	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.7	4 0.7	4 0.7	4 0.8	4 0.8
0	1	56	13	-	208	F	4	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5
0	1	58	13	-	209	F	4	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5
0	1	60	14	-	210	F	4	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3
0	1	121	14	-	211	F	4	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6
0	1	120	14	-	212	F	5	5 0.1	5 0.1	5 0.2	5 0.2	5 0.3	5 0.3	5 0.4	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.6	5 0.6	5 0.6
0	1	37	15	-	16	F	3	3 0.5	3 0.5	3 0.5	3 0.5	3 0.6	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.8	3 0.8	3 0.8	3 0.8	3 0.8
0	1	64	15	-	215	F	4	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.8
0	1	89	16	-	64	F	4	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4
0	1	38	16	-	66	F	4	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.7	4 0.7	4 0.8
0	1	88	16	-	70	F	4	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4
0	1	54	16	-	75	F	4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.6	4 0.6	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8
0	1	35	17	-	18	F	3	3 0.3	3 0.3	3 0.3	3 0.4	3 0.4	3 0.5	3 0.5	3 0.6	3 0.6	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.8	3 0.9	3 0.9	3 0.9
5	1	13	17	-	19	F	1	1 0.3	1 0.3	1 0.3	1 0.3	1 0.3	1 0.4	1 0.4	1 0.4	1 0.4	1 0.4	1 0.4	1 0.4	1 0.4	1 0.5	1 0.5	1 0.5	1 0.5	1 0.5	1 0.5	1 0.5	1 0.6
0	1	84	17	-	69	F	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4
0	1	127	17	-	215	F	4	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6
0	1	81	18	-	10	F	4	4 0.3	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.7	4 0.7	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 1.0

App. Table 2-2 Continued

LINK R#	P#	NO. SER	NODE NO. FROM	TO	T	C	1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
							Growth in Congestion Ratio by Section																				
							7th FYP								8th FYP					9th FYP					10th FYP		
0	1	91	19 -	63	F	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2
0	1	63	20 -	61	F	4	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5
0	1	51	21 -	85	F	3	3 0.1	3 0.2	3 0.2	3 0.2	3 0.3	3 0.3	3 0.4	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5	3 0.5
55	1	201	21 -	231	F	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4
0	1	53	22 -	23	F	4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.6	4 0.6	4 0.7	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.9	4 0.9	4 0.9	4 0.9
0	1	43	22 -	79	F	4	4 0.2	4 0.2	4 0.3	4 0.3	4 0.4	4 0.5	4 0.6	4 0.7	4 0.7	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8	4 0.8
0	1	52	22 -	85	F	4	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.4	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6
0	1	92	22 -	100	F	4	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3
0	1	78	23 -	120	F	4	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.8	4 0.8
5	1	6	23 -	121	F	4	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5
0	1	129	24 -	67	F	4	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3
5	1	11	24 -	71	F	2	2 0.6	2 0.6	2 0.6	2 0.7	2 0.7	2 0.7	2 0.8	2 0.8	2 0.8	2 0.8	2 0.8	2 0.9	2 0.9	2 0.9	2 0.9	2 0.9	2 0.9	2 0.9	2 0.9	2 1.0	2 1.0	2 1.0
5	1	10	24 -	72	F	3	3 0.5	3 0.5	3 0.6	3 0.6	3 0.6	3 0.6	3 0.6	3 0.6	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7
0	1	68	24 -	76	F	4	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.4	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.7	4 0.7
0	1	130	24 -	216	F	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3
0	1	133	25 -	26	F	5	5 0.2	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.4	5 0.4	5 0.4	5 0.4	5 0.5	5 0.5	5 0.5	5 0.6	5 0.6	5 0.6	5 0.6	5 0.7	5 0.7	5 0.8	5 0.8
5	1	5	25 -	121	F	3	3 0.6	3 0.7	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.8	3 0.9	3 0.9	3 0.9	3 0.9	3 0.9	3 0.9	3 0.9	3 0.9	3 0.9	3 0.9	3 0.9	3 0.9	3 0.9
0	1	73	26 -	73	F	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3

App. Table 2-2 Continued

LINK R#	LINK P#	NO. SER	NODE NO. FROM	NODE NO. TO	T	C	1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
							Growth in Congestion Ratio by Section																				
										7th FYP					8th FYP					9th FYP					10th FYP		
0	1	67	26	76	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0	1	66	26	78	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
85	2	11	28	29	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
55	2	16	28	30	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
85	2	12	28	83	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
55	2	15	30	34	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
0	2	45	30	83	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	2	26	31	86	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
							0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0	2	20	33	105	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
							0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
0	2	34	33	107	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0	2	25	34	102	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0	2	28	36	103	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0	2	44	36	104	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
0	2	29	36	106	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0	2	33	37	109	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0	2	38	38	88	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0	2	32	38	109	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
0	2	31	38	122	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

App. Table 2-2 Continued

LINK R#	LINK P#	LINK SER	NODE NO. FROM	NODE NO. TO	T	C	Growth in Congestion Ratio by Section																			
							7th FYP						8th FYP					9th FYP					10th FYP			
							1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
25	2	10	39	151	F	3	3 0.4	3 0.4	3 0.4	3 0.4	3 0.4	3 0.4	3 0.4	3 0.4	3 0.4	3 0.5	3 0.5	3 0.5	3 0.5	3 0.6	3 0.6	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.7
65	4	10	40	45	M	4	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6
50	4	8	40	96	F	5	5 0.5	5 0.6	5 0.6	5 0.6	5 0.6	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.8	5 0.8	5 0.8	5 0.8	5 0.8	5 0.8	5 0.8	5 0.8	5 0.8
0	4	11	40	218	M	5	5 0.2	5 0.2	5 0.2	5 0.2	5 0.3	5 0.3	5 0.4	5 0.4	5 0.4	5 0.4	5 0.5	5 0.5	5 0.5	5 0.6	5 0.6	5 0.6	5 0.7	5 0.7	5 0.7	5 0.8	5 0.8
25	4	6	40	221	M	4	4 0.2	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.8	4 0.8	4 0.8	4 0.9	4 0.9
40	4	24	40	223	M	5	5 0.2	5 0.2	5 0.2	5 0.3	5 0.3	5 0.4	5 0.5	5 0.5	5 0.5	5 0.8	5 0.6	5 0.6	5 0.6	5 0.7	5 0.7	5 0.7	5 0.8	5 0.8	5 0.8	5 0.9	5 0.9
0	4	27	41	218	M	5	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.1	5 0.1	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2
40	4	14	42	51	F	5	5 0.1	5 0.1	5 0.1	5 0.1	5 0.1	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.4	5 0.4
65	4	9	45	154	F	4	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.8	4 0.8	4 0.8
0	4	23	45	222	M	5	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0
0	4	17	46	111	F	5	5 0.0	5 0.1	5 0.1	5 0.1	5 0.1	5 0.2	5 0.2	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4
0	4	20	46	113	F	5	5 0.0	5 0.1	5 0.1	5 0.1	5 0.1	5 0.2	5 0.3	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.6
99	0	4	47	229	M	4	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0
0	3	38	48	54	M	4	4 0.1	4 0.1	4 0.1	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0
99	0	1	49	201	M	3	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0	3 0.0
99	0	3	49	221	H	4	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0
0	3	25	52	230	M	4	4 0.0	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3
5	3	2	53	116	F	3	3 0.4	3 0.4	3 0.5	3 0.5	3 0.5	3 0.6	3 0.6	3 0.7	3 0.7	3 0.7	3 0.7	3 0.7	3 0.8	3 0.8	3 0.8	3 0.8	3 0.8	3 0.8	3 0.9	3 0.9	3 0.9

App. Table 2-2 Continued

LINK NO. R#	P#	SER	NODE NO. FROM		TO	T	C	Growth in Congestion Ratio by Section																			
								7th FYP					8th FYP					9th FYP					10th FYP			
								1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
35	3	8	54	-	89	M	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5	1	21	55	-	117	F	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
								0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
35	1	23	55	-	152	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
								0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.6	0.7	0.7	0.7	0.7	0.7
0	1	99	56	-	58	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.9	1.0
0	1	30	56	-	68	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0	1	31	56	-	117	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9
0	1	49	57	-	92	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9
0	1	96	58	-	60	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5
0	1	97	58	-	68	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
0	1	119	62	-	210	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
0	1	118	63	-	209	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
0	1	39	65	-	66	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
								0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8
0	1	93	65	-	100	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0	1	94	65	-	211	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0	1	45	66	-	101	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
0	1	85	67	-	70	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6
0	1	103	67	-	71	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
0	1	74	69	-	71	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.8

App. Table 2-2 Continued

LINK NO. R#	P#	SER	NODE NO. FROM		TO	T	C	Growth in Congestion Ratio by Section																				
								7th FYP						8th FYP					9th FYP					10th FYP				
								1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
0	1	83	69	-	73	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5
0	1	87	70	-	72	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6
0	1	86	72	-	98	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5
5	1	9	72	-	119	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
0	1	131	73	-	216	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
0	1	104	74	-	99	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
55	1	34	74	-	160	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
								0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0
5	1	8	75	-	119	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0	1	81	76	-	98	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0	1	82	76	-	216	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
0	1	75	77	-	78	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
0	1	80	77	-	98	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7
0	1	79	77	-	120	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
5	1	3	79	-	80	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
0	2	42	81	-	82	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	2	18	81	-	84	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.2	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
55	2	19	81	-	159	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
								0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5	2	9	82	-	150	F	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
								0.5	0.6	0.6	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8

App. Table 2-2 Continued

LINK NO. R#	P#	SER	NODE NO. FROM		TO	T	C	Growth in Congestion Ratio by Section																	
								7th FYP					8th FYP					9th FYP					10th FYP		
								1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
0	2	46	83	-	84	F	4	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0
65	2	13	83	-	154	F	4	4 0.2	4 0.2	4 0.3	4 0.3	4 0.4	4 0.4	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.7	4 0.8	4 0.8
0	1	107	85	-	99	F	4	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6
0	2	43	87	-	104	F	4	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2
0	2	35	88	-	107	F	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1
0	2	40	88	-	108	F	4	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0
35	3	9	89	-	229	M	4	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.1	4 0.2	4 0.2	4 0.2	4 0.2	4 0.2
0	3	29	90	-	115	M	3	3 0.1	3 0.2	3 0.2	3 0.2	3 0.2	3 0.2	3 0.2	3 0.3	3 0.3	3 0.3	3 0.3	3 0.3	3 0.3	3 0.4	3 0.4	3 0.4	3 0.4	3 0.5	3 0.5	3 0.5	3 0.6	3 0.6
0	3	13	94	-	157	M	5	5 0.2	5 0.2	5 0.3	5 0.4	5 0.4	5 0.5	5 0.6	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7
0	1	28	95	-	157	M	5	5 0.2	5 0.2	5 0.3	5 0.4	5 0.4	5 0.5	5 0.6	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7	5 0.7
0	4	28	97	-	222	H	5	5 0.1	5 0.1	5 0.1	5 0.2	5 0.2	5 0.2	5 0.2	5 0.2	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4
0	1	105	99	-	214	F	5	5 0.0	5 0.0	5 0.0	5 0.0	5 0.1	5 0.1	5 0.2	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5
0	1	106	100	-	101	F	5	5 0.2	5 0.2	5 0.2	5 0.2	5 0.3	5 0.3	5 0.3	5 0.3	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4	5 0.5	5 0.5	5 0.5	5 0.5	5 0.6	5 0.6	5 0.6	5 0.7	5 0.7
0	2	38	104	-	217	F	4	4 0.0	4 0.0	4 0.0	4 0.1	4 0.1	4 0.2	4 0.3	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6
0	2	21	105	-	106	F	4	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.3	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4	4 0.4
0	2	39	105	-	108	F	5	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.1	5 0.1	5 0.1	5 0.1
0	2	49	105	-	217	F	4	4 0.0	4 0.0	4 0.0	4 0.1	4 0.1	4 0.2	4 0.3	4 0.5	4 0.5	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6	4 0.6
0	2	30	106	-	122	F	4	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0	4 0.0

App. table 2-2 Continued

LINK R#	LINK P#	LINK SER	NODE NO. FROM	NODE NO. TO	T	C	Growth in Congestion Ratio by Section																		
							1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
							7th FYP								8th FYP					9th FYP					10th FYP		
0	2	47	108	122	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	4	16	111	112	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
0	4	21	111	113	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
0	4	18	112	225	H	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6
0	4	15	112	228	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
0	4	19	113	114	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6
0	3	32	115	116	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
0	1	76	119	120	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0	1	77	120	121	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
50	4	26	153	219	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0	1	117	204	207	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
0	1	110	205	208	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0	1	113	206	207	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
0	1	112	207	208	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
0	1	116	207	209	F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
0	1	124	210	211	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0	1	123	211	212	F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
							0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0	4	37	218	222	M	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
							0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3

App. Table 2-2 Continued

LINK NO. R#	P#	SER	NODE NO. FROM	TO	T	C	1985	86	87	88	89	1990	91	92	93	94	1995	96	97	98	99	2000	01	02	03	04	2005
							Growth in Congestion Ratio by Section																				
										7th FYP					8th FYP					9th FYP					10th FYP		
0	4	25	219 -	220	M	5	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0
0	4	32	224 -	225	M	5	5 0.0	5 0.0	5 0.0	5 0.1	5 0.1	5 0.1	5 0.2	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.3	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4	5 0.4	5 0.5	5 0.5
0	4	35	225 -	226	M	5	5 0.0	5 0.0	5 0.1	5 0.1	5 0.1	5 0.2	5 0.3	5 0.4	5 0.4	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.6	5 0.6	5 0.6	5 0.6	5 0.6	5 0.7	5 0.7	5 0.7
0	4	36	226 -	227	M	5	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0	5 0.0
0	4	30	226 -	228	M	5	5 0.0	5 0.0	5 0.1	5 0.1	5 0.1	5 0.2	5 0.3	5 0.4	5 0.4	5 0.5	5 0.5	5 0.5	5 0.5	5 0.5	5 0.6	5 0.6	5 0.6	5 0.6	5 0.6	5 0.7	5 0.7	5 0.7

App. Table 3-1 Traffic Assignment on the Study Roads (1992/93)

TRAFFIC ASSIGNMENT .. (1985 NET / 1992 OD - case 2)

LINK NO R#	P#	SER	NODE NO FROM	TO	DIST. (Km)	CLASS	TER-RAIN	SUR-FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	PROPO.	CLASS EXIST.	PROPO.
0	3	33	1 - 2	80	3	F	D	7.3	0	0	0	0	0.00	0.00	3	3
0	3	24	1 - 52	68	3	H	T	7.0	2,401	1,124	2,503	6,028	0.70	0.70	3	3
0	3	23	1 - 53	23	4	F	T	6.5	2,495	1,339	2,903	6,737	0.76	0.76	4	4
0	3	27	1 - 91	28	3	F	D	7.3	2,839	1,204	646	4,689	0.35	0.35	3	3
0	3	28	1 - 115	46	3	F	D	7.3	3,618	831	1,556	6,005	0.45	0.45	3	3
55	3	21	2 - 3	64	4	H	T	6.0	2,325	1,885	2,466	6,676	1.42	0.32	4	1
5	3	3	2 - 53	35	1	F	B	14.6	7,724	1,875	2,641	12,240	0.24	0.24	1	1
0	3	26	2 - 91	29	3	F	D	7.3	8,409	1,381	1,007	10,797	0.65	0.65	3	3
5	3	4	2 - 201	53	3	H	B	7.3	1,563	8	445	2,016	0.18	0.18	3	3
55	3	20	3 - 94	29	5	F	T	5.5	245	206	1,159	1,610	1.24	0.22	5	4
0	3	15	3 - 158	50	4	F	D	6.0	2,057	372	1,500	3,929	0.38	0.38	4	4
0	3	14	3 - 202	186	5	H	T	4.0	1,637	184	361	2,182	1.40	0.25	5	4
35	3	7	4 - 54	24	4	H	T	6.0	4,468	294	583	5,345	0.49	0.49	4	4
35	3	6	4 - 90	47	3	H	T	7.3	4,285	494	2,618	7,397	0.96	0.96	3	3
0	3	11	4 - 155	55	4	H	T	5.5	356	54	104	514	0.07	0.07	4	4
55	3	17	5 - 59	94	4	F	T	6.0	969	299	1,483	2,751	0.32	0.32	4	4
50	3	10	5 - 153	90	4	H	B	5.5	25	34	867	726	0.14	0.14	4	4
55	3	16	5 - 160	51	5	F	T	4.0	515	208	988	1,711	1.17	0.21	5	4
0	3	22	5 - 161	8	4	F	T	5.5	252	82	1,449	1,783	0.24	0.24	4	4
0	3	35	5 - 203	105	4	F	B	6.0	757	274	837	1,868	0.20	0.20	4	4
55	3	18	6 - 59	47	4	F	T	6.0	1,303	347	1,576	3,226	0.35	0.35	4	4
55	3	19	6 - 94	96	4	H	T	6.0	234	199	648	1,081	0.18	0.18	4	4
0	3	36	6 - 203	150	4	H	B	6.0	338	109	149	596	0.07	0.07	4	4
0	3	37	7 - 230	73	4	H	D	5.5	64	62	729	855	0.24	0.24	4	4
0	3	30	8 - 52	35	4	F	T	6.0	869	425	1,124	2,418	0.28	0.28	4	4
0	3	31	8 - 89	82	5	H	T	3.8	0	0	0	0	0.00	0.00	5	5
5	1	22	9 - 55	44	3	H	T	7.3	5,378	1,398	4,090	10,866	1.14	0.30	3	1
0	1	98	9 - 68	81	5	H	T	3.8	1,301	55	504	1,860	1.01	0.18	5	4
5	3	1	9 - 116	9	3	F	B	7.3	2,688	872	3,993	7,553	0.72	0.72	3	3
5	1	19	10 - 57	31	3	F	T	7.3	5,344	1,860	5,335	12,539	1.12	0.30	3	1
5	1	20	10 - 117	12	1	F	T	14.6	10,002	1,981	8,155	20,138	0.45	0.45	1	1
0	1	24	10 - 155	72	4	H	T	6.0	3,305	390	627	4,322	0.47	0.47	4	4
5	1	17	11 - 93	40	3	H	T	7.3	3,770	1,432	4,530	9,732	1.15	0.31	3	1
5	1	16	11 - 204	24	3	F	T	7.3	3,002	1,723	4,758	9,483	0.94	0.94	3	3
0	1	109	11 - 205	32	5	F	B	3.8	250	141	1,507	1,898	1.48	0.26	5	4
5	1	15	12 - 61	11	3	F	T	7.3	5,871	1,755	4,787	12,413	1.06	0.28	3	1
5	1	111	12 - 204	38	3	F	T	7.3	3,515	1,316	4,551	9,382	0.88	0.88	3	3
0	1	114	12 - 206	37	4	F	T	6.5	974	851	1,347	3,172	0.38	0.38	4	4
0	1	55	13 - 16	117	5	F	T	5.0	1,259	633	776	2,668	1.57	0.27	5	4
0	1	59	13 - 62	47	3	F	T	7.3	1,448	1,218	2,948	5,612	0.58	0.58	3	3
0	1	71	13 - 64	52	4	F	T	6.5	1,736	1,037	3,435	6,208	0.76	0.76	4	4
0	1	56	13 - 208	95	4	F	T	6.5	473	433	1,711	2,617	0.35	0.35	4	4
0	1	58	13 - 209	43	4	F	T	6.5	866	321	1,370	2,557	0.30	0.30	4	4
0	1	95	14 - 58	99	5	F	T	5.0	1,002	197	2,172	3,371	2.32	0.41	5	4
0	1	27	14 - 95	48	5	F	T	4.5	1,047	264	1,352	2,663	1.68	0.29	5	4
0	1	60	14 - 210	41	4	F	T	5.5	551	379	1,128	2,058	0.25	0.25	4	4
0	1	121	14 - 211	87	4	F	T	6.0	712	303	2,309	3,324	0.43	0.43	4	4
0	1	120	14 - 212	100	5	F	G	3.8	12	14	605	631	0.53	0.53	5	5
0	1	37	15 - 16	82	3	F	T	7.3	1,208	1,348	3,541	6,097	0.66	0.66	3	3
0	1	36	15 - 18	97	3	F	T	7.3	2,052	2,012	3,114	7,178	0.73	0.73	3	3
0	1	70	15 - 64	37	3	F	T	7.3	3,099	1,016	2,630	6,745	0.58	0.58	3	3
0	1	69	15 - 67	40	4	F	T	6.5	1,826	1,393	2,500	5,719	0.68	0.68	4	4
0	1	64	15 - 215	38	4	F	T	6.0	1,682	914	1,119	3,715	0.39	0.39	4	4
0	1	89	16 - 64	82	4	F	T	6.0	324	312	1,337	1,973	0.26	0.26	4	4
0	1	38	16 - 66	32	4	F	T	6.0	670	730	2,452	3,852	0.51	0.51	4	4

LINK NO R#	P#	SER	NODE NO FROM	TO	DIST. (Km)	CLASS	TER-RAIN	SUR-FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	PROPO.	CLASS EXIST.	PROPO.
0	1	102	16 -	67	84	5	F	T	4.0	351	224	522	1,097	0.74	0.74	5	5
0	1	88	16 -	70	51	4	F	T	6.0	823	229	919	1,771	0.20	0.20	4	4
0	1	54	16 -	75	113	4	F	T	6.0	650	902	3,579	5,131	0.70	0.70	4	4
0	1	35	17 -	18	38	3	F	T	7.3	3,220	1,251	2,303	6,774	0.58	0.58	3	3
5	1	13	17 -	19	73	1	F	T	14.6	13,975	2,943	3,794	20,712	0.38	0.38	1	1
0	1	50	17 -	50	88	3	F	T	7.3	6,908	914	2,070	9,892	0.66	0.66	3	3
0	1	84	17 -	69	138	4	F	T	6.0	382	281	791	1,454	0.18	0.18	4	4
5	1	12	17 -	71	111	2	F	B	7.3	2,690	1,106	4,637	8,433	0.83	0.83	2	2
0	1	127	17 -	215	100	4	F	T	6.0	1,138	499	994	2,631	0.28	0.28	4	4
0	1	61	18 -	19	53	4	F	T	6.5	1,056	747	2,899	4,702	0.60	0.60	4	4
0	1	57	18 -	63	70	3	F	T	7.3	2,517	1,046	3,483	7,046	0.67	0.67	3	3
0	1	62	19 -	20	48	5	F	T	5.0	1,855	1,070	766	3,691	2.10	0.37	5	4
5	1	14	19 -	61	39	3	F	T	7.3	8,421	2,055	4,721	15,197	1.20	0.32	3	1
0	1	91	19 -	63	99	4	F	T	5.5	238	171	372	781	0.09	0.09	4	4
0	1	115	19 -	206	69	4	F	T	6.0	1,365	1,085	1,989	4,439	0.53	0.53	4	4
0	1	63	20 -	61	42	4	F	T	6.5	1,263	1,068	825	3,156	0.35	0.35	4	4
55	1	33	21 -	74	51	5	F	T	4.5	276	208	643	1,127	0.81	0.81	5	5
0	1	51	21 -	85	34	3	F	T	7.3	732	251	3,145	4,128	0.46	0.46	3	3
0	1	42	21 -	97	92	5	M	T	4.5	108	38	1,557	1,703	2.77	0.48	5	4
55	1	201	21 -	231	109	4	F	T	6.0	248	196	2,038	2,482	0.35	0.35	4	4
0	1	53	22 -	23	34	4	F	T	6.0	1,951	1,163	3,205	6,319	0.75	0.75	4	4
0	1	43	22 -	79	129	4	F	T	6.0	811	489	4,176	5,476	0.74	0.74	4	4
0	1	52	22 -	85	23	4	F	T	6.5	882	378	2,975	4,235	0.55	0.55	4	4
0	1	92	22 -	100	60	4	F	T	5.5	115	214	1,809	1,938	0.28	0.28	4	4
0	1	44	22 -	101	83	5	F	T	4.5	199	195	1,495	1,889	1.51	0.26	5	4
5	1	7	23 -	75	29	4	F	T	6.5	1,832	1,648	4,045	7,525	0.95	0.95	4	4
0	1	78	23 -	120	40	4	F	T	6.0	1,454	1,121	1,130	3,705	0.41	0.41	4	4
5	1	6	23 -	121	75	4	F	T	6.0	1,341	806	1,674	3,821	0.44	0.44	4	4
0	1	129	24 -	67	80	4	F	T	6.0	210	739	220	1,169	0.15	0.15	4	4
5	1	11	24 -	71	34	2	F	B	7.3	1,886	1,106	4,637	7,629	0.80	0.80	2	2
5	1	10	24 -	72	42	3	F	T	7.3	872	955	3,867	5,694	0.64	0.64	3	3
0	1	68	24 -	76	46	4	F	T	5.5	1,138	883	2,575	4,396	0.55	0.55	4	4
0	1	130	24 -	216	42	4	F	B	6.0	411	343	517	1,271	0.15	0.15	4	4
0	1	133	25 -	26	242	5	F	B	3.8	149	258	161	568	0.40	0.40	5	5
0	1	65	25 -	78	91	5	F	T	4.5	329	243	865	1,437	1.04	0.18	5	4
5	1	4	25 -	80	71	3	F	B	7.0	758	528	9,765	11,051	1.32	0.35	3	1
5	1	5	25 -	121	20	3	F	T	7.3	514	897	5,709	7,120	0.85	0.85	3	3
0	1	73	26 -	73	130	4	F	T	5.5	339	367	462	1,168	0.14	0.14	4	4
0	1	67	26 -	76	40	4	F	T	6.0	148	522	433	1,103	0.15	0.15	4	4
0	1	66	26 -	78	78	4	F	T	6.0	392	457	1,014	1,863	0.24	0.24	4	4
5	1	2	27 -	79	101	4	F	T	6.5	160	379	6,710	7,249	1.07	0.89	4	2
0	1	72	27 -	80	107	5	F	T	4.5	1,116	581	3,911	5,608	4.17	0.73	5	4
5	1	1	27 -	150	48	4	F	T	6.5	220	298	9,185	9,703	1.43	0.32	4	1
65	2	11	28 -	29	31	4	F	T	6.0	2,695	710	2,700	6,105	0.65	0.65	4	4
55	2	16	28 -	30	62	4	F	T	6.0	648	439	2,246	3,333	0.44	0.44	4	4
65	2	12	28 -	83	42	4	F	T	6.0	906	373	2,846	4,125	0.53	0.53	4	4
55	2	17	28 -	84	64	5	F	T	5.0	1,305	263	5,355	6,923	5.19	0.91	5	4
5	2	7	29 -	32	25	3	F	T	7.3	1,029	563	10,187	11,779	1.39	0.37	3	1
5	2	8	29 -	82	112	3	F	T	7.3	1,670	374	7,467	9,511	1.05	0.28	3	1
55	2	15	30 -	34	119	4	F	T	6.0	1,263	632	3,525	5,420	0.69	0.69	4	4
0	2	45	30 -	83	135	5	F	B	5.0	0	0	0	0	0.00	0.00	5	5
0	2	26	31 -	86	21	3	F	B	7.3	1,006	317	3,774	5,097	0.55	0.55	3	3
0	2	27	31 -	103	16	5	F	B	3.8	581	266	2,164	3,011	2.25	0.39	5	4
5	2	6	32 -	102	137	3	F	T	7.3	555	321	7,035	7,911	0.94	0.94	3	3
0	2	24	33 -	37	100	3	F	B	7.3	1,544	831	6,251	8,626	0.95	0.95	3	3

LINK NO R#	P#	SER	NODE NO FROM	TO	DIST. (Km)	CLASS	TER- RAIN	SUR- FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	PROPO.	CLASS EXIST.	PROPO.
5	2	3	33 -	87	48	3	F	T	7.3	1,871	553	8,258	10,682	1.18	0.31	3	1
0	2	20	33 -	105	34	3	F	B	7.3	3,097	1,110	3,728	7,935	0.73	0.73	3	3
0	2	34	33 -	107	34	4	F	B	6.0	912	330	1,077	2,319	0.26	0.26	4	4
5	2	2	33 -	118	15	2	F	T	7.3	1,826	741	10,812	13,379	1.52	0.41	2	1
0	2	48	33 -	217	60	5	F	B	3.8	1,082	919	9,476	11,477	9.22	0.36	5	1
0	2	25	34 -	102	24	4	F	B	5.5	678	191	2,846	3,715	0.49	0.49	4	4
55	2	201	34 -	232	165	4	F	T	6.0	1,128	442	8,763	10,333	1.44	0.32	4	1
0	2	22	35 -	106	74	5	F	B	5.0	2,104	1,012	1,035	4,151	2.36	0.41	5	4
0	2	28	36 -	103	48	4	F	B	5.5	213	87	232	532	0.06	0.06	4	4
0	2	44	36 -	104	40	4	F	B	5.5	1,637	405	756	2,798	0.26	0.26	4	4
0	2	29	36 -	106	68	4	F	B	5.5	669	341	236	1,246	0.12	0.12	4	4
0	2	23	37 -	39	102	3	F	B	7.3	3,593	1,334	7,599	12,526	1.27	0.34	3	1
0	2	33	37 -	109	24	4	F	B	5.5	879	496	1,649	3,024	0.37	0.37	4	4
0	2	36	38 -	88	52	4	F	B	5.5	366	119	593	1,078	0.13	0.13	4	4
0	2	32	38 -	109	81	5	F	B	5.0	73	222	750	1,045	0.85	0.85	5	5
0	2	31	38 -	122	45	4	F	B	5.5	102	116	229	447	0.06	0.06	4	4
5	2	1	39 -	118	150	2	F	B	7.3	1,754	582	9,208	11,544	1.30	0.35	2	1
25	2	10	39 -	151	23	3	F	B	7.3	4,635	532	1,370	6,537	0.43	0.43	3	3
25	4	5	40 -	43	145	4	H	B	6.0	771	942	3,416	5,129	0.91	0.91	4	4
85	4	10	40 -	45	148	4	M	T	6.0	467	106	1,433	2,006	0.49	0.49	4	4
50	4	8	40 -	86	175	5	F	B	3.8	309	130	601	1,040	0.71	0.71	5	5
0	4	11	40 -	218	182	5	M	G	3.8	145	48	160	353	0.40	0.40	5	5
25	4	6	40 -	221	130	4	H	B	6.0	1,382	533	1,452	3,367	0.47	0.47	4	4
40	4	24	40 -	223	129	5	H	D	3.8	173	90	326	589	0.52	0.52	5	5
0	4	22	41 -	96	72	5	M	B	3.8	284	144	229	657	0.72	0.72	5	5
0	4	12	41 -	97	189	5	F	B	3.8	64	45	871	980	0.80	0.80	5	5
0	4	27	41 -	218	35	5	M	G	3.8	70	29	57	156	0.17	0.17	5	5
40	4	14	42 -	51	385	5	F	G	3.8	78	41	147	266	0.18	0.18	5	5
40	4	13	42 -	223	181	5	H	D	3.8	173	90	414	677	0.63	0.63	5	5
25	4	4	43 -	110	69	5	F	B	3.8	268	36	787	1,091	0.78	0.78	5	5
25	4	2	44 -	114	76	5	F	B	4.0	2,201	464	367	3,032	1.34	0.23	5	4
25	4	3	44 -	227	196	5	M	B	3.8	165	47	627	839	1.20	0.21	5	4
0	4	29	44 -	228	173	5	F	G	3.8	97	49	550	696	0.54	0.54	5	5
65	4	9	45 -	154	147	4	F	D	6.0	434	320	2,895	3,649	0.50	0.50	4	4
0	4	23	45 -	222	17	5	H	G	3.8	0	0	27	27	0.03	0.03	5	5
0	4	17	46 -	111	230	5	F	G	3.8	96	12	281	389	0.28	0.28	5	5
0	4	20	46 -	113	169	5	F	G	3.8	0	8	412	420	0.36	0.36	5	5
99	0	4	47 -	229	430	4	M	B	6.5	0	0	0	0	0.00	0.00	4	4
0	3	38	48 -	54	18	4	M	B	5.5	0	0	0	0	0.00	0.00	4	4
99	0	1	49 -	201	192	3	M	T	7.3	2	0	46	48	0.01	0.01	3	3
99	0	3	49 -	221	565	4	H	B	6.0	2	0	46	48	0.01	0.01	4	4
0	3	25	52 -	230	132	4	M	D	5.5	64	62	729	855	0.24	0.24	4	4
5	3	2	53 -	116	22	3	F	B	7.3	2,968	1,065	3,343	7,376	0.67	0.67	3	3
35	3	8	54 -	89	122	4	M	T	6.0	905	50	189	1,144	0.12	0.12	4	4
5	1	21	55 -	117	37	1	F	T	14.6	6,686	1,413	6,095	14,194	0.32	0.32	1	1
35	1	23	55 -	152	14	3	F	T	7.0	3,769	528	2,598	6,895	0.55	0.55	3	3
0	1	99	56 -	58	87	4	F	T	6.0	1,999	338	2,634	4,971	0.55	0.55	4	4
0	1	30	56 -	68	40	4	F	T	6.0	865	232	894	1,991	0.21	0.21	4	4
0	1	31	56 -	117	30	4	F	T	6.0	1,538	520	2,610	4,668	0.55	0.55	4	4
0	1	49	57 -	82	62	4	F	T	6.0	2,366	901	1,551	4,818	0.49	0.49	4	4
5	1	18	57 -	93	33	3	H	T	7.3	3,636	1,432	4,530	9,598	1.15	0.31	3	1
0	1	96	58 -	60	47	4	F	T	5.5	694	165	677	1,536	0.16	0.16	4	4
0	1	97	58 -	68	82	4	F	T	5.5	448	75	474	997	0.10	0.10	4	4
0	1	101	58 -	92	46	5	F	T	4.0	1,475	254	728	2,457	1.26	0.22	5	4
0	3	12	59 -	156	39	5	H	D	5.0	696	48	763	1,507	1.13	0.20	5	4

LINK R#	LINK P#	LINK SER	NODE NO FROM	NODE NO TO	DIST. (Km)	CLASS	TER-RAIN	SUR-FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	V/C RATIO PROPO.	CLASS EXIST.	CLASS PROPO.
0	1	47	60	62	46	5	M	T	5.0	672	626	1,920	3,218	4.56	0.80	5	4
0	1	48	60	92	58	5	F	T	3.8	1,201	449	916	2,566	1.51	0.26	5	4
0	1	46	62	66	138	5	F	T	5.0	404	232	438	1,074	0.69	0.69	5	5
0	1	119	62	210	48	4	F	T	5.5	1,946	748	1,678	4,372	0.46	0.46	4	4
0	1	90	63	64	33	4	F	T	6.5	1,041	638	2,995	4,674	0.60	0.60	4	4
0	1	118	63	209	20	4	F	T	6.5	254	322	1,417	1,993	0.27	0.27	4	4
0	1	39	65	66	94	5	F	T	3.8	134	129	614	877	0.68	0.68	5	5
0	1	93	65	100	104	4	F	T	5.5	346	214	2,492	3,052	0.42	0.42	4	4
0	1	94	65	211	40	4	F	T	6.0	178	173	2,178	2,529	0.36	0.36	4	4
0	1	40	65	213	20	5	F	T	4.5	190	227	844	1,261	0.97	0.97	5	5
0	1	45	66	101	92	4	F	T	6.0	136	123	1,385	1,644	0.23	0.23	4	4
0	1	85	67	70	48	4	F	T	6.0	469	823	911	2,203	0.28	0.28	4	4
0	1	103	67	71	57	4	F	T	6.0	430	364	613	1,407	0.17	0.17	4	4
0	1	29	68	158	38	5	F	T	3.8	310	186	884	1,380	1.01	0.18	5	4
0	1	74	69	71	25	4	F	T	6.0	1,060	700	1,459	3,219	0.38	0.38	4	4
0	1	83	69	73	24	4	F	T	6.0	578	546	931	2,055	0.25	0.25	4	4
0	1	87	70	72	40	4	F	T	6.0	524	843	870	2,237	0.28	0.28	4	4
0	1	128	71	215	62	5	F	B	3.8	285	208	348	821	0.55	0.55	5	5
0	1	86	72	98	48	4	F	T	6.0	479	455	813	1,747	0.21	0.21	4	4
5	1	9	72	119	80	4	F	T	6.5	1,078	830	3,765	5,673	0.74	0.74	4	4
0	1	131	73	216	22	4	F	T	6.0	361	312	587	1,260	0.15	0.15	4	4
0	1	104	74	99	29	4	F	T	6.0	182	219	663	1,064	0.14	0.14	4	4
55	1	34	74	160	106	5	F	T	4.5	226	156	581	963	0.70	0.70	5	5
5	1	8	75	119	14	4	F	T	6.0	378	874	2,484	3,736	0.52	0.52	4	4
0	1	81	76	98	40	4	F	T	6.0	763	827	2,108	3,698	0.48	0.48	4	4
0	1	82	76	216	32	4	F	T	6.0	263	328	454	1,045	0.13	0.13	4	4
0	1	75	77	78	50	4	F	T	6.0	313	430	497	1,240	0.15	0.15	4	4
0	1	80	77	98	35	4	F	T	6.0	807	904	2,082	3,793	0.49	0.49	4	4
0	1	79	77	120	57	4	F	T	6.0	720	645	922	2,287	0.27	0.27	4	4
0	1	132	77	121	99	5	F	B	5.0	428	181	949	1,558	1.09	0.19	5	4
5	1	3	79	80	13	4	F	T	6.0	131	320	4,607	5,058	0.75	0.75	4	4
0	2	42	81	82	31	4	F	B	5.5	14	38	524	576	0.09	0.09	4	4
55	2	18	81	84	47	4	F	T	5.5	540	247	4,314	5,101	0.71	0.71	4	4
55	2	19	81	159	2	4	F	T	5.5	19	30	1,464	1,513	0.23	0.23	4	4
5	2	9	82	150	13	3	F	T	7.3	92	277	5,634	6,003	0.74	0.74	3	3
0	2	46	83	84	78	4	F	B	5.5	7	2	271	280	0.04	0.04	4	4
65	2	13	83	154	11	4	F	T	6.0	999	365	3,142	4,506	0.58	0.58	4	4
0	1	107	85	99	50	4	F	T	5.5	318	278	2,068	2,664	0.37	0.37	4	4
5	2	4	86	87	39	3	F	T	7.3	1,145	383	7,892	9,420	1.08	0.29	3	1
5	2	5	86	102	70	3	F	B	7.3	1,137	442	9,197	10,776	1.25	0.33	3	1
0	2	43	87	104	26	4	F	B	5.5	850	214	384	1,448	0.13	0.13	4	4
0	2	35	88	107	16	4	F	B	6.0	366	119	593	1,078	0.13	0.13	4	4
0	2	40	88	108	26	4	F	B	5.5	0	0	0	0	0.00	0.00	4	4
35	3	9	89	229	157	4	M	B	6.5	187	24	228	439	0.08	0.08	4	4
0	3	29	90	115	88	3	M	D	7.3	1,060	88	815	1,963	0.27	0.27	3	3
35	3	5	90	152	19	4	H	T	6.0	3,769	528	2,598	6,895	0.81	0.81	4	4
0	1	100	92	93	68	5	F	T	4.5	692	190	357	1,239	0.67	0.67	5	5
0	1	108	92	205	91	5	F	B	3.8	414	333	936	1,683	1.21	0.21	5	4
0	3	13	94	157	37	5	M	B	3.8	11	7	410	428	0.72	0.72	5	5
0	1	26	95	158	54	5	F	T	4.5	555	142	906	1,603	1.06	0.18	5	4
0	1	28	95	157	27	5	M	B	3.8	11	7	410	428	0.72	0.72	5	5
50	4	7	96	219	139	5	F	B	4.5	95	104	1,189	1,388	1.14	0.20	5	4
0	4	28	97	222	255	5	H	G	3.8	67	24	171	262	0.24	0.24	5	5
0	1	105	99	214	8	5	F	T	3.8	0	0	526	526	0.45	0.45	5	5
0	1	108	100	101	31	5	F	T	3.8	136	52	289	477	0.33	0.33	5	5

LINK NO R#	P#	SER	NODE NO FROM	TO	DIST. (Km)	CLASS	TER-RAIN	SUR-FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	PROPO.	CLASS EXIST.	PROPO.
0	1	126	100	214	9	5	F	T	3.8	109	177	787	1,073	0.86	0.86	5	5
0	2	37	103	104	30	5	F	B	3.8	368	179	1,932	2,479	1.91	0.34	5	4
0	2	38	104	217	41	4	F	B	5.5	1,381	381	2,779	4,541	0.54	0.54	4	4
0	2	21	105	106	32	4	F	B	6.5	1,716	729	824	3,269	0.32	0.32	4	4
0	2	39	105	108	45	5	F	B	5.0	0	0	0	0	0.00	0.00	5	5
0	2	48	105	217	14	4	F	B	5.5	1,381	381	2,779	4,541	0.54	0.54	4	4
0	2	30	106	122	40	4	F	B	5.5	106	116	135	357	0.04	0.04	4	4
0	2	41	107	109	77	5	F	B	5.0	843	383	1,248	2,474	1.64	0.29	5	4
0	2	47	108	122	13	4	F	B	5.5	0	0	0	0	0.00	0.00	4	4
0	4	33	110	224	78	5	H	G	3.8	810	451	1,872	3,133	2.89	0.51	5	4
25	4	34	110	227	104	5	M	B	3.8	283	55	643	981	1.28	0.22	5	4
0	4	16	111	112	118	5	F	G	3.8	8	4	242	254	0.21	0.21	5	5
0	4	21	111	113	115	5	F	B	3.8	138	49	157	344	0.22	0.22	5	5
0	4	18	112	225	405	5	H	G	3.8	130	58	169	357	0.30	0.30	5	5
0	4	15	112	228	155	5	F	G	3.8	8	4	242	254	0.21	0.21	5	5
0	4	19	113	114	372	5	F	G	3.8	0	8	412	420	0.36	0.36	5	5
25	4	1	114	151	77	5	F	B	4.0	2,201	472	777	3,450	1.70	0.30	5	4
0	3	32	115	116	33	4	F	D	6.0	1,427	361	856	2,644	0.25	0.25	4	4
55	2	14	118	232	30	5	F	T	3.8	1,128	442	8,763	10,333	8.21	0.32	5	1
0	1	76	119	120	31	4	F	T	6.5	271	253	3,393	3,917	0.56	0.56	4	4
0	1	77	120	121	57	4	F	T	6.0	279	324	3,422	4,025	0.58	0.58	4	4
50	4	26	153	219	70	5	F	B	4.5	25	34	667	726	0.61	0.61	5	5
55	1	32	159	231	109	5	F	T	3.8	248	196	2,038	2,482	1.99	0.35	5	4
0	1	122	161	212	12	5	F	T	4.5	64	82	1,449	1,595	1.33	0.23	5	4
0	3	34	203	220	80	5	M	B	3.8	325	145	548	1,018	1.28	0.22	5	4
0	1	117	204	207	51	4	F	T	6.0	10	4	207	221	0.03	0.03	4	4
0	1	110	205	208	31	4	F	T	6.0	377	409	1,518	2,304	0.31	0.31	4	4
0	1	113	206	207	21	4	F	T	6.5	565	349	612	1,526	0.17	0.17	4	4
0	1	112	207	208	18	4	F	T	6.5	575	352	772	1,699	0.20	0.20	4	4
0	1	116	207	209	70	5	F	G	3.8	0	1	47	48	0.04	0.04	5	5
0	1	124	210	211	125	4	F	B	5.5	0	0	0	0	0.00	0.00	4	4
0	1	123	211	212	50	4	F	B	5.5	305	208	393	906	0.11	0.11	4	4
0	1	134	212	213	16	5	F	T	4.5	706	248	1,197	2,151	1.44	0.25	5	4
0	1	125	213	214	118	5	F	G	3.8	307	198	428	933	0.82	0.82	5	5
0	4	37	218	222	180	5	M	G	3.8	24	10	126	160	0.24	0.24	5	5
0	4	25	219	220	97	5	M	G	3.8	0	0	0	0	0.00	0.00	5	5
0	4	31	223	224	178	5	M	B	3.8	91	13	246	350	0.47	0.47	5	5
0	4	32	224	225	47	5	H	G	3.8	8	4	242	254	0.28	0.28	5	5
0	4	35	225	226	26	5	M	G	3.8	8	4	242	254	0.42	0.42	5	5
0	4	36	228	227	61	5	M	G	3.8	0	0	0	0	0.00	0.00	5	5
0	4	30	226	228	166	5	M	G	3.8	8	4	242	254	0.42	0.42	5	5

App. Table 3-2 Traffic Assignment on the Study Road (2005/06)

TRAFFIC ASSIGNMENT .. (1985 NET / 2005 OD - case 2)

LINK NO R#	P#	SER	NODE NO FROM	TO	DIST. (Km)	CLASS	TER- RAIN	SUR- FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	PROPO.	CLASS EXIST.	PROPO.
0	3	33	1 - 2	80	3	F	D	7.3	0	0	0	0	0.00	0.00	3	3
0	3	24	1 - 52	66	3	H	T	7.0	4,070	1,899	3,912	9,881	1.14	0.30	3	1
0	3	23	1 - 53	23	4	F	T	6.5	4,475	2,437	4,707	11,619	1.30	0.29	4	1
0	3	27	1 - 91	28	3	F	D	7.3	4,557	1,859	872	7,288	0.53	0.53	3	3
0	3	28	1 - 115	46	3	F	D	7.3	6,755	1,552	3,390	11,697	0.90	0.90	3	3
55	3	21	2 - 3	64	4	M	T	6.0	4,136	3,443	4,283	11,862	2.52	0.56	4	1
5	3	3	2 - 53	35	1	F	B	14.6	14,391	3,528	3,629	21,548	0.40	0.40	1	1
0	3	26	2 - 91	29	3	F	D	7.3	14,953	2,189	1,660	18,802	1.10	0.29	3	1
5	3	4	2 - 201	53	3	M	B	7.3	2,917	15	804	3,736	0.33	0.33	3	3
55	3	20	3 - 94	29	5	F	T	5.5	359	287	1,197	1,843	1.37	0.24	5	4
0	3	15	3 - 158	50	4	F	D	6.0	3,784	880	2,498	6,942	0.66	0.66	4	4
0	3	14	3 - 202	186	5	M	T	4.0	3,055	343	788	4,186	2.81	0.49	5	4
35	3	7	4 - 54	24	4	M	T	6.0	8,338	549	1,272	10,159	0.96	0.96	4	4
35	3	6	4 - 90	47	3	M	T	7.3	6,644	642	3,361	10,647	1.28	0.34	3	1
0	3	11	4 - 155	55	4	M	T	5.5	943	172	553	1,668	0.26	0.26	4	4
55	3	17	5 - 59	94	4	F	T	6.0	1,734	418	2,488	4,640	0.52	0.52	4	4
50	3	10	5 - 153	90	4	H	B	5.5	36	62	667	765	0.15	0.15	4	4
55	3	18	5 - 180	51	5	F	T	4.0	909	302	1,685	2,896	1.96	0.34	5	4
0	3	22	5 - 181	8	4	F	T	5.5	457	141	1,449	2,047	0.26	0.26	4	4
0	3	35	5 - 203	105	4	F	B	6.0	1,412	512	1,825	3,749	0.42	0.42	4	4
55	3	18	6 - 59	47	4	F	T	6.0	2,332	469	2,349	5,150	0.54	0.54	4	4
55	3	19	6 - 94	96	4	H	T	6.0	342	272	787	1,401	0.23	0.23	4	4
0	3	36	8 - 203	150	4	H	B	6.0	630	203	326	1,159	0.14	0.14	4	4
0	3	37	7 - 230	73	4	M	D	5.5	96	93	972	1,161	0.32	0.32	4	4
0	3	30	8 - 52	35	4	F	T	6.0	1,234	818	1,522	3,374	0.38	0.38	4	4
0	3	31	8 - 88	82	5	M	T	3.8	0	0	0	0	0.00	0.00	5	5
5	1	22	9 - 55	44	3	H	T	7.3	8,963	2,121	4,390	15,474	1.46	0.39	3	1
0	1	98	9 - 68	81	5	H	T	3.8	2,511	168	1,520	4,199	2.85	0.46	5	4
5	3	1	9 - 116	9	3	F	B	7.3	4,764	1,587	5,002	11,353	1.02	0.27	3	1
5	1	19	10 - 57	31	3	F	T	7.3	9,159	2,870	6,664	18,693	1.57	0.42	3	1
5	1	20	10 - 117	12	1	F	T	14.6	16,887	3,167	12,197	32,251	0.70	0.70	1	1
0	1	24	10 - 155	72	4	M	T	6.0	6,447	799	1,693	8,939	1.07	0.89	4	3
5	1	17	11 - 93	40	3	H	T	7.3	8,180	2,207	5,526	13,913	1.55	0.41	3	1
5	1	18	11 - 204	24	3	F	T	7.3	4,538	2,875	5,928	13,341	1.29	0.34	3	1
0	1	109	11 - 205	32	5	F	B	3.8	400	191	2,210	2,801	2.17	0.38	5	4
5	1	15	12 - 61	11	3	F	T	7.3	9,109	2,234	4,952	16,295	1.28	0.34	3	1
5	1	111	12 - 204	38	3	F	T	7.3	4,982	1,828	4,805	11,615	1.04	0.28	3	1
0	1	114	12 - 206	37	4	F	T	6.5	2,011	1,649	3,238	6,898	0.83	0.83	4	4
0	1	55	13 - 16	117	5	F	T	5.0	2,349	1,182	1,692	5,223	3.13	0.55	5	4
0	1	59	13 - 62	47	3	F	T	7.3	2,845	2,122	5,616	10,383	1.08	0.29	3	1
0	1	71	13 - 84	52	4	F	T	6.5	2,860	1,406	6,731	10,997	1.36	0.30	4	1
0	1	58	13 - 208	95	4	F	T	6.5	636	582	2,676	3,894	0.52	0.52	4	4
0	1	58	13 - 209	43	4	F	T	6.5	1,554	506	1,979	4,039	0.45	0.45	4	4
0	1	95	14 - 58	99	5	F	T	5.0	1,865	348	3,563	5,776	3.89	0.68	5	4
0	1	27	14 - 95	48	5	F	T	4.5	1,924	457	1,903	4,284	2.57	0.45	5	4
0	1	60	14 - 210	41	4	F	T	5.5	910	502	1,392	2,804	0.33	0.33	4	4
0	1	121	14 - 211	87	4	F	T	6.0	1,320	466	2,848	4,634	0.56	0.56	4	4
0	1	120	14 - 212	100	5	F	G	3.8	37	31	605	673	0.56	0.56	5	5
0	1	37	15 - 16	82	3	F	T	7.3	1,888	1,788	4,356	8,032	0.85	0.85	3	3
0	1	36	15 - 18	97	3	F	T	7.3	3,505	3,388	3,816	10,707	1.05	0.28	3	1
0	1	70	15 - 64	37	3	F	T	7.3	5,620	1,552	5,841	13,013	1.16	0.31	3	1
0	1	69	15 - 67	40	4	F	T	6.5	3,286	2,151	5,807	11,244	1.36	0.30	4	1
0	1	64	15 - 215	38	4	F	T	6.0	3,140	1,706	2,442	7,288	0.78	0.78	4	4
0	1	89	16 - 64	82	4	F	T	6.0	403	398	2,174	2,975	0.41	0.41	4	4
0	1	38	16 - 66	32	4	F	T	6.0	1,235	1,346	3,436	6,017	0.78	0.78	4	4

LINK NO R#	P# SER	NODE NO FROM	TO	DIST. (Km)	CLASS	TER- RAIN	SUR- FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	PROPO.	CLASS EXIST.	PROPO.
0	1 102	16 -	67	64	5	F	T	4.0	655	418	1,140	2,213	1.52	0.27	5	4
0	1 88	16 -	70	51	4	F	T	6.0	1,143	349	2,022	3,514	0.41	0.41	4	4
0	1 54	16 -	75	113	4	F	T	6.0	1,074	1,182	3,673	5,929	0.78	0.78	4	4
0	1 35	17 -	18	38	3	F	T	7.3	5,767	2,268	3,116	11,151	0.91	0.91	3	3
5	1 13	17 -	19	73	1	F	T	14.6	24,087	4,860	4,113	33,060	0.57	0.57	1	1
0	1 50	17 -	50	88	3	F	T	7.3	12,894	1,706	4,515	19,115	1.31	0.35	3	1
0	1 84	17 -	69	138	4	F	T	6.0	712	524	1,726	2,962	0.37	0.37	4	4
5	1 12	17 -	71	111	2	F	B	7.3	4,862	1,753	5,092	11,507	1.05	0.28	2	1
0	1 127	17 -	215	100	4	F	T	6.0	2,125	931	2,168	5,224	0.57	0.57	4	4
0	1 61	18 -	19	53	4	F	T	6.5	1,747	1,124	4,709	7,580	0.96	0.96	4	4
0	1 57	18 -	63	70	3	F	T	7.3	4,670	1,940	6,696	13,306	1.27	0.34	3	1
0	1 62	19 -	20	48	5	F	T	5.0	3,123	1,742	1,427	6,292	3.81	0.63	5	4
5	1 14	19 -	61	39	3	F	T	7.3	13,539	2,701	4,819	21,059	1.50	0.40	3	1
0	1 91	19 -	63	99	4	F	T	5.5	409	239	702	1,350	0.16	0.16	4	4
0	1 115	19 -	208	69	4	F	T	6.0	3,225	2,443	4,276	9,944	1.17	0.97	4	2
0	1 63	20 -	61	42	4	F	T	6.5	1,722	1,395	1,271	4,388	0.49	0.49	4	4
55	1 33	21 -	74	51	5	F	T	4.5	479	320	1,137	1,936	1.39	0.24	5	4
0	1 51	21 -	85	34	3	F	T	7.3	1,264	318	3,145	4,727	0.49	0.49	3	3
0	1 42	21 -	97	92	5	M	T	4.5	191	75	2,846	3,112	5.06	0.89	5	4
55	1 201	21 -	231	109	4	F	T	6.0	467	365	2,038	2,870	0.38	0.38	4	4
0	1 53	22 -	23	34	4	F	T	6.0	3,240	1,600	3,205	8,045	0.88	0.88	4	4
0	1 43	22 -	79	129	4	F	T	6.0	1,472	903	4,176	6,551	0.84	0.84	4	4
0	1 52	22 -	85	23	4	F	T	6.5	1,527	536	2,975	5,038	0.60	0.60	4	4
0	1 92	22 -	100	60	4	F	T	5.5	189	291	1,725	2,205	0.31	0.31	4	4
0	1 44	22 -	101	63	5	F	T	4.5	371	354	2,347	3,072	2.42	0.42	5	4
5	1 7	23 -	75	29	4	F	T	6.5	3,048	2,215	4,045	9,308	1.09	0.91	4	2
0	1 78	23 -	120	40	4	F	T	6.0	2,626	1,953	2,468	7,047	0.79	0.79	4	4
5	1 6	23 -	121	75	4	F	T	6.0	2,262	967	1,706	4,935	0.51	0.51	4	4
0	1 129	24 -	67	80	4	F	T	6.0	268	905	808	1,981	0.27	0.27	4	4
5	1 11	24 -	71	34	2	F	B	7.3	3,162	1,753	5,092	10,007	0.99	0.99	2	2
5	1 10	24 -	72	42	3	F	T	7.3	1,370	1,357	3,867	6,594	0.71	0.71	3	3
0	1 68	24 -	76	46	4	F	T	5.5	2,002	890	3,114	6,006	0.70	0.70	4	4
0	1 130	24 -	216	42	4	F	B	6.0	767	640	1,127	2,534	0.30	0.30	4	4
0	1 133	25 -	26	242	5	F	B	3.8	278	482	351	1,112	0.78	0.79	5	5
0	1 65	25 -	78	91	5	F	T	4.5	414	372	1,003	1,789	1.30	0.23	5	4
5	1 4	25 -	80	71	3	F	B	7.0	1,298	618	9,765	11,679	1.35	0.36	3	1
5	1 5	25 -	121	20	3	F	T	7.3	705	1,170	5,709	7,584	0.89	0.89	3	3
0	1 73	26 -	73	130	4	F	T	5.5	633	685	1,007	2,325	0.29	0.29	4	4
0	1 67	26 -	76	40	4	F	T	6.0	176	632	731	1,539	0.21	0.21	4	4
0	1 66	26 -	78	78	4	F	T	6.0	532	772	1,328	2,632	0.34	0.34	4	4
5	1 2	27 -	79	101	4	F	T	6.5	227	599	6,710	7,536	1.11	0.92	4	2
0	1 72	27 -	80	107	5	F	T	4.5	1,996	816	3,911	6,723	4.62	0.81	5	4
5	1 1	27 -	150	48	4	F	T	6.5	345	433	9,185	9,963	1.46	0.32	4	1
65	2 11	28 -	29	31	4	F	T	6.0	4,367	771	2,741	7,879	0.75	0.75	4	4
55	2 16	28 -	30	62	4	F	T	6.0	1,431	578	2,246	4,255	0.50	0.50	4	4
65	2 12	28 -	83	42	4	F	T	6.0	2,258	586	2,846	5,690	0.63	0.63	4	4
55	2 17	28 -	84	64	5	F	T	5.0	2,427	489	8,417	11,333	8.33	0.32	5	1
5	2 7	29 -	32	25	3	F	T	7.3	1,643	1,088	10,988	13,719	1.58	0.42	3	1
5	2 8	29 -	82	112	3	F	T	7.3	3,089	674	7,467	11,230	1.15	0.31	3	1
55	2 15	30 -	34	119	4	F	T	6.0	2,287	905	3,525	6,717	0.78	0.78	4	4
0	2 45	30 -	83	135	5	F	B	5.0	0	0	0	0	0.00	0.00	5	5
0	2 26	31 -	86	21	3	F	B	7.3	1,330	484	3,774	5,588	0.59	0.59	3	3
0	2 27	31 -	103	16	5	F	B	3.8	581	266	2,164	3,011	2.25	0.39	5	4
5	2 6	32 -	102	137	3	F	T	7.3	990	771	7,035	8,796	1.02	0.27	3	1
0	2 24	33 -	37	100	3	F	B	7.3	3,059	1,608	6,251	10,918	1.11	0.30	3	1

LINK NO R#	P#	SER	NODE NO FROM	TO	DIST. (Km)	CLASS	TER-RAIN	SUR-FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	PROPO.	CLASS EXIST.	PROPO.
5	2	3	33 -	87	46	3	F	T	7.3	3,346	1,100	9,695	14,141	1.49	0.40	3	1
0	2	20	33 -	105	34	3	F	B	7.3	3,711	1,500	3,728	8,939	0.81	0.81	3	3
0	2	34	33 -	107	34	4	F	B	6.0	1,212	355	1,077	2,644	0.28	0.28	4	4
5	2	2	33 -	118	15	2	F	T	7.3	4,781	2,058	12,350	19,189	2.00	0.53	2	1
0	2	48	33 -	217	60	5	F	B	3.8	2,019	1,716	20,670	24,405	19.76	0.77	5	1
0	2	25	34 -	102	24	4	F	B	5.5	1,194	428	3,328	4,950	0.62	0.62	4	4
55	2	201	34 -	232	165	4	F	T	6.0	2,696	878	8,763	12,337	1.58	0.35	4	1
0	2	22	35 -	106	74	5	F	B	5.0	2,633	1,444	1,279	5,356	3.09	0.54	5	4
0	2	28	36 -	103	48	4	F	B	5.5	213	87	232	532	0.06	0.06	4	4
0	2	44	36 -	104	40	4	F	B	5.5	2,623	640	1,277	4,540	0.42	0.42	4	4
0	2	29	36 -	106	68	4	F	B	5.5	669	354	236	1,259	0.12	0.12	4	4
0	2	23	37 -	39	102	3	F	B	7.3	4,918	1,881	7,599	14,398	1.39	0.37	3	1
0	2	33	37 -	109	24	4	F	B	5.5	1,202	547	1,673	3,422	0.39	0.39	4	4
0	2	36	38 -	88	52	4	F	B	5.5	494	180	630	1,304	0.15	0.15	4	4
0	2	32	38 -	109	81	5	F	B	5.0	73	222	750	1,045	0.85	0.85	5	5
0	2	31	38 -	122	45	4	F	B	5.5	102	116	229	447	0.06	0.06	4	4
5	2	1	39 -	118	150	2	F	B	7.3	3,648	1,562	9,208	14,419	1.50	0.40	2	1
25	2	10	39 -	151	23	3	F	B	7.3	8,070	855	2,449	11,374	0.75	0.75	3	3
25	4	5	40 -	43	145	4	H	B	6.0	2,107	1,919	7,240	11,266	1.94	0.43	4	1
65	4	10	40 -	45	148	4	M	T	6.0	1,517	309	1,433	3,259	0.60	0.60	4	4
50	4	8	40 -	96	175	5	F	B	3.8	489	213	601	1,303	0.84	0.84	5	5
0	4	11	40 -	218	182	5	M	G	3.8	252	85	351	688	0.82	0.82	5	5
25	4	6	40 -	221	130	4	H	B	6.0	2,580	994	3,002	6,576	0.93	0.93	4	4
40	4	24	40 -	223	129	5	H	D	3.8	259	144	584	987	0.91	0.91	5	5
0	4	22	41 -	96	72	5	M	B	3.8	453	249	308	1,010	1.08	0.19	5	4
0	4	12	41 -	97	189	5	F	B	3.8	110	87	1,424	1,621	1.33	0.23	5	4
0	4	27	41 -	218	35	5	M	G	3.8	113	49	57	219	0.21	0.21	5	5
40	4	14	42 -	51	365	5	F	G	3.8	145	76	321	542	0.38	0.38	5	5
40	4	13	42 -	223	181	5	H	D	3.8	259	144	782	1,185	1.13	0.20	5	4
25	4	4	43 -	110	69	5	F	B	3.8	1,371	248	1,514	3,133	1.90	0.33	5	4
25	4	2	44 -	114	76	5	F	B	4.0	3,527	727	513	4,767	2.07	0.36	5	4
25	4	3	44 -	227	196	5	M	B	3.8	1,180	269	1,293	2,742	3.01	0.53	5	4
0	4	29	44 -	228	173	5	F	G	3.8	182	91	1,306	1,579	1.25	0.22	5	4
65	4	9	45 -	154	147	4	F	D	6.0	1,404	588	3,117	5,109	0.63	0.63	4	4
0	4	23	45 -	222	17	5	H	G	3.8	0	0	27	27	0.03	0.03	5	5
0	4	17	46 -	111	230	5	F	G	3.8	176	21	388	585	0.40	0.40	5	5
0	4	20	46 -	113	169	5	F	G	3.8	0	18	646	662	0.57	0.57	5	5
99	0	4	47 -	229	430	4	M	B	6.5	0	0	0	0	0.00	0.00	4	4
0	3	38	48 -	54	18	4	M	B	5.5	0	0	0	0	0.00	0.00	4	4
99	0	1	49 -	201	192	3	M	T	7.3	4	0	46	50	0.01	0.01	3	3
99	0	3	49 -	221	565	4	H	B	6.0	4	0	46	50	0.01	0.01	4	4
0	3	25	52 -	230	132	4	M	D	5.5	96	93	972	1,161	0.32	0.32	4	4
5	3	2	53 -	116	22	3	F	B	7.3	5,332	1,955	3,534	10,821	0.91	0.91	3	3
35	3	8	54 -	89	122	4	M	T	6.0	1,688	94	411	2,193	0.24	0.24	4	4
5	1	21	55 -	117	37	1	F	T	14.6	10,705	1,932	7,383	20,020	0.43	0.43	1	1
35	1	23	55 -	152	14	3	F	T	7.0	5,583	698	3,159	9,440	0.71	0.71	3	3
0	1	99	56 -	58	87	4	F	T	6.0	3,737	745	4,595	9,077	0.99	0.99	4	4
0	1	30	56 -	88	40	4	F	T	6.0	1,556	398	1,215	3,169	0.32	0.32	4	4
0	1	31	56 -	117	30	4	F	T	6.0	2,817	1,049	3,809	7,675	0.87	0.87	4	4
0	1	49	57 -	92	62	4	F	T	6.0	4,458	1,545	2,778	8,781	0.87	0.87	4	4
5	1	18	57 -	93	33	3	H	T	7.3	5,929	2,207	5,514	13,650	1.53	0.41	3	1
0	1	96	58 -	60	47	4	F	T	5.5	1,390	511	2,035	3,936	0.45	0.45	4	4
0	1	97	58 -	88	82	4	F	T	5.5	922	205	1,414	2,541	0.29	0.29	4	4
0	1	101	58 -	92	46	5	F	T	4.0	2,753	470	1,434	4,657	2.42	0.42	5	4
0	3	12	59 -	156	39	5	H	D	5.0	1,273	51	1,322	2,646	1.93	0.34	5	4

LINK NO R#	P# SER	NODE NO FROM - TO	DIST. (Km)	CLASS	TER-RAIN	SUR-FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	PROPO.	CLASS EXIST.	PROPO.
0	1 47	60 - 62	46	5	M	T	5.0	1,314	1,226	4,443	6,983	10.09	0.39	5	1
0	1 48	60 - 92	58	5	F	T	3.8	2,206	693	1,692	4,591	2.67	0.47	5	4
0	1 46	62 - 66	138	5	F	T	5.0	755	433	955	2,143	1.41	0.25	5	4
0	1 119	62 - 210	48	4	F	T	5.5	3,513	1,190	2,592	7,295	0.74	0.74	4	4
0	1 90	63 - 64	33	4	F	T	6.5	1,956	1,193	6,656	9,805	1.28	0.28	4	1
0	1 118	63 - 209	20	4	F	T	6.5	424	511	2,205	3,140	0.43	0.43	4	4
0	1 39	65 - 66	94	5	F	T	3.8	237	234	614	1,085	0.79	0.79	5	5
0	1 93	65 - 100	104	4	F	T	5.5	821	291	2,954	3,866	0.52	0.52	4	4
0	1 94	65 - 211	40	4	F	T	6.0	323	224	2,561	3,108	0.43	0.43	4	4
0	1 40	65 - 213	20	5	F	T	4.5	326	407	844	1,577	1.17	0.20	5	4
0	1 45	66 - 101	92	4	F	T	6.0	252	221	2,107	2,580	0.36	0.36	4	4
0	1 85	67 - 70	48	4	F	T	6.0	878	1,562	2,013	4,453	0.58	0.58	4	4
0	1 103	67 - 71	57	4	F	T	6.0	803	679	1,337	2,819	0.34	0.34	4	4
0	1 29	68 - 158	38	5	F	T	3.8	523	312	1,152	1,987	1.40	0.25	5	4
0	1 74	69 - 71	25	4	F	T	6.0	1,979	1,306	3,183	6,468	0.77	0.77	4	4
0	1 83	69 - 73	24	4	F	T	6.0	1,079	1,018	2,031	4,128	0.51	0.51	4	4
0	1 87	70 - 72	40	4	F	T	6.0	961	1,520	1,940	4,421	0.57	0.57	4	4
0	1 128	71 - 215	62	5	F	B	3.8	494	388	758	1,640	1.12	0.20	5	4
0	1 86	72 - 98	48	4	F	T	6.0	898	874	1,828	3,600	0.45	0.45	4	4
5	1 9	72 - 119	80	4	F	T	6.5	1,770	1,202	3,765	6,737	0.83	0.83	4	4
0	1 131	73 - 216	22	4	F	T	6.0	673	582	1,281	2,536	0.31	0.31	4	4
0	1 104	74 - 99	29	4	F	T	6.0	324	391	1,242	1,957	0.26	0.26	4	4
55	1 34	74 - 160	106	5	F	T	4.5	369	205	798	1,372	0.97	0.97	5	5
5	1 8	75 - 119	14	4	F	T	6.0	479	1,291	2,798	4,568	0.64	0.64	4	4
0	1 81	76 - 98	40	4	F	T	6.0	1,330	1,401	2,322	5,053	0.82	0.82	4	4
0	1 82	76 - 216	32	4	F	T	6.0	491	612	990	2,093	0.26	0.26	4	4
0	1 75	77 - 78	50	4	F	T	6.0	585	803	1,084	2,472	0.31	0.31	4	4
0	1 80	77 - 98	35	4	F	T	6.0	1,418	1,589	2,320	5,305	0.65	0.65	4	4
0	1 79	77 - 120	57	4	F	T	6.0	1,258	1,065	2,043	4,366	0.53	0.53	4	4
0	1 132	77 - 121	99	5	F	B	5.0	794	358	949	2,101	1.35	0.24	5	4
5	1 3	79 - 80	13	4	F	T	6.0	161	472	4,607	5,240	0.77	0.77	4	4
0	2 42	81 - 82	31	4	F	B	5.5	15	38	524	577	0.09	0.09	4	4
55	2 18	81 - 84	47	4	F	T	5.5	973	361	4,314	5,648	0.75	0.75	4	4
55	2 19	81 - 159	2	4	F	T	5.5	40	56	1,464	1,560	0.23	0.23	4	4
5	2 9	82 - 150	13	3	F	T	7.3	106	394	5,634	6,134	0.76	0.76	3	3
0	2 48	83 - 84	76	4	F	B	5.5	7	2	271	280	0.04	0.04	4	4
65	2 13	83 - 154	11	4	F	T	6.0	2,459	673	3,657	6,789	0.77	0.77	4	4
0	1 107	85 - 99	50	4	F	T	5.5	580	500	3,610	4,690	0.65	0.65	4	4
5	2 4	86 - 87	39	3	F	T	7.3	2,502	921	9,401	12,824	1.39	0.37	3	1
5	2 5	86 - 102	70	3	F	B	7.3	1,970	939	9,197	12,106	1.35	0.38	3	1
0	2 43	87 - 104	26	4	F	B	5.5	1,150	293	678	2,121	0.20	0.20	4	4
0	2 35	88 - 107	16	4	F	B	6.0	498	180	631	1,309	0.15	0.15	4	4
0	2 40	88 - 108	26	4	F	B	5.5	4	0	1	5	0.00	0.00	4	4
35	3 9	89 - 229	157	4	M	B	6.5	349	45	497	891	0.18	0.18	4	4
0	3 29	90 - 115	88	3	M	D	7.3	2,076	172	1,937	4,185	0.61	0.61	3	3
35	3 5	90 - 152	19	4	H	T	6.0	5,583	698	3,159	9,440	1.05	0.88	4	3
0	1 100	92 - 93	68	5	F	T	4.5	1,291	355	792	2,438	1.35	0.24	5	4
0	1 108	92 - 205	91	5	F	B	3.8	852	627	1,574	3,053	2.13	0.37	5	4
0	3 13	94 - 157	37	5	M	B	3.8	17	15	410	442	0.73	0.73	5	5
0	1 26	95 - 156	54	5	F	T	4.5	1,010	227	1,635	2,872	1.88	0.33	5	4
0	1 28	95 - 157	27	5	M	B	3.8	17	15	410	442	0.73	0.73	5	5
50	4 7	96 - 219	139	5	F	B	4.5	166	192	1,472	1,830	1.47	0.28	5	4
0	4 28	97 - 222	255	5	H	G	3.8	124	45	300	469	0.43	0.43	5	5
0	1 105	99 - 214	8	5	F	T	3.8	1	0	526	527	0.45	0.45	5	5
0	1 106	100 - 101	31	5	F	T	3.8	255	97	630	982	0.70	0.70	5	5

LINK NO R#	P#	SER	NODE NO FROM	TO	DIST. (Km)	CLASS	TER-RAIN	SUR-FACE	WIDTH (m)	ASSIGNED VOLUME CAR	BUS	TRUCK	TOTAL	V/C RATIO EXIST.	PROPO.	CLASS EXIST.	PROPO.
0	1	126	100 -	214	9	5	F	T	3.8	204	330	1,019	1,553	1.21	0.21	5	4
0	2	37	103 -	104	30	5	F	B	3.8	368	179	1,932	2,479	1.91	0.34	5	4
0	2	38	104 -	217	41	4	F	B	5.5	1,883	534	2,779	5,196	0.59	0.59	4	4
0	2	21	105 -	106	32	4	F	B	6.5	1,870	974	1,102	3,946	0.40	0.40	4	4
0	2	39	105 -	108	45	5	F	B	5.0	0	0	95	95	0.08	0.08	5	5
0	2	49	105 -	217	14	4	F	B	5.5	1,883	534	2,779	5,196	0.59	0.59	4	4
0	2	30	106 -	122	40	4	F	B	5.5	106	116	135	357	0.04	0.04	4	4
0	2	41	107 -	109	77	5	F	B	5.0	1,293	564	1,716	3,573	2.32	0.41	5	4
0	2	47	108 -	122	13	4	F	B	5.5	4	0	96	100	0.01	0.01	4	4
0	4	33	110 -	224	78	5	H	G	3.8	1,509	840	3,961	6,310	5.92	0.86	5	3
25	4	34	110 -	227	104	5	M	B	3.8	1,401	284	1,323	3,008	3.16	0.55	5	4
0	4	16	111 -	112	118	5	F	G	3.8	12	6	302	320	0.27	0.27	5	5
0	4	21	111 -	113	115	5	F	B	3.8	258	91	343	692	0.45	0.45	5	5
0	4	18	112 -	225	405	5	H	G	3.8	242	109	368	719	0.61	0.61	5	5
0	4	15	112 -	228	155	5	F	G	3.8	12	6	302	320	0.27	0.27	5	5
0	4	19	113 -	114	372	5	F	G	3.8	0	16	646	662	0.57	0.57	5	5
25	4	1	114 -	151	77	5	F	S	4.0	3,527	743	1,155	5,425	2.63	0.48	5	4
0	3	32	115 -	116	33	4	F	D	6.0	2,759	681	2,030	5,470	0.54	0.54	4	4
55	2	14	118 -	232	30	5	F	T	3.8	2,696	878	8,763	12,337	9.03	0.35	5	1
0	1	76	119 -	120	31	4	F	T	6.5	496	484	3,393	4,373	0.81	0.81	4	4
0	1	77	120 -	121	57	4	F	T	6.0	514	618	3,422	4,554	0.83	0.83	4	4
50	4	26	153 -	219	70	5	F	B	4.5	36	62	667	765	0.64	0.64	5	5
55	1	32	159 -	231	109	5	F	T	3.8	467	365	2,038	2,870	2.19	0.38	5	4
0	1	122	161 -	212	12	5	F	T	4.5	105	141	1,449	1,695	1.39	0.24	5	4
0	3	34	203 -	220	80	5	M	B	3.8	606	270	1,195	2,071	2.68	0.47	5	4
0	1	117	204 -	207	51	4	F	T	6.0	532	296	1,123	1,951	0.24	0.24	4	4
0	1	110	205 -	208	31	4	F	T	6.0	716	697	1,761	3,174	0.40	0.40	4	4
0	1	113	206 -	207	21	4	F	T	6.5	1,428	856	1,374	3,658	0.41	0.41	4	4
0	1	112	207 -	208	18	4	F	T	6.5	995	587	1,639	3,221	0.38	0.38	4	4
0	1	116	207 -	209	70	5	F	G	3.8	13	5	226	244	0.20	0.20	5	5
0	1	124	210 -	211	125	4	F	B	5.5	0	0	0	0	0.00	0.00	4	4
0	1	123	211 -	212	50	4	F	B	5.5	570	388	857	1,815	0.22	0.22	4	4
0	1	134	212 -	213	16	5	F	T	4.5	1,289	448	1,320	3,055	1.88	0.33	5	4
0	1	125	213 -	214	118	5	F	G	3.8	573	370	934	1,877	1.28	0.22	5	4
0	4	37	218 -	222	180	5	M	G	3.8	45	18	126	189	0.26	0.26	5	5
0	4	25	219 -	220	97	5	M	G	3.8	0	0	0	0	0.00	0.00	5	5
0	4	31	223 -	224	178	5	M	B	3.8	170	24	541	735	1.02	0.18	5	4
0	4	32	224 -	225	47	5	H	G	3.8	12	6	410	428	0.48	0.48	5	5
0	4	35	225 -	226	26	5	M	G	3.8	12	6	410	428	0.72	0.72	5	5
0	4	36	226 -	227	61	5	M	G	3.8	0	0	4	4	0.01	0.01	5	5
0	4	30	226 -	228	166	5	M	G	3.8	12	6	406	424	0.71	0.71	5	5